Research Article

Nursing Practice Errors: A Comprehensive Questionnaire Survey of Hospital Nurses in Yasuj, South of Iran

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ABSTRACT:

Maintenance and improvement of human health is the main purpose of nursing. Nowadays, accountability and civil liability have occupied significant positions in this field. As errors are inevitable in any profession, nursing is also no exception to this rule and due to this fact, maintaining patient safety has become a huge challenge. Though, a reduction of nursing errors to zero percentage is highly unlikely, it is possible to reduce these types of errors through research and promoting levels of awareness. By definition, nursing error means a breach in delivering standards of care approved by the Ministry of Health. This study was carried out to determine the status of nursing errors and error management in nurses working at Shahid Beheshti Hospital of Yasuj in 2014. This study is a descriptive, cross-sectional one; the sampling method is complete enumeration and the target population was all the161 nurses working at Yasuj Shahid Beheshti hospital. The data collecting tool was a researcher-made questionnaire which included first the demographic characteristics such as age, gender, ward, marital status and then investigated nursing errors such as medication errors, procedures and performance errors, laboratory errors, report writing errors, and ethical ones. After collecting the filled questionnaires, the data were analyzed according to the objectives of the study by descriptive statistics including tables, central and dispersion parameters and inferential statistic such as T-test and analysis of variance using SPSS version 21 software. Research findings showed that only 6.83% of nurses had no nursing errors and 93.17% of them made at least one nursing error in this six-month period. The commonest type of errors was medication error. The mean error for each nurse was 30.61 during this six-month period and 5.10 in a one-month period. The rates of errors were meaningful according to gender, age and marital status. Considering research findings and the importance of preventing and reducing nursing errors, it seems that providing continuous education programs for employees, creating a safe and assuring environment and encouraging staff to honestly report their errors are essential.

Key Words: Nurse, Error, Nursing Errors, Patient Safety.

1. INTRODUCTION

The patient's safety as the first priority for healthcare provider systems, is defined as the avoidance of damage to patients during cure and care process. (Stetina, Groves, & Pafford, 2005) Patient safety is one of the fundamental concepts in health care system but clinical errors pose serious threats to this system and they are considered as major concerns in health care system (Anoosheh, etal, 2008). As errors are inevitable in any profession, medical professions are no exception to this rule (Darabi et al., 2009). The problem is that errors in these professions are life-threatening and can cause irremediable damages to patients (Marc, 2004). According to WHO, one out of ten patients is affected by medical errors (WorldHealthOrganization, 2008). In United State of America, These types of errors are ranked as the eight leading cause of death to the extent that they are accounted for nearly 100000 deaths per year (Schuer, Doll, & McNellis, 2010). These errors lead to patient's death and endangered thousands of lives around the world in addition to the fact that they increase costs of treatment (Edwin, 2009; Valentin et al., 2009). Obtaining exact statistics and estimating the rate of occurrence for these types of errors are difficult in the third world and developing countries due to nonexistence of proper documentation and reporting systems but some experts believe that the rates of medical errors are high as they observe a surge in the number of law suits and formal complaints filed against nurses and doctors (Najafi, 2009). Among medical errors, nursing errors have the highest occurrence rates because of their extensive contacts with patients (Borhani,

Abbaszadeh, Kohan, & Fazael, 2010; Jolaee et al., 2010). Maintaining a career in health care system bears different kinds of physical and mental stresses which lead to job burnout and nursing errors among nurses (Habibzade, Ahmadi, & Vanaki, 2010; Hekmat Afshar, Jooybari, Sanagou, & Kalantari, 2013) and all of these can affect the quality of care and performance of nurses (Mojoyinola, 2008).

As the ultimate ideal of nursing profession is delivering quality cares to the patient based on the highest standards, nothing is in direct opposition to these ideal more than nursing errors. Therefore, following nursing principles and making proper medical decisions are essential (Borhani, Alhani, Mohammadi, & Abbaszadeh, 2009; Jolaee et al., 2010; Sanjari, Zahedi, & Larijani, 2008). Nursing errors can lead to loss of confidence in nurses and a surge in the number of complaints filed against them (Ayoubian et al., 2016; Kermani, Mazloumi, NaslSeraji, & GhasemZadeh, 2013). Findings of extensive studies suggest that rates of medical errors such as nursing errors are high (WorldHealthOrganization, 2008). Considering five main types of nursing errors like medication errors, laboratory errors, report writing errors, ethical errors, procedure and performance errors, studies suggest that medication error accounts for 28.9-79.2 percent of error (Ebrahimpour, Shahrokhi, & Ghodousi, 2014; Mirzaei, Khatony, Safari Faramani, & Sepahvand, 2013; Shams, Bagherieh, Feizi, Baghaei, & Hashemlo, 2012), report writing error accounts for 49.3-85 percent (Ghazanfari, Sheykhpour-khani, & Haghdoost, 2009; Roshan, Noorian, & Shakeri, 2015;

Sheykhpourkhani & Haghdoust, 2010), pre-analytical laboratory error accounts for 84.5 percent and violating ethics code (Borhani et al., 2009; Mohajjel Aghdam, Hassankhani, Zamanzadeh, Khameneh, & Moghaddam, 2013), and procedure error and wrong application of medical equipment in the ward (Mohammadfam, Movafagh, Soltanian, Salavati, & Bashirian, 2014; Tanha, Mazloumi, Faraji, Kazemi, & Shoghi, 2015; Yekkeh fallah, 2006). Studies maintain that 70 percent of medical errors are preventable (Rosner, Berger, Kark, Potash, & Bennett, 2000) but there exists a lack of systematic and comprehensive study and exact statistics in relation to different types of errors. Considering all of these, performing further studies are essential to promote level of awareness about the true status of errors and the current study is done to compensate for this lack in literature about all areas of activities of nurses to determine the status of nursing errors in nurses working at Yasuj Shahid Beheshti Hospital.

2. Method

This cross-sectional descriptive study was conducted on nurses who worked at Shahid Beheshti Hospital (affiliated to Yasuj University of Medical Sciences, south of Iran) at 2015. The sampling method was complete enumeration that included all the nurses with ASN, BSN, and MSN degrees working at clinical wards. Out of 182 qualified nurses, 161 nurses (88.46%) participated in the study and others either did not participate in the study or failed to fill the questionnaire properly, therefore, they were excluded from the study (11.54%). The inclusion criteria were holding associate, B.S or

M.S. degrees, having at least a six-month working experience as a nurse in hospital wards and willingness to participate in the study and the only exclusion criterion was incomplete filling of questionnaire. This study observe all the ethical principles such as necessary correspondence with responsible officials and units, introduction of the program and acquiring staff's consent with strict emphasis on ensuring nurses regarding the confidentiality of information, voluntarily participation and anonymity of participants. As an example of the study's restrictions, this study was developed based on staff's self-reporting and it seemed that samples were not cooperative enough. So, researcher ensured them about confidentiality of information and anonymity without the need to mention their names and surnames. Also, nurses handed their filled questionnaires to a reliable mediator without having to meet the researcher face-to-face. It can be said that nurses' level of participation and their honest reporting of errors were a proof that researcher managed to win their trust. Data collecting tool was a researcher-made questionnaire consisting of six parts. The first part examined demographic information such as age, gender, academic degree, marital status, working hours, form of employment, health condition, their working ward. In the second to sixth parts, nursing errors such as medication error (19 questions), procedure and performance error (32 questions), documentation error (19 questions), ethical error (17 questions), and laboratory errors(12 questions), were examined through questions respectively. In each error part, there were three options including "I have committed", "I haven't

committed" and "number of occurrence" with "I have committed" scored (1) and "I haven't committed" scored (0). The number of error occurrence was used to score each question, for example, if a participant answered that I committed this error five times, his or her score was considered five for that question.

Data collecting tool was developed through review of literature, references and consulting with experts and after final edition was sent to 12 faculty members of Yasuj University of Medical Sciences to confirm its validity and after incorporating their thoughtful comments, it was confirmed. For the final examination of researcher-made questionnaire , test retest-method was used, so, ten other nurses who did not participated in the study filled the questionnaire two times at two-week intervals and after data analysis and with regard to r=0.81, the reliability of this questionnaire was confirmed.

Questionnaires were handed to the participants and after their completion were collected. Data was entered into SPSS software version 19 and was analyzed utilizing descriptive statistics and T-test to compare the means of two independent communities and variance analysis to compare the mean of independent communities.

3. RESULTS

In this study, 161 nurses with mean age of 30.02±4/87 years, and mean job experiences of 5.63±5/01 years were participated. They were working in night shift mostly (37.3%), and in average 181.1±21/7 hours monthly at Shahid Beheshti Hospital affiliated with Yasuj University of Medical Sciences, south of Iran.

154 person (95.7%) of them were staff nurse while the rest were head nurses. Often they were worked full-time with no other vocation (95%). According to themselves expressions, there were 145 healthy nurses (90.1%) against 16 nurses (9.9%) who had a systemic diseases.

The findings of this study showed that nurses have been recorded 4928 errors in six months consist of medication errors(1264), documentation errors(1175), laboratory errors (1001), procedure and performance errors(1001), and ethical errors (487) using self-report. In the other hand, with respect to results of this study, nursing error rate was 5.1 errors per month. The highest number of errors were related to medication errors, and prevalence of ethical errors were less than the rest as shown in Figure 1.
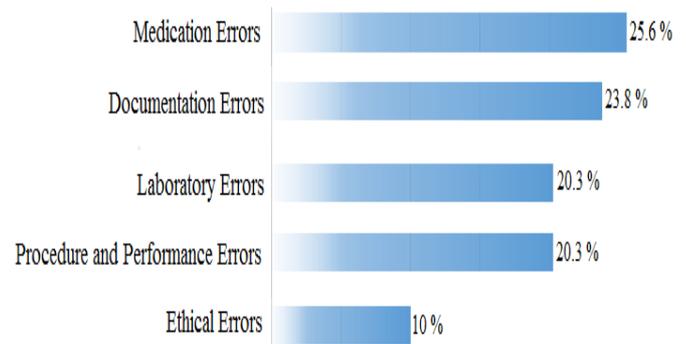

Figure 1: Prevalence of self-reported errors during six months by nurses who working in Shahid Beheshti Hospital affiliated to Yasuj University of Medical Sciences- South of Iran

The most prevalent items of each errors were included as following:

medication errors: giving medicine to the patient at the later or earlier than prescribed time, mistake of infusion rate, wrong calculation of the required dose; documentation errors: writing a long report, report writing in lieu of another

colleagues, recording the events without attention to their priority and posteriority; laboratory errors: less or exceed sample taking than needed amounts, lack of sampling in proper time; procedure and performance errors: errors in the use of medical equipment such as monitoring devices, DC shock, pulse oximeter, laryngoscope, etc., wrong triage, negligence in patients' assessment process and history taking mistakes; and Ethical errors: failure to job discipline, lack of obtaining patients' consent at required times , and misconduct with the patients.

In this study, results of Kolmogorov-Smirnov test indicated that the p-values of medication errors (p=0.0001), documentation errors (p=0.037), laboratory errors (p=0.003), procedure and performance errors (p=0.0001), ethical errors (p=0.0001), and total nursing errors (p=0.02) were less than 0.05 as significant level. It means that these variables were not normally distributed, thusthe differences of each above errors between several age group, gender, academic degree, job experiences, Hospital ward, marital status, frequently working shift, amount of work per month, and recruitment status were analyzed using nonparametric statistics such as Mann-Whitney U and Kruskal- Wallis. While the result of statistical tests showed that the rate of each above nursing errors were equal in different academic degree, job experiences, Hospital ward, marital status, frequently working shift, and amount of work per month statistically (p>0.05); but there were significant statistical difference between various age group, sex, and recruitment status according to the rate of total nursing errors and some of various types of nursing errors (p<0.05).

Table 1 shows that the older nurses perpetrated total nursing errors, and some of various types of nursing errors such as laboratory errors, procedure and performance errors, and ethical errors more than younger nurses (p<0.05).

Also, the result of statistical test indicated that the total nursing errors, and some of various types of nursing errors such as documentation errors, and ethical errors occured by male nurses more than female nurses (p<0.05)(Table 2).

As shown in table 3, although the rate of all types of nursing errors by official and Contractual nurses were higher than interim nurses, but the result of Kruskal- Wallis test confirmed statistical equality between the rate of all nursing errors and its mentioned types in different recruitment status (p>0.05) except laboratory errors that the interim nurses perpetrated less than the rest significantly (p<0.05).

Table 1: Comparison of the rate of each errors by nurses who working in Shahid Beheshti Hospital affiliated to Yasuj University of Medical Sciences- South of Iran during six months at 2015 according to age group

Type of errors	Age group	Number	Mean ± SD	Median	> Median	≤ Median	Mean Rank	Z	p-value* (2-tailed)
Medication errors	up to 35 y/o	140	7.46± 7.78	6	59	81	79.7	-0.92	0.36
	36 y/o and older	21	10.48± 10.48	10	13	8	89.64		
Documentation errors	up to 35 y/o	140	7.19± 6.03	7	66	74	80.01	-0/7	0.49
	36 y/o and older	21	8± 5.75	7	9	12	87.57		
Laboratory errors	up to 35 y/o	140	5.61± 5.3	4.5	60	80	76.96	-2/86	0.004

	36 y/o and older	21	10.29± 7.36	11	15	6	107.9		
Procedure and performance errors	up to 35 y/o	140	5.75± 7.07	3	60	80	77.94	-2.17	0.03
	36 y/o and older	21	9.33± 7.79	7	15	6	101.4		
Ethical errors	up to 35 y/o	140	2.68± 3.93	1	61	79	77.45	-2.61	0.009
	36 y/o and older	21	5.33± 4.99	4	14	7	104.7		
Total Nursing errors	up to 35 y/o	140	28.69± 24.01	24	64	76	77.87	-2.2	0.03
	36 y/o and older	21	43.43± 29.53	34	14	7	101.9		

* **Mann-Whitney U**

Table 2: Comparison of the rate of each errors by nurses who working in Shahid Beheshti Hospital affiliated to Yasuj University of Medical Sciences- South of Iran during six months at 2015 according to gender

Type of errors	Gender	Number	Mean ± SD	Median	> Median	≤ Median	Mean Rank	Z	p-value* (2-tailed)
Medication errors	Male	46	10.02± 9.94	6.5	23	23	91.08	-1.75	0.08
	Female	115	6.98± 7.27	5	49	66	76.97		
Documentation errors	Male	46	9.04± 6.51	10	28	18	93.79	-2/21	0.03
	Female	115	6.6± 5.64	5	47	68	75.88		
Laboratory errors	Male	46	7.46± 6.24	6.5	25	21	90.95	-1/72	0.09
	Female	115	5.72± 5.58	4	50	65	77.02		
Procedure and performance errors	Male	46	6.63± 6.98	4.5	23	23	84.59	-0.62	0.53
	Female	115	6.05± 7.37	4	52	63	79.57		
Ethical errors	Male	46	4 ± 4.27	2.5	27	19	94.86	-2.5	0.01
	Female	115	2.63± 4.08	1	48	67	75.46		
Total Nursing errors	Male	46	37.15± 24.78	31.5	29	17	95.72	-2.5	0.01
	Female	115	27.99± 24.99	22	49	66	75.11		

* **Mann-Whitney U**

Table 3: Comparison of the rate of each errors by nurses who working in Shahid Beheshti Hospital affiliated to Yasuj University of Medical Sciences- South of Iran during six months at 2015 according to recruitment status

Type of errors	Recruitment Status	Number	Mean ± SD	Minimum	Maximum	Median	Mean Rank	χ^2	p-value* (2-tailed)
Medication errors	Official	19	8.37±11.01	0	36	4	73.82	2.25	0.33
	Contractual	87	8.46± 8.27	0	44	6	86.02		
	Interim	55	6.71± 6.95	0	28	5	75.54		
Documentation errors	Official	19	7.58± 5.88	0	18	7	83.21	5.08	0.08
	Contractual	87	8.18± 6.23	0	28	9	87.64		
	Interim	55	5.8± 5.38	0	19	5	69.73		
Laboratory errors	Official	19	7.79±8.14	0	27	5	86.34	7.68	0.02
	Contractual	87	6.97± 5.5	0	24	7	88.68		
	Interim	55	4.49±4.99	0	21	3	67		
Procedure and performance errors	Official	19	6.37±7.1	0	22	4	82.66	0.68	0.71
	Contractual	87	6.46± 7.16	0	32	4	83.26		
	Interim	55	5.78± 7.53	0	29	4	76.85		

Ethical errors	Official	19	3.84 ± 4.05	0	13	2	95.24	5.35	0.07
	Contractual	87	3.45±4.6	0	22	2	84.38		
	Interim	55	2.07± 3.28	0	14	1	70.74		
Total Nursing errors	Official	19	33.95± 26.42	0	89	31	87.61	5.48	0.06
	Contractual	87	33.52± 25.49	0	101	29	87.1		
	Interim	55	24.86± 23.71	0	97	19	69.06		

* **Kruskal-Wallis H**

4. DISCUSSION

There exist some obstacles in the way of error reporting like management issues, fear of losing job and concerns about awful treatment of patient and his or her caregivers (Jahromi, Parandavar, & Rahmanian, 2014) but the findings of study and the number of reported errors showed that nurses confided in the researcher. According to findings, the mean of the number of error for each nurse was 30.61 in six months and 5.10 in a month.

Among nursing errors, medication error has the highest frequency (25.65%), and then report writing error (23.84%), procedure and performance (20.31%), laboratory errors (20.31%), and finally ethical errors account for 9.89 percent of nursing errors. Findings showed that medication error is the most prevalent error committed by nurses while preparing or administering medications and this finding is consistent with many studies performed in Iran and abroad. The rate of medication error was 616 cases in a three-month period in a study performed by Musa Kazemi in 2011 at hospitals affiliated with Isfahan University of Medical Sciences which is consistent with the findings of this study and also the number of medication error was 11 cases for each nurse per three months (Musarezaie, Momeni, & Zargham, 2013). Shams et al.'s study which was performed in 2011 indicated that the mean of

medication error was 28.9 percent for each nurse per six months (Shams et al., 2012) while giving medications to patient is one of the most important duties of a nurse and it takes 40 percent of a nurse's working-hour in general (Armitage & Knapman, 2003; Potter & Perry, 2009). Factors like high work pressure, inadequate knowledge of nurses regarding drug administration is among the reasons behind medication error (Soltanian, Molazem, Mohammadi, Sharif, & Rakhshan, 2016). Therefore, hospital officials should do their best to standardize nurse-to-patient-ratio, developing educational planning for different aspects of professional activities of nurses like preparing and administering medications, familiarity with fundamentals of report writing ,following ethical principles, familiarity with procedures and application of medical equipment and scientific method of taking laboratory samples. In this way, they promote nurse's awareness and reduce the rate of errors.

There was a meaningful relationship among different errors and nurse's age (p=0.04) and the rates of errors have increased with aging. Also in subcategories of errors including procedure and performance error (p=0.03), laboratory error (p=0.01) and ethical errors (p=0.03) there exist a meaningful relationship between each error and age, separately (Shams et al., 2012). This can be ascribed to high workload and fatigue as a result

of job difficulty among nurses (Gorgich, Barfroshan, Ghoreishi, & Yaghoobi, 2015). In a study performed by Shams et al., there was a meaningful relationship between errors and age(Shams et al., 2012). Dehghani et al. 's study titled "Assessing patients' viewpoints regarding nurses' level of respect for ethical codes" suggested that the level of respect for ethical codes has decreased with aging in nurses (Dehghani, Ordoubadi, Shamsizadeh, Parviniyan Nasab, & Talebi, 2014). Tang et al.'s study showed that with aging, the rate of errors decreases which is in contrast to the findings of this study (Tang, Sheu, Yu, & et al., 2007). Taheri et al.'s study showed no meaningful relationship between age and error and age did not play a role in medication error (Taheri, Norian, Rasoli, & Kavoosi, 2013). Utilizing modern technology, high-tech equipment and training courses are useful solutions for decreasing nursing errors like laboratory errors (Mohammedsaleh & Mohammedsaleh, 2015). Although there are different findings regarding aging and nursing errors but various factors such as work overload, utilities and equipment, level of awareness and being up-to-date can affect the role of age in increasing or decreasing errors.

There was a meaningful relationship among different errors and nurse's gender (p=0.04) and the rates of errors were higher in men in comparison to women. Also in subcategories of errors including medication error (p=0.03), ethical error (p=0.006) and report writing errors (p=0.02). The mean of errors in male nurses was higher in comparison to female nurses which confirmed the findings of study based on the total mean of errors. Although there is no other

similar study regarding all nursing errors but a study which was performed in affiliated hospitals with Shahid Beheshti University of Medical Sciences in 2011 showed a meaningful relationship between medication error and gender. So, male nurses committed more errors in comparison to female nurses (Yousefi, Abed Saeedi, Maleki, & Sarbakhsh, 2015) which confirm the findings of this study. Also, in a study by Hanifi and Mohammadi titled "Causes of incorrect report writing in nursing" the rate of incorrect report writing was higher in women in comparison to men (Hanifi & Mohamadi, 2004). Also, Jafareimanesh et al. 's study titled "Assessing nursing students' level of respect for ethical codes of nursing" showed a meaningful relationship between gender and ethical conduct in delivering care to patient, so women acted more ethically in comparison to men (Jafareimanesh, Alibazi, Zaghari Tafreshi, & Ranjbaran, 2014). In Baghaei et al.'s study men did better in report writing in comparison to women but there was no meaningful difference (Bagaei, Nadari, & Khalkhali, 2012). Different studies at home and abroad have shown that assessing the status of errors based on demographic characteristics is very complicated. The total rate of nursing errors was meaningful based on marital status (p=0.05) to the extent that the mean of errors in married nurse was higher that mean of errors in single nurses. Also, in subcategories of errors including procedure and performance error (p=0.04) and laboratory errors (p=0.04) there exist a meaningful relationship with age.

No other similar study was found regarding meaningfulness of errors based on marital status

but Taheri Habibabad et al. in a paper titled "Associated Factors with medication errors in the pediatric and pediatric emergency departments from the view point of nurses" confirm a meaningful relationship between marital status and number of errors (Taheri et al., 2013). Also, Jafareimanesh et al. 's study titled" Assessing nursing students' level of respect for ethical codes of nursing " emphasizes a meaningful relationship between marital status and rate of errors but in contrast to this study, married persons had better performances in comparison to single ones (Jafarei manesh, Ranjbaran, Vakilian, Tajik, & Almasi-Hashiani, 2014). Studying the relationship among errors and demographic characteristics can be related to different factors but it can be concluded that single persons are less busy in comparison to married persons and this helps to them to be more focused and meticulous.

The findings of this study showed that nursing errors are very prevalent in Yasuj Shahid Beheshti Hospital and medication errors have the highest frequency in comparison to other types of errors. Although different studies have shown that the rate of errors vary a lot based on demographic characteristics and different situations and do not follow a specific pattern, this study showed that nursing errors are meaningful based on characteristics like age, gender, marital status. Error management situation was meaningful based on some demographic characteristics. Considering the obtained results, this study suggests that there should be training programs regarding nursing standards and promoting level of awareness for staffs to deliver safe cares to patient. Also

creating a safe environment for reporting errors is essential.

Acknowledgments

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