Patient Safety: Assessing Nurses' Compliance

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Abstract: Patient safety is a major challenge for quality improvement and enhancing provider's performance. Protecting patients and staff members from harm is fundamental responsibility of all hospitals, which must devote their attention to manage the safety of patients .Sometimes unintentional harm comes to patient during a clinical procedure, this harm can lead to death. **Aim:** The study aims to assess nurses' compliance to patient safety parameters at intensive care unit and examine socioeconomic factors affecting it. **Subjects and Methods**: This study was conducted at ICU in the Ain-shams University hospital using a descriptive design. 30 nurses were included in the study. Tools of the study included 1) Interview questionnaire sheet to collect the study subjects characteristics data. 2) An observational checklists that developed based upon review of International Patient Safety Goals accredited by Joint commission International Standards for Hospitals (2008). **Results:** The mean score of nurses' compliance to parameter related to reducing the risk of health care associated infection has the highest score, while safety of high alert medication has the lowest score. There was statistically significant relation between nurses' compliance to most parameters of patient safety and their age, qualification, years of experience and attending training courses. **Conclusion:** nurse's compliance highest score in reducing the risk of healthcare associated infection, the second highest mean scores was improve effective communication parameter and the parameter of correct patient identification was third high mean score. While, the parameter of reducing the risk of patient harm from falls had low mean score, and the lowest score in improving the safety of high alert medication. In addition**,** there are clear discrepancy in relation between total means scores of nurses' compliance toward patients' safety parameters and their socio-demographic characteristics. **Recommendation**: development programs for nurses working in ICU related to patient safety parameters improve and support a blame-free and forgiveness environment enhance patient safety culture. Further studies are needed for testing the influence of safe work environment on nurses' performance and productivity.
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1. Introduction

Patient safety, is a relatively new concept in health care organization, it is a global issue affecting countries at all levels of development. Patient safety has been defined as the freedom from accidental or preventable injuries produced by medical care ***(Agency for Health care Research and Quality (AHRQ), 2005).*** According to a World health organization (WHO) report, one out of every 10-hospital patients in many developed countries experiences an adverse event that can lead to serious injury and death. The situation in developing countries is even worse.

Care is often delivered in a pressurized and fast moving environment, involving a vast array of technology, and daily decisions and judgments by health care professional staff. Sometimes unintentional harm comes to patient during a clinical procedure, or because of clinical decision. Errors in the process of care can result in injury or harm that sometimes can leads to death (***Johnstone & Kanitsaki, 2006 and Markowitz, 2009***).

The increasing incidence of documented cases of adverse events in health care has led to a growing concern in a number of countries about patient safety, which remains a fundamental principle of patient care and a critical component of quality management. WHO is committed to make patient safety a high priority on the policy agenda of countries (***WHO, 2008)***.

Although estimate of the size of the problem are scarce, particularly in developing and transitional countries, it is likely that millions of patients worldwide suffer disabling injuries or death every year due to unsafe medical care. Patient harm occurs because of a constellation of factors and circumstances. Understanding the magnitude of the problem and the main contributed factors that lead to patients harm is essential to design effective and efficient solutions for different context in addition to establishing a safe health system **(*Al-Ameri, 2000 and Milligan, 2007*)**

Bad events occur in hospitals everyday, it can occur in the most efficient and safety conscious areas, no area is immune. One challenge facing critical care units today is the need for safety standards because the patient will be monitored closely for a critical medical condition with safety. This is especially true because of the staffing pattern and the acuity of the patients admitted to the critical care units, which demand the nurses be qualified and highly experienced in the care

of critically ill patients with highly compliance of patients' safety (***Attia, 2003, Marino, 2007 and Lambert, 2010***).

Nurses represent the largest component of the healthcare work force; they are in a key position to improve patient safety through exerting significant influence in the health care system. So, it is important to understand nurses' compliance to patient safety and to comprehend what factors influence their views (***Affonso***, ***et al***., ***2003 and page, 2004***).

Compliance has been defined as the extent to which certain behavior is in accordance with the physicians' instructions or health care advice. The recent studies have linked global measures of a safety culture to nurses and other health team compliance with safe work practices and to exposure to incidents, regardless of the outcome, may be extremely burdensome to health team as well as to organizations (***Espin et al., 2006 and Sexton et al., 2011***).

Significance of the study:

Patient safety has received increased attention in recent years, but mostly with a focus on the epidemiology of errors and adverse events, rather than on practices that reduce such events (***The Institute of Medicine, 2007).*** One of the United States National Academies - reported that, there are 44,000 to 98,000 people who die in hospitals each year because of preventable practice errors. Between 4% and 16% of hospitalized patients experienced to one or more adverse events, up to half of these adverse events are preventable. Searching about why these preventable errors occur is the first step to develop strategies that can minimize it.

Nurse's compliance regarding to safety are rarely formally evaluated or considered during the design or updating of safety programs. Despite, a strongly nurse's compliance to patients' safety contributes to a positive patients safety culture that necessary to maintain patient safety and avoid needles patient death. In addition, starting point for improving quality nursing care is to assess nurse's compliance to patient's safety and examines factors affecting it (***Thirumalai, 2010***)

Aim of the study:

The study aims at assessing nurses' compliance to the patient safety parameters at intensive care unit and examining socioeconomic factors affecting it.

Research questions:

What is the level of nurses' compliance to patient safety parameters at intensive care unit?

What are the socioeconomic factors affect on of nurses' compliance to patient safety parameters at intensive care unit?

2. Subjects &Methods

Research design

A descriptive design was used in the conduction of the study.

Setting:

The study was conducted in intensive care unit at Ain-Sham University hospital.

Subjects:

Subjects of the study included all nurses working in intensive care units. Total number of nurses was 34 working in three shifts. Out of the total number, 30 nurses who were agreed to participate in this study. The inclusion criterion was that nurses should be working at least one year in the current unit.

Tools of data collection:

The following two tools were used;

- **Interview questionnaire sheet** was used to collect the nurses' characteristics data, such as; age, marital status, qualification, years of experience & attending training courses.
- **An observation checklists:** to assess the nurse's compliance toward patient safety parameters. This tool was developed by the researcher based on review of the International Patient Safety Goals accredited by the **Joint Commission International Standards for Hospital (2008)**. It consists of five parameters with 101 items. These parameters including: 1) parameter to ensure the accuracy of patient identification divided into 3sub items with 21 items. 2) Parameter checks the effectiveness of communication among healthcare workers through two sub items with 19 items. 3)parameter to assess the safety of high –alert medication with 10 items , 4) parameter to observing staff nurse's compliance to the policy and procedures related to infection control practices, classified into 3 sub items with 37 items and 5) parameter to recognize risk of patient harm resulting from falls with 14 items . The parameter 4 to insure correct site, correct procedures, and correct patient surgery with 5 items was excluded from the observational checklist. Because it is the responsibility of the physician to mark of surgical site, this procedure is performed as a preoperative preparation to the patient either in inpatient unit or inside the operating room directly before beginning the operation. Therefore, nurses have no responsibility to this parameter. Each item scored, as complied (1) while not complied (0) and total scores 101. Competent level is considered ≥80%, while incompetent level < 80%.

Tools validity & reliability

To achieve the criteria of trustworthiness of the tool of data collection in this study, the tools were tested for validity and reliability.

Five experts in the field administrative, and medical surgical nursing tested it for content validity. Modification was carried out accordingly taking into consideration hospitals policy and units facilities.

The reliability has been examined and test-retest ranged from 0.81 to 0.89 for each of the patients' safety parameters.

Procedures

An official permission from each hospital administrative authority. was obtained. A study done and completed from November 2010 to August 2011. The researchers themselves completed the observational checklists. They observed the nurses performance two days per week each Saturday and Wednesday throughout the morning and afternoon shifts for 3 months. Most of nurses in the study were cooperative with the researchers.

A pilot study

Was carried out on four nurses, to test the clarity and practicability of the tool in addition to the suitability of the setting. These Subjects not excluded from the study, as there were no radical modifications on the study tool. Then, the purpose of the study was explained to nurses who accepted to participate in the study.

Ethical Consideration and human rights:

Verbal approval from each participant was obtained from subjects prior the study conduction and after explanation of the purpose of the study. They were informed about their right to with draw at any time and that all data will be kept confidential.

Statistical analysis:

Data entry and data analysis were done using the Statistical Package for Social Sciences (SPSS) version 14.0 statistical software package. Data were presented using numbers, percentages, chi- and t-tests. Statistical significance considered at p value <0.05.

3. Result

As evident in table (1) 80% of the studied nurses, their age was 30 years and more with a total mean age **(**36.2±1.4 years), while more than half of them (56.7%) had experience less than 15 years. Results also showed that less than three quarter of them was married. As regards qualification level it was found that, (70%) of the study group had a technical nursing diploma. Almost of study sample were attended training programs (90%).

Concerning the nurses' compliance toward two from patient's safety parameters, the table (2) shows that the highest percentage of nurses' compliance (96.7%) was when taking blood sample and other specimens, while the lowest percentage of their compliance (76.7%) was when giving medication, which related to correct patient identification parameter. As regarding improve effective communication parameter, the same table revealed that, more than four fifths of the study group was complied to shift reporting (83.3%).

Table (3) illustrated the nurses' compliance toward others patient's safety parameters. Only **(56.7%)** of study group complied with the parameter related to improve the safety of high alert medication**.** The majority of them were complied during procedures of urinary catheter care and central & peripheral line care with the parameter of reducing the risk of health care associated infection (90%& 86.7% respectively). The same table showed that, less than two third of the study group was complied to reduce the risk of patient harm resulting from falls (**63.3**%).

Table (4) represents the comparison between total mean scores of nurses' compliance toward patients' safety parameters. The table shows that, the highest mean scores of nurses' compliance were with the parameters of reducing the risk of health care associated infection, improve effective communication, and correct patients' identification (83.0 $\pm$ 6.3, 80.4 $\pm$ 10.4, & 79.3$\pm$ 8.2 respectively). While the lowest mean score was regarding the parameter to improve the safety of high alert medication (47.8 $\pm$ 20.7).

Table (5) illustrates the relation between total mean scores of nurses' compliance to patient's safety parameters and their socio-demographic characteristics. There were statistically significant differences between nurses' age and their compliance to all patients' safety parameters except correct patient identification and reducing the risk of patient harm resulting from falls parameters. No relation found between nurses' marital status and all patient safety parameters. However, there were statistical significant differences between years of experience and nurses' compliance to all parameters. In addition, the table discovered that, there were statistical significant differences between educational levels & attending programs and total scores of nurses' compliance to correct patient identification, improve the safety of high alert medication, and reducing the risk of health care associated infection parameters (p**<0.05)**.

Table (1): Socio-demographic characteristics of the study sample (n=30)

Items	No	(%)
Age(in Years)		
<30-	6	40
30-	24	80
Mean ± SD= 36.2±1.4		
Work Experience in Years		
Less than 15	17	56.7
15-	13	43.3
Marital status		
Married	22	73.3
Single	8	26.7
Qualification in nursing		
Diploma	21	70
Technical institute	7	23.3
Bachelor	2	6.7
Attending Training programs		
Yes	27	90
No	3	10

Table (2): Frequency distribution of nurses' compliance toward patients' safety parameters (n=30).

Parameters	Nurses' Compliance			
	Compliance		not Compliance	
	No	%	No	%
3-Improve the safety of high alert medication	**17**	**56.7**	**13**	**43.3**
4-Reducing the risk of health care associated infection				
a) Patient with mechanical ventilation	21	70	9	30
b) In urinary catheterization	27	90	3	10
c) In central and peripheral line (Daily maintenance)	26	86.7	4	13.3
5-Reduce the risk of patient harm resulting from falls	**19**	**63.3**	**11**	**36.7**

Table (3): Frequency distribution of nurses' compliance toward patients' safety parameters (n=30).

Parameters	Total mean scores
1-Correct patient identification	**79.3± 8.2**
2-Improve effective communication	**80.4 ± 10.4**
3-Improve the safety of high alert medication	**47.8 ± 20.7**
4-Reducing the risk of health care associated infection	**83.0 ± 6.3**
5-Reduce the risk of patient harm resulting from falls	**66.2 ± 12.5**

Table (4): Total means scores of nurses' compliance toward patients' safety parameters

Parameters	Nurses' Compliance			
	Compliance		not Compliance	
	No	%	No	%
1-Correct patient identification				
a) When giving medication	23	76.7	7	23.3
b) When giving blood or blood products	24	80	6	20
c) When taking blood sample and other specimens	29	96.7	1	3.3
2-Improve effective communication				
a) In verbal orders	22	73.3	8	26.6
b) shift reporting	25	83.3	5	16.7

Table (1): The relation between total means scores of nurses' compliance toward patients' safety parameters and their socio-demographic characteristics

Socio-demographic characteristics	Total scores of nurses' compliance				
	Correct patient identification	Improve effective communication	Improve the safety of high alert medication	Reducing the risk of health care associated infection	Reduce the risk of patient harm resulting from falls
Age					
• **<30**	82.7 ± 5.6	79.8 ± 13.3	37.4 ± 4.0	68.2 ± 8.1	66.2 ± 13.4
• **≥30**	84.1 ± 9.2	80.6 ± 9.9	65.3 ± 4.0	79.9 ± 9.2	66.1 ± 8.7
t-test	0.474	0.159	3.8	2.04	0.026
P value	>0.05	>0.05	<0.05*	<0.05*	>0.05
Work Experience in years					
• <15	71.9 ± 3.8	68.8 ± 11.0	33.4 ± 20.9	79.7 ± 8.8	65.7 ± 14.9
• ≥15	83.3 ± 4.6	83.7 ± 11.8	45.0 ± 21.1	86.6 ± 7.1	67.1 ± 5.8
t-test	3.5	2.7	2.6	2.4	2.78
P value	<0.05*	<0.05*	<0.05*	<0.05*	<0.05*
Marital status					
•Married	83.9 ± 5.7	80.6 ± 10.0	48.6 ± 22.6	80.3 ± 8.7	67.2 ± 14.4
•Single	80.4 ± 7.6	79.9 ± 12.1	45.6 ± 15.2	76.7 ± 6.3	63.4 ± 3.7
t-test	1.409	0.157	0.347	1.066	0.735
P value	>0.05	>0.05	>0.05	>0.05	>0.05

Qualification in nursing					
• Diploma	79.7 ± 10.1	82.1 ± 8.9	39.1 ± 10.0	72.0 ± 11.4	65.2 ± 7.6
• Technical institute	91.5 ± 10.6	83.8 ± 5.3	58.6 ± 26.8	89.5 ± 10.6	66.4 ± 14.5
• Bachelor	98.4 ± 2.4	78.6 ± 3.4	62.5 ± 24.7	96.7± 6.0	67.9 ± 10.1
ANOVA test	3.1	0.710	4.303	5.64	0.045
P value	<0.05*	>0.05	<0.05*	<0.05*	>0.05
Attending Training Programs					
• Yes	83.3 ± 13.6	80.3 ± 10.6	69.7 ± 4.4	79.7 ± 8.4	67.2 ± 10.5
• No	61.2+ 10.4	82.9 ± 9.3	37.4+ 4.1	56.3 ± 7.9	51.8 ± 32.8
t-test	2.6	0.340	3.9	4.4	0.662
***P* value**	<0.05*	>0.05	<0.05*	<0.05*	>0.05

Insignificant at $p>0.05$ (*) Statistically Significant at $p<0.05$

4. Discussion

The present study was carried out to assess nurses' compliance to the patient safety parameters at Intensive Care Unit (ICU) at Ain-Shams university hospital to identify areas, which need improvement in the line of quality improvement. In agreement with this aim, ***Paul (2004)*** emphasized that improving patient safety should be one of the highest priorities of healthcare leaders. ***The Patient Safety Group (2008)*** defined patient safety as the avoidance and prevention of patient injuries or adverse events resulting from the processes of health care delivery.

Despite, the present study discovered that; the most of nurses in the present study had high percentage of compliance toward parameter of correct identification of patients at different procedures however; there was no enough when comparing with the importance of this parameter. By asking the nurses, they replied and interpreted that they are assigned for small number of patients and they know the patient very well due to his/her long stay in ICU. This finding is in agreement with ***Zidicky (2004),*** who stated that staff nurses sometimes mistakenly bypassed patient identification because they already know the patient. The findings are also in agreement with ***Stephen and Peter (2000)*** who stated that the correct wristband identification was essential to prevent wrong blood transfusion and preventing blood sampling errors.

In addition, between November 2003 and July 2005, the United Kingdom National Patient Safety Agency reported 236 incidents and near misses related to missing wristbands or wristbands with incorrect information ***(WHO, 2007).*** As well; in recognition of this patient safety risk, the Australian Commission on Safety and Quality in Health Care ***(ACSQHC, 2008)*** established a patient identification program to take a national approach to reducing errors associated with the misidentification of patients and their care and improving the patient identification process.

The current study showed that nurses were highly comply to improve effective communication parameter in verbal order and shift report .This result could be explained as nurses who working in intensive care unit recognize the importance of effective communication among healthcare team. This results is congruent with (***Cuthbertson et al.,2007 and Baker et al., 2009***) who concluded that effective team communication and coordination are recognized as being crucial for improving quality and safety in ICU. Additionally, the Joint commission of Accreditation (***2009***) emphasized the importance of effective communication among caregivers.

On the same line, ***Shendell& Feinson (2007)*** found that the transfer of essential information and the responsibility for care of the patient from one health care provider to another is an integral component of communication in health care. This critical transfer point is known as a handoff. An effective handoff supports the transition of critical information and continuity of care and treatment. Additionally, ***Peter and Horn (2003)*** mentioned that an explicit approach to bedside rounds in ICU improves communication and satisfaction of health care providers.

High Alert Medication (HAM) are drugs causing significant patient harm when used in a wrong way; such as concentrated solution, chemotherapeutic drugs, anesthetic drugs, hypoglycemic drugs, vasodilator drugs, calcium channel blockers, adrenergic agonists, anti arrhythmic and anticoagulants ***(Institute for Safe Medication Practices, 2005).***

Medication errors represent a major sector in patient safety that needs special attention due to its direct and high impact on patients; however, the present study highlighted on around half of present sample were not complied with the parameter of improving the safety of high alert medication. This result may be due to lack of nurses' knowledge & experience about (HAM) that indicates importance of educational program about high alert medication for the nurses working in critical care units generally; and ICU especially. This recommended agreement with ***(Shady, 2008)*** who emphasized that medication errors are among the most common nursing errors, the nurse spends time and energy in the administration process carrying the responsibility for accurately administration of the right drug. For that, the nurse should encompass the knowledge about the reason for

giving a certain drug, its action, side effects, usual dose and recognize mistakes in prescriptions.

Infection prevention and control are challenging in most health care settings. Concerning nurses' compliance to reducing the risk of health care associated infection, the present study revealed that, the majority of nurses in the present study had high percentage related to compliance at the procedures of urinary catheter and central & peripheral care than the procedure of mechanical ventilation care. This result indicates that, the nurses could reduce the risk for infection and colonization by their compliance of infection control measures and applying stander precautions. The result agreement with ***(Collins, 2004)*** who mentioned that, when the nurses using evidence-based aseptic work practices that diminish the entry of endogenous or exogenous organisms via invasive medical devices.

The study finding revealed that, more than one third of the study groups were not comply to reduce the risk of patient harm resulting from falls parameter. This result may be due to adequate of nurses experiences to evaluate the factors caused it as ; the persons' health status, response to medical interventions, external factors such as the type of floor or other factors. In the similar study, (***Ari***, ***2011***) stated that, The evaluation could include fall history, medications and alcohol consumption review, gait and balance screening, and walking aids used by the patient, and recommended that, the health organizations establishes a fall-risk reduction program based on appropriate policies and/or procedures.

As regarding, a comparison between total mean scores of nurses' compliance toward patients' safety parameters, Table (4) answers the first research question and discovered that, the mean score of nurses' compliance to reduce the risk of (HAI) parameter has got the highest score. That could be attributed to the effect of attending training courses especially related to infection control for all ICU nurses, continuous supervision, as well as sufficient facilities inside ICU that help all healthcare providers adhering to all practices that promote patient safety in work place. This finding is in agreement with ***Abdullatif (2008),*** who stated that the poor state of infrastructure and equipment, unreliable supply and quality of drugs, shortcomings in waste management and infection control, poor performance of personnel and severe under financing of essential operating costs of health services make the probability of adverse events much higher than in industrialized nations. The majority of incidents occur as a result of such health system factors.

As well, the second highest mean scores were improving effective communication parameter. This may be due to the positive nurses' perception regarding safety patient culture and compliance of them for hospital policies. ***(JCI, 2008)*** emphasized that**,** Effective communication, which is timely, accurate, complete, unambiguous, and understood by the recipient, reduces errors, and results in improved patient safety. The present finding consistent with similar study by, **(Sexton, 2011).**

At the same table, the parameter of correct patient identification was third high mean score. This may be due to nurses sophisticated thought about their remember quality about patient identification. ***(JCI, 2008)*** consistent with this meaning from emphasized on the nurses should review existing policies, procedures, and practices related to patient identification.

On the other hand, the previous table discovered that, the parameter of reducing the risk of patient harm from falls had the lowest mean score. This result reflects the reality of nurses concern regarding this parameter, which depending on lack of their experiences. **(Sexton , 2011)**reported that, nurses are responsible for identifying patients who are at risk for falls and developing a plan of care to minimize that risk. In the same line, **(Georgios, 2011)** ensured that, the patient fall rates are perceived as the indicator that could be most improved through nurse-led safety strategies or interventions.

Finally, the present study highlighted on the lowest mean score of nurses' compliance was noticed in the parameter of improving the safety of HAM, despite, that medication-related errors were a significant cause of morbidity and mortality. These findings could be due to the sophisticated patient care procedure performed by nurses in ICU and work overload that may lead to keep some of these medications with patient medication in same drawer for save time as nurses perceived. In addition, this error can occur when a staff member has not been properly oriented to non-proprietary names and proprietary (brand or trademarked) names of medication. Many drug names look or sound like other drug names. Contributing to this confusion are illegible handwriting, incomplete knowledge of drug names, newly available products, similar packaging or labelling, similar clinical use, similar strengths, dosage forms, frequency of administration. ***(WHO, 2007).***

The previous findings were agreed with ***Timmons (2005),*** who stated that critical steps to meaningful improvements in patient safety are; identification of all significant errors, analysis of each error , compilation of data about error frequencies and root causes, dissemination of derived information to permit redesign of systems and processes. Then, finally periodic assessment of effectiveness of risk reduction efforts should be done. In this respect, the ***AONE (2007)*** highlighted that when leaders begin to change their responses to mistakes and failure, asking what happened instead of who made the error, the

culture within their health care institutions will begin to change.

A clear discrepancy in relation between total mean scores of nurses' compliance toward patients' safety parameters and their socio-demographic characteristics was detected which answer the second research question of the study. The table (5) shows that, there were statistically significant differences between years of experiences, nurses' qualification and attending training programs and most of the parameters of patient safety; and the age was statistical significant difference with improve the safety of high alert medication and reducing the risk of health care associated infection. While, no statistical significant difference was noticed with marital status. This may attribute to that; higher education and training are concerning and affecting the employee performance and compliance. The findings are in agreement with ***Gaba et al. (2002)*** who stated that**,** there was differences in the perception of safety between leaders and front line staff.

Leaders in general have more positive view of safety within the organization. ***Sean*** (***2003***) stated that in hospitals with higher proportions of nurses who highly educated, patients experienced lower mortality and failure –to- rescue rates. Moreover, ***Hall***(***2004***) identified that a higher proportion of professional nurses were associated with low rate of medication errors and wound infections.

The present study revealed a statistically significant difference in all parameters related to patient safety and attending training programs. The reason behind this could be simply explained as training and ongoing education are usually directed to critical care unit nurses which affect and improve their clinical practice and increased their awareness to patient safety. In the study conducted by ***(Pollack and Patel, 2000)*** who found that; nurses working in ICU with fellowship training programs are generally, associated with better risk-adjusted mortality rates than those without training programs. Additionally, ***(Ahmed, 2002)*** also reported that, most of the training required by nurses was in the area of critical care unit.

Conclusion

Nurse's compliance highest score in reducing the risk of healthcare associated infection, the second highest mean scores was improve effective communication parameter and the parameter of correct patient identification was third high mean score. While, the parameter of reducing the risk of patient harm from falls had low mean score, and the lowest score in improving the safety of high alert medication. In addition, the study concluded that nurses' compliance to patient safety parameters has potential areas for improvement in the provision of safe health care, such as awareness of HAM items among nurses, development of policies for storage and administration of HAM, adverse event reporting and recording, improving overall perception of patient safety, and leadership Walk rounds. There were statistically significant differences between nurse's age, qualification, years of experience, and attending training courses and their compliance with reducing the risk of health care associated infection and improve the safety of high alert medication parameters.

Recommendations:

1- Create a blame-free environment that encourages nurses to report errors
2- Staff development programs for nurses working in ICU related to High Alert Medications.
3- Improve nurses reporting skills of incidents related to patient safety
4- Develop a strategic plan for patient safety
5- Further studies are needed for assessing patient safety culture and its effect on patient care, assessing the effect of nurses' compliance to patient safety parameters on patient satisfaction, length of stay.
6- Establish teamwork spirit among staff nurses and provide mutual communication.
7- Collaborative efforts must begin to assess current patient Safety culture and to identify nurses' perceptions and attitudes toward safety environment.
8- Search about factors influencing nurses' compliance with safety in order to prevent patient harm.

Implication of the study

The study has implications for both clinical practices of nurses and managerial issue. The out come of this study would be useful in improving nurses performance related to patient safety and quality improvement in health care service. It could help nurse managers to change their reactions to bad events and work effectively to minimize/ prevent accidental harm through identifying root causes of errors, analysis it, and develop disciplinary action.

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