Developing a Reporting and Tracking Tool for Nursing Student Errors and Near Misses

Joanne Disch, PhD, RN, FAAN, and Jane Barnsteiner, PhD, RN, FAAN

Little is known about the extent and types of errors and near misses (ENMs) made by nursing students. In nursing schools, the norm has been a culture of blame in which a student, a faculty member, or both are held accountable for ENMs regardless of the source. However, evidence suggests that a failure to track and trend ENMs and learn from them actually increases the likelihood of more ENMs. To help student nurses become competent nurses, educators need systems and structures that allow trending and analysis of ENMs. Key first steps include creating a mechanism for schools to use in reporting nursing-student ENMs and creating a transparent and blame-free culture. In addition, it will be critical to establish a national database to reflect the occurrence and types of ENMs. The database will provide a baseline of information that will guide faculty members in designing interventions to reduce ENMs. This article describes the issues and challenges encountered in creating an occurrence reporting tool, testing the tool, and establishing a national database for tracking and trending ENMs encountered by nursing students. In addition, this article presents an adaptation of the tested occurrence reporting tool that schools can use while a national database is established.

Since the publication of *To Err is Human* by the Institute of Medicine (1999), tremendous effort has been invested in making health care safer and creating health care environments that promote a just culture—"a culture in which employees can admit to their mistakes and system and individual accountability can be balanced to best support system safety and other organizational values" (Marx, 2001, p. 7). Today, safety science calls for transparency in reporting errors and near misses (ENMs).

Failure to track, trend, and learn from ENMs decreases the likelihood that underlying system issues can be identified and corrected. A punitive environment actually results in less reporting of ENMs (Isaac & Ruitenberg, 2002). Health care leaders are increasingly being held accountable for adopting the necessary policies, systems, and practices for creating safe environments in health care organizations, establishing blame-free error reporting, and directing sufficient resources toward safe, quality care (The Joint Commission, 2009). The authors suggest that analogous systems ought to be in place in schools of nursing. The purposes of this article are to discuss the issues and challenges in creating and piloting an online occurrence reporting tool for ENMs by prelicensure nursing students and to provide an occurrence reporting tool that can be used by schools of nursing.

Errors and Near Misses

The Institute for Safe Medication Practices (2005) defines a *near miss* as "an event, situation, or error that took place but was captured before reaching the patient." The Institute of Medicine (1999) defines *safety* as "freedom from accidental injury," and *error* is defined as "the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim" (p. 4). Reason (1990) outlines three types of errors:

- *Skill-based errors* are unintended actions (or slips), such as dialing a wrong number on an I.V. pump, and omitted actions (or lapses), such as missing an item on the central-line dressing change checklist.
- *Rule-based mistakes* are actions that match intentions but do not achieve their intended outcome because of an incorrect application of a rule or the inadequacy of the plan. For example, a nurse wrongly believes that he or she is taking the right action.
- *Knowledge-based mistakes* are actions that do not achieve the intended outcome because of knowledge deficits. For example, a novice nurse who has not completed a chemotherapy certification course gives a medication via the wrong line.

Errors and Near Misses in Schools of Nursing

Errors or near misses that may be reported by nursing students may reflect any or all the three types described above. Little is known about the extent to which students commit ENMs, and most information that does exist concerns medication errors. Wolf, Hicks, and Serembus (2006) found 1,300 errors reported over a 5-year period. Reid-Searl, Moxham, and Happell (2010) interviewed 28 students; 9 reported making errors or having near misses. Given that approximately one in five medications is given

incorrectly (The Joint Commission, 2009), it is logical to assume that nursing students would frequently be involved in ENMs.

A complicating factor in examining this issue is that schools of nursing have not kept pace with the philosophical change to a just culture. Too often, schools continue to operate in an environment of secrecy, shame, and blame. Rather than learning from ENMs, students are counseled, reprimanded, or dismissed. Faculty members are often reluctant to share information on student performance among each other, believing that such information will influence a colleague's view of a student and the faculty member. Faculty members are responsible for their students and the care they provide patients. As such, an error by a student could reflect negatively on the faculty member. In some settings, faculty members are reprimanded or terminated if their students make mistakes. These behaviors are characteristic of a culture of blame, where errors are viewed as preventable by individual vigilance and tracking mistakes is seen as condoning them (Barnsteiner & Disch, 2012). Because of these beliefs, few schools of nursing have instituted formal ENM occurrence reporting systems, databases tracking the number and kind of errors, or trending reports that would enable examination of precipitating factors and vulnerabilities in educational programs.

Two skills listed under the Quality and Safety Education for Nurses (QSEN) Safety competency address the idea of ENM reporting:

- Communicate observations or concerns related to hazards and errors to patients, families, and the health care team.
- Use organizational error reporting systems for near miss and error reporting (Cronenwett et al., 2007, p. 128).

For student nurses to become competent nurses, they must be held accountable for individual actions yet understand how system issues can precipitate errors and how responsible reporting can help identify problems. A key first step in transforming nursing education is creating an awareness of and a commitment to establishing just cultures. A second key step is to establish a reporting tool for schools and have them use the information to design interventions to reduce ENMs. A national database would enable schools to recognize trends in nursing-student ENMs and to institute preventive measures.

Given the trends in safety science and quality improvement, the authors strongly believe that an occurrence reporting tool and database would help nursing faculty gain valuable insights into the factors associated with student ENMs and support the faculty's ability to institute systems and processes to minimize them. This initiative in schools of nursing could serve as a national model for tracking and reporting ENMs in other health professions' schools.

A Study to Launch the Initiative

In the fall of 2011, the National Council of State Boards of Nursing (NCSBN) provided funding to conduct a study to gather information on current practices in reporting and trending ENMs by prelicensure students for the purpose of developing and piloting an occurrence reporting tool and creating a national data repository for tracking and trending ENMs. The study of current practices in reporting and trending ENMs has confirmed the hypothesis that the majority of schools do not have policies or reporting tools. As a next step, a pilot study of students and faculty members at 10 schools tested a proposed occurrence reporting tool. We asked the faculty and students to test the tool by using it; then we asked three additional questions on the website related to ease of use, completeness, and any suggestions (open-ended). This pilot study used a Web-based format (www.grassp.org). The creation of a national, anonymous, Web-based data repository for reporting ENMs by nursing students is ongoing. (See Table 1.)

Designing an Occurrence Reporting Tool

Designing an occurrence reporting tool required several considerations. The design team had to reflect diverse perspectives and have relevant areas of expertise. In addition to the authors, a nursing informatician, a nursing doctoral student, two engineering graduate students, and a project manager were included. When identifying the priorities and values that would be reflected in the tool, the team placed a high value on functionality and ease of use for the end user and felt that these considerations should drive decisions about wording and sequencing of key steps. Other considerations included having a tool that could be used by the individual student, faculty member, or both; a tool with elements that captured ENMs beyond medication errors, such as falls, needlesticks, and practice gaps; and a tool that could reflect incidents that affected patients, their families, or the nursing students themselves.

The leaders of the design team needed to create an environment that invited healthy disagreement and discussion, so all options could be brought forward and examined. The team also considered the trade-off required to make the tool comprehensive enough to capture the essential elements of the situation or experience and yet not so lengthy that it was burdensome to use. Pilot testing was essential.

A particularly important part of designing the tool was naming it. Based on information from the few schools of nursing who had developed such a tool, the team learned that a tool's title could introduce unintended biases. Thus, the team avoided names that implied blame, such as Error Reporting Tool or Practice Violation Tool. Instead, the team decided to use the phrase Occurrence Reporting Tool.

Pilot Testing

Twenty schools were invited to participate in the pilot testing of the tool. Eighteen agreed to participate. Before the pilot study, a webinar was held with the lead faculty member from

TABLE 1

The GRaSSP Network

The GRaSSP (Generating Reports about Safe Student Practice) Network will be a national, Web-based data repository for the anonymous reporting of errors and near misses (ENMs) by nursing students, faculty members, or both. The intent is to invite all prelicensure programs in schools of nursing to become members of the GRaSSP Network for a minimal fee, which will support the maintenance of the repository and website. Membership will give faculty members and students access to a Web-based program on their school of nursing intranet to fill out an occurrence report and to print a personal copy of it.

The data repository will enable each participating program to track and trend the type and number of ENMs for their nursing students to improve the educational system and help students practice safely. Each school will designate one faculty person to be the GRaSSP administrator, who will create internal reports from the password-protected data as desired, thus ensuring confidentiality of the data within the school. This parallels national initiatives within health care delivery systems for promoting transparency in ENM reporting and putting processes in place for reporting, responding to, and preventing ENMs.

The repository, as a national, standardized collection system, will provide the opportunity for benchmarking. All participant schools will receive an annual national report with aggregated deidentified data from all participant schools. The national report will provide information on how the school performed relative to comparable schools and nationally. Though the data repository has been designed to compile reports of ENMs within nursing schools, it could easily be adapted to include other health professions' schools.

each school to explain the purpose of the project, outline the components of the tool, gain feedback on a preliminary version of the tool, discuss institutional review board (IRB) and Family Educational Rights and Privacy Act (FERPA) implications, and enlist support. Four additional webinars were conducted for other interested faculty members to educate them on the electronic tool and reporting process. All participating faculty members had previously received education on just culture through the San Francisco Bay Area QSEN Faculty Institutes held in 2010 and 2011.

IRB approval through the expedited review process from the University of Minnesota IRB was obtained before the study. The risk to participants was anticipated to be nonexistent. Schools participating in the pilot testing followed the guidelines of their own organizations for the research review processes. Some schools accepted the University of Minnesota IRB approval, and others filed individual applications. Assistance was provided by the research team to schools that filed for themselves.

The brief, electronically based tool consisted of six parts:

- Demographic information on the student (type of program, year in school, gender)
- School characteristics (geographic location, state/private status, urban/rural)
- Nature of the ENM
- Whether the student reported the incident, why/why not; if yes, what happened as a result of the incident?
- What happened, if anything, to the student or faculty member as a result of the incident and were there consequences for the patient?
- Originator of the report, for example, student, faculty member or both.

Open-ended questions were offered at the end of the draft tool to obtain feedback on ease of use, any missing or confusing questions, and recommendations for improvement.

The pilot test was conducted in February and March of 2013. Although 18 schools indicated an interest in participating, only 70 tools from 10 schools were submitted. Because the purpose of this part of the project was gathering feedback on the tool (e.g., readability, ease of use, comprehensiveness) and not accurately capturing ENMs, faculty members were encouraged to report current incidents, previous incidents, or fabricated incidents.

Results

The incidents reported, which could have been actual or fabricated, included medication errors, communication issues, and inappropriate practice. Most reports were from faculty members; a few were from faculty member–student dyads. Feedback from the participants indicated that the tool was robust enough to capture the incidents submitted; the tool could be used for a wide array of incidents, including medication errors, breaches of confidentiality, student injuries, communication breakdowns, falls, and needlesticks; and the tool could be used for incidents that occurred in the clinical setting, in simulation, and other sites.

Students and faculty were positive about the tool and reported it was easy to use. A total of 27 comments and suggestions were made, including comments on the electronic process and suggestions for including options in drop-down boxes. Another suggestion was to include spaces to write in other prelicensure degrees being offered in certain parts of the country. The majority of suggestions were related to allowing additional space to explain the details of the incident. All suggestions were considered in the final formatting of the reporting tool. Figure 1 shows an adaptation of the final tool.

National Data Repository: Issues and Challenges

Faculty members and students can now use this adaptation of the tested occurrence reporting tool to track and trend ENMs in their schools. However, the authors believe that without a

FIGURE 1

GRaSSP Occurrence Reporting Tool

Information About Incident

Recipient of Unsafe Event

Who received injury? Patient

Gender
- ○ Male
- ○ Female
- ○ Not reported

English is predominant language
- ○ Yes
- ○ No
- ○ Unknown

Status of patient/individual
- ○ Harm
- ○ No harm
- ○ Death
- ○ Other

Age: 15-20

Event Demographics

Date: 01 January e.g., 2012

Time: hrs e.g., 14:28

Category of event
- ○ Error
- ○ Near miss

Type of Incident

- Medication error
- Needle stick
- Inadequate preparation for providing patient care
- Blood/pathogen exposure
- Fall event
- Outside scope of practice
- Injury to body
- Change in patient condition
- Deviation in protocols
- Equipment or medical device malfunction
- Environmental safety – for self, patient, or others
- Inappropriate or inadequate communication by: Faculty, preceptor, other student, health care team, patient, or visitor
- Breach of confidentiality
- Other

Event Description

Enter N/A if there is no event description.

Location of event: Classroom

Who is completing the report?
- ○ Student
- ○ Faculty
- ○ Student/faculty dyad

Follow-up Action

Who is alerted?
- ○ Faculty
- ○ SON administration
- ○ Patient/family
- ○ Other
- ○ Unknown

Inform clinical agency
- ○ Yes
- ○ No
- ○ Unknown
- ○ N/A

Agency incident report completed
- ○ Yes
- ○ No
- ○ Unknown
- ○ N/A

Changes occurring as a result of incident
- ☐ System changes
- ☐ Policy changes
- ☐ Practice changes
- ☐ Curriculum changes
- ☐ Nothing at present

Follow-up actions

Enter N/A if no follow-up action.

Information About Student

Current semester or quarter number: e.g., 2

Total number of semesters or quarters in program: e.g., 8

Student age: 15-20

Type of program: Associate

Final Remarks

Do you wish to share anything else relevant to this report?

Submit Query

national data repository to aggregate consistent information on ENMs, provide benchmark data, suggest areas for curricular improvement, and offer peer pressure to create change, little substantive change will occur. Finding a central site where data are securely stored and maintained is a significant challenge that must be solved.

Regulatory Issues

Data security is an increasing concern in higher education and health care. Thus, in setting up a data repository with elements related to both industries, consideration had to be given to applicable regulations. The Health Insurance Portability and Accountability Act (or HIPAA) requires that "healthcare providers and organizations establish and implement procedures that ensure the confidentiality and security of protected health information (PHI) when it is transferred, received, handled, or shared" (California Department of Health Care Services, 2013). A fair amount of confusion exists about HIPAA's jurisdiction, but because the information we were collecting was not PHI, we determined that HIPPA did not apply.

FERPA protects the privacy of student education records. However, the term "education records" is defined as "those records that contain information directly related to a student and which are maintained by an educational agency or institution or by a party acting for the agency or institution" (U.S. Department of Education, n.d.). This definition refers to personally identifiable information. Because the students and faculty members would not be identifiable, we determined that the data repository would not be subject to FERPA oversight.

Within the nursing profession, NCSBN (2005) has developed recommendations for Clinical Instruction in Prelicensure Nursing Programs. Included in this document are statements regarding the faculty's responsibility for guidance and direction for nursing students. Two statements are relevant:

- Prelicensure clinical education should be supervised by qualified faculty members who provide feedback and facilitate reflection.
- Faculty members retain the responsibility to demonstrate that programs have clinical experiences with actual patients that are sufficient to meet program outcomes.

Furthermore, boards of nursing in each state stipulate faculty responsibilities related to oversight of nursing-student performance.

Data Confidentiality

One criterion of faculty members and school administrators was to keep repository data confidential. The team anticipated that confidentiality would be a concern and knew that health care organizations use peer review protection for tracking and trending data on errors for the purposes of quality improvement. We believed a similar approach could be used because the schools would be internally tracking and trending data on errors for their own quality improvement. However, we did not anticipate the difficulty of ensuring confidentiality using peer review protection. To better understand the requirements, we explored the concept of peer review.

Peer review is the "process by which doctors, hospitals, and other healthcare providers review the performance of other doctors and healthcare providers" (Miller, 2013). It has several applications: reviewing the quality and nature of and the need for care given to a particular patient; determining the appropriateness of care to populations of patients; and reviewing the credentials and competencies of health care providers. However, promoting quality care and working to improve processes can lead to unintended consequences if the process is not fair and secure. Thus, the process of making peer review confidential is critical and has been adopted by statute in all 50 states, the District of Columbia, and the federal government (Miller, 2013), with each entity approaching the issue somewhat differently. Key commonalities include the immunity of participants in the peer review process and the protection of the records from disclosure to third parties. Originally, we assumed that these provisions would apply to protecting data collected for peer review and improvement in schools of nursing.

Minnesota Law

Because the grant was administered through the University of Minnesota and we planned to house the database there, legal counsel was sought regarding how to set up a peer review protected process in Minnesota. Though the data in the repository were not patient-specific, there was a great deal of interest in protecting the data from discovery by outside parties who might publicize the data or make allegations about the quality of nursing education in the various programs based on how many ENMs a school reported.

In Minnesota statute 145.61 (The Office of the Revisor of Statutes, 2013), a *review organization* is defined as

> a hospital, a clinic, a nursing home, an ambulance service or first responder service regulated under chapter 144E, one or more state or local associations of professionals, an organization of professionals from a particular area or medical institution, a health maintenance organization as defined in chapter 62D, a community integrated service network as defined in chapter 62N, a nonprofit health service plan corporation as defined in chapter 62C, a preferred provider organization, a professional standards review organization established pursuant to United States Code, title 42, section 1320c-1 et seq., a medical review agent established to meet [certain] requirements, the department of human services, or a nonprofit corporation that owns, operates, or is established by one or more of the above referenced entities, to gather and review information relating to the care and treatment of patients.

Legal counsel from the Academic Health Center at the University of Minnesota reached the following conclusions:

- An educational institution such as the school of nursing does not qualify as a review organization.
- The data repository could possibly be housed in an organization listed above, but there was a question about whether the mission of the organization would be sufficiently linked to the purpose of the project.
- There were nursing organizations in the state that could possibly qualify, but there was a question about whether the expense and complexity of establishing and maintaining a national database would fit within their priorities and resources.

Thus, attention is now being directed toward finding a different home site from the one originally intended.

Ownership of the Data

A critical question is who owns the data and the data repository. The answer varies, usually based on the source of funding for the database creation and the policies of the organization administering the grant. In this case, the funding agency, NCSBN, supported the identification of a home site for the data repository and relinquished its ownership. The two principal investigators also agreed to relinquish their rights to an appropriate agency that could carry on the work. At the University of Minnesota, the Office for Technology Commercialization, guided by policy approved by the Regents of the University of Minnesota, is the entity that establishes the rights and responsibilities of the investigators and home site.

Other considerations included whether the software program for the repository would be transferred to the host entity; whether there would be a charge for the transfer; the extent to which there would be ongoing participation by the investigators; the extent to which the university would retain income from the project; whether a major goal would be to maximize income or cover expenses; and who would retain the intellectual capital from the project. Every school and institution have distinct policies for addressing these issues. A critical step in establishing a home for a data repository is a timely discussion with the relevant parties to discuss the nature of the project or invention, the partners in the situation, organization policies, and accountabilities.

Financial Considerations

In developing a financial model, we focused on the purpose of the data repository: to serve as a home site for reporting nursing-student ENMs so faculty members could track and trend common sources of ENMs in their own schools. The goal was to engage as many prelicensure programs as possible to create a robust database for educational and quality improvement purposes only and not to generate excess income. Thus, we needed to determine the reasonable costs of launching and maintaining a database and develop a pricing structure to cover these costs. Assumptions were made about the percentage of personnel effort required, Web and computer support, communications, and generation and dissemination of reports.

Next Steps

Although there was significant support from the dean of the University of Minnesota School of Nursing, the challenges outlined by the legal counsel regarding housing the database were daunting. Thus, discussions are currently underway with national organizations that may better qualify as a home site because they have a national scope; they have a mission that is complementary to or consistent with the purpose of the database; they have the experience, resources, and capacity for hosting a large national database; and they could qualify as a review organization or have a process in place that could support confidentiality of the data. This process is underway.

Through publications such as this and presentations and communication via faculty networks, the authors are informing faculty members about the issues surrounding nursing-student ENMs, the importance of a just culture, the existence of the occurrence reporting tool, and the importance of getting started in their own schools of nursing with conversations on just culture and tracking and trending ENMs. There is a tremendous enthusiasm among many nursing faculty members to begin this work. Though a national initiative could accelerate the process, we believe that local conversations about just culture and nursing-student ENMs can be a helpful step.

Conclusion

Helping student nurses become competent novice nurses requires implementing systems and structures that allow for trending and analysis of ENMs and creating transparent and just cultures in which nursing faculty and students can learn from mistakes and change systems to prevent them. This requires a transformational change in schools of nursing. A key first step is establishing a reporting mechanism for students' ENMs. With a national data repository, a baseline could be created, and appropriate interventions could be designed to reduce the number of ENMs by nursing students. The authors hope that creating an occurrence reporting tool and a data repository will serve as a foundation for improving the education of nursing students in delivering quality nursing care.

References

Barnsteiner, J., & Disch, J. (2012). A just culture for nurses and nursing students. *Nursing Clinics of North America, 47*(3), 407–416.

California Department of Health Care Services. (2013). *Health insurance portability and accountability act.* Retrieved from www.dhcs.ca.gov/formsandpubs/laws/hipaa/Pages/1.00%20WhatisHIPAA.aspx

Cronenwett, L., Sherwood, G., Barnsteiner, J., Disch J., Johnson, J., Mitchell, P., Sullivan, D., & Warren, J. (2007). Quality and safety education for nurses. *Nursing Outlook, 55*, 122–131.

Institute for Safe Medication Practices. (2005). *ISMP survey helps define near miss and close call.* Retrieved from www.ismp.org/Newsletters/acutecare/articles/20090924.asp

Institute of Medicine. (1999). *To err is human: Building a safer health system.* Washington, DC: National Academies Press.

Isaac, A., & Ruitenberg, B. (2002). *Air traffic control human performance factors.* Wey Court East, UK: Ashgate Publishing.

The Joint Commission. (2009). *Sentinel event alert #43. Leadership committed to safety.* Retrieved from www.jointcommission.org/sentinel_event_alert_issue_43_leadership_committed_to_safety

Marx, D. (2001). *Patient safety and the 'just culture:' A primer for health care executives.* New York, NY: Columbia University.

Miller, L. K. (2013). *Protecting and preserving the peer review privilege—Solutions for corporate counsel representing hospitals, health care corporations, and health care providers.* Retrieved from www.elliswinters.com/?p=inside/7recent_developments

National Council of State Boards of Nursing. (2005). *Clinical instruction in prelicensure nursing programs.* Retrieved from www.ncsbn.org/Final_Clinical_Instr_Pre_Nsg_programs.pdf

The Office of the Revisor of Statutes. (2013). *2013 Minnesota statutes. Statute 145.61.* Retrieved from www.revisor.mn.gov/statutes/?id=145.61

Reason, J. (1990). *Human error.* Cambridge, UK: Cambridge University Press. Retrieved from http://patientsafetyed.duhs.duke.edu/module_e/definitions.html

Reid-Searl, K., Moxham, L., & Happell, B. (2010) Enhancing patient safety: The importance of direct supervision for avoiding medication errors and near misses by undergraduate nursing students. *International Journal of Nursing Practice, 16,* 225–232.

U.S. Department of Education. (n.d.). *Family educational rights and privacy act.* Retrieved from www.ed.gov/policy/gen/guid/fpco/ferpa/index.html

Wolf, Z. R., Hicks, R., & Serembus, J. F. (2006). Characteristics of medication errors made by students during the administration phase: A descriptive study. *Journal of Professional Nursing, 22*(1), 39–51.

Joanne Disch, PhD, RN, FAAN, is Professor ad Honorem, University of Minnesota School of Nursing, Minneapolis.
Jane Barnsteiner, PhD, RN, FAAN, is Professor Emerita, University of Pennsylvania School of Nursing, Philadelphia.

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