Experiences of and support for nurses as second victims of adverse nursing errors: a qualitative systematic review

C.J. Cabilan[1,2] • Kathryn Kynoch[1,3]

[1]Evidence in Practice Unit/The Queensland Centre for Evidence Based Nursing and Midwifery: a Joanna Briggs Institute Centre of Excellence, Mater Misericordiae Limited, Brisbane, Australia, [2]Emergency Department, Princess Alexandra Hospital, Brisbane, Australia, and [3]School of Nursing, Midwifery, and Social Work, The University of Queensland, Brisbane, Australia

EXECUTIVE SUMMARY

Background
Second victims are clinicians who have made adverse errors and feel traumatized by the experience. The current published literature on second victims is mainly representative of doctors, hence nurses' experiences are not fully depicted. This systematic review was necessary to understand the second victim experience for nurses, explore the support provided, and recommend appropriate support systems for nurses.

Objectives
To synthesize the best available evidence on nurses' experiences as second victims, and explore their experiences of the support they receive and the support they need.

Inclusion criteria
Participants
Participants were registered nurses who made adverse errors.

Phenomena of interest
The review included studies that described nurses' experiences as second victims and/or the support they received after making adverse errors.

Context
All studies conducted in any health care settings worldwide.

Types of studies
The qualitative studies included were grounded theory, discourse analysis and phenomenology.

Search strategy
A structured search strategy was used to locate all unpublished and published qualitative studies, but was limited to the English language, and published between 1980 and February 2017. The references of studies selected for eligibility screening were hand-searched for additional literature.

Methodological quality
Eligible studies were assessed by two independent reviewers for methodological quality using a standardized critical appraisal instrument from the Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI QARI).

Data extraction
Themes and narrative statements were extracted from papers included in the review using the standardized data extraction tool from JBI QARI.

Data synthesis
Data synthesis was conducted using the Joanna Briggs Institute meta-aggregation approach.

Results
There were nine qualitative studies included in the review. The narratives of 284 nurses generated a total of 43 findings, which formed 15 categories based on similarity of meaning. Four synthesized findings were generated from the categories: (i) The error brings a considerable emotional burden to the nurse that can last for a long time. In some

Correspondence: C. J. Cabilan, carajoyce.cabilan@health.qld.gov.au

There is no conflict of interest in this project.

DOI: 10.11124/JBISRIR-2016-003254

cases, the error can alter nurses' perspectives and disrupt workplace relations; (ii) The type of support received influences how the nurse will feel about the error. Often nurses choose to speak with colleagues who have had similar experiences. Strategies need to focus on helping them to overcome the negative emotions associated with being a second victim; (iii) After the error, nurses are confronted with the dilemma of disclosure. Disclosure is determined by the following factors: how nurses feel about the error, harm to the patient, the support available to the nurse, and how errors are dealt with in the past; and (iv) Reconciliation is every nurse's endeavor. Predominantly, this is achieved by accepting fallibility, followed by acts of restitution, such as making positive changes in practice and disclosure to attain closure (see "Summary of findings").

Conclusion

Adverse errors were distressing for nurses, but they did not always receive the support they needed from colleagues. The lack of support had a significant impact on nurses' decisions on whether to disclose the error and his/her recovery process. Therefore, a good support system is imperative in alleviating the emotional burden, promoting the disclosure process, and assisting nurses with reconciliation. This review also highlighted research gaps that encompass the characteristics of the support system preferred by nurses, and the scarcity of studies worldwide.

Keywords adverse events; nurses; nursing errors; safety; second victims

JBI Database System Rev Implement Rep 2017; 15(9):2333–2364.

Summary of findings

Review title: Experiences of and support for nurses as second victims of adverse nursing errors: a qualitative systematic review.
Participants: Participants were registered nurses who made adverse errors.
Phenomena of interest: The review included studies that described nurses' experiences as second victims and the support they received after making adverse errors.
Context: The review included all studies conducted in any clinical settings worldwide.

Synthesized finding	Dependability	Credibility	ConQual score
The error brings a considerable emotional burden to the nurse that can last for a long time. In some cases, the error can alter nurses' perspectives and disrupt workplace relations.	Moderate* (7 High + 8 Moderate)	Unequivocal (14 Unequivocal)	Moderate
The type of support received influences how the nurse will feel about the error. Often nurses choose to speak with colleagues who have had similar experiences. Strategies need to focus on helping them to overcome the negative emotions associated with being a second victim.	Moderate* (7 High + 2 Moderate)	Equivocal** (8 Unequivocal + 1 Equivocal)	Low
After the error, nurses are confronted with the dilemma of disclosure. Disclosure is determined by the following factors: how nurses feel about the error, harm to the patient, the support available to the nurse, and how errors are dealt with in the past.	High (5 High)	Equivocal** (3 Unequivocal + 2 Equivocal studies)	Moderate
Reconciliation is every nurse's endeavor. Predominantly, this is achieved by accepting fallibility, followed by acts of restitution, such as making positive changes in practice and disclosure to attain closure.	Moderate* (11 High + 3 Moderate)	Equivocal** (12 Unequivocal + 2 Equivocal)	Low

*Downgraded due to a mix of high and moderate scores of dependability.
**Downgraded due to a mix of unequivocal and equivocal studies.

Background

The seminal report from the Institute of Medicine, To Err is Human: Building a Safer Health System, emphasized unsafe practices in health care, such as medication errors and ineffective communication processes, which often lead to adverse events and deaths that could be prevented.[1] As a result, many prevention strategies have been recommended and implemented to reduce health care errors. These include (but are not limited to) falls assessment and prevention strategies,[2] structured communication processes between clinicians,[3] medication reconciliation,[4] independent double-checks and checklists,[5] and continuing education for clinicians.[6] While the ultimate aim of these strategies is an error-free health care system, the strategies only mitigate errors, not eliminate them.[7]

Errors refer to "the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim".[1(p.4)] Some errors cause adverse events, which are injuries acquired while receiving health care that cannot be attributed to the patients' present illness or medical condition.[1] These injuries can include infections, patient falls and harm from medication errors.[8] Dr James Reason's Swiss Cheese Model illustrates that despite error-prevention strategies in place within a health care system, opportunities for errors (the holes in the Swiss cheese) are always present.[9] Within a health care system, these opportunities can be dormant but have the capacity to cause errors when there is active involvement or trigger by individuals. Examples of these include inadequate supervision, overwhelming workload, insufficient labelling or signage, structural flaws, distractions, technological errors, and inadequate resources.[7,10-12] Human fallibility is also a significant factor to errors because this proves that as humans we are not resistant to the latent conditions in which we work.[9] In the nursing context, the nature of the work of nurses allows more patient contact and opportunities to perform procedures, hence the chances of errors are always present.[13] As fallible beings, nurses are susceptible to work-related fatigue, errors in judgment, memory lapses, distractions and oversights.[5]

When adverse events from nursing errors occur, there are three potential victims: patients, nurses and the health care organization.[14] Patients as primary victims become the priority and the focus of interventions, however caring for the nurses as second victims is also equally important.[15] Second victims are health care professionals who have made an error, and have been formally defined as "healthcare providers who are involved in an unanticipated adverse patient event, in a medical error and/or a patient-related injury and become victimized in the sense that the provider is traumatized by the event".[16(p.326)] The term second victim was first used in an editorial by Dr Albert Wu, who highlighted the emotionally and psychologically devastating effects of adverse medical errors on doctors, and also emphasized the alienation doctors feel from the lack of support from peers and superiors.[17] Second victims are generally traumatized by the event and feel that they are primarily responsible for the adverse event, which consequently induces self-doubt and feelings of failure.[16] Unfortunately, this may be unrecognized due to the misconstrued public view that clinicians (including nurses) are perfect,[17] the name and blame culture,[18] and perhaps the lack of understanding of the second victim phenomenon.[19]

Personal descriptive accounts of second victim experiences in health care have been published since the mid-1980 s.[16] Within the literature the estimated prevalence of second victims in health care varies widely and ranges from 2.5% to 43.3%.[14] Despite the potentially wide prevalence there is little published evidence of the second victim phenomenon in nursing. Evidence suggests that nurses as second victims feel guilty, humiliated, embarrassed, and experience self-blame, frustration, loss of confidence and self-doubt[7,10,17,20-25] that can remain even up to 10 years after the event.[21,25,26] In one study, the lived experience of second victims was reported to be comparable to post-traumatic stress disorder.[21] The reported symptoms include insomnia, burnout, flashbacks, emotional outbursts, distinct incessant thoughts of the event irrespective of the time elapsed, depression, fatigue and anxiety.[10,17,21-24] However, distress can be moderated by the support second victims receive.[27] Unfortunately only 7%[23] to 35%[28] of second victims receive the appropriate support from their superiors or colleagues, which at times prove to be inadequate or substandard.[16,25]

A search in relevant sources (CINAHL, Cochrane Library and *JBI Database of Systematic Reviews and Implementation Reports*) revealed three systematic reviews[14,29,30] and a literature review on this topic.[31] Schwappach and Boluarte[30] summarized the experiences of doctors as second victims. Two

reviews[14,29] highlighted the experiences of all health care providers (i.e. doctors, nurses and allied health) as second victims. However the specific impact to nurses is poorly differentiated. Another limitation of the current published literature on this topic is the disproportion between doctors and nurses as the studies synthesized in the reviews were mostly representative of doctors. Having this distinction is important because it could impair how nurses as second victims are managed and supported.[29] Lewis *et al.*[31] conducted an integrative literature review that modeled the factors that affect nurses' experiences as second victims, in particular, burnout, moral distress, intention to leave and constructive change. An important limitation of this review is that it dilutes nurses' actual experiences as second victims and therefore leaves a risk that the depth of second victimhood in nursing may not be fully depicted.

This systematic review synthesized the available qualitative evidence on the experiences of nurses as second victims and explored the support that these second victims received. It is anticipated that this review will facilitate the understanding of the depth of the second victim experience, explore support strategies, identify gaps in research, and potentially lead to appropriate care processes for second victim nurses. The methods of this review has been described and published previously.[32]

Objectives

The review aimed to answer the following questions:

1. What are the experiences of nurses as second victims of adverse nursing errors?
2. What type of support do nurses receive as second victims of adverse nursing errors?
3. How do nurses perceive or experience the support they receive as second victims of adverse nursing errors?

Inclusion criteria

Types of participants

Participants were registered nurses who had unintentionally made adverse clinical errors. Nurses who witnessed an adverse error but had been emotionally or psychologically affected were excluded.

Phenomenon of interest

This review considered studies that investigated the second victim phenomenon or experience. In this review, second victims were registered nurses who had made an adverse error (i.e. medication error, fall, procedural error), and felt traumatized by the event as a result.[16] In this review, adverse errors were errors that resulted in harm (i.e. temporary, permanent or death) to the patient.[1] Further, studies that examined nurses' experiences of the support they received were also included.

Context

This review included all studies that sought to investigate the second victim phenomenon in all health care settings worldwide.

Types of studies

This review considered studies that focused on qualitative data including, but not limited to, designs such as phenomenology, grounded theory, ethnography, action research, feminist research, discourse analysis, and mixed methods.

Search strategy

The search strategy aimed to find both published and unpublished studies. An initial limited search of MEDLINE and CINAHL was undertaken followed by analysis of the text words contained in the title and abstract, and of the index terms used to describe the article. Initial keywords used were: nurses, errors, health care errors, nursing errors, medication errors, adverse events, second victims, moral distress, emotional distress, psychological distress. A second search using all relevant keywords and subject headings was subsequently undertaken across all included databases. The final search strategy can be found in Appendix I.

In the final search, studies published in English language (due to limited funding for translators) between 1980 and February 8, 2017 were sought in PubMed, CINAHL, PsycINFO, Embase and Web of science. OpenGrey and ProQuest Dissertations and Theses were also accessed to obtain unpublished studies. The date range was chosen because 1980 was the year when publication of nurses' descriptive accounts as a second victim commenced.[33,34] Handsearching in the references of the studies assessed for eligibility was also performed.

Assessment of eligibility and methodological quality

The final papers that were located by the search strategy were screened for relevance using the title and abstract. Full text of papers that were deemed

relevant were retrieved to verify their eligibility based on the inclusion criteria.[35] Subsequently eligible papers were assessed by two independent reviewers for methodological quality using a standardized critical appraisal instrument from the Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI QARI) Any disagreements between the reviewers were resolved through discussion.

Data extraction

Qualitative data were extracted from papers included in the review using the standardized data extraction tool from JBI QARI (Appendix II). The data extracted included geographical location, setting, number of participants, participant demographics (e.g. age, sex, years of experience), type of error, method of data collection, study design and study findings.

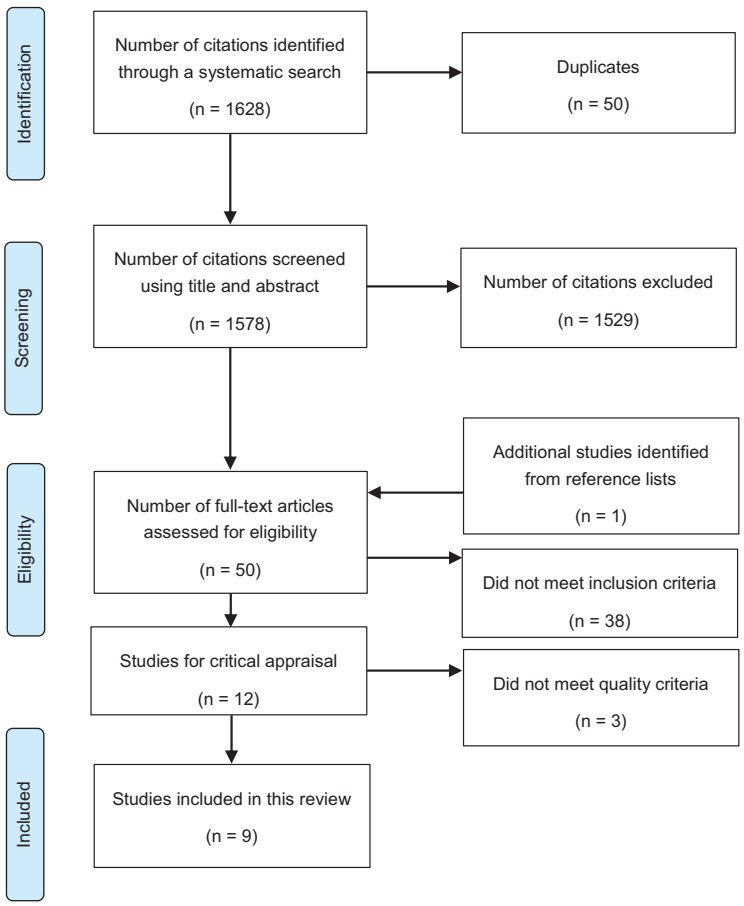
Data synthesis

Qualitative research findings were pooled using JBI QARI. This process involved aggregation or synthesis of findings to generate a set of statements that represented that aggregation, through assembling the findings rated according to their quality, and categorizing these findings on the basis of similarity in meaning. These categories were then subjected to a meta-synthesis in order to produce a single comprehensive set of synthesized findings that could be used as a basis for evidence-based practice.

Results

Description of studies

The searches yielded 1628 citations, of which, 50 were duplicates, and 1578 were screened for relevance using the title and abstract (Figure 1).



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097.

Figure 1: Flowchart of study selection and inclusion process

Subsequently, 49 papers were retrieved for eligibility review against the inclusion criteria. The references of these papers were also hand-searched for additional literature, wherein one paper was identified. There were 38 papers (Appendix III) that did not meet inclusion criteria, thus 12 were appraised for methodological quality.

Methodological appraisal of studies

Three papers[10,19,24] were excluded because the research methodology was not sound (Appendix IV). The studies did not meet any of the following criteria that were essential to the concept of dependability in qualitative research:[36]

i) Is there congruity between the research methodology and the research question or objectives?
ii) Is there congruity between the research methodology and the methods used to collect data?
iii) Is there congruity between the research methodology and the representation and analysis of data?

Overall, nine studies were included. The included studies fulfilled all of the quality criteria with the exception of three studies.[21,22,37] Two peripheral quality criteria were not met in these studies: Criteria 6 (Is there a statement locating the researcher culturally or theoretically?) and Criteria 7 (Is the influence of the researcher on the research addressed, and vice-versa, addressed?) (see Table 1).

Review findings

The findings of this review comprised narratives of 284 registered nurses in nine qualitative studies. The study design was mainly phenomenological.[21,22,26,37-40] Studies were published between 1994 and 2017. Nurses were mostly women, aged

Table 1: Assessment of methodological quality

Criteria	1	2	3	4	5	6	7	8	9	10	Final
Included papers											
Arndt[41]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dyal[38]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rassin *et al.*[21]	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Crigger and Meek[42]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Santos *et al.*[22]	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Schelbred and Nord[26]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Luk *et al.*[39]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Treiber and Jones[40]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ajri-Khameslou *et al.*[37]	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Excluded papers											
Serembus *et al.*[24]	No	No	No	No	No	No	UC	Yes	Yes	No	No
Maiden[10]	No	No	No	No	No	No	No	No	Yes	No	No
Scott *et al.*[19]	UC	UC	UC	UC	UC	No	No	Yes	Yes	No	No

UC, Unclear.
Criteria:
1 – Is there congruity between the stated philosophical perspective and the research methodology?
2 – Is there congruity between the research methodology and the research questions or objectives?
3 – Is there congruity between the research methodology and the methods used to collect data?
4 – Is there congruity between the research methodology and the representation and analysis of data?
5 – Is there congruity between the research methodology and the interpretation of results?
6 – Is there a statement locating the researcher culturally or theoretically?
7 – Is the influence of the researcher on the research addressed, and vice-versa, addressed?
8 – Are participants, and their voices, adequately represented?
9 – Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?
10 – Do the conclusions drawn from the research report flow from the analysis, or interpretation, of the data?

between 21 and 60 years, and their post-registration experience ranged from six months to 40 years. Six studies described nurses' second victim experiences associated with adverse medication errors,[22,26,38-41] while the other three studies were combined experiences of nurses who made any nursing errors that led to adverse events.[21,37,42] The studies were conducted in hospital ward settings,[21,26,38,39,41,42] critical care departments (including emergency departments),[22,37] and one study did not specify the settings.[40] Studies were conducted in Germany and Scotland,[41] Canada,[38] United States of America,[40,42] Israel,[21] Brazil,[22] Norway,[26] Macau[39] and Iran.[37] The characteristics of the included studies are summarized in Table 2.

The review had a total of 43 study findings, which formed 15 categories based on similarity in meaning. Four synthesized findings were generated from the categories. All extracted findings are detailed in Appendix V.

Meta-synthesis

Synthesized finding 1

The error brings a considerable emotional burden to the nurse that can last for a long time. In some cases, the error can alter nurses' perspectives and disrupt workplace relations.

This synthesized finding was derived from 15 study findings and five categories. Nurses considered the error to be personally and professionally

Table 2: Characteristics of included studies

Study	Location	Setting	Number of participants	Age (years)	Post-registration experience (years)	Women (%)	Type of errors	Study design	Method of data collection
Arndt[41]	Germany and Scotland	Hospital	40	Not reported	3 and over	Not reported	Adverse medication errors	Discourse analysis	Interviews, free-text report
Dyal[38]	Canada	Hospital	5	30 to 60	10 to 15	5 (100%)	Adverse medication errors	Phenomenology	Interviews
Rassin *et al.*[21]	Israel	Hospital	21	21 to 52	1 to 20	14 (67%)	All adverse nursing errors	Phenomenology	Interviews
Crigger and Meek[42]	USA	Hospital	10	25 to 57	1 to 35	Not reported	All adverse nursing errors	Grounded theory	Interviews
Santos *et al.*[22]	Brazil	Hospital: Critical care including emergency department	15	22 to 49	1 to 20	Not reported	Adverse medication errors	Phenomenology	Interviews
Schelbred and Nord[26]	Norway	Hospital, community, nursing home	10	Not reported	0.5 to 30	10 (100%)	Adverse medication errors	Phenomenology	Interviews
Luk *et al.*[39]	Macau	Hospital: medical, surgical, paediatric, outpatient, and emergency department	7	Not reported	1 to 5	7 (100%)	Adverse medication errors	Phenomenology	Interviews
Treiber and Jones[40]	USA	Not reported	158	Not reported	1 to 40	123 (78%)	Adverse medication errors	Phenomenology	Free text responses from survey
Ajri-Khameslou *et al.*[37]	Iran	Emergency department	18	23 to 48	4 months to 22 years	10 (55.5%)	All adverse nursing errors	Phenomenology	Interviews

traumatizing. Several negative emotions afflicted the nurse after an adverse error; some of these were described as panic, shock, devastation, disbelief, guilt, shame and loss of confidence. Nurses affirmed that these emotions can linger for years. The distress nurses felt also came from the fear and worry of the harm they could cause to the patient, and how the error would impact their professional image and their employment.

Category 1: Emotional distress immediately afflicts the nurse after the error

All nurses reported that they felt panic, shock, disbelief, shame and anger that they made the error:

''I felt absolutely sick when I realized I gave a double dose''.[40,p.1333]

Category 2: The distress after the error is caused by the fear of causing harm to the patient

The error activated a sense of fear for the patient's welfare. One nurse spoke of the experience:

''My thoughts were this could be very serious incident, could jeopardize my patient's health. I felt responsible, I felt guilty, I felt devastated, and very stressed''.[38,p.47]

To ensure the patient's safety, nurses consulted the doctors immediately and constantly monitored their patient's status:

''I at once went to the doctor because I wanted to prevent complications from the patient. By the end of the shift I was very stressed out, and all the time I checked if he's ok''.[21,p.878]

Category 3: Afflicted by distress after the error: ''I might get fired''

It was evident that nurses were worried how the error would have a catastrophic impact on their career:

''It was a cascade of thoughts. I replayed what happened and couldn't sleep right. I thought how the system would treat the mistake, will they keep me or throw me out''.[21,p.880]

Category 4: Afflicted by distress after the error: ''. . .it will always be on my mind''

Negative emotions such as guilt, shame, and loss of confidence were present even up to two years after the event. Despite the time that had elapsed, nurses were able to recall the event as if it only just occurred:

''Time went by and it still lingers on. For a few months I was very nervous, I had difficulties falling asleep, because most of the time my mind kept busy thinking about it. It's hard even today, it left me deeply traumatized. I can't forgive myself. When I distribute medication I have to do it with another nurse. Every time I treat it like it's my first. It damaged my confidence a lot''.[21,p.882]

The experience was likened to the symptoms of post-traumatic stress disorder by some nurses.

Category 5: The error can alter nurses' self-image and disrupt relationships in the workplace

Errors dented the nurses' confidence. Nurses asserted that they avoided tasks that previously led to a mistake:

''I tried not to deal with urinary catheterization and if I did, I was very careful. Furthermore, if there was a case which was difficult for me to do as catheterization in bladder, I said that I was not able to do''.[37,p.73]

The error impacted on relationships within the department. The study described nurses as being ''exhausted in the teamwork instead of getting positive energy''[37,p.73] in their workplace. There was a sense of distrust and astonishingly some nurses were treated with disrespect and mocked for their errors:

''Whenever I have to work with some careless nurses who were causing problems, I tried to either change my shift or in some case that there was no other choice, I did all the tasks on my own and tried to avoid them''.[37,p.73]

Nurses remarked that this type of treatment was neither helpful nor constructive. This rang true to one nurse who was crippled by the ordeal, as the study described:

''For the nurse who was exposed to criticism and reproach by her management, the error was devastating to both her personal and professional life. She was no longer capable of working as a nurse, and although she did not feel disabled, she was in no position to find another job, yet felt embarrassed and ashamed of having a professional in which she could no longer participate''.[26,p.321–322]

Synthesized finding 2

The type of support received influences how the nurse will feel about the error. Often nurses choose to speak with colleagues who have had similar experiences. Strategies need to focus on helping them to overcome the negative emotions associated with being a second victim.

This synthesized finding was derived from nine study findings and three categories. Many nurses expressed the need to speak about their experience

with a person they trusted such as their partner, friend or a close family member. As well, nurses spoke about how they were and should be treated by their colleagues and supervisors.

Category 1: The sources of support for the nurses

"I wanted someone to help me",[22,p.485] lamented the nurse at the time of the error.

Nurses looked for support and sought a person they trusted to talk to. Some chose to speak to their partner, best friend or relative, but others preferred to speak to a health care professional because they felt that their family would lack the foundation for understanding what they were experiencing. The experiences of a second victim can be isolating, therefore having someone to talk to about the error generated a feeling of assurance that they were not alone:

"Well, my closest colleagues who I work with all the time and who I trust, who I can sit down and talk to and say you know, 'this is what happened' and, you know, they could, you know, they kind of let me know that, you know, this could happen to anybody. So having the support of your colleagues to me is very important".[38,p.59]

Not all nurses who had support felt better about what transpired; to some, time was imperative to recovery:

"For most of them (nurses), time was an important factor: as time went by, the anguish lessened".[26,p.321]

Category 2: Nurses' perceptions of the support they receive from colleagues and managers

The level of support received influenced how nurses coped with the error. Unfortunately, the treatment of the nurses by their colleagues and/or manager was not always supportive. Nurses indicated that they reported their error because it was a means of getting their colleagues to support them and they also felt that having the support would lighten the burden of guilt. For some nurses, ridicule and punitive action were all that awaited them. On the other hand, some nurses indicated that their colleagues were understanding, comforting, helpful and supportive. Nurses described that this type of treatment alleviated their guilt, shame, fear and loss of confidence. As one nurse recalled:

"My senior told me that what happened was already past. I also had done the self-evaluation. She encouraged me not to be frustrated because of that event. She said not to be confused by that incident; otherwise it would be easy to make more mistakes. I would then pay more attention to everything I encountered. I was touched by hearing her words. Actually, our seniors were very helpful and appreciated our work. They would not dismiss staff because of minor events. They wanted us to learn from our mistakes, to think of improvement and ways of making our work better".[39,p.32]

Category 3: Recommendations from second victims

Nurses recommended that institutions steered away from the culture of punishment:

"It helps if your facility has a non-punitive approach to med errors (as my facility does). This encourages reporting so that trends/patterns can be identified and improvement projects implemented".[40,p.1338]

Synthesized finding 3

After the error, nurses are confronted with the dilemma of disclosure. Disclosure is determined by the following factors: how nurses feel about the error, harm to the patient, the support available to the nurse, and how errors are dealt with in the past.

This synthesized finding that pertains to the dilemma of disclosure was derived from three categories from five findings. Disclosure was done in two ways: informing the patient about the error and incident reporting. Although nurses were willing to report their error, the act of disclosure hinged on several factors.

Category 1: Nurses believe that disclosure is a responsibility, thus they are willing to report their errors

Several nurses asserted their willingness to report their error:

"...facing up to your responsibility, being accountable for what you do, that's what it's all about".[41,p.523]

"I have to inform my manager".[41,p.523]

The milieu of responsibility of disclosure originates from professional accountability and personal beliefs. Nurses believed that disclosure was an inherent responsibility of the profession. As a nurse, one was accountable for their actions and their consequences, be it therapeutic or harmful, therefore, nurses accepted disclosure as a responsibility. On the other hand, nurses also felt that disclosure was a moral responsibility to inform the patients. However, despite the nurses' readiness to disclose

their errors it was clear that this was not adhered to all the times, as described in one study:

''Several felt a moral responsibility to inform the patient about the error, its consequences, and that they were responsible. Others told the patients about the medication error, but failed to disclose the possible consequences, or that they themselves were responsible. The latter was because they were ashamed and disappointed in themselves''.[26,p.320]

Category 2: Disclosure is not likely to occur if there is little or no harm to the patient

Studies described that if the error was not serious but likely to be detected, it was probable that nurses would file an incident report. However, for minor errors that wereunlikely to be detected, there was a tendency that the error would be unreported. There was an indication that only errors that caused harm were reported:

''I didn't tell the patient that he was given the wrong medication. I was afraid it would affect his illness when I told him. The medicine I gave him was vitamins and one was a coagulant. It didn't really matter. So, I didn't immediately tell him he was given an incorrect medication''.[39,p.31]

Category 3: Support is pivotal to the nurse's decision to disclose their error

The availability of support and the nurse's experience of how previous errors were handled had a significant influence in disclosure. There was an implication that if errors were handled negatively in the past, nurses were unlikely to report their errors:

''If it was in a similar situation, I would feel very reluctant to inform the nursing officer. Unless I knew the nursing officer and I knew that they were going to support me''.[41,p.523]

Synthesized finding 4

Reconciliation is every nurse's endeavor. Predominantly, this is achieved by accepting fallibility, followed by acts of restitution, such as making positive changes in practice and disclosure to attain closure.

This synthesized finding, which provides an insight into the key elements of reconciliation after making an error, is derived from four categories from 14 study findings.

Category 1: Reconciliation is every nurse's endeavor

There are no direct quotes for this study, however, the following was described in a study:

''Reconciling means to bring to acquiescence or to resolve an issue or situation. In reconciling, one might not be happy with the outcome but still has some degree of acceptance and acquiesces to the situation. In this instance, once participants perceived that mistakes had occurred and that they were responsible, their self-esteem plummeted, and their focus became one of regaining their self-worth through making it right''.[42,p.179]

Category 2: Accepting fallibility, particularly to the factors, places nurses at risk of errors

Arndt added that reconciliation was a necessity for every nurse to reverse the guilt associated with making the error.[41] Reconciliation amongst nurses started with having an awareness of their weakness, ''I was not the only one to do such thing'',[41,p.524] as one nurse said. This insight also allowed nurses to liberate themselves from self-blame, and acknowledge their fallibility to the factors that placed them at risk. Stress, work overload, distractions, inattention and lack of concentration were frequently mentioned:

''It was two years ago. In winter there was huge and catastrophic pressure in the ward. Lots of geriatric patients. In a momentary absent mindlessness, the error occurred. Luckily for me I picked it up in a couple of minutes, so the patient's condition hadn't worsened''.[21,p.876]

Category 3: The error serves as a foundation for improvements in practice

In line with the primary objective to ''make it right'',[42,p.179] nurses ensured that the errors were not repeated. Nurses reported that they undertook education and training, and made behavioral changes. Vigilance, cautiousness and heightened awareness were frequently described:

''I was familiar with these patients and didn't check armbands—it was an automatic thing to go to the patient I was talking to. I tell patients now and have for years not to talk to a nurse while she is giving meds. Barcode med administration would not have helped in my error. Barcode med administration is important but the nurse must always be diligent and stay focused''.[40,p.1337]

''Well it's allowed me to be more careful, to check medication more carefully, or sometimes at the medication cart it can be very distracting because it's ten o'clock, everybody is trying to give their medication at the same time. I try not to do my med administered in a rush, you know. I just tell

people look and find, you gotta wait and don't rush''.[38,p.61]

Category 4: Disclosure brings a sense of closure to the nurse

In one study disclosure was described as an important element of reconciliation:

''The acting phase for the publicly known error included apologizing to the parties who were affected by the error and, in some instances, making restitution. Participants said they usually felt relief and a sense of closure when the mistake was disclosed and dealt with. In a very different trajectory for action after the privately known error, steps to disclose and deal with the error were not followed. Our participants never described personal instances of non-disclosed mistakes that caused harm, but such instances were described in stories of mistakes by others''.[42,p.181]

However, it was apparent that not every second victim had the opportunity to attain closure and there was little understanding of the course of reconciliation for these nurses who internalized their errors.

Discussion

This review aimed to highlight the second victim phenomenon in nursing and determine the support provided to the nurses experiencing second victimhood. Adverse nursing errors are not only devastating for patients, but the effects also resonate among nurses. As second victims, nurses are burdened by emotionally distressing states that are expressed as panic, shock, devastation, disbelief, guilt, shame, worry and loss of confidence. Alarmingly, these can persist long-term. Nurses do not always receive the support they need. Some choose to speak about their experience to their close kin, but feel that this is insufficient as family members may be ignorant of the health care process and the extent of the emotional distress. Colleagues and managers can be sources of support, and often nurses turn to the ones they trust. The treatment of the second victim is not always pleasant as some can be made to feel worse. Despite the desire to disclose their error, the nurse's decision whether to disclose an error is ultimately determined by the degree of harm to the patient and how they are supported. Reconciliation is an important process for which every second victim strives in order to regain their self-worth. Few pivotal steps are necessary towards reconciliation, which include: nurses' acknowledgement of their vulnerability to errors, improvements in practice, and disclosure of errors.

The review findings are echoed in other literature and systematic reviews.[14,29-31] Previous reviews,[14,29,30] although mostly represented by doctors, also found that second victims experience distress, self-doubt, confusion, fear, remorse, guilt, feelings of failure, depression, anger, shame and inadequacy that they have to deal with for a long time. Several factors influence the distress of nurses as second victims. First, the nurse's negative emotional response (i.e. shame. guilt, loss of confidence) can be attributed to the altruistic foundation on which the profession is built. Altruism infers that the nurse possesses expert knowledge and has the transcendent aim to heal.[43] First, adverse errors can therefore be seen as a betrayal of their purpose of facilitating healing. Second, it is likely that the emotions are triggered by the harm or the possibility of fatally injuring the patient. As one nurse reported, ''I was devastated. I was afraid I could kill my pt [patient]. It was horrible!''[40] Third, distress can be due to the anxiety nurses feel about their jobs after the adverse error. Finally, much of the anguish felt by nurses can be caused by the detrimental treatment they received from their colleagues.

It is difficult to dismiss the possibility that had support been adequate for nurses, perhaps the emotional distress they felt could be less severe. Several nurses in this review did not feel that they were offered adequate support or that support was made available for them,[21,26,39,41] but this is not uncommon. In a survey of 269 health care professionals, 65% reported that they dealt with the personal aftermath of errors by themselves.[28] In another study, second victims were made to face the inquiry without being briefed of its process or being debriefed of its outcome.[25] The lack of a good support system has important implications for the nurses' well-being. Nurses seek support to lessen the emotional burden.[41] Hence, in the absence of a good support system, distress is likely to worsen,[30,44,45] and moving forward can become harder for the second victim.[16]

The absence of a supportive culture also influences the process of disclosure.[41,42] Five rights of second victims have been suggested, which include: right to treatment, right to respect, right to understanding and compassion, supportive care and transparency, and opportunity to enhance practice.[46] In

the absence of these, organizations risk cultivating a culture of non-disclosure and underreporting.[47] The danger of non-disclosure is it creates a significant discord and distrust between patients and the health care service,[48] and leaves safety risks unaddressed.[49]

Reconciliation is crucial to enable the second victim to regain his or her self-worth. Three actions are necessary for the process of reconciliation: nurses' acceptance of their fallibility to errors, making constructive changes in practice, and disclosure. However, Crigger and Meek asserted that these were ''healthier responses''[42(p.177)] because other nurses kept silent about their second victim experience. Similarly, Scott *et al.*[16] revealed that second victims could either drop out, survive or thrive. Dropping out involves leaving the profession or workplace. Surviving is being able to live with the disappointment and torment that an adverse error has been committed. Thriving is characterized by the ability to cope by turning the negative event into something beneficial. Reconciliation is an interplay between the severity of the psychological toll of the error and the nature of the support system. Inadequate support systems hamper the reconciliation process because it damages the nurse's confidence to practice and leads to anxiety, error internalization and isolation.[7] Conversely, a supportive culture helps nurses unload negative emotions, accept responsibility, and make constructive changes in practice.[7,50]

This review establishes the importance of a supportive culture in nursing, and for nurses (second victims) to have access to a support person who is well-oriented with the processes of the health care systems (e.g. nursing colleagues, nursing managers) immediately after the error. A supportive culture can minimize the emotional burden of second victims, encourage disclosure and facilitate reconciliation. Second victims must be treated with respect, and in a manner that does not impose blame and subject them to shame.[46] Seys *et al.*[27] adds that second victims need to be reassured by their supervisors that they are valued and trusted. What is unclear from this review and would benefit from research is an exploration of how and where else nurses want to receive the support, how frequently, and for how long. In a previous study, second victims expressed the need to be given time off from work to recollect one's thoughts; receive information about the management of adverse errors, the second victim phenomenon, and information about available support networks; and have confidential access to a support system at any time.[28] There can be three sources of support for second victims: i) departmental support, ii) trained peer support, and iii) external support.[28] Departmental support can include a respected person from the second victim's unit that can provide one-on-one, face-to-face reassurance immediately after the error. Trained peer support can include personnel from occupational health and safety who acts as the second victim's support person through the inquiry or litigation. External support can be sought from employee assistance programs, pastoral care, social work, a psychologist or a counsellor.[28] However, a respected peer is the support system most desired by the second victims.[51] Recently, peer support programs have been trialed and received positively by health care professionals including nurses.[52,53] The effectiveness of peer support programs has not yet been established.

The findings of this revew are not only relevant for the development of support strategies or network for second victims, but also imperative for the uptake of error prevention strategies. As Dr Caroline Clancy insinuated, ''The best way to avoid second-victimhood is obviously to avoid patient harm in the first place''.[54(p.4)] However, it is dangerous to assume that second victims can be negated by the avoidance of mistakes altogether as risks of error are always present for nurses.[55] Many of the adverse nursing errors are related to medication administration, patient monitoring (e.g. deterioration, falls), pressure injuries, and lack of equipment or resources.[56] Perhaps error prevention strategies that focus on these practices can highlight that error prevention does not just safeguard patients from harm but are also vital to protect nurses from being second victims. Therefore, the management of second victims warrants a place alongside error prevention.

Limitations

The views of female nurses were mostly represented in this review. In view of previous findings that women tend to worry and experience disrespect,[14] our findings may not be representative of male nurses.

Although the search strategy was designed to include all relevant publications, it is still possible that the search strategy used in this review might have omitted publications that were not indexed in

MeSH (Medical Subject Headings) terms. Nevertheless, the final search strategy for this review was deemed the best out of the other keyword combinations. As well, it is worth noting that this review was able to capture studies that should have been included in other reviews.[14,29]

Since 1980, only nine qualitative studies of sound methodological quality explored the experiences of second victims. The knowledge base of second victimhood in nursing is still in its infancy,[31] but this is not to be understood that second victims in the nursing profession are scarce. Overall, there is much work to be done to highlight the prevalence of second victims and the second victim support system in nursing.

Conclusion

The aftermath of adverse errors proves difficult for nurses. As second victims, nurses experience emotional torment that lingers over time which may be manifested in shock, disbelief, guilt, shame, loss of confidence and worry. Unfortunately, not all nurses receive appropriate and adequate support at the time of need. It is evident that, for some, judgement, blame and disciplinary action are all they receive. For most nurses, this reception prevents nurses from reporting their errors formally to their managers, and informing patients. However, some nurses have colleagues who are understanding, comforting, helpful and supportive, which alleviate the emotional burden. After the error, nurses attempt to reconcile with the event by accepting their vulnerabilities to errors, learning from the error, and having disclosure.

Implications for practice

The review highlights the distressing experiences of nurses as second victims. The review recommends that this must be acknowledged as an expected response to adverse errors, therefore support for these nurses is paramount. Based on the studies included in this review, the following recommendations have been developed:

(1) It is important for health care services to acknowledge the detrimental effects of adverse errors on nurses.
(2) Nurses must have access to a support person whom they trust, is well-oriented with the health care system and understands the experiences of second victims.
(3) The treatment of nurses must be without judgment, blame and punitive action in order to facilitate disclosure and reconciliation, and minimize the distress associated with being a second victim of adverse nursing errors.

Implications for research

Further studies are warranted to describe the experiences of nurses as second victims. In particular, the experiences of male nurses as second victims may be worth exploring as they are currently underrepresented. There are several research gaps in the desired support system of nurses that include but are not limited to: additional sources of support other than peers, delivery of support, its frequency, and the length of time the support is required. Therefore, further research is necessary to establish the desired support system of second victims.

References

1. Institute of Medicine. To err is human: Building a safer health system. Washington, DC: National Academy of Sciences; 1999.
2. Australian Commission on Safety and Quality in Health Care. Guidebook for preventing falls and harm from falls in older people: Australian hospitals. 2009.
3. Leonard M, Graham S, Bonacum D. The human factor: the critical importance of effective teamwork and communication in providing safe care. Qual Saf Health Care 2004;13(suppl 1):i85–90.
4. Lehnbom EC, Stewart MJ, Manias E, Westbrook JI. The impact of medication reconciliation and review on clinical outcomes. Ann Pharmacother 2014;48(10):1298–312.
5. Benner P, Sheets V, Uris P, Malloch K, Schwed K, Jamison D. Individual, practice, and system causes of errors in nursing: a taxonomy. J Nurs Adm 2002;32(10):509–23.
6. Institute of Medicine. Crossing the quality chasm: A new helath system for the 21st century (brief report). Washington, DC: 2001.
7. Meurier C, Vincent C, Parmar D. Learning from errors in nursing practice. J Adv Nurs 1997;26(1):111–9.
8. Australian Institute of Health and Welfare. Adverse events 2015 [March 17, 2015]. Available from: http://www.aihw.gov.au/haag11–12/adverse-events/.
9. Reason J. Human error: models and management. Br Med J 2000;320(7237):768–70.
10. Maiden J, Georges JM, Connelly CD. Moral distress, compassion fatigue, and perceptions about medication errors in certified critical care nurses. Dimens Crit Care Nurs 2011;30(6):339–45.
11. Taxis K, Barber N. Ethnographic study of incidence and severity of intravenous drug errors. Br Med J 2003;326 (7391):684.

12. Tran D, Johnson M. Classifying nursing errors in clinical management within an Australian hospital. Int Nurs Rev 2010;57(4):454–62.
13. Bolton LB, Donaldson NE, Rutledge DN, Bennett C, Brown DS. The Impact of Nursing Interventions Overview of Effective Interventions, Outcomes, Measures, and Priorities for Future Research. Med Care Res Rev 2007;64(2 suppl):123S–43S.
14. Seys D, Wu AW, Van Gerven E, Vleugels A, Euwema M, Panella M, *et al*. Health care professionals as second victims after adverse events: a systematic review. Eval Health Prof 2013;36(2):135–62.
15. Manser T. Managing the aftermath of critical incidents: meeting the needs of health-care providers and patients. Best Pract Res Clinl Anaesthesiol 2011;25(2):169–79.
16. Scott S, Hirschinger LE, Cox KR, McCoig M, Brandt J, Hall LW. The natural history of recovery for the healthcare provider "second victim" after adverse patient events. Qual Saf Health Care 2009;18(5):325–30.
17. Wu AW. Medical error: the second victim: the doctor who makes the mistake needs help too. Br Med J 2000;320(7237):726.
18. Wolf ZR, Serembus JF. Medication errors: ending the blame-game. Nurs Manag (Harrow) 2004;35(8):41–8.
19. Cox KR, Hirschinger LE, Scott SD. Sharing the load of a nurse "second victim" 2008 [May 15,2015]. Available from: http://www.modernmedicine.com/modern-medicine/news/modernmedicine/modern-medicine-feature-articles/sharing-load-nurse-second-victi.
20. R E. The mistake I'll never forget. Nursing (Lond) 1990;20(9):50.
21. Rassin M, Kanti T, Silner D. Chronology of medication errors by nurses: accumulation of stresses and PTSD symptoms. Issues Ment Health Nurs 2005;26(8):873–86.
22. Santos JO, Silva AEB, Munari DB, Miasso AI. Feelings of nursing professionals after the occurrence of medication errors. Acta Paulista de Enfermagem 2007;20(4):483–8.
23. Wolf ZR, Serembus JF, Smetzer J, Cohen H, Cohen M. Responses and concerns of healthcare providers to medication errors. Clin Nurse Spec 2000;14(6):278–90.
24. Serembus JF, Wolf ZR, Youngblood N. Consequences of fatal medication errors for health care providers: A secondary analysis study. Medsurg Nurs 2001;10(4):193.
25. Ullström S, Sachs MA, Hansson J, Øvretveit J, Brommels M. Suffering in silence: a qualitative study of second victims of adverse events. BMJ Qual Saf 2014;23(4):325–31.
26. Schelbred A, Nord R. Nurses' experiences of drug administration errors. J Adv Nurs 2007;60(3):317–24.
27. Seys D, Scott S, Wu A, Van Gerven E, Vleugels A, Euwema M, *et al*. Supporting involved health care professionals (second victims) following an adverse health event: a literature review. Int J Nurs Stud 2013;50(5):678–87.
28. Scott SD, Hirschinger LE, Cox KR, McCoig M, Hahn-Cover K, Epperly KM, *et al*. Caring for our own: deploying a system-wide second victim rapid response team. Jt Comm J Qual Patient Saf 2010;36(5):233–40.
29. Sirriyeh R, Lawton R, Gardner P, Armitage G. Coping with medical error: a systematic review of papers to assess the effects of involvement in medical errors on healthcare professionals' psychological well-being. Qual Saf Health Care 2010;19(6):1–8.
30. Schwappach DL, Boluarte TA. The emotional impact of medical error involvement on physicians: a call for leadership and organisational accountability. Swiss Med Wkly 2009;139(1):9.
31. Lewis EJ, Baernholdt M, Hamric AB. Nurses' experience of medical errors: an integrative literature review. J Nurs Care Qual 2013;28(2):153–61.
32. Cabilan C, Kynoch K. The experiences of and support for nurses as second victims of adverse nursing errors: a qualitative systematic review protocol. JBI Database System Rev Implement Rep 2015;13(9):63–71.
33. Hilfiker D. Facing Our Mistakes. N Engl J Med 1984;310(2):118–22.
34. Levinson W, Dunn PM. A piece of my mind. Coping with fallibility. JAMA 1989;261(15):2252.
35. Higgins J, Green S. Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]: The Cochrane Collaboration; 2011. Available from: www.cochrane-handbook.org.
36. Munn Z, Porritt K, Lockwood C, Aromataris E, Pearson A. Establishing confidence in the output of qualitative research synthesis: the ConQual approach. BMC Med Res Methodol 2014;14(1):108.
37. Ajri-Khameslou M, Abbaszadeh A, Borhani F. Emergency Nurses as Second Victims of Error: A Qualitative Study. Adv Emerg Nurs J 2017;39(1):68–76.
38. Dyal SV. Nurses' perceptions of their experiences with medication administration errors [M. S.]. Ann Arbor: D'Youville College; 2005.
39. Luk LA, Ng WIM, Ko KKS. Nursing management of medication errors. Nurs Ethics 2008;15(1):28–39.
40. Treiber LA, Jones JH. Devastatingly human: An analysis of registered nurses' medication error accounts. Qual Health Res 2010;20(10):1327–42.
41. Arndt M. Nurses' medication errors. J Adv Nurs 1994;19(3):519–26.
42. Crigger NJ, Meek VL. Toward a theory of self-reconciliation following mistakes in nursing practice. J Nurs Scholarsh 2007;39(2):177–83.
43. Milton CL. Altruism. Nurs Sci Q 2012;25(3):222–4.
44. Lewis EJ, Baernholdt MB, Yan G, Guterbock TG. Relationship of adverse events and support to RN burnout. J Nurs Care Qual 2015;30(2):144–52.
45. Quillivan RR, Burlison JD, Browne EK, Scott SD, Hoffman JM. Patient safety culture and the second victim phenomenon: connecting culture to staff distress in nurses. The Joint Commission Journal on Quality and Patient Safety 2016;42(8):377–82.

46. Denham CR. TRUST: the 5 rights of the second victim. J Patient Saf 2007;3(2):107–19.
47. Fung WM, Koh SSL, Chow YL. Attitudes and perceived barriers influencing incident reporting by nurses and their correlation with reported incidents: a systematic review. JBI Database System Rev Implement Rep 2012;10(1):1–65.
48. McVeety J, Keeping-Burke L, Harrison MB, Godfrey C, Ross-White A. Patient and family member perspectives of encountering adverse events in health care: a systematic review. JBI Database System Rev Implement Rep 2014;12(7):315–73.
49. Noble DJ, Pronovost PJ. Underreporting of patient safety incidents reduces health care's ability to quantify and accurately measure harm reduction. J Patient Saf 2010;6(4):247–50.
50. Karga M, Kiekkas P, Aretha D, Lemonidou C. Changes in nursing practice: associations with responses to and coping with errors. J Clin Nurs 2011;20(21–22):3246–55.
51. Burlison JD, Scott SD, Browne EK, Thompson SG, Hoffman JM. The second victim experience and support tool (SVEST): Validation of an organizational resource for assessing second victim effects and the quality of support resources. J Patient Saf 2017;13(2):93–102.
52. Edrees H, Connors C, Paine L, Norvell M, Taylor H, Wu AW. Implementing the RISE second victim support programme at the Johns Hopkins Hospital: a case study. BMJ Open 2016;6(9).
53. Lee S. Implementation of a second victim program: HOPE Team. Boiling Springs: Gardner-Webb University; 2014.
54. Clancy CM. Alleviating "second victim" syndrome: how we should handle patient harm. J Nurs Care Qual 2012;27(1):1–5.
55. Jones JH, Treiber LA. When nurses become the "second" victim. Nurs Forum (Auckl) 2012;47(4):286–91.
56. Duarte SdCM, Stipp MAC, Silva MMd, Oliveira FTd. Adverse events and safety in nursing care. Rev Bras Enferm 2015;68(1):144–54.

Appendix I: Database search strategy for second victims qualitative systematic review

Search dates	1980 to February 8, 2017	
Limiters	English language only	
CINAHL via EBSCO		
Relevant search terms	1. SU nurs*	564,707
	2. SU error* OR SU adverse event*	33, 576
	3. TX second victim* OR TX distress OR TX guilt OR TX stress	245, 725
	4. S1 AND S2 AND S3	622
MEDLINE		
Relevant search terms	1. nurses[MeSH Terms] or nursing[MeSH Terms]	321,957
	2. (adverse event*[Title/Abstract]) OR medical errors[MeSH Terms]	204,517
	3. ((second victim*[Title/Abstract]) OR distress[Title/Abstract]) OR guilt*[Title/Abstract]) OR stress[Title/Abstract])	656,713
	4. #1 AND #2 AND #3	79
Embase		
Relevant search terms	1. nurs* AND [english]/lim AND [embase]/lim AND [1980–2017]/py	258,777
	2. error* AND [english]/lim AND [embase]/lim AND [1980–2017]/py	403,177
	3. 'adverse event*' AND [english]/lim AND [embase]/lim AND [1980–2017]/py	258,777
	4. #2 OR #3	564,579
	5. 'distress'/exp OR 'guilt'/exp OR 'stress'/exp AND [english]/lim AND [embase]/lim AND [1980–2017]/py	184,288
	6. #1 AND #4 AND #5	249
PsycINFO via EBSCO		
Relevant search terms	1. SU nurs*	60,814
	2. SU error*	17,572
	3. SU "adverse event*"	784
	4. S2 OR S3	17,279
	5. S1 AND S4	258
Web of Science		
Relevant search terms	1. TOPIC: (distress) or TOPIC: ("second victim") OR TOPIC: (guilt) OR TOPIC: (stress)	1,558,670
	2. TOPIC: (nursing)	204,726
	3. TOPIC: (error*) OR TOPIC: (adverse events)	918,889
	4. #1 AND #2 AND #3	316
OpenGrey		
Relevant search terms	(errors OR nursing errors OR medication errors) AND (adverse events) lang:"en"	4
ProQuest Dissertations and Theses Global		
Relevant search terms	1. all(nurse) OR all(nursing) OR all(nurses)	51,441
	2. all(adverse event) OR all(error) OR all(nursing error)	87,287
	3. all(second victim) OR all(distress) OR all(stress) OR all(guilt)	139,899
	4. 1 AND 2 AND 3	100

Appendix II: QARI data extraction instrument

JBI QARI Data Extraction Form for Interpretive & Critical Research

Reviewer _____ Date _____

Author _____ Year _____

Journal _____ Record Number _____

Study Description

Methodology

Method

Phenomena of interest

Setting

Geographical

Cultural

Participants

Data analysis

Authors Conclusions

Comments

Complete Yes ☐ No ☐

Findings	Illustration from Publication (page number)	Evidence		
		Unequivocal	Credible	Unsupported

Extraction of findings complete Yes ☐ No ☐

Appendix III: List of studies that did not meet the eligibility criteria

	Eligibility criteria			
Citations	Qualitative study	Registered nurses involved in adverse clinical errors	Experiences of errors and/or support received	Any clinical setting
Wolf ZR. Medication errors and nursing responsibility. Holist Nurs Pract. 1989;4(1):8–17.	No	No	No	No
Meurier CE, Vincent CA, Parmar DG. Learning from errors in nursing practice. J Adv Nurs.1997;26(1):111–9.	No	Yes	Yes	Yes
Booth MJ. Nurse anesthetist reaction to the unexpected or untimely death of patients in the operating room. Holistic Nurs Prac. 1998;13(1):51–8.	Unclear	Yes	No	Yes
Meurier CE, Vincent CA, Parmar DG. Nurses' responses to severity dependent errors: a study of the causal attributions made by nurses following an error. J Adv Nurs.1998;27(2):349–54.	No	Yes	Yes	Yes
Fink JL. Emma & the med error. J Christ Nurs. 2000;17(2):26–9.	Unclear	No	Yes	Yes
Wolf ZR, Serembus JF, Smetzer J, Cohen H, Cohen M. Responses and concerns of healthcare providers to medication errors. Clin Nurse Spec. 2000;14(6):278–87.	No	No	Yes	Yes
Ludwick R, Silva MC. Errors, the nursing shortage and ethics: Survey results. Online J Issues Nurs. 2003;8(3):114–21.	No	No	No	Yes
Ebright PR, Urden L, Patterson E, Chalko B. Themes surrounding novice nurse near-miss and adverse-event situations. J Nurs Adm. 2004;34(11):531–8.	Yes	No	No	Yes
Fogarty GJ, McKeon CM. Patient safety during medication administration: the influence of organizational and individual variables on unsafe work practices and medication errors. Ergonomics. 2006;49(5/6):444–56.	No	No	No	Yes

(*Continued*)

	Eligibility criteria			
Citations	**Qualitative study**	**Registered nurses involved in adverse clinical errors**	**Experiences of errors and/or support received**	**Any clinical setting**
Bennett P, Lowe R. Emotions and their cognitive precursors - Responses to spontaneously identified stressful events among hospital nurses. J Health Psychol. 2008;13(4):537–46.	No	No	No	Yes
MacDonald BJ. The experience of registered nurses involved in malpractice litigation [M.N.]. Ann Arbor: Dalhousie University (Canada); 2009.	Yes	No	No	Yes
Roesler R, Ward D, Short M. Supporting staff recovery and reintegration after a critical incident resulting in infant death. Adv Neonatal Care. 2009;9(4):163–71.	No	No	No	Yes
Scott SD, Hirschinger LE, Cox KR, McCoig M, Brandt J, Hall LW. The natural history of recovery for the healthcare provider 'second victim' after adverse patient events. Qual Saf Health Care. 2009;18(5):325–30.	Yes	No	Yes	Yes
Sexton JD, Pennebaker JW, Holzmueller CG, Wu AW, Berenholtz SM, Swoboda SM, *et al.* Care for the caregiver: Benefits of expressive writing for nurses in the United States. Prog Palliat Care. 2009;17(6):307–12.	No	No	No	Yes
Chard R. How perioperative nurses define, attribute causes of, and react to intraoperative nursing errors. AORN J. 2010;91(1):132–45.	No	Yes	Yes	Yes
de Cássia Pires Coli R, dos Anjos MF, Pereira LL. The attitude of nurses from an intensive care unit in the face of errors: An approach in light of bioethics. Rev Latino-Am Enfermagem. 2010;18(3):324–30.	Yes	Unclear	Unclear	Yes
Karga M, Kiekkas P, Aretha D, Lemonidou C. Changes in nursing practice: Associations with responses to and coping with errors. J Clin Nurs. 2011;20(21–22):3246–55.	No	Unclear	Unclear	Yes

(*Continued*)

	Eligibility criteria			
Citations	**Qualitative study**	**Registered nurses involved in adverse clinical errors**	**Experiences of errors and/or support received**	**Any clinical setting**
Paparella S. Caring for the Caregiver: Moving Beyond the Finger Pointing After an Adverse Event. J Emerg Nur. 2011;37(3):263–5.	No	Unclear	No	No
Anonymous. Still haunted by an error...'-Don't Abandon the Second Victims of Medication Errors' (February, 2012). Nursing. 2012;42(4):8-.	Yes	No	Yes	Yes
Atashzadeh Shorideh F, Ashktorab T, Yaghmaei F. Iranian intensive care unit nurses' moral distress: a content analysis. Nurs Ethics. 2012;19(4):464–78.	Yes	No	No	Yes
Clancy CM. Alleviating 'second victim' syndrome: how we should handle patient harm. J Nurs Care Qual. 2012;27(1):1–5.	Yes	No	No	Yes
Dewar AL. Dealing with errors on the job. J Psychosoc Nurs Ment Health Serv. 2012;50(4):4–5.	No	No	No	Unclear
Hall LW, Scott SD. The second victim of adverse health care events. Nurs Clin North Am. 2012;47(3):383–93.	No	No	No	No
Hofeldt R, McCotter PI. Supporting Colleagues Following an Adverse Event. Wash Nurse. 2012;42(1):23–5.	No	No	No	No
Jones JH, Treiber LA. When Nurses Become the 'Second' Victim. Nurs Forum. 2012;47(4):286–91.	No	No	No	No
Lewis EJ. The Relationship of Nurse Involvement in Medical Error with Nurse Outcomes: University of Virginia; 2012.	No	Unclear	Unclear	Yes
Smetzer J. Don't abandon the 'second victims' of medical errors. Nursing. 2012;42(2):54–8.	No	No	No	No

(*Continued*)

	Eligibility criteria			
Citations	**Qualitative study**	**Registered nurses involved in adverse clinical errors**	**Experiences of errors and/or support received**	**Any clinical setting**
Laurent A, Aubert L, Chahraoui K, Bioy A, Mariage A, Quenot JP, *et al.* Error in intensive care: Psychological repercussions and defense mechanisms among health professionals. Crit Care Med. 2014;42(11):2370–8.	Yes	No	Yes	Yes
Ullstrom S, Sachs MA, Hansson J, Ovretveit J, Brommels M. Suffering in silence: a qualitative study of second victims of adverse events. BMJ Qual Saf. 2014;23(4):325–31.	Yes	No	Yes	Yes
Taifoori L, Valiee, S. Understanding or nurses' reactions to errors and using this understanding to improve patient safety. Victoria, BC, British Columbia: Operating Room Nurses Association of Canada; 2015. p. 13–22.	No	Yes	Yes	Yes
Scott, SD. The second victim experience: Mitigating the harm. Am Nurse Today. 2015;10(9):8–11.	No	No	No	No
Harrison R, Lawton R, Perlo J, Gardner P, Armitage G, Shapiro J. Emotion and Coping in the Aftermath of Medical Error: A Cross-Country Exploration. J Patient Saf. 2015;11(1):28–35.	No	No	Yes	Yes
Lewis EJ, Baernholdt MB, Yan G, Guterbock TG. Relationship of Adverse Events and Support to RN Burnout. J Nurs Care Qual. 2015;30(2):144–52.	No	Unclear	Unclear	Yes
Wolf ZR, Zuzelo PR. ''Never again'' stories of nurses: dilemmas in nursing practice. Qual Health Res. 2006;16(9):1191–1206.	Yes	No	No	Yes
Van Gerven E, Vander Elst T, Vandenbroeck S, Dierickx S, Euwema M, Sermeus W, *et al.* Increased risk of burnout for physicians and nurses involved in a patient safety incident. Med Care. 2016;54(10):937–43.	No	Yes	No	Yes

(*Continued*)

	Eligibility criteria			
Citations	**Qualitative study**	**Registered nurses involved in adverse clinical errors**	**Experiences of errors and/or support received**	**Any clinical setting**
Quillivan RR, Burlison JD, Browne EK, Scott SD, Hoffman JM. Patient Safety Culture and the Second Victim Phenomenon: Connecting Culture to Staff Distress in Nurses. Jt Comm J Qual Saf. 2016;42(8):377–+.	No	Yes	No	Yes
Kaur A, Carino G, Levinson A. The impact of errors on healthcare professionals in the critical care setting. Crit Car Med. 2016;44(12):305.	No	No	Yes	Yes

Appendix IV: List of studies that did not meet quality criteria

Citation	Reason for exclusion
Serembus JF, Wolf ZR, Youngblood N. Consequences of fatal medication errors for health care providers: a secondary analysis study. Medsurg Nurs. 2001;10(4):193–201.	This study was a re-analysis of data from another study, and focused on the experiences of nurses whose errors resulted in patients' death. The methodology is not rigorous in consequence data analysis and themes were inadequate.
Maiden J. A quantitative and qualitative inquiry into moral distress, compassion fatigue, medication error, and critical care nursing: University of San Diego; 2008.	The primary methodology was quantitative. Although the researcher reported mixed methods, the qualitative analysis lacked sufficient rigor.
Scott SD, Hirschinger LE, Cox KR. Sharing the load. RN. 2008;71(12):38–43.	This would have been a valuable study because it was nursing-focused. Unfortunately, the framework guiding the research was lacking, hence data analysis and interpretation were fragmented.

Appendix V: Summary of extracted findings

Synthesized finding 1: The error brings a considerable emotional burden to the nurse that can last for a long time. In some cases, the error can alter nurses' perspectives and disrupt workplace relations.					
Study	**Level of dependability**	**Level of credibility**	**Findings in the study**	**Description in the study**	**Category**
Ajri-Khameslou M, Abbaszadeh A, Borhani F. Emergency Nurses as Second Victims of Error: A Qualitative Study. Adv Emerg Nurs J. 2017;39(1):68–76.	Moderate	Unequivocal	Psychological reactions to errors	Nurses described common immediate reactions to making an error: restlessness, self-consciousness, fear of outcomes, and feeling remorse. To a certain extent, these psychological reactions interfered with their personal lives. One nurse described that she experienced nightmares. *"I extremely had obsession and I was confused what was going to happen any time. Sometimes I was getting extremity restlessness that I can't handle everyday tasks at home and I was not able to take care of my child properly".*(p.71)	1. Emotional distress immediately afflicts the nurse after the error
Crigger NJ, Meek VL. Toward a theory of self-reconciliation following mistakes in nursing practice. J Nurs Scholarsh. 2007 2007;39(2):177–83.	High	Unequivocal	Process of self-reconciliation: reality hitting	The primary response was shock, followed by strong disbelief and anger that an error occurred. *"It rips me up".*(p.180) *"I was beating myself up because I had made the mistake".*(p.180) Interestingly, in this study nurses compared the error to an ideal situation or a standard. Hence, they feel inadequate, lose their confidence, and are shameful. *"I am getting older in nursing, and I am supposed to know better than that, how could I ever have made that mistake?"* (p.180)	
Schelbred A, Nord R. Nurses' experiences of drug administration errors. J Adv Nurs. 2007;60(3):317–24.	High	Unequivocal	Immediate reactions	Nurses felt shock, dread, disbelief, panic, paralysis and powerlessness. One nurse insinuated that it was as if she died inside. *"I could not believe that I made such as error!"* (p.319)	
Treiber LA, Jones JH. Devastatingly human: An analysis of registered nurses' medication error accounts. Qual Health Res. 2010;20(10):1327–42.	High	Unequivocal	Devastating reactions	Nurses felt awful, horrible, terrible, sick and devastated. No patients died as a direct result of the errors, and few were harmed at all, but to read the accounts, one would imagine very serious outcomes for the errors made. *Q: How did you feel when you made a medication error? R: I felt absolutely sick when I realized I gave a double dose P1333*	
Dyal SV. Nurses' perceptions of their experiences with medication administration errors [M.S.]. Ann Arbor: D'Youville College; 2005.	High	Unequivocal	Feeling burdened and liberated by professionalism	*"My thoughts were this could be very serious incident, could jeopardize my patient's health. I felt responsible, I felt guilty, I felt devastated, and very stressed".* (p.47)	2. The distress after the error is caused by the fear of causing harm to the patient
Rassin M, Kanti T, Silner D. Chronology of medication errors by nurses: accumulation of stresses and PTSD symptoms. Issues Ment Health Nurs. 2005;26(8):873–86.	Moderate	Unequivocal	Day of the error: Responsibility	All nurses reported stress-related physical responses. On realizing the error, it also activated a sense of fear for the patient's welfare. *"I at once went to the doctor because I wanted to prevent complications from the patient. By the end of the shift I was very stressed out, and all the time I checked if he's ok".*(p.878) *"Of course I feared first for the patient. I reported straight away to the treating doctor and head nurse for support, not mentally but practically. I've checked the patient's symptoms and followed her condition. As much as I remember, she was a terminal patient".*(p.878) *"When I realized that I made a mistake, I went to the treating doctor and head nurse and told them what happened. I asked how we proceed from here".*(p.878)	
Rassin M, Kanti T, Silner D. Chronology of medication errors by nurses: accumulation of stresses and PTSD symptoms. Issues Ment Health Nurs. 2005;26(8):873–86.	Moderate	Unequivocal	Day of the error: Double-fear, the anger and shame	*"At that moment I felt very bad, very shameful and helpless. I was worried about the patient, even though I knew he'd sail through it.* (p.878)	
Treiber LA, Jones JH. Devastatingly human: An analysis of registered nurses' medication error accounts. Qual Health Res. 2010;20(10):1327–42.	High	Unequivocal	Dealing with fear	Fear stemmed from the anxiety about the patient's outcome and the professional impact of the error. *R: I was devastated. I was afraid I could kill my pt. It was horrible! (28 yrs) P1335 R: I felt ill and questioned my ability as a nurse. P1335*	
Rassin M, Kanti T, Silner D. Chronology of medication errors by nurses: accumulation of stresses and PTSD symptoms. Issues Ment Health Nurs. 2005;26(8):873–86.	Moderate	Unequivocal	Immediate: I might get fired	It was evident that nurses were constantly worried about the impact of the error on their career. *"It affected the home very much. All the thoughts were on it—that I won't get promoted, that they'll fire me".*(p.880) *"I kept reliving the scenario over and over for days, always looking for how it could be prevented".* (p.880) *"It was a cascade of thoughts. I replayed what happened and couldn't sleep right. I thought how the system would treat the mistake, will they keep me or throw me out".*(p.880)	3. Afflicted by distress after the error: "I might get fired"
Rassin M, Kanti T, Silner D. Chronology of medication errors by nurses: accumulation of stresses and PTSD symptoms. Issues Ment Health Nurs. 2005;26(8):873–86.	Moderate	Unequivocal	Immediate: Waiting for the enquiry – "Every day is like eternity"	*"I was very frightened. What do they expect of me, what am I to do by then? They should pick up the phone and arrange for a meeting, not wait, because you get all the worst scenarios running, like I'll be fired, that I'll be under close scrutiny now. Not only that I've made a mistake, I also have to deal with this fear".*(p.882)	

(*Continued*)

Synthesized finding 1: The error brings a considerable emotional burden to the nurse that can last for a long time. In some cases, the error can alter nurses' perspectives and disrupt workplace relations.

Study	Level of dependability	Level of credibility	Findings in the study	Description in the study	Category
Rassin M, Kanti T, Silner D. Chronology of medication errors by nurses: accumulation of stresses and PTSD symptoms. Issues Ment Health Nurs. 2005;26(8):873–86.	Moderate	Unequivocal	Long-term: Absurdly it got worse with time	In some nurses, the memory of the error and the associated negative emotions lingered even after six months. *"Absurdly it got worse with time. At first I rationalized it, belittled it, nothing happened. But with time, the burden got heavier. Sometimes I have nightmares, I dream that the patient died, It all comes to me in flashbacks. .. but I try to forget"*.(p.882) *"Time went by and it still lingers on. For a few months I was very nervous, I had difficulties falling asleep, because most of the time my mind kept busy thinking about it. It's hard even today, it left me deeply traumatized. I can't forgive myself. When I distribute medication I have to do it with another nurse. Every time I treat it like it's my first. It damaged my confidence a lot"*.(p.882)	4. Afflicted by distress after the error: "…it will always be on my mind"
Santos JO, Silva AEB, Munari DB, Miasso AI. Feelings of nursing professionals after the occurrence of medication errors. Acta Paulista de Enfermagem. 2007;20(4):483–8.	Moderate	Unequivocal	Feelings experienced after the error	Panic, despair, preoccupation, guilt, shame, fear and insecurity were emotions felt. Panic was observed as the initial response to the error. *"I was terrified, and trying to discover what had happened, it was me and the patient being sick, then I decided to check what medication I had given and I got really scared"*.(p.485) It was evident that the negative emotions from the errors can remain for a long time: *"The feeling was of fear, I get scared until today. I pray to God every day when I come to work so that he can help me not to commit an error"*.(p.485) *"I got insecure for, let's say, a couple of months, but, you know, until today when I prepare a medication I feel it"*.(p.485)	5. The error can affect the nurses' perspective and can disrupt relationships in the workplace
Schelbred A, Nord R. Nurses' experiences of drug administration errors. J Adv Nurs. 2007;60(3):317–24.	High	Unequivocal	Emotional responses	Even though there was no permanent harm to the patient, nurses considered the error to be personally and professionally traumatizing. Some felt shame and that they had betrayed their patients, colleagues and their own family. *"I felt ashamed, making such a mistake, and that I abandoned others' trust in me. I felt that I gambled with others' trust and love"*.(p.320) The distress lingered even up to two years after the error occurred. One nurse alluded to not forgiving herself yet, despite the support of her colleagues. On the contrary, one nurse felt depressed because of the way the error was managed. Two nurses contemplated suicide. Several nurses likened their experience to PTSD. *"I could walk down the street when it came to my mind, 'you did it!' It has lasted for years. And I feel at this moment; it will always be in my mind"*. (p.320)	
Schelbred A, Nord R. Nurses' experiences of drug administration errors. J Adv Nurs. 2007;60(3):317–24.	High	Unequivocal	Impact of the error on nursing practice	Errors had a significant impact on the nursing practice. Certainly, vigilance and caution were most common, but equally important was how it changed the perspective of the nurse. One nurse asserted: *"I have a deeper insight in the sense of not judging other people so easily. My tolerance is much higher"*.(p.321) On another extreme, errors can be crippling. This study described one nurse's ordeal: *"For the nurse who was exposed to criticism and reproach by her management, the error was devastating to both her personal and professional life. She was no longer capable of working as a nurse, and although she did not feel disabled, she was in no position to find another job, yet felt embarrassed and ashamed of having a professional in which she could no longer participate"*.(p.321–322)	
Ajri-Khameslou M, Abbaszadeh A, Borhani F. Emergency Nurses as Second Victims of Error: A Qualitative Study. Adv Emerg Nurs J. 2017;39(1):68–76.	Moderate	Unequivocal	Avoiding reactions	Two avoiding reactions were observed. First, nurses were reluctant to perform tasks that previously led to the mistake. *"I tried not to deal with urinary catheterization and if I did, I was very careful. Furthermore, if there was a case which was difficult for me to do as catheterization in bladder, I said that I was not able to do"*.(p.73) Second, nurses avoided colleagues who were disruptive: "*Whenever I have to work with some careless nurses who were causing problems, I tried to either change my shift or in some case that there was no other choice, I did all the tasks on my own and tried to avoid them"*.(p.73)	

Synthesized finding 2: The type of support received influences how the nurse will feel about the error. Often nurses choose to speak with colleagues who have had similar experiences. Strategies need to focus on helping them to overcome the negative emotions associated with being a second victim.					
Study	**Level of Dependability**	**Level of credibility**	**Findings in the study**	**Description in the study**	**Category**
Dyal SV. Nurses' perceptions of their experiences with medication administration errors [M.S.]. Ann Arbor: D'Youville College; 2005.	High	Unequivocal	Isolation and comfort coexist amid chaos	The error was an isolating experience for the nurses but they found comfort in their colleagues whom they trusted. *"You know what? It was a kind of healing thing for me, because I had to unload my stress. So of course I told them what had happened, and I got reassurance from them, and even to the point that this same medication error had happened already to two or three different nurses. And so it was reassuring in away, but it still didn't make me feel that great, because knowing that that had happened between so many nurses already, you know, something really should have been done. There should be an alert, or something put on the medication so that we know that they are two different strengths in similar packages. And then there was a lot of reassurances, a lot of comfort. There's a lot of, you know, support from my peers".*(p.56) Support: *"(Long pause) Well, my closest colleagues who I work with all the time and who I trust, who I can sit down and talk to and say you know, 'this is what happened' and, you know, they could, you know, they kind of let me know that, you know, this could happen to anybody. So having the support of your colleagues to me is very important".*(p.59)	1. The sources of support for the nurses
Rassin M, Kanti T, Silner D. Chronology of medication errors by nurses: accumulation of stresses and PTSD symptoms. Issues Ment Health Nurs. 2005;26(8):873–86.	Moderate	Unequivocal	Immediate: He who works, errs	Nurses talked about the errors to their family and to their colleagues from whom they knew they would get support. *"At first I told only to the head nurse and another nurse, since I knew they would react maturely and won't ridicule it. Principally, people's reactions were divided into two: those who said that he who works errs and that it could happen to anyone, and others who didn't, but I knew they were talking behind my back".*(p.881)	
Santos JO, Silva AEB, Munari DB, Miasso AI. Feelings of nursing professionals after the occurrence of medication errors. Acta Paulista de Enfermagem. 2007;20(4):483–8.	Moderate	Unequivocal	Actions and strategies to face feelings caused by errors	Nurses looked for support and sought a person with whom they could talk about the experience. *"I wanted someone to help me".*(p.485) *"We feel incapable of doing things at the time, incapable".*(p.485) Having had someone to talk to about the error generated a feeling of tranquility. *"But then I talked to the resident, to my supervisor and they soothed me".*(p.485) *"The decision I took soothed me because I did the right thing. I called my boss and communicated the event to her".*(p.485)	
Schelbred A, Nord R. Nurses' experiences of drug administration errors. J Adv Nurs. 2007;60(3):317–24.	High	Unequivocal	Nurse candor	Some nurses chose to speak about the error to their partners or relatives, but some preferred healthcare professionals because they felt that their family would lack the understanding of what they were going through. *'I did not feel that my husband understood what I was going through. I do not think he saw how painful this was for me'.*(p.321)	
Schelbred A, Nord R. Nurses' experiences of drug administration errors. J Adv Nurs. 2007;60(3):317–24.	High	Crediblbe	Coping with the incident	Several nurses talked to family, friends or colleagues, and/or sought professional help to unload their emotional burden from the error. Time proved to be one the most important factors for nurses. As the study described: "For most of them (nurses), time was an important factor: as time went by, the anguish lessened". (p.321)	

(*Continued*)

Synthesized finding 2: The type of support received influences how the nurse will feel about the error. Often nurses choose to speak with colleagues who have had similar experiences. Strategies need to focus on helping them to overcome the negative emotions associated with being a second victim.

Study	Level of Dependability	Level of credibility	Findings in the study	Description in the study	Category
Luk LA, Ng WIM, Ko KKS. Nursing management of medication errors. Nurs Ethics. 2008;15(1):28–39.	High	Unequivocal	Ethical issues relating to the management of nurses involved in the error: Being understood and treated fairly	For many nurses, the management of error was described positively, such as understanding, empathy, considerate, supportive. An illustration from the study was: "*My senior told me that what happened was already past. I also had done the self-evaluation. She encouraged me not to be frustrated because of that event. She said not to be confused by that incident, otherwise it would be easy to make more mistakes. I would then pay more attention to everything I encountered. I was touched by hearing her words. Actually, our seniors were very helpful and appreciated our work. They would not dismiss staff because of minor events. They wanted us to learn from our mistakes, to think of improvement and ways of making our work better*".(p.32) However, some did not have a positive experience: "*Subjectively, I felt that I was treated unjustly. Though I guided the student in how to work and fulfilled my responsibility, she was alone for a short while and gave the injection without my instruction*".(p.33)	2. Nurses' perceptions of the support they receive from colleagues and managers
Schelbred A, Nord R. Nurses' experiences of drug administration errors. J Adv Nurs. 2007;60(3):317–24.	High	Unequivocal	Reactions from colleagues and managers	Colleagues reacted differently, but the most comforting reactions were the positive ones. Such reactions helped the nurses to deal with feelings of guilt, shame, fear and loss of clinical confidence. "*Everyone said: 'we think about you and this is not only your fault. You are one of our best nurses'! And I got the chance to talk a lot about what happened and how I felt*".(p.320) Some colleagues tried to minimize the erring nurse's error, but this reaction neglected the nurses 'call for help' and somewhat underestimated the nurse's distress. Some nurses received silence from colleagues and managers; neither was this helpful nor satisfactory. *'I did not feel that I became excluded in any way. But not being excluded is not the same as being supported'*.(p.320)	
Schelbred A, Nord R. Nurses' experiences of drug administration errors. J Adv Nurs. 2007;60(3):317–24.	High	Unequivocal	Help and support after the incident	Only two nurses felt that they were given the help they needed from management. All the nurses needed help, and felt it would have helped them. Interestingly, none of the nurses voiced their need for help. *'I wish she (the head nurse) could have seen me. It seemed like she had forgotten it 2 days after I told her about it. She took it for granted that I could handle it on my own'*.(p.321)	
Treiber LA, Jones JH. Devastatingly human: An analysis of registered nurses' medication error accounts. Qual Health Res. 2010;20(10):1327–42.	High	Unequivocal	Advice about error	Nurses were encouraged to offer their perspectives on why and/or how medication errors occurred. Instead, nurses recommended that institutions should steer away from the culture of punishment in nursing. *R: It helps if your facility has a non-punitive approach to med errors (as my facility does). This encourages reporting so that trends/patterns can be identified and improvement projects implemented.*(p.1338)	3. Recommendations from second victims

Synthesized finding 3: After the error, nurses are confronted with the dilemma of disclosure. Disclosure is determined by the following factors: how nurses feel about the error, harm to the patient, the support available to the nurse, and how errors were dealt with in the past.					
Study	**Level of Dependability**	**Level of credibility**	**Findings in the study**	**Description in the study**	**Category**
Arndt M. Nurses' medication errors. J Adv Nurs. 1994;19(3):519–26.	High	Unequivocal	Subjection and power: identification and change Identification	Nurses saw themselves as primarily responsible for medication administration and its impact on patients. This understanding made nurses admit their willingness to disclose their mistake. *"I have to inform my manager"*.(p.523)	1. Nurses believe that disclosure is a responsibility; thus were willing to report their errors
Schelbred A, Nord R. Nurses' experiences of drug administration errors. J Adv Nurs. 2007;60(3):317–24.	High	Credible	Relations with patients and family	*"Several felt a moral responsibility to inform the patient about the error, its consequences, and that they were responsible. Others told the patients about the medication error, but failed to disclose the possible consequences, or that they themselves were responsible. The latter was because they were ashamed and disappointed in themselves"*.(p.320)	
Crigger NJ, Meek VL. Toward a theory of self-reconciliation following mistakes in nursing practice. J Nurs Scholarsh. 2007 2007;39(2):177–83.	High	Credible	Process of self-reconciliation: Weighing In	A decision had to me made as to whether or not to disclose the error to a colleague and the patient. *"The factors that participants identified as reasons to disclose mistakes or nonmistakes were often determined by the harm or potential harm to the patient, the potential for legal repercussions, the availability of family members, or the patient's state of consciousness"*.(p.181)	2. Disclosure is not likely to occur if there is little or no harm to the patient
Luk LA, Ng WIM, Ko KKS. Nursing management of medication errors. Nurs Ethics. 2008;15(1):28–39.	High	Unequivocal	Ethical issues relating to the management of patients and relatives: Non-disclosure of errors	Disclosure of errors was not likely to occur if the error was inconsequential. Nurses wanted to avoid making the patients and/or their relatives anxious. *"I didn't tell the patient that he was given the wrong medication. I was afraid it would affect his illness when I told him. The medicine I gave him was vitamins and one was a coagulant. It didn't really matter. So, I didn't immediately tell him he was given an incorrect medication"*.(p.31)	
Arndt M. Nurses' medication errors. J Adv Nurs. 1994;19(3):519–26.	High	Unequivocal	Subjection and power: identification and change Counter-identification	Nurses' previous experiences with how their mistakes were handled meant that some of them defied the rules. If errors were handled negatively, nurses were unlikely to report new errors. However, nurses were willing to disclose the error if they knew they would be adequately supported. *"If it was in a similar situation, I would feel very reluctant to inform the nursing officer. Unless I knew the nursing officer and I knew that they were going to support me"*. (p.523)	Support is pivotal to nurse's decision to disclose their error

Synthesized finding 4: Reconciliation is every nurse's endeavor. Predominantly, this is achieved by accepting fallibility, followed by acts of restitution, such as making positive changes in practice and disclosure.					
Study	**Level of Dependability**	**Level of credibility**	**Findings in the study**	**Description in the study**	**Category**
Crigger NJ, Meek VL. Toward a theory of self-reconciliation following mistakes in nursing practice. J Nurs Scholarsh. 2007;39(2):177–83.	High	Credible	Reconciliation of the self and cultural transition	*"Reconciling means to bring to acquiescence or to resolve an issue or situation. In reconciling, one might not be happy with the outcome but still has some degree of acceptance and acquiesces to the situation. In this instance, once participants perceived that mistakes had occurred and that they were responsible, their self-esteem plummeted, and their focus became one of regaining their self-worth through making it right".*(p.179)	1. Reconciliation is every nurse's endeavor
Arndt M. Nurses' medication errors. J Adv Nurs. 1994;19(3):519–26.	High	Unequivocal	Guilt and shame: reconciliation with human precariousness	Reconciliation was seen by the nurses as a state that reversed the feelings of guilt. Acknowledging their fallibility and precariousness helped them come to terms with the error. *"I was not the only to do such a thing".*(p.524) *"We are all human, we all make mistakes".*(p.524)	2. Accepting fallibility, particularly to the factors that place nurses at risk of errors
Rassin M, Kanti T, Silner D. Chronology of medication errors by nurses: accumulation of stresses and PTSD symptoms. Issues Ment Health Nurs. 2005;26(8):873–86.	Moderate	Unequivocal	Day of the error: Stress, Pressure, and Inattention	Stress and work overload were associated with the preceding events of the error. Nurses felt that this put them in a vulnerable position for errors, particularly distractions, inattention and lack of concentration. *"It was two years ago. In winter. There was huge and catastrophic pressure in the ward. Lots of geriatric patients. In a momentary absent mindlessness, the error occurred. Luckily for me I picked it up in a couple of minutes, so the patient's condition hadn't worsened".*(p.876) *"I actually had a good morning, I came to work all pumped up. I felt great, there were no ominous signs. On my row there were few patients so there was no pressure. Three had to be administrated antibiotics intravenously. I put the drugs on a small tray and went to the first room. I couldn't find the patient, so I went to the second room. I've gone through the vials in the tray and took the appropriate one. I didn't check again, and administrated the medicine. I kept talking to the patient and hadn't paid attention. Later, another nurse asked me why the patient was suddenly been given antibiotics".*(p.877)	
Treiber LA, Jones JH. Devastatingly human: An analysis of registered nurses' medication error accounts. Qual Health Res. 2010;20(10):1327–42.	High	Unequivocal	I'm to blame, but…	All accounts were indicative of the self-blame; along with it nurses acknowledged factors (e.g. documentation error, workload) that triggered the error. *Q: Why did it happen, in your opinion? R: Carelessness. Very busy pediatric unit—too many high acuity patients per nurse, too many meds to give at peak times, along with so many other procedures (too rushed).*(p.1331) *Q: How did you feel when you made a medication error?* *R: Stupid, but sometimes when you are very busy and pushed for time you don't check all the "5 rights" & that's when you make mistakes.*(p.1332) The acknowledgement of other factors that led to the error help nurses externalize the error.	
Treiber LA, Jones JH. Devastatingly human: An analysis of registered nurses' medication error accounts. Qual Health Res. 2010;20(10):1327–42.	High	Unequivocal	Being new	Errors usually occurred during the early stages of the nurses' career, which the nurses attributed to their inexperience. *"The error occurred while I was still in new grad [graduate] orientation at my job. I was working under the supervision of an experienced nurse. We were assigned to care for patients jointly. I gave a medication not realizing that the nurse I was working with had already given it. She did not chart that she'd given the medication already. The patient had a substantial drop in blood pressure that had to be treated with emergency drugs. He could have died. In speaking with my managers about the occurrence, and with other new grads, it was not uncommon for new grads working with a more experienced nurse to have this type of error. The administering nurse should chart the drug. I think the experienced nurse was just expecting me to do all the charting to gain experience in doing that, but I had no way of realizing she'd already given the drug because she hadn't said so. I made it a personal priority to only chart what I'd done, what I'd seen, etc. from that point on. Even if I was covering for another nurse on break, I'd chart what I did for her/his patient myself".*(p.1332–33)	
Treiber LA, Jones JH. Devastatingly human: An analysis of registered nurses' medication error accounts. Qual Health Res. 2010;20(10):1327–42.	High	Unequivocal	Frustrations with technology and regulations	Nurses acknowledged the positive aspect of technology, but also recognized its limitations. *R: It was extremely busy, short staffed. I just grabbed the medicine (checked for the right patient name & drug, but not the dose). In the facility where I work, we reorder the next "cycle" of meds for each patient in the computer. Frequently, the computer will change the dosage from what's actually ordered (a glitch in the program?). If you don't recheck what the computer orders against the original order, errors are made.* *Q: How did you feel when you made a medication error?* *R: First & foremost, I felt horrible that the problem for which the med was prescribed might not be alleviated due to not enough med given. (I did later call the patient, to come in for more drug). Secondly, I felt really, really stupid and inadequate that I didn't take the time to check the order.*(p.1336)	

(*Continued*)

Synthesized finding 4: Reconciliation is every nurse's endeavor. Predominantly, this is achieved by accepting fallibility, followed by acts of restitution, such as making positive changes in practice and disclosure.

Study	Level of Dependability	Level of credibility	Findings in the study	Description in the study	Category
Ajri-Khameslou M, Abbaszadeh A, Borhani F. Emergency Nurses as Second Victims of Error: A Qualitative Study. Adv Emerg Nurs J. 2017;39(1):68–76.	Moderate	Unequivocal	Learning from errors	One of the key responses of nurses to their errors was ensuring that they or their colleagues did not make the same mistake. Methods employed varied, and they included self-education, training, consultation with colleagues and heightened awareness: *"There was a time that I made a big mistake, because of that I got warned. I decided to refer to my pharmacology textbooks and then I found out what the problem was. For example, I found out that I had to make an infusion Dilantin within half an hour".*(p.72–73) *"I am not ashamed of asking question when I do not know the answer. If I face with a situation that I do not know the answer to it, I would ask either one of my knowledgeable colleagues or my supervisor to help me. By this way I would prevent any harm to my patients".*(p.72)	3. The error serves as a foundation for improvements in practice
Arndt M. Nurses' medication errors. J Adv Nurs. 1994;19(3):519–26.	High	Credible	Learning from mistakes, teaching and learning ethics in nursing education	Learning from the error occurred at a personal or organizational level. One nurse summed up the experience aptly. Prior to the error, the nurse was willing to work in understaffed conditions. The error empowered the nurse to be assertive so that no one would be subjected to such dangerous working conditions. *"One participant mentioned how for a long time she had been willing to work under great pressure, not having enough staff on her ward, and how she was easily pacified by her managers to make do with the resources she had at her disposal. The experience of having made a medication error in a situation of severe understaffing caused this nurse to be more assertive in asking for more staff in order to cope difficult situations on her ward She did not feel compelled any more to cope under all circumstances. It also caused her managers to heed her requests".*(p.525)	
Arndt M. Nurses' medication errors. J Adv Nurs. 1994;19(3):519–26.	High	Unequivocal	Subjection and power: identification and change Dis-identification	Nurses were also willing to discuss how and why the error occurred as a strategy to ensure that it did not happen again. *"I would be quite happy to sit down with her, or him discuss the error, trying to find out how it happened, again, and find areas that had led to the error happening".*(p.524)	
Crigger NJ, Meek VL. Toward a theory of self-reconciliation following mistakes in nursing practice. J Nurs Scholarsh. 2007;39(2):177–83.	High	Unequivocal	Process of self-reconciliation: Resolving	Nursing errors brought worry and anxiety to nurses; however errors also made nurses more cautious and gave them heightened awareness of potential errors. One nurse asserted: *"I double check, triple check sometimes".*(p.181)	
Dyal SV. Nurses' perceptions of their experiences with medication administration errors [M.S.]. Ann Arbor: D'Youville College; 2005.	High	Unequivocal	Hopefulness and uncertainty coexist amid yearning for successes from the moment	*"Well it's allowed me to be more careful, to check medication more carefully, or sometimes at the medication cart it can be very distracting because it's ten o'clock, everybody is trying to give their medication at the same time. I try not to do my med administered in a rush, you know. I just tell people look and find, you gotta wait and don't rush".*(p.61)	
Rassin M, Kanti T, Silner D. Chronology of medication errors by nurses: accumulation of stresses and PTSD symptoms. Issues Ment Health Nurs. 2005;26(8):873–86.	Moderate	Unequivocal	Long-term: Following the event I learned my lesson	The error made nurses more cautious and vigilant. *"When there are several things to do at once, I do one at a time, not more. I used to do ten different things at once, today I'm slower. I have it in the back of my mind that if I made a mistake once, it could happen again. That's why I check and double-check".*(p.884) *"I've learned that what you begin you must finish, and not leave in the middle. One thing should finish before another starts. We're in a hazardous occupation, something always happens, and there're no guarantees. But one should be very very careful".*(p.884)	
Treiber LA, Jones JH. Devastatingly human: An analysis of registered nurses' medication error accounts. Qual Health Res. 2010;20(10):1327–42.	High	Unequivocal	Lessons learned	In many of the accounts, making an error resulted in greater knowledge and commitment to safely administer medications. Many resolutions were personal, and there was no mention at all of system changes. *I was familiar with these patients and didn't check armbands—it was an automatic thing to go to the patient I was talking to. I tell patients now and have for years not to talk to a nurse while she is giving meds. Barcode med administration would not have helped in my error. Barcode med administration is important but the nurse must always be diligent and stay focused.*(p.1337)	

(*Continued*)

Synthesized finding 4: Reconciliation is every nurse's endeavor. Predominantly, this is achieved by accepting fallibility, followed by acts of restitution, such as making positive changes in practice and disclosure.

Study	Level of Dependability	Level of credibility	Findings in the study	Description in the study	Category
Crigger NJ, Meek VL. Toward a theory of self-reconciliation following mistakes in nursing practice. J Nurs Scholarsh. 2007;39(2):177–83.	High	Credible	Process of self-reconciliation: Acting	This stage was composed of two independent reactions, dependent on whether disclosure occurred. After the disclosure, nurses' actions were characterized by apologizing and making amends for their error. The aftermath of non-disclosure on the other hand was poorly understood. *"The acting phase for the publicly known error included apologizing to the parties who were affected by the error and, in some instances, making restitution. Participants said they usually felt relief and a sense of closure when the mistake was disclosed and dealt with. In a very different trajectory for action after the privately known error, steps to disclose and deal with the error were not followed. Our participants never described personal instances of non-disclosed mistakes that caused harm, but such instances were described in stories of mistakes by others".*(p.181)	4. Disclosure brings a sense of closure to the nurse