

Original Paper

Association Between Professional Commitment and Reported Medication Errors in Nurses



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Citation Nasiri Kh, Hamidi H, Hajzadeh M, Gholinejad S, Ebadi J, Mirzaee Jirdehi M, et al. Association Between Professional Commitment and Reported Medication Errors in Nurses. *J Holist Nurs Midwifery*. 2024; 34(3):221-228. <https://doi.org/10.32598/jhnm.34.3.2578>

Running Title Professional Commitment and Reported Medication

doi <https://doi.org/10.32598/jhnm.34.3.2578>

Article info:

Received: 16/12/2022
Accepted: 2/3/2024
Available Online: 01/07/2024

ABSTRACT

Introduction: Medication error and professional commitment are two topics in the nursing profession.

Objective: The current study aims to determine the association between professional commitment and reported medication errors in nurses working in hospitals in Ardabil and Khalkhal cities, Iran, in 2021.

Materials and Methods: This descriptive-analytical research was correlational and was conducted on 350 nurses working in educational and medical centers in Ardabil and Khalkhal cities in the north of Iran in 2021. Sampling was done by simple random method. The questionnaire on professional commitment and medication error was used to collect information. The t-test, Pearson test, chi-squared test and multivariate linear regression were used to determine the associations between study variables.

Results: The results show that the Mean±SD of the study participants' age was 34.76±27.20 years and most participants were female (78.28%). Also, the Mean±SD of the total score of medication error and professional commitment in nurses were 14.64±4.56 and 94.15±11.97, respectively. Statistically, there was a significant relationship between medication error and nurses' professional commitment (P=0.008, r=-0.15). The results show that among the investigated variables and their effect on medication error, commitment to the nursing profession (β=0.154, 95% CI; 0.001%, 0.3%, P=0.048) has a direct and significant relationship, with the increase in commitment to the nursing profession, medication error increases and also married status (β=-0.261, 95% CI; -2.96%, -1.007%, P=0.002) has an indirect and significant relationship with medication error.

Conclusion: The study's findings showed a statistically significant relationship between professional commitment and medication errors in nurses. Therefore, strengthening the organizational commitment of nurses can reduce medication errors and ultimately increase the safety of patients.

Keywords:

Professional commitment, Medication errors, Nurses

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Highlights

- Medication errors have become one of the challenges of the healthcare system and are associated with an increase in mortality.
- Direct care of the patient and implementation of medication orders are the cause of medication errors in nurses.
- Nurses with high professional commitments will try to achieve professional values, one of the most important of which is reducing medication errors.

Plain Language Summary

Medication errors are among the most common health errors used today as an indicator to determine patient safety in hospitals. In recent years, it has become one of the challenges of health care systems and is associated with increased mortality. Since nurses are responsible for the direct care of the patients and participate in the process of giving medication, they can make medication errors. The professional commitment of nurses leads to the reduction of medication errors. The present study investigated the relationship between medication error and professional commitment in nurses. The results showed a relationship between medication error and nurses' professional commitment. With an increase in the dimension of perception of nursing, the amount of medication error decreases.

Introduction

One of the most critical issues in health centers, especially medical centers, is the quality of care, which consists of several elements and patient safety is one of the most important [1]. In recent years, medication errors have become one of the challenges of health care systems and are associated with an increase in mortality [2]. The United States Institute of Medicine estimates that 150000 people are affected by medication errors, of whom 7000 die [3]. Among the health system staff, nurses spend most of the time with the patients from hospital admission until discharge; nurses monitor the whole process of giving medicine during this time [4]. As nurses are responsible for the direct care of the patients and participate in the process of providing medications, they can make medication errors [5].

Unfortunately, accurate statistics on medication errors in Iran are not available. Although medication errors occur by any healthcare team member, errors made by nurses are among the most common [6]. There are various reasons for nurses' medication errors. The results of a study in the United States of America showed that physical and mental health disorders of nurses can increase the incidence of medication errors [7]. Also, factors such as salary, clinical work experience, cognitive impairment, stressful factors related to the task and interpersonal relationships contribute to clinical errors in nurses [8]. The study results showed that the most

frequent errors include the wrong dose, wrong registration, wrong drug, and wrong patient. Also, this study found that the most frequent errors were in the oral and intravenous methods and the least error occurred in the injection method, intramuscular, and inhalation [9]. Self-reporting of errors is the key to maintaining patient safety [10].

People with higher professional commitment are likelier to report violations and illegal cases [11]. Therefore, it seems necessary to pay more attention to the professional competencies of nurses [12]. Nurses with high professional commitments will try to achieve professional values, one of the most important of which is reducing medication errors [13]. Considering the lack of sufficient studies related to a medication error, the importance of medication errors in patient safety, the significance of professional commitment as an influential factor for the nursing profession, reported medication errors and different institutional cultures among university hospitals, this study was conducted to determine the association between professional commitment and reported medication errors in nurses working in hospitals in Ardabil and Khalkhal cities, Iran, in 2021.

Materials and Methods

This descriptive-analytical research was correlational and was approved by the [Khalkhal University of Medical Sciences](#). The study was conducted on 350 nurses working in Ardabil and Khalkhal educational and medi-

cal centers in 2021. The inclusion criteria were working as a nurse for at least one year, having a bachelor's degree or higher, and signing informed consent to participate in the study. According to the study by Yousefiasl et al. [9], by considering $\alpha=0.05$, study power=0.9 and the standard deviation of medication error=1.64 in this study, and a 10% attrition rate, the sample size was determined at 350.

Simple random sampling was used to select study participants. The tool for collecting data was a three-part questionnaire. The first part consists of demographic information on nurses (age, gender, work experience, marriage status, employment condition, educational level, ward and work shift type). The second part was a self-report medication error survey. It is a researcher-made questionnaire designed by Jolaei et al. [14]. This tool had 11 items ranging from never (level 1), 1 to 5 times (level 2), 6 to 10 times (level 3), to >10 times (level 4) for assessing medication errors in the past three months. The minimum point is 11, and the maximum is 44, which 11 means the least medication errors, while 44 shows the highest medication errors. In the present study, the tool validity was also confirmed by 10 members of the nursing and midwifery faculties in Ardabil and Khalkhal. The questionnaire's content validity index (CVI) was estimated at 0.73, and the content validity ratio (CVR) was estimated at 0.8. The internal consistency of this tool in the present study was calculated using the Cronbach α of 0.81. The third part was the professional commitment questionnaire that was first used by Lachman et al. [15], including 26 items in four dimensions: Perception of nursing (6 items), job satisfaction (4 items), involvement in the nursing profession (6 items), and dedication to the nursing profession (10 items). This questionnaire was validated and translated into Persian by Jolaei et al. [14]. In the present study, the validity was also confirmed by 10 nursing faculty members in Ardabil and Khalkhal. The questionnaire's CVI was estimated at 0.71. A pilot study calculated the reliability of this tool in the present study using the Cronbach α coefficient, which was acquired at 0.84. Professional commitment questionnaire is scored on a 5-point Likert scale: "Completely disagree" (level 1), "disagree" (level 2), "neutral" (level 3), "agree" (level 4) and "completely agree" (level 5). The potential grades are between 26 and 130, which higher grades indicate higher professional commitment in nurses.

To conduct sampling, the researcher referred to the research units. Sampling was done after explaining the study's objectives to the participants and obtaining informed consent.

Descriptive statistics were used to calculate demographic data's frequency, Mean \pm SD and grades for medication errors and professional commitment. All the statistical analysis was conducted using SPSS software, version 26. The t-test, Pearson test, chi-squared test and multivariable linear regression using the backward method were used to determine the associations between variables and the significance level was set at <0.05 .

Results

A total of 350 questionnaires were distributed among nurses, and data analysis was performed using 345 samples. The Mean \pm SD of the study participants' age was 34.76 \pm 27.20 years. Also, the Mean \pm SD of nurses' work experience was 6.78 \pm 8.78 years. Most participants were female (78.28%) and married (59.4%), held bachelor's degree (97.4%) and worked rotational shifts (73.3%). Moreover, around half of them secured official conditional employment (45.21%) and worked in internal medicine wards (17.97%). Table 1 presents the characteristics of samples.

The Mean \pm SD of the total score of medication error in nurses participating was 14.64 \pm 4.56. The most frequent medication error related to "giving medicine to the patient later or earlier than the prescribed time" and the lowest medication error was "incorrect injection (intravenous instead of intramuscularly, subcutaneously instead of intravenously, intravenously instead of subcutaneously, intramuscularly instead of intravenously)". These results were shown in Table 2.

The Mean \pm SD of the total score of professional commitment in nurses participating was 94.15 \pm 11.97. The Mean \pm SD of dimensions of professional commitment were 18.90 \pm 3.87 for the perception of nursing dimension, 14.75 \pm 4.32 for job satisfaction, 23.63 \pm 3.86 for the involvement in the nursing profession, and 36.14 \pm 4.29 for the commitment to the nursing profession. Based on the Pearson correlation, the evaluation relationship between different dimensions of professional commitment and medication error in nurses shows a significant inverse relationship between medication error and nursing commitment ($r=-0.198$, $P=0.001$). This relationship was also seen in relation to job satisfaction and conflict in the nursing profession. Still, it did not show a significant relationship in the dimension of commitment to the nursing profession (Table 3).

Table 1. Demographic characteristics of the study participants (n=345)

| Variables | | No. (%) |
|--------------------------|-------------------------|------------|
| Gender | Male | 75(21.73) |
| | Female | 270(78.27) |
| Marital status | Single | 139(40.60) |
| | Married | 206(59.4) |
| Employment condition | Formal | 156(45.21) |
| | Contractual | 70(20.4) |
| | Projective | 119(34.5) |
| Education | Bachelor of science | 336(97.4) |
| | Master of science | 9(2.6) |
| Ward | Internal | 62(17.97) |
| | Surgical | 42(12.17) |
| | Pediatrics | 20(5.79) |
| | Intensive care unit | 52(15.07) |
| | Coronary care unit | 16(4.63) |
| | Dialysis | 16(4.63) |
| The work shift condition | Obstetrics & gynecology | 12(3.47) |
| | Fixed morning | 59(17.1) |
| | Fixed evening | 33(9.6) |
| | Rotating shift | 253(73.3) |

Table 2. The mean score of medication error occurred in the last 3 months in samples (n=345)

| Reported Medication Error Occurred in the Last 3 Months | Mean±SD |
|--|------------|
| Giving medicine to the patient later or earlier than the prescribed time | 1.96±0.91 |
| Failure to observe the appropriate time of medication (before or after meal) | 1.41±0.91 |
| Failure to comply with necessary measures regarding drugs that require special attention (taking pulse, blood pressure, etc.) | 1.27±0.60 |
| Mixing two or more drugs in a micro set regardless of drug interactions | 1.16±0.53 |
| Rapid injection of a drug that should be injected slowly. Giving several oral medications together | 1.24±0.59 |
| Giving several oral medications together | 1.69±0.86 |
| Incorrect injection (intravenous instead of intramuscularly, subcutaneously instead of intravenously, intravenously instead of subcutaneously, intramuscularly instead of intravenously) | 1.13±0.45 |
| Giving sublingual or chewable medicine by swallowing | 1.14±0.46 |
| Giving medicine without having a specific prescription method | 1.16±0.49 |
| Giving pain relievers without a physician's prescription | 1.51±0.87 |
| Giving more or less than the prescribed dose | 1.26±0.64 |
| Total score | 14.64±4.56 |

Table 3. The relationship between medication error and professional commitment in nurses participating in the study (n=345)

| Dimension of Professional Commitment | Mean±SD | Relationship With Medication Error | |
|---------------------------------------|-------------|------------------------------------|-------|
| | | r | P* |
| Perception of nursing | 18.90±3.87 | -0.198 | 0.001 |
| Job satisfaction | 14.75±4.32 | -0.128 | 0.021 |
| Involvement in the nursing profession | 23.63±3.86 | -0.128 | 0.050 |
| Sacrifice for the nursing profession | 36.14±4.29 | -0.075 | 0.048 |
| Total score | 94.15±11.97 | -0.159 | 0.008 |

*Pearson correlation test.

The results of multivariable linear regression using the backward method are presented in Table 4. The results show that among the investigated variables and their effect on medication error, sacrifice for the nursing profession ($\beta=0.154$, 95% CI; 0.001%, 0.3%, $P=0.048$) has a direct and significant relationship, with the increase in sacrifice for the nursing profession, medication error increases and also married status ($\beta=-0.261$, 95% CI; -2.96%, -1.007%, $P=0.002$) has an indirect and significant relationship with medication error. This finding shows that married people have a lower medication error score than single people, but other variables did not show an important relationship.

Discussion

The present study investigated the relationship between professional commitment and medical error in nurses working in Ardabil and Khalkhal cities. The present study's findings showed that the medication errors

of nurses working in Ardabil and Khalkhal hospitals are infrequent. This rate is consistent with the findings of the other studies [9, 14, 16, 17]. It seems that issues such as hospitals' attention to the issue of medication errors and safety, the importance of this issue in the accreditation of hospitals, the lack of reporting medication errors by nurses, and the use of medication error self-report tools are the reasons for the similar results. A study in India reported the prevalence of medication errors among nurses at 70% [18] and a study in Saudi Arabia also reported a high rate of medication errors among nurses [19]. The most frequent medication error in nurses participating in the present study was related to giving medicine to the patient later or earlier than the prescribed time. In a study by Jolaei et al. the most frequent medication errors occurred related to giving multiple oral medications [14] and in the study by Yousefiasl et al. [9], the most frequent medication errors were giving the wrong medicine and registration. In another study, the most frequent error was the administration of drugs at the

Table 4. Results of multivariate linear regression between medication error and independent variables

| Variables | Adjusted β | SE | t | P | 95% CI | |
|--|------------------|-------|--------|-------|--------|--------|
| | | | | | Lower | Upper |
| Perception of nursing | -0.061 | 0.081 | -0.816 | 0.415 | -0.228 | 0.094 |
| Job satisfaction | -0.124 | 0.065 | -1.668 | 0.097 | -0.237 | 0.019 |
| Involvement in the nursing profession | -0.126 | 0.077 | -1.719 | 0.087 | 0.284 | 0.019 |
| Commitment to the nursing profession | 0.154 | 0.075 | 1.988 | 0.048 | 0.001 | 0.300 |
| Age | -0.119 | 0.008 | -1.846 | 0.066 | -0.030 | 0.001 |
| Marital status (married vs single) | -0.261 | 0.495 | -4.004 | 0.002 | -2.960 | -1.007 |
| The work shift condition (rotating shift vs fixed shift) | -0.112 | 0.098 | -1.701 | 0.090 | -0.360 | 0.026 |

wrong time [20]. The lowest frequent error was related to incorrect injection, which aligns with the other studies' findings [9, 14, 20]. It seems that increasing the awareness of nurses in the field of pharmacology affects reducing medication errors, especially injection drugs [21-23]. Another part of the study results showed that the level of professional commitment in nurses working in Ardabil and Khalkhal hospitals is medium, which is consistent with the findings of the study by Jolaei et al. [14], Rafiee Vardanjani [24], Mohamadkhani Shahri et al. [25] and Tang et al. [26]. These differences in the results can be due to the prevailing organizational culture in different hospitals and sampling in different departments of hospitals, including special departments. An investigation of the relationship between medication error and professional commitment showed a statistically significant relationship between each dimension of professional commitment and the total score for medication error. This finding is contrary to the Yousefiasl et al. [9] and Jolaei et al. [14] studies. They found no statistically significant relationship between professional commitment and medication error [9, 14]. Also, in Penjvini [27] and Santell and Cousins' s studies [28], no statistically significant relationship was found between professional commitment and medication error, inconsistent with the present study's findings. However, Rezaian reported in their study that the high level of professionalism reduced medication errors in special departments, that the results of this study is consistent with them [29]. The contradictory results seem to be caused by individual differences and organizational factors that affect people's responsibility and conscientiousness. Therefore, according to a significant relationship between professional commitment and medication error in nurses, medication error will decrease by strengthening the organizational commitment in nurses. Finally, the safety of patients will increase.

Another part of the study's findings showed that the dimension of professional commitment is related to reducing medication errors. In this regard, the results show that perception of the nursing profession causes a significant reduction in medication errors, which is inconsistent with the findings of Baghaei's study [30]. It can be concluded that nurses with a truthful perception of their profession perform better in patient care. Also, in relation to job satisfaction and medication error, Khan and Tidman's study showed that job dissatisfaction is one of the factors affecting the increase in medication errors among nurses [31]. Therefore, high job satisfaction among nurses will lead to the provision of quality services and the reduction of medication errors [32].

Based on the study findings, commitment to the nursing profession is associated with a decrease in medication errors. In the nursing literature, sacrifice is mentioned as a necessary and positive characteristic, and committed nurses are not committed to their patients [33]. Therefore, it seems that this aspect of nursing's professional commitment is an influential factor in providing quality nursing services, including correctly implementing medication orders. One of the present study's limitations was using a self-report tool that could affect the study results, which was impossible for the researchers to control. Also, considering the diversity of organizational culture in the nursing profession, it is suggested that nurse's study in hospitals of other medical sciences universities.

The study's findings showed a statistically significant relationship between professional commitment and medication errors in nurses. Therefore, strengthening the organizational commitment of nurses can lead to reducing medication errors and ultimately increase the safety of patients.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of [Khalkhal University of Medical Sciences](#) (Code: IR.KHALUMS.REC.1399.014).

Funding

This study was financially supported by [Khalkhal University of Medical Sciences](#) (Grant No.: 400.1898).

Authors' contributions

Study design: Hanane Hamidi, Mohadeseh Hajizadeh and Khadijeh Nasiri; Data collection: Somayeh Gholinejad and Javad Ebadi; Data analysis: Esmail Najafi; Data interpretation and writing the original draft: Hanane Hamidi and Mohadeseh Hajizadeh; Final approval: All authors; Supervision: Khadijeh Nasiri.

Conflict of interest

The authors declared no conflict of interest.

Acknowledgments

The authors wish to thank the nurses who participated in the study.

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