Medication Errors In Relation To Education & Medication Errors In Relation To Years of Nursing Experience

Chris G. Bailey, Bryan S. Engel, Jillian N. Luescher, Maegan L. Taylor

Abstract

Medication errors are a significant issue affecting patient safety and costs in hospitals often posing dangerous consequences for patients. It is important to understand that an analysis of medication errors can help healthcare professionals and managers identify why medication errors occur and provide insight into how to make improvements to prevent or reduce them. There are several types of medication errors such as wrong dosage, wrong patient, wrong route, wrong time, or wrong medication. The causes are also varied such as inexperienced or insufficient staff, or perhaps procedure or protocol not being followed. This study explored the relationship between the number of medication errors and level of education and the relationship between the number of medication errors and years of nursing experience. In researching the relationship between these possible contributing factors and medication errors, the safety of patients could be greatly enhanced and costs of healthcare can be reduced.

Medication errors are a significant issue affecting patient safety in United States hospitals and pose dangerous consequences for patients. Every step in patient care for a nursing professional involves a potential for error and some degree of risk to patient safety. However, this is especially true in regards to medication errors. A proper understanding of the contributing factors that increase medication errors is the first step toward preventing them. There are many factors, such as training deficiencies, undue time pressure, and nursing shortages that may have contribute to medication errors. The amount of nursing education and the years of nursing experience are two factors that may have a relationship to medication errors. Due to the fact that nursing staff is a large cost to hospitals, these organizations are constantly trying to manage expenses. This is supported by Yang (2003) who states "nursing professionals typically represent the largest employee group in hospitals, and have become a primary target for redesign measures". Consequently, medication errors are costly and seem to be proportional to the staffing of nurses. Since nurses make up such a large portion of the staff population, it is important to understand the factors behind these medication errors. With a better understanding of the relationship between education level and medication errors, along with years of nursing experience, it is believed that healthcare will improve and become more efficient.

Literature Review

These issues of medication errors were present even at the time when Benjamin Franklin founded America's first hospital and he stated that patients ultimately suffer and die without good nursing care (Clarke, 2003). The framework for this study is the belief that relationship that less education and less experience lead to increased medication errors. This is supported by the evidence that there is a rise in medication errors resulting in deaths (Stetina, Groves, & Pafford, 2005). Based upon this, it is important to evaluate nurses' medication errors including why they make them, how they are made, and what preventive measures can be taken to decrease the risk of making additional mistakes. There is a limited amount of published research correlating nursing experience and/or education with the number of medication administration errors.

Although there are many layers involved in medication administration, it is the nurse now who is generally held accountable for medication errors. Jill Gladstone reports "advancements in medical science have led to the increase in both the numbers and potency of medications that are prescribed" (Gladstone, 1995, p. 628). Gladstone (1995) did a study over a twelve month period in England, which looked at self administered questionnaires about medication errors and incident reports. The sample size was a total of seventy-nine. The study showed that over half the medication errors were dosage related and involved intravenous medications.

Pamela Stetina, Michael Groves, and Leslie Pafford(2005) stated "medications errors accounted for 7,931 deaths in 1993, compared to 2,876 deaths in 1983" (p. 174). In this particular study the researchers wanted to obtain a better understanding of how nursing experience related to medication errors. In order to acquire a better understanding, researchers used the Heideggerian phenomenological method to discover how nurses' handled medication errors. The researchers interviewed twelve nurses in Texas. The data revealed three key concepts. These included medication errors involving violation of the "five rights", context of medication administration, and dependence on medication administration systems such as medication administration report sheets and computers. The "five rights" of medication safety refer to the right patient, right drug, right dose, right time and right route. The data from this study showed that "nurses viewed the system as infallible and a relief from the duty of systematic checking against error" (Stetina, 2005, p. 177). It is important to understand that an analysis of medication errors can help healthcare professionals and managers to identify why medication errors can occur and make improvements to prevent or reduce them.

Table 1: Types of Medication Errors

Types	Contributing Factors	Causes
extra dose	distractions	performance deficit
improper dose/quantity	workload increase	procedure/protocal not followed
omission error	inexperienced staff	knowledge deficit
prescribing error	shift change	inaccurate or lack of documentation
unauthorized drug	agency /temporary staff	confusing communication
wrong administration	no 24 hour pharmacy	inaccurate or omitted transcription
technique	insufficient staffing	computer entry
wrong dosage form	emergency situation	drug distribution system
wrong drug prepartaion	cross coverage	inadequate system safeguards
wrong patient	code situation	illegible or unclear hand-writing
wrong route	no access to patient	
wrong time	information	

(From: "Legal Issues in Critical Care," by R. M. Kleinpell, 2001, *Nursing Spectrum*, 2, 39).

Purpose

The purpose of this study was to determine the relationship between level of education and medication errors and years of work experience and medication errors. With a better understanding of these relationships, nursing professionals can learn what characteristics tend to make a nurse prone to medication errors and can develop methods and procedures to reduce incidence.

Method

Procedure

The researchers in this study were nursing students who had obtained approval from the hospital where the study was to be conducted and the College's Institutional Review Board where they were enrolled to execute a study on factors that might affect the number of medication errors. The data for this study was collected through anonymous self reported surveys distributed to nursing staff members throughout the selected hospital. The surveys consisted of six questions that were a combination of short answer and multiple choice. On

the front side of each survey was an informed consent sheet explaining the study and policies related to it. The surveys were placed on each floor of the hospital in the nurses' stations in a labeled manila envelope with instructions concerning participation in the study. Additionally, there was another envelop for the subjects to place the completed surveys. The researchers collected the completed surveys on the Friday of each week for a two week period. Upon completion of the two week period, all the surveys were compiled and analyzed. Microsoft Excel was used in calculations and presentation of the results. The statistics were added and averaged per nurse per level of education and also added and averaged per nurse per years of experience. All original surveys were shredded.

Subjects

The subjects of this study were Bachelor of Science in Nursing Registered Nurses, Associate Degree Registered Nurses, and Licensed Practical Nurses from a rural hospital in west Georgia. The convenience sample was obtained through distribution of surveys to nurses on each floor of the selected hospital. Participation was voluntary and surveys were completely anonymous. The study consisted of 47 completed surveys, two of which were discarded due to lack of inclusion criteria (see figure 1). Of the 45 remaining surveys, 23 were from Registered Nurses with Associate Degrees in nursing. This group comprised 51% percent of the returned surveys. The second group in this study was fifteen nurses who had completed a Bachelor of Science degree in nursing. This group comprised 33% of the returned surveys. The third group that participated was made up of seven Licensed Practical Nurses who comprised 16% of surveys returned.

Study Design

This study used a quantitative non-experimental correlation design to examine the relationship between medication errors and level of education in addition to the relationship between medication errors and years of nursing experience. A survey consisting of six questions regarding medication administration experience was used for data collection. Microsoft Excel was used in calculations and presentation of the results.

Results

The results of the study suggested that there is a direct relationship between education and medication errors, rather than an inverse relationship, wherein as education increased number of errors decreased. The study showed that Licensed Practical Nurses (LPN) made the least number of medications errors followed by Registered Nurses with Associate Degrees, with BSN Registered Nurses having the highest incidence of medication errors. The LPNs in this study had made an average of 1.1 medication errors within the last twelve

months (see Figure 2). The RNs in this study had made an average of 1.4 medication errors within the last twelve months. The BSN RNs who participated in this study had made an average of 2.3 medication errors within the last twelve months. The results indicate that as the education level increased so did the number of medication errors. The study showed that nurses made the most medication errors either in their first five years of nursing experience or after twenty years of nursing (see Figure 3). The results showed that nurses within the first five years of work experience had an average of 2.2 errors within the last twelve months. The nurses with more than 20 years of nursing experience made an average of 2 errors per nurse within the last twelve months. The three other work experience groups with 6-20 years of experience, varied within .5 errors of each other. This study also indicated that giving medication at the wrong time was the most common type of medication error made by the participants (see Figure 4). The shift that reported having the most medication errors was 7am-7pm, when most medications are administered (see Figure 5). The most common route for medications errors was PO or "by mouth" (see Figure 6).

Discussion

Due to the limited size of the sample population and the fact that the scope was limited to one hospital, the results of this study cannot be generalized. However, the results do provide insight into the probable impact of education and experience on medication error rates. The study suggests there is a relationship between the number of medication errors and nurses with varying education levels. The study indicates that a BSN RN generally makes the most errors, which could be useful information in structuring future BSN programs to increase clinical focus in the preparation of their students. This study indicates little difference between the number or medication errors and work experience.

Since nurses make up such a large portion of the hospital staff population, it is important to understand this relationship and possible contributing factors leading to medication errors. With a better understanding of the relationship between education level and medications errors, along with years of nursing experience and medications errors, it is believed that healthcare will improve and costs would be decreased. The scarcity of published literature on this particular topic supports the need for further research.

References

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(Figure 1) Number of Responses as a Function of Years of Experience
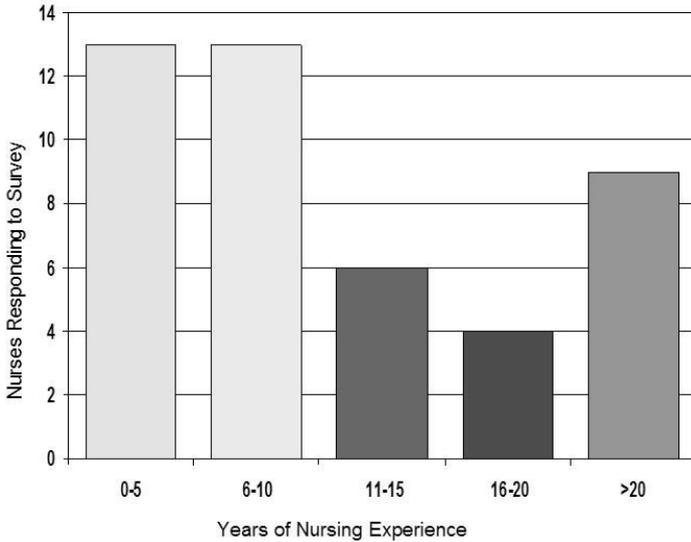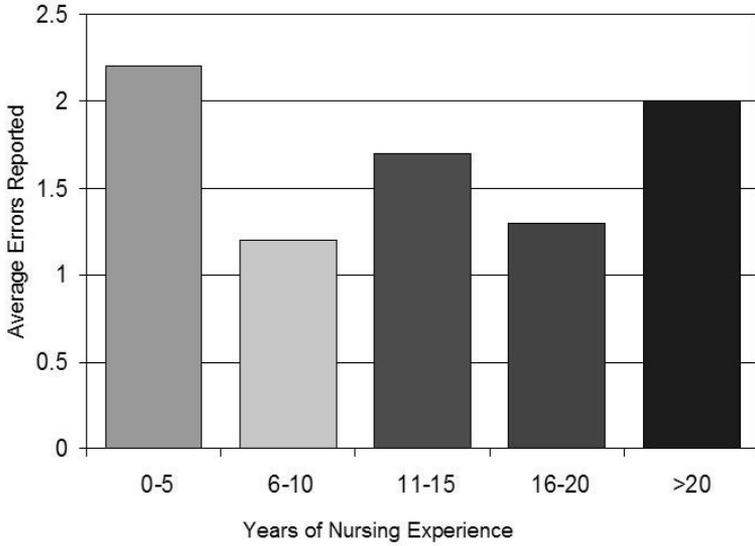

(Figure 2) Number of Medication Errors as a Function of Nursing Level of Education
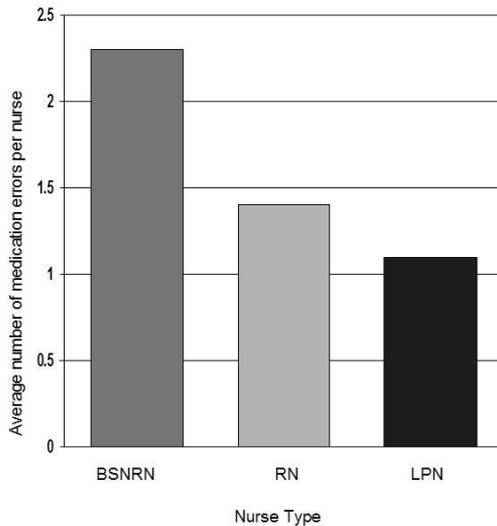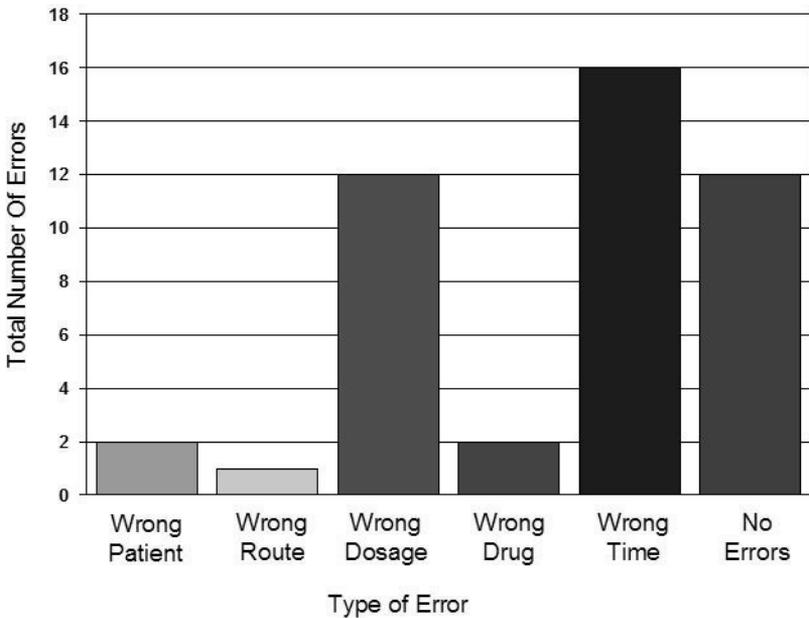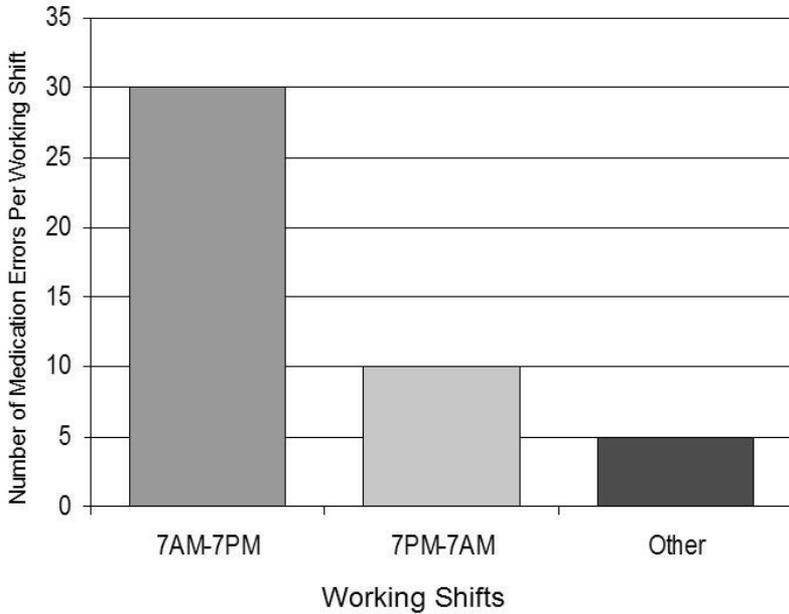
Medication Errors

(Figure 3) Number of Medication Errors as a Function of Years of Nursing Experience

(Figure 4) Number of Medication Errors as a Function of Error Types

(Figure 5) Number of Medication Errors as a Function of Working Shift

(Figure 6) Number of Medication Errors as a Function of Medication Route