Nurses' Compliance with Patient Safety Standards in an Accredited Hospital

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Abstract

Background: Patient safety standards are the most important of all accreditation standards. **Aim of the study**: to assess nurses' compliance with patient safety standards in an accredited hospital through assessing their knowledge, compliance, and documentation of patient safety standards. **Subjects and methods**: The study was carried out at "Dar Al-Shifa" Hospital using a descriptive cross-sectional design on 89 staff nurses. Data were collected using a self-administered questionnaire for nurses' knowledge, an observation checklist for compliance, and an audit sheet for reviewing documentation. **Results**: Nurses' age ranged between 19 and 55 years, mostly females (82.0%), with diploma degree in nursing (87.6%). Most nurses (84.3%) had satisfactory total knowledge of patient safety. Their compliance was lowest for hand hygiene (68.5%), and labeling medication containers (53.4%), while 86.5% had adequate total compliance, and 94.4% had adequate documentation. A significant positive correlation was found between the scores of compliance and related documentation (r=0.273). In multivariate analysis, training in leadership was a significant positive predictor of the compliance and audit score, whereas a higher qualification was a negative predictor. **Conclusion and recommendations**: The majority of staff nurses in accredited hospital have satisfactory knowledge of patient safety, adequate total compliance with patient safety standards, and adequate related documentation. All hospitals should to seek accreditation due to its positive impact.

Key words: Accredited hospital, Compliance, Patient safety standards.

Introduction

Patient safety is a serious public health issue worldwide. Estimates show that one in 10 patients is harmed while receiving hospital care due to errors or adverse events. Of every hundred 100 hospitalized patients at any given time, 7 in developed and 10 in developing countries will acquire healthcare-associated infections. Hundreds of millions of patients are affected by this worldwide each year (**World Health Organization [WHO], 2014**).

The simplest definition of patient safety is the prevention of errors and adverse effects to patients associated with healthcare. While Health care has become more effective, it has also become more complex, with greater use of new technologies, medicines and treatments. Health services treat older and sicker patients who often present with significant co-morbidities requiring more and more difficult decisions as to healthcare priorities. Increasing economic pressure on health systems often leads to overloaded healthcare environments (**WHO, 2017**).

Patient safety is one of the most important points to consider in healthcare. As such, various programs are entered by

healthcare institutions to monitor their services including patient safety procedures. One of these programs is accreditation. Accreditation is an internationally recognized evaluation process used to assess, promote and guarantee efficient and effective quality of patient care and patient safety *(Al-Awa et al, 2011).*

Accreditation has been defined as an external evaluation mechanism that assesses the performance of healthcare organizations by investigating their compliance with a series of predefined, explicitly written standards *(Jaafaripooyan et al., 2011).* External assessment determines whether a healthcare organization complies with international standards and can provide quality assurance *(Greenfield and Braithwaite, 2008).*

The Accreditation programs have been increasing and spreading throughout the world from developed to developing countries from the past three decades; and today there are several accreditation programs for healthcare organizations. The accreditation process is an integral part of healthcare systems in over 70 countries *(Smits, 2014).*

In some regions, the accreditation of health care organizations remains voluntary, while in others it has become government mandated *(Pomey et al., 2010).* Its rapid growth over the last 40 years is partially attributable to media reporting of serious inadequacies in the quality and safety of healthcare services, and an escalating focus on patient safety *(Accreditation Canada, 2011).* Hospitals seeking to earn and maintain accreditation undergo unannounced on-site visits by a team of surveyors at least once every 3 years. These surveys address a variety of domains, including the environment of care, infection prevention and control, information management, adherence to a series of national patient safety goals (NPSG), and leadership *(The Joint Commission [TJC], 2011).*

The quality improvement and patient safety standards are the most important of all accreditation standards. Continuous improvement and constant concern over reducing the risks to patients identify hospitals that are committed to the welfare of their patients. To improve quality and reduce risks, the hospital must constantly evaluate its performance and use that information to identify ways in which it can improve. This self-evaluation must be planned and ongoing and should focus on systems and processes, not solely on individual performance *(Nicklin, 2015).*

Accreditation and compliance with standards aim to improve patient safety and strengthen the quality of healthcare; as improvement in quality is believed to result in fewer mistakes, shorter delays, improvements in productivity, increased market share, and lower costs *(Halasa et al., 2015).* Healthcare compliance is the ongoing process of meeting, or exceeding the legal, ethical, and professional standards applicable to a particular healthcare organization or provider. Healthcare compliance requires healthcare organizations and providers to develop effective processes, policies, and procedures to define appropriate conduct, train the organization's staff, and then monitor the adherence to the processes, policies, and procedures *(Smith, 2014).* The recent studies have linked global measures of a safety culture to nurses and other health team compliance with safe work practices and exposure to incidents *(Sexton et al., 2011).*

Obtaining and maintaining accreditation helps organization to create a culture of safety and quality, which results in a number of benefits. It helps organize and strengthen patient safety efforts, and strengthens community confidence in the quality and safety of care, treatment and services. Moreover, achieving accreditation makes a strong statement to the community about an organization's efforts to provide the highest quality services. It Improves risk management and risk reduction since the Joint Commission standards focus on state-of-the-art performance improvement strategies that help healthcare

organizations continuously improve the safety and quality of care, which can reduce the risk of error *(TJC, 2015).*

Nurses are at the center of patient care and therefore are essential drivers of quality improvement. Patient safety remains one of the most critical issues facing healthcare today and nurses are the healthcare professionals most likely to intercept errors and prevent harm to patients *(Hughes, 2008).* Of all the members of the healthcare team, nurses therefore play a critically important role in ensuring patient safety by monitoring patients for clinical deterioration, detecting errors and near misses, understanding care processes and weaknesses inherent in some systems, and performing countless other tasks to ensure patients receive high-quality care *(Agency for Healthcare Research and Quality* **[AHRQ],** *2016).*

Significance of the Study

Egyptian patient safety standards have been developed lately based on the International Society for Quality in Health Care (ISQua) to avoid the complicity of Joint Commission International (JCI) standards applications. The Accreditation committee of ministry of health started to apply these standards in its organizations. Accreditation and compliance with standards aims to improve the patient safety as improvement in patient safety is believed to ensure a safe environment, prevent or reduce harm to patients, shorter delays, improvements in productivity, increased market share, and lower costs. For this reasons, the researcher thought to test nurses' compliance to patient safety standards in an accredited hospital to find out whether accredited hospital nurses maintain compliance and aware of the patient safety standards after obtaining accreditation certificate; to illustrate whether the hospital has taken accreditation certificate in a serious way or not.

Aim of the study

This study was aimed at assessing nurses' compliance with patient safety standards in an accredited hospital through:

1. Assessing nurses' knowledge regarding patient safety standards in the accredited hospital;
2. Assessing nurses' performance regarding patient safety standards in the accredited hospital;
3. Auditing nurses' documentation of patient safety standards through review of medical records in the accredited hospital.

Research question

Are nurses' in the accredited hospital compliant with patient safety standards?

subjects and methods

Research design

A descriptive cross-sectional research design.

Settings

The study was conducted at "Dar Al-Shifa" Hospital. It is the first Egyptian hospital to receive Egyptian accreditation for the quality of medical services. It received the first accreditation in 2010, the second time was in 2014, and the third time in 2017.

Subjects

The actual study sample consisted of 89 staff nurses met the eligibility criteria**.**

Inclusion Criteria

The criteria for inclusion in the main study sample are working full time at the study setting and having experience more than 6 months,

Sample technique

No sampling technique was applied since all eligible nurses were recruited in the study.

Tools of data collection

Data for this study was collected using three tools:

1. A Self-administered questionnaire regarding patient safety standards to assess nurses' knowledge (Included 20 MCQ covering general, medication and operative patient safety standards).
2. An observation checklist to assess nurses' performance (Included 18 standards covering general, medication and operative patient safety standards.
3. An audit sheet for reviewing medical records to assess nurses' documentation of patient safety standards (Included 11 standards covering general and operative patient safety standards).

Pilot study

A pilot study was carried out on nine nurses selected from different units and represented approximately 10 % of study sample. The aim of the pilot study was to ensure the clarity, feasibility and applicability of the tools and to estimate the time needed to apply them. Data obtained from the pilot study were analyzed. The time to fill-in, the observation checklist ranged from 30 to 45 minutes, the audit sheet from 20 to 25 minutes, and the nurse knowledge questionnaire sheet from 15 to 20 minutes.

Fieldwork

After securing necessary official permissions, the researcher met with the eligible staff nurses individually or in small groups in their workplace, explained the aim of the study and invited them to participate. Those who gave their verbal consent to participate were handed the self –administered questionnaire and instructed in how to fill it out. Every nurse took 15 to 20 minutes to fill the form.

As regards observation of performance and auditing, the researcher observed every staff nurse in the study sample three times in two different shifts in different time. The staff nurse was observed while providing patient care, with emphasis on the procedures related to patient safety standards. This was done using the designed observation checklist. A participant observation technique was utilized in order to minimize any observation bias.

Concerning the auditing of staff nurses documentation of patient safety standards, this was done using the designed audit checklist. The medical file of the patient observed was checked for the documentation of the procedures related to patient safety standards.

The data were collected 7 days per week on two shifts (morning and night) starting from 8:00 am to 5:00 pm in the morning shift and from 8:00 pm to 12:00am in the night shift. The data collection process was started post hospital accreditation at the beginning of March 2017 and was completed at the end of April 2017.

Ethical consideration

The study proposal was approved by the research ethics committee at the Faculty of Nursing, Ain-Shams University. Official permissions to conduct the study were secured. All participants showed their verbal consent to participate in the study. They were informed about the study purpose and about their rights to refuse or withdraw at any time without giving reasons. The study maneuvers could not entail any harmful effects on participants. Total confidentiality of any obtained information was ensured. The collected data were used only for research purposes.

Statistical Design

Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations and medians for quantitative variables. Cronbach Alpha coefficient was calculated to assess the reliability of the developed tools through its internal consistency. Qualitative categorical variables were compared using chi-square test. Whenever the expected values in one or more of the cells in a 2x2 tables was less than 5, Fisher Exact test was used instead. Chi-square

for trend was used to assess the statistical significance of trends of scales. Spearman rank Correlation for ranked ones. To identify the independent predictors of the knowledge, performance and audit, multiple linear regression analysis was used of variance for the full regression models were done. Statistical significance was considered at p-value <0.05.

Results

Table (1): Socio-demographic characteristics of nurses in the study sample (n=89).

Item	Frequency	Percent
Age:		
<30	46	51.7
30+	43	48.3
Range	19.0-55.0	
Mean±SD	30.7+8.5	
Median	28.00	
Gender:		
Male	16	18.0
Female	73	82.0
Nursing qualification:		
Diploma	78	87.6
Bachelor	11	12.4
Marital status:		
Unmarried (single, divorced, widow)	41	46.1
Married	48	53.9

Table (1): The study involved 89 nurses whose age ranged between 19 and 55 years, with median 28.0 years, mostly females (82.0%) as illustrated in Table 1. The majority were diploma degree nurses (87.6%), and 53.9% were married.

Table (2): Job characteristics of nurses in the study sample (n=89).

Item	Frequency	Percent
Department:		
OR/endoscopy	29	32.6
Critical care	13	14.6
NICU	13	14.6
Dialysis	7	7.9
Wards	27	30.3
Experience years:		
<5	30	33.7
5+	59	66.3
Range	1.0-34.0	
Mean±SD	11.3±9.0	
Median	10.00	
Attended training about hospital safety policies/procedures regarding:		
General patient safety	89	100.0
Medication management safety	89	100.0
Operative /invasive procedures safety	89	100.0

Table (2): Regarding job characteristics, Table 2 shows that each of the operation rooms and the wards contributed to almost one-third of the sample. Nurses experience years were mostly five or more (66.3%). and ranged between 1 and 34 years. All of them had training in hospital safety policies and procedures.

Table (3): Knowledge regarding patient safety standards among nurses in the study sample (n=89)

| PS. No.	Standard	Correct	
		No	**%**
	General patient safety		
PS.6	Accurate standardized Patient identification	89	100.0
PS.7	Hand hygiene to prevent healthcare associated infections	81	91.0
PS.8	Single use of injection devices	89	100.0
PS.9	Dealing with verbal or telephone orders	66	74.2
PS.10	Avoiding catheter and tubing misconnections	62	69.7
PS.11	Assessment of patient's risk of falling	87	97.8
PS.12	Prevention action of patient's risk of falling	85	95.5
PS.13	Assessment of patient's risk of developing pressure ulcers	86	96.6
PS.14	Prevention action of patient's risk of developing pressure ulcers	80	89.9
PS.16	Monitoring and responding to alarm signals	70	78.7
PS.17	A standardized approach to hand over communications	58	65.2
	Medication management safety		
PS.18	Medication management safety policy and procedures	86	96.6
PS.22	Prevent errors from look -alike. Sound-alike medications	89	100.0
PS.23	The list of high risk medications including concentrated electrolytes	53	59.6
PS.24	Prevent errors from high risk medications	75	84.3
PS.25	Labeling of medications, medication containers and other solution	85	95.5
	Operative and invasive procedure safety		
PS.29	Operative and invasive procedures safety policy and procedures.	65	73.0
PS.30	Process for verification of all documents and equipment's needed for surgery or invasive procedures preoperatively.	84	94.4
PS.31	Accurate documented patient identification preoperatively and just before surgery (time out).	74	83.1
PS.33	Verification of accurate counting of sponges, needles and instrument pre and post procedure.	84	94.4

Table (3): As regards nurses' knowledge of patient safety standards, Table 3 indicates generally high percentages of correct knowledge. It reached 100% concerning general patient safety regarding accurate standardized patient identification and single use of injection devices. On the other hand 65.2% of them had correct knowledge regarding standard related to a standardized approach to hand over communications.

Concerning medication management safety, also all nurses had correct knowledge regarding prevent errors from look-alike and sound alike medications. Meanwhile 59.6% of them had correct knowledge regarding list of high-risk medications including concentrated electrolytes.

Concerning operative/invasive procedures safety, 94.4% of the nurses had correct knowledge regarding standards related to process for verification of all documents and equipment's needed for surgery or invasive procedures preoperatively and verification of accurate counting of sponges, needles, and instrument pre and

post procedure. Meanwhile, 73.0% had correct knowledge regarding operative and invasive procedures safety policy and procedures.

Figure (1): Total knowledge of patient safety standards among nurses in the study sample (n=89).

■ Satisfactory (60%+) ■ Unsatisfactory (<60%)

15.7%

84.3%
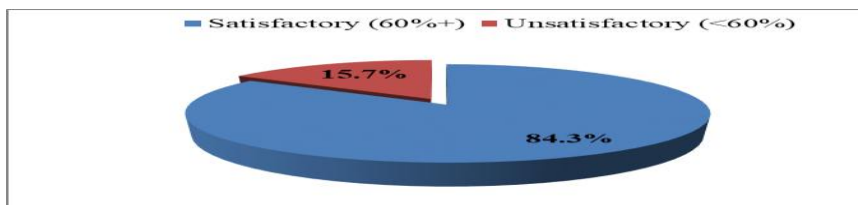
Figure (1): demonstrates that 84.3% of the study sample were having satisfactory total knowledge of patient safety standards.
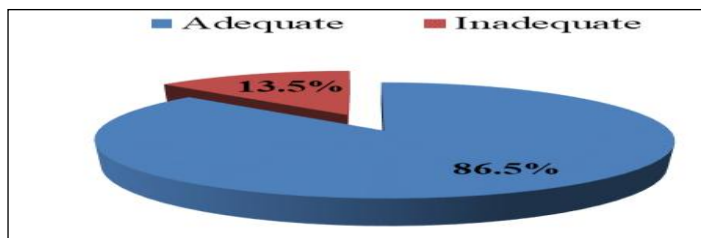
Table (4): Total compliance with patient safety standards as observed among nurses in the study sample (n=89).

Adequate compliance (60%+):	Comply		Not Applicable
	No.	%	
General patient safety standards:			
PS.6. accurate standardized Patient identification	89	100.0	0
PS.7. Hand hygiene	61	68.5	0
PS.8. Single use injection	89	100.0	0
PS.9. Verbal/telephone order	44	97.8	44
PS.10. Prevent catheter/tubing misconnections	86	96.6	0
PS.11. Fall risk assessment	41	100.0	48
PS.12. Fall prevention	76	100.0	13
PS.13 Pressure ulcer risk assessment	53	100.0	36
PS.14. Pressure ulcer prevention	44	97.8	44
PS.16. Monitoring and responding to alarms	86	96.6	0
PS.17. Standardized handover	85	95.5	0
Total general	77	86.5	0
Medication safety standards:			
PS.22. Look-alike/sound-alike medications	87	98.9	1
PS.23. High risk electrolytes	88	100.0	1
PS.24. high -alert medications not removed	88	100.0	1
PS.25. Labeling of medication containers	47	53.4	1
Total medication	50	56.8	1
Operative/invasive procedures:			
PS.30. verification of all documents and equipment preoperatively	61	100.0	28
PS.31. Accurate documentation of patient identification preoperatively	53	100.0	36
PS.33. Verification of accurate counting of sponges and needles pre and post procedure	29	100.0	60
Total operative	61	100.0	28

Table (4): indicates that nurses' compliance with general patient safety standards was lowest for hand hygiene (68.5%), with a total general compliance of 86.5%. the compliance with medication safety standards was generally high except for labeling of medication containers, which was as low as 53.4%. as for the compliance with operative /invasive procedures, the table shows 100.0% compliance of all its categories and total when applicable.

Figure (2): Total compliance with safety standards as observed among nurses in the study sample (n-89).

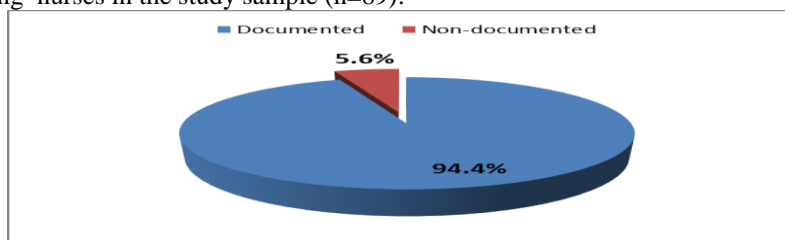**Figure (2):** displays that 86.5% of the study sample had adequate total compliance with patient safety standards**.**

Table (5): Nurses' total audited documentation of patient safety standards (n=89).

Standard	Documented		Not
	No.	%	Applicable
General patient safety:			
PS.6. accurate standardized Patient identification	89	100.0	0
PS.9. Verbal/telephone orders	66	98.5	22
PS.10. Prevention of misconnections of tubing/ catheters	86	96.6	0
PS.11. Fall assessment	69	100.0	20
PS.12. Fall prevention	50	82.0	28
PS.13. Pressure ulcer assessment	82	100.0	7
PS.14. Pressure ulcer prevention	43	66.2	24
PS.17. Handover documentation	86	96.6	0
Total general patient safety	82	92.1	0
Operative/invasive procedures:			
PS.30. verification of all documents and equipment preoperatively	54	100.0	35
PS.31. Accurate documentation of patient identification preoperatively	54	100.0	35
PS.33. Verification of accurate counting of sponges and needles pre and post procedure	54	100.0	35
Total operative/invasive procedures	54	100.0	35

Table (5): indicates that nurses' total audited documentation with patient safety standards was lowest for pressure ulcer prevention (66.2%), with a total general patient safety compliance of 92.1%. as for the compliance with documentation of operative /invasive procedures, the table shows 100.0% compliance of all its categories and total when applicable.

Figure (3): Total compliance with documentation of patient safety standards as audited among nurses in the study sample (n=89).

figure (3): the 94.4% of the study sample   had adequate total compliance with documentation of patient safety standards.

Table (6): Relations between nurses' compliance with patient safety standards and their characteristics.

Items	Compliance				X² Test	p-value
	Adequate		Inadequate			
	No.	%	No.	%		
Department:						
OR/endoscopy	29	100.0	0	0.0		
Critical care	7	53.8	6	46.2		
NICU	13	100.0	0	0.0	--	--
Dialysis	5	71.4	2	28.6		
Wards	23	85.2	4	14.8		
Age:						
<30	38	82.6	8	17.4		
30+	39	90.7	4	9.3	1.25	0.26
Gender:						
Male	11	68.8	5	31.3		
Female	66	90.4	7	9.6	Fisher	0.04*
Nursing qualification:						
Diploma	67	85.9	11	14.1		
Bachelor	10	90.9	1	9.1	Fisher	1.00
Marital status:						
Unmarried	32	78.0	9	22.0		
Married	45	93.8	3	6.3	4.67	0.03*
Job position:						
Staff nurse	70	85.4	12	14.6		
Specialist	7	100.0	0	0.0	Fisher	0.59
Experience years:						
<5	24	80.0	6	20.0		
5+	53	89.8	6	10.2	Fisher	0.21
Attended training in leadership						
No	43	79.6	11	20.4		
Yes	34	97.1	1	2.9	Fisher	0.02*

Table (6): points to statistically significant relations between nurses compliance with patient safety standards and their gender (p=0.04, marital status (p=0.03), and

attendance training in leadership (p=0.02). as the table shows, the percentages of nurses with adequate compliance were higher among females, married, and those who received training in leadership.

Table (7): Correlation matrix of nurses' scores of knowledge of patient safety standards and their compliance and audit findings.

	Spearman's rank correlation coefficient		
	Knowledge	**Compliance**	**Audit**
Knowledge			
Compliance	-0.01		
Audit score	-.254*	.273**	

(*) Statistically significant at p< 0.05   (* *) statistically significant at p< 0.01

Table (7): demonstrates a statistically significant weak positive correlation between nurses' scores of compliance with patient safety standards and their related audited compliance with documentation (r=0.273). Conversely, a negative correlation was identified between nurses' scores of knowledge and their audited compliance with documentation of patient safety standards (r=-0.254).

Table (8): Correlation between nurses' scores of knowledge of patient safety standards and their compliance and audit findings and their characteristics.

Items	Spearman's rank correlation coefficient		
	Knowledge	**Compliance**	**Audit**
Age	0.08	.235*	0.11
Qualification	0.14	-0.17	-0.08
Experience	0.06	.240*	0.07

(*) Statistically significant at p<0.05

Table (8): nurses' compliance scores had statistically significant weak positive correlations with their age(r=0.235) and experience years(r=0.240). Meanwhile, their knowledge and audit scores had no correlation with any of their personal characteristics.

Discussion

Concerning nurses' knowledge about patient safety standards, the current study results showed that the majority of nurses were having satisfactory total knowledge about patient safety standards. This finding could be explained by the fact that all nurses were attended training in patient safety and oriented about hospital patient safety policies / procedures regarding general, medication and operative safety standards as well as the nurses in the study sample had at least 6 months of experience in working with hospital and being socialized with hospital norms and process to gain accreditation. This finding agrees with *Duello et al (2015)* in the US, they reported that training modules offered to health care team could improve their knowledge and interest in quality initiatives and accreditation standards. Similarly, *Braun et al (2008)* in federally supported health centers, show that accreditation and compliance with accreditation standards lead to better staff training and education and competency verification.

Regarding nurses' compliance with patient safety standards, a great majority of the nurses in the study had

adequate total compliance with patient safety standards and all nurses were compliant with 11 out of 18 standards; which is an expected that accreditation process helps the hospital to keep on track of the road of compliance to patient safety standards. In line with this, *Halasa et al (2015)* in Jordan who emphasized that achieving accreditation and compliance with standards aims to improve patient safety and strengthen the quality of healthcare; as improvement in quality is believed to result in fewer mistakes, shorter delays, improvements in productivity, increased market share, and lower costs. Meanwhile, this finding disagrees with *Seliem (2012*) in a study at Nasser institute hospital (non-accredited hospital at this time) in Egypt about nurses' compliance with patient safety standards who mentioned that the majority of her study nurses had inadequate performance regarding safety standards; the possible explanation for this disagreement is that she carried out her study at Nasser institute hospital which was non-accredited hospital at that time.

The present study had also assessed nurses' documentation regarding patient safety. The present study showed that a great majority of the nurses had adequate total compliance with documentation and all of nurses documented 6 out of 11 standards. This could be explained by the fact that one of the audit team in the hospital performs revision to medical records daily and focusing from hospital management on importance of documentation as an evidence of fulfilling accreditation criteria. This finding disagree with *Seliem (2012)* who mentioned that the majority of the studied nurses at Nasser institute only fulfill the documentation of two patient safety standards which discuss handover communication and double check of surgical patient data. The explanation to that; the current study was carried out in an accredited hospital while

Seliem (2012) carried out her study in a non-accredited hospital such the accreditation is an important factor that positively affect nurses compliance to documentation.

Moreover, this is in agreement with *Halasa et al (2015)* in Jordan, who show that accreditation and compliance with accreditation standards lead to the completeness of medical records and improvement in quality are the result of accreditation. *The National Audit Office (2001)* has portrayed documentation as an integral part of nursing, which serves to protect the welfare of patients and clients. It also reflects the standard of professional practice, and is the mark of a skilled and safe practitioner

In total, the current study points to statistically significant relations between nurses' compliance with patient safety standards and females gender, married, and those who received training in leadership. This finding was further confirmed again when multivariate analysis was carried out to determine independent predictors of performance and audit scores. Interestingly, the higher compliance among married females may be linked to their inclination act or implement socially acceptable conduct with much emphasis on maintaining their reputation. The present finding agreed with *Colet et al (2016)* in a study in Saudi who mentioned that female respondents are more compliant the standard than male.

The positive effects with those who received training in leadership explained by the fact that an environment of continuous learning is highly required to continuously improve the quality of medical service, allow the medical staff to acquire new skills and to be highly competent with updated standards. The present finding agreed with *Hill (2010)* in a study about improving quality and patient safety by retaining nursing

expertise at hospital in Lexington who mentioned that although we must continue to explore the relationship between expertise in nursing practice who are trained with leadership skills and quality care, the data available have already demonstrated that training in leadership in nursing support expertise and have a positive impact on the quality of care provided.

Conversely, when multivariate analysis was carried out to determine independent predictors of performance and audit scores, the result revealed that their higher qualification was a negative predictor. The negative effects of the higher qualification may be explained by that bachelor and higher degree nurses might be more frustrated with the wages and untoward work factors that could negatively affect their performance and hamper the application of accreditation standards. In disagreement with this, a study conducted in Australia reported that there is increasing evidence of a link between nurses' level of qualification and the quality of care they provide to their patients *(Gillespie et al, 2011).*

The current study also demonstrates a statistically significant positive correlation between nurses' scores of compliance with patient safety standards and their related audited compliance to documentation. This finding was further confirmed again when multivariate analysis was carried out to determine independent predictors of audit score, which revealed that their compliance score were the statistically significant independent positive predictor of this score. This is explained by the nurses' satisfaction with documentation systems, and the hospital administrators view recordkeeping as an important element leading to continuity of care, safety, quality care, and compliance*.* This is in disagreement with *Pongpirul et al. (2006*) who informed that documentation of patient care management was the major obstacle identified by surveyors of

national accreditation programs in Thailand.

Conversely, a negative correlation was identified between nurse's scores of knowledge and their audited compliance with documentation with patient safety standards. This might be explained by the amount of time spent documenting, the desire to make nursing work visible and excessive workload. This is in agreement with *Laschober et al (2007)* in a study in Germany about mandatory quality reports, they informed that the regulatory requirements from accreditation agencies may generate significant workload in terms of administrative tasks, and compliance with these requirements often results in time-consuming documentation and audit activities.

Finally, the current study found that nurses' compliance scores had statistically significant positive correlations with their age and experience years. These might be due to routine work for years increased nurses' performance. This is in agreement with *The National Association of Neonatal Nurses (2016)* who stated that years of experience have a significant effect on the nurses' knowledge and performance, which result in improving the quality and consistency of nurse care offered to their patients.

Conclusion

The study results revealed that nurses in the accredited hospital had satisfactory knowledge regarding patient safety standards except improving the safety from high alert electrolytes. Their compliance regarding patient safety standards was mostly adequate except for hand hygiene after touching patient surroundings and labeling of dates and times of preparation and expiry of medication containers. Their documentation was highly adequate except for nursing care plan and nursing interventions to decrease any identified risks for developing pressure ulcers. In

addition, the results revealed a positive significant relation between nurses' gender, marital status, attended training courses in leadership and their compliance. A positive correlation between audit and compliance. Conversely, a negative correlation between audit and knowledge. A positive correlation between their age, experience years and their compliance score. Females, and those who received training in leadership predicts high for compliance and audit scores, while higher qualification predicts low compliance and audit scores.

Recommendation

For education and training:

- More emphasis on training at the areas of improving the safety of high risk electrolytes, labeling of medications containers, hand hygiene and documenting nursing action care plan and nursing interventions to decrease any identified risks for developing pressure ulcers in order to improve the total compliance with patient safety standards.

- More emphasis on attending training courses in leadership, which shows higher percentage of adequate compliance.

For Practical and clinical area:

- Enhancing the hospital accreditation and compliance with its standards because it leads to better patients and staff outcomes such as satisfaction, education, competency verification and completeness of medical records regarding patient safety.

- Performance feedback and verbal reminders are needed to sustain adherence to hand hygiene.

- Direct and extensive leadership combined with more timely and persistent audit and feedback are necessary for substantial improvements in nurses' documentation skills especially in pressure ulcer prevention actions.

- The nurses with higher qualifications need to foster their compliance and documentation regarding patient safety standards through positive reinforcement by rewarding them morally and financially.

For research:

- Further research is suggested to conduct the study in both accredited and non-accredited hospital with comparisons to assess the differences in staff compliance to patient safety.

- Further research is suggested to assess the effect of implementing accreditation on both nurses and patients outcomes.

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