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Adverse event reporting following simulation encounters in accelerated and traditional bachelor nursing students☆

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ABSTRACT

Objective: This study was to investigate the differences in the types, frequency, and perspectives of self-reported adverse events reported following simulation encounters between students enrolled in two Bachelor of Science in Nursing (BSN) programs: accelerated option (AO-BSN) or traditional (T-BSN) and by role (participant or observer) during simulation.
Methods: This study analyzed 6994 adverse event reports entered by students through the simulated adverse event reporting system.
Results: The AO-BSN students reported a higher percentage of adverse events coded as errors. In contrast the T-BSN students reported more near misses and sentinel events. Further, the T-BSN students significantly reported more fall related errors, while AO-BSN students reported more confidentiality breach errors. Participants reported more medication errors, whereas observers reported more airway and fall categorized errors.
Conclusion: The vantage from which adverse events are viewed and educational track appear to alter slightly the perceptions of the precipitating factors leading to committed or observed adverse events.

1. Introduction

Approximately 400,000 deaths are caused by medical errors in the U.S annually. By this estimate, medical errors account for the third leading cause of premature death in the U.S. (Makary, 2016). Reporting of all adverse events is essential to identify error causes and prevent future occurrences. Despite known benefits and institutional directives stressing the importance of reporting, there remains significant underreporting in healthcare settings (Hajibabaee et al., 2011; Sarvadikar et al., 2010). By some estimates, only 10% of all adverse events are ever captured and reported. The capture and analysis of events allows systems to discover the errors that are made, form a better understanding of their causes, and to subsequently generate processes and systems that mitigate repeat incidences (Haslbeck et al., 2015).

Recognizing an opportunity to indoctrinate the next generation of nurses with a strong culture of safety and a comfort with reporting adverse events, a simulated adverse event reporting system was incorporated into our simulation program. The Simulated Adverse Event Reporting System (S-AERS) was launched in 2013 with two goals; (1) to use simulation methodologies to teach students about the importance of adverse event reporting, and (2) to develop a platform where students could gain hands-on practice with reporting adverse events (McKay and Sanko, 2014). Since inception, system has captured > 9000 reported events. A secondary benefit of the system is the information garnered from data. The data are assisting with uncovering curricular gaps, which can be subsequently addressed with changes to educational content.

The web-based S-AERS system was developed using Qualtrics© and is designed to allow anonymous reporting of errors, near misses, sentinel events, and other adverse events. Definitions for each of these terms are embedded into the system for purpose of providing consistent reference when reporting (Table 1). The S-AERS presents predetermined choices for categorizing and describing the adverse events. The categories included are: medication, scope of practice, order execution, failure to rescue, confidentiality breaches, falls, and airway events. Two open ended questions are also included in the form. The two open ended questions prompt those reporting adverse events to expound upon what was perceived to be the precipitating contributing factors for the event as well as what was learned.

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Table 1
Definitions of adverse event type.

Type	Definition	Reference
Error	Circumstances in which planned or unplanned actions fail to achieve desired outcome leading to patient harm	Agency for Healthcare Research and Quality (n.d.)
Near miss	Events which did not lead to patient harm because an intervening event interrupted the course of the incident	
Sentinel event	An unexpected occurrence resulting in patient death or serious physical or psychological injury or risk thereof	

2. Literature Review

Barriers to reporting are often cited as the reasons for the under-reporting of adverse events in healthcare. Documented barriers include fear, shame, legal repercussions, and knowledge gaps. (Hajibabaee et al., 2011; Haslbeck et al., 2015). A well-accepted reporting culture supports efforts to capture adverse events (Haslbeck et al., 2015). To date healthcare has failed to develop a strong reporting culture; as a result, healthcare lacks a safety ethos that promotes adverse event disclosure and reporting.

Overall, there is little published research on the differences in Accelerated Option Bachelor of Science in Nursing (AO-BSN) and Traditional Bachelor of Science in Nursing (T-BSN) students. A majority of research found in the literature focuses on demographic characteristics of AO-BSN students, however a few researchers have explored critical thinking abilities, stress levels (Youssef and Goodrich, 1996), and self-efficacy (Durkin and Feinn, 2017) in this population. Researchers examining differences in AO-BSN (a.k.a. second degree BSN) and T-BSN students have noted differences in demographics (Diers, 1987; Feldman and Jordet, 1989; Wu and Connelly, 1992), not surprisingly AO-BSN students are older in age (Bowie and Carr, 2013; Schwartz et al., 2015). These studies have found differences in critical thinking abilities of students enrolled in AO-BSN versus T-BSN programs. Brown et al. (2001) found that T-BSN students had more gains in critical thinking skills compared to AO-BSN students (Brown et al., 2001). Similarly, Newton and Moore (2013) found that AO-BSN students had better critical thinking skills compared to T-BSN students. Durkin and Feinn (2017) found that AO-BSN students demonstrated overall higher self-efficacy.

Research on self-reported adverse events in either of these populations of nursing students was not found during a literature search. Further, to our knowledge our program is the only nursing program with an incorporated S-AERS in use as part of their simulation program. These two gaps in the literature afforded an excellent opportunity to add to what is known about reporting tendencies in student nurses and what is known about differences between AO-BSN and T-BSN students.

3. Research Questions

The system contains a large data set thus allowing for exploration of various questions to examine characteristics of adverse event commission in simulation-based education. The questions driving this study were: (1) 'Are there differences in the types, frequency, characteristics, and learning that occurs from self-reported adverse events reported following simulation encounters between Accelerated Option Bachelor of Science in Nursing and Traditional Bachelor of Science in Nursing students?' and (2) 'Do observers and participants of simulation encounters have different perspectives on reported adverse events?'

4. Methods

4.1. Study Design and Sample

This secondary data analysis study used data extracted from the S-AERS. On average 200 undergraduate nursing students per year are enrolled into one of two programs, an accelerated option BSN or a traditional BSN. The traditional BSN program is a four-year program where students matriculate into during their nursing course work during junior year of college following completion of all nursing program prerequisites. The accelerated option BSN program is a fast-track program for students committed to earning their BSN in 12 months and who have completed a bachelor's degree in another field of study. The clinical course required for both programs are identical, and all include simulation-based education.

Simulation is incorporated into all clinical courses. As part of the simulation program, all students are invited to report any adverse events, which were self-committed as a participant or noted as an observer during each simulation encounter. After each simulation encounter, students are allowed time for entering adverse events into the S-AERS prior to debriefing the simulation encounter. This practice allows them to report before debriefing avoiding possible influences from the debriefing that could alter perceptions of adverse events and subsequent reporting of them.

4.2. Data Collection

Data was collected in the S-AERS per usual and then extracted into a statistical package for social sciences (SPSS) for the quantitative data analyses. Qualitative data was extracted into a series of word documents for qualitative data analyses. Data were extracted for the time period of April 2013 (inception of the system) through September 2016. During this period, > 7000 adverse events were reported into the system. A total of 6994 reports entered by students enrolled in accelerated and traditional BSN programs were analyzed as part of the study, incomplete records were not analyzed due to missing information. This study was approved by the university's Institutional Review Board.

4.3. Statistical Analysis

Descriptive statistics was used to describe the characteristics of study cases. To control for differences in the samples sizes among the groups compared (AO-BSN vs. T-BSN, and observer vs. participant), proportions were calculated using raw data for each group and condition. Proportion comparisons were completed using chi-square tests to examine differences in adverse events reported by nursing program enrolled (AO-BSN vs. T-BSN) and by role during simulation encounter (participant vs. observer). The statistical significance was set at a level of $p < 0.05$. Content analysis was used to explore the qualitative data collected through the two open ended questions that are included as part of the reports.

5. Results

5.1. Quantitative Data Analysis

During the data collection period, 5076 reports were entered from students enrolled in the accelerated program and 1918 reports from those in the traditional program. Of the total 6994 reports, 41.8% were from simulation participants and 58.2% were from simulation