

Assessment of Patient Safety Competencies among Critical Care Nurses

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Abstract

Background: Quality assurance programs have been implemented worldwide to address nursing errors and improve patient safety. However, despite these efforts, threats to patient safety remain a major concern and contribute to the overall crude death rate. The World Health Organization (2018) reported that 42.7 million medical errors occurrences annually during hospitalizations. These errors are identified as the 14th leading cause of death and morbidity worldwide (Mohanty et al., 2018). **Aim:** This study aims to assess levels patient safety competencies among critical care nurses. **Research Question:** What is the level of patient safety competencies among critical care nurses? **Research design:** Descriptive research design was used to carry out this study. **Setting:** This study was conducted at all critical units of Alexandria Main University Hospital. **Subjects:** All nurses (N=289) who are working in the previous mentioned units were recruited to collect the required data. **Tools:** One tool is used to collect the necessary data Patient Safety Competency Self-Evaluation Questionnaire (PSCSE). **Results:** The highest percentage of nurses (72.7%) had high level of patient safety competencies. **Conclusion:** This study highlights that nurses exhibit a moderate to high level of patient safety competencies. By possessing the necessary competencies, healthcare professionals can identify, prevent, and manage medical errors and adverse events, contributing to a culture of safety within the healthcare system. **Recommendations:** Based on the findings of this study the policy makers and nurse leaders should fund training programs by allocating funding for the development and implementation of training programs that focus on patient safety competencies. Mandate continuing education by requiring ongoing professional development in patient safety as part of licensure renewal for nurses, ensuring continuous improvement in these critical areas. Promote a safety culture by encouraging healthcare organizations to cultivate a culture of safety, where patient safety is core values supported by leadership and embedded in daily practices. Standardize competency assessments through establish standardized tools and methods for regularly assessing nurses' patient safety competencies, ensuring consistency and accountability.

Keywords: patient safety, safety competencies, nurses, critical care unit.

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Introduction

Quality assurance programs have been implemented worldwide to address nursing errors and improve patient safety. However, despite these efforts, threats to patient safety remain a major concern and contribute to the overall crude death rate. The World Health Organization (2018) reported that 42.7 million medical errors occurrences annually during hospitalizations. These errors are identified as the 14th leading

cause of death and morbidity worldwide. (Mohanty et al., 2018).

The Institute of Medicine posits that preventable adverse events occur due to the incompetency of health care professionals in ensuring patient safety, involving inadequate skills or knowledge of nurses as the main group of health care providers (Raymond, 2017). Mitigating these errors require the

direction of focus toward upskilling of patient safety competencies among healthcare providers, particularly nurses (Al Munajjam et al., 2023).

The importance of patient safety has led to the development of safety protocols, guidelines, and quality improvement initiatives within healthcare organizations. These efforts aim to enhance patient safety by promoting a culture of safety, implementing standardized practices, utilizing technology for error prevention, and fostering effective communication among healthcare providers (Wagner, Kristensen, Sousa, & Panteli, 2019). Furthermore, patient engagement and shared decision-making have emerged as essential components of patient safety. Involving patients and their families in care planning and decision-making processes helps improve communication, increase patient satisfaction, and reduce the likelihood of errors (Clavel et al., 2021).

Nurses have a crucial role in safeguarding patient safety within hospital settings. Their responsibilities, such as continuous patient monitoring and coordinating care, position them as frontline observers of safety issues and providers of high-quality healthcare. (Fracica & Fracica, 2021) Consequently, it is imperative for nurses to possess patient safety competencies that enable them to accurately report information and assess patient safety outcomes, including adverse events. There is substantial evidence supporting the notion that nurses should be equipped with these competencies to fulfill their role effectively in ensuring patient safety. (Gandhi et al., 2018).

Patient safety competency refers to the knowledge, skills, and attitudes necessary for healthcare professionals to deliver safe and quality care to patients. It encompasses a range of abilities, including clinical expertise, effective communication, critical thinking, problem-solving, teamwork, and a commitment to continuous learning and improvement. Nurses with patient safety competencies understand the basic principles of safety and system design, optimize human and environmental factors, demonstrate effective communication skills and use appropriate strategies and safety resources for error reporting systems (Jalali, Dehghan, Habibi, & Khakzad, 2023).

Assessing the strengths and weaknesses of patient safety competencies is the first step for nurses to develop effective strategies to improve their patient safety competencies (Han & Roh,

2020). The factors affecting the patient safety competency of nurses should be identified to enhance their competency (Rizany et al., 2018). The most important factor of these factors is critical system thinking that characterize nurses (Rizany et al., 2018).

According to Habibi Soola, et al. (2022), the development of nursing patient safety competency can be facilitated by promoting system thinking among nurses who possess a high level of professionalism. Mahsoon and Dolansky (2021) posit that system thinking among nurses is a powerful determinant for various nursing competencies especially those associated with patient safety in the contemporary nursing practice. Meanwhile, Aljuffali et al (2023) highlighted that investing in the healthcare system require a holistic approach able to analyze elements of this system then using various competencies to predict opportunities for improvement. This could be augmented if system thinking becomes corporate culture among nurses.

Significance of the study:

The current study is in line with Egypt vision 2030 and offers new insights to reduce the margins of healthcare errors and help to fulfill eligibility requirements of the General Authority for Health Accreditation and Regulation (GAHAR) needed for health agency to be enrolled under the umbrella of new health insurance system. Moreover, the current study offers strategies for nursing managers to upgrade nursing practice using nursing competencies in the contemporary context where information technology tools proliferated across sector.

Aim of the study: This study aims to assess levels patient safety competencies among critical care nurses.

Research Question: What is the level of patient safety competencies among critical care nurses?

Materials and Method

Research design: Descriptive research design was used to carry out this study.

Setting: This study was conducted at Alexandria Main University Hospital, which is affiliated to Alexandria

University. It provides public non paid health service with bed capacity more than 6760 beds. It is the largest educational university hospital in Alexandria. It is the first university hospital started serious steps to fulfill requirements of the General Authority for Health Accreditation and Regulation (GAHAR) regarding patient safety. The study was conducted at all critical care units (N=10) namely, Second unit, Third unit, Fourth unit, Medical emergency unit, Surgical emergency unit, Intensive Care Unit of Emergency Operations, Transitional intensive care unit, New transitional unit, Continuous renal replacement therapy & critical cases intensive care unit, and Toxicology unit.

Subjects:

All nurses (N=289) who are working in the previous mentioned units were recruited to collect the required data. They provide direct, indirect care with at least 6 months of experience to become aware of the hospital policies, roles, and regulations and willing to participate in the study.

Tools:

Tool (I): Patient Safety Competency Self-Evaluation Questionnaire (PSCSE)

This tool was developed by Lee et al., (2014) to assess the level of patient safety competency among nurses. This questionnaire has 41 items in three dimensions: knowledge and awareness (6 items), skills (21 items), and attitudes (14 items). Concerning knowledge and awareness dimension, it is subdivided into two sub categories namely; patient safety culture (4 items), and error and cause analysis (2 items). Items of knowledge and awareness dimension was rated using a 5-point Likert scale ranging from 1=not knowledgeable to 5=very knowledgeable.

Regarding the skill dimension, it is subdivided into six sub categories namely; error reporting and response to an error (4 items), communication related to error (3 items), resource utilization/evidence-based practice (3 items), safe nursing practice (5 items), infection prevention (4 items), and precise communications during hand offs (2 items). Items were scored using a five-choice scale ranging from 1= very uncomfortable to 5 = very comfortable. Finally, the attitude dimension is further subdivided into 4 subcategories namely; patient safety promotion/prevention strategy (4items), responsibility of health care professionals for

patient safety culture (4 items), error reporting and disclosing (4 items), and the components of patient safety culture (2 items). Items of the attitude dimension were assessed using a 5-point Likert scale ranging from 1=strongly disagree to 5=strongly agree. The total score of the PSCSE was calculated by summing the scores for all three domains. Nurses' perceived level of patient safety competency was categorized as the following; scores range from 41<95 low level, 95<150 moderate level, 150-205 high level. This tool has high reliability since score of Cronbach's Alpha Coefficient was 0.92 (Kakemam et al., 2022) and in the current study was 0.97.

Method

An official approval for conducting the study was obtained from the Research Ethics Committee (REC) **IRB00013620 (9/19/2025) (17-8-2023)** Faculty of Nursing, Alexandria University, and an official permission for conducting the study was obtained from Faculty of Nursing, Alexandria University, and the hospital administrators to collect the necessary data. The tools were translated into Arabic, back-to-back translation were done.

Ethical Considerations

Written informed consent from the study subjects was obtained after explanation of the aim of the study, The subjects participated in the study on a voluntary base. Confidentiality of the data will be maintained and the anonymity of the study subjects was assured. The subject's right to withdraw at any time from the study was assured.

Statistical Analysis

Data collected throughout the study have been coded and entered to the computer using the IBM SPSS statistical package (V.27). Data validation has been done by dual data entry and cross-matching entered data to elucidate data entry typos, in addition to other validation and cleansing techniques like verifying variables logically. Distribution of all quantitative variables have been tested for normality using the Shapiro-Wilk and Kolmogorov-Smirnov Test. Then descriptive statistics included the mean and standard deviation (\pm S.D.).

Results

Table (1) presents the personal and professional characteristics characteristics of the 289 studied nurses, providing essential insights into the composition of the cohort. Regarding their age; the highest percentage (56.1%) of them had from 20 to less than 30 years old while the lowest percentage (3.5%) of them had more than 50 years old, with a mean of (30.15 ± 8.1 SD) in total population. Concerning their qualifications, the highest percentage (45.3%) of them had bachelor degree whereas the lowest percentage (0.3%) of them had master degree.

Pertaining their years of experience; slightly less than two thirds of them (60.9%) had from one year to less than 10 years of experience while the lowest percentage (2.8%) of them had more than 30 years of experience with a mean of (8.07 ± 7.69 ±SD) in the total studied nurses. In addition, the experience duration in the current job of the studied nurses scored the highest percentage (60.2%) of them from one year to less than 10 years whereas the lowest percentage (0.7%) of them had more than 30 years of experience in the current job with a mean of (5.21 ± 6.37 ±SD) in the whole population. Furthermore, marital status indicates that more than half of them (53.6%) are single while the lowest percentage (2.4%) of them are widowed.

As observed in **Table 1**, Taking patient safety courses revealed the highest percentage (65.1%) of them didn't get those courses compared to (34.9%) of them who attend previous courses addressing patient safety issues. Among those who attend such courses, (17%) believed that patient safety courses were beneficial to some extent. More than half (52.9%) of the surveyed subjects attended courses at healthcare setting. Additionally, the highest percentage (64%) of the studied nurses did not attend any previous patient safety workshops compared to (36%) of them who attend previous workshop regarding patient safety. Among those who received these workshops, (22.8) of them stated that these workshops were very beneficial. More than half of those nurses (52.9%) attended these courses at healthcare setting.

Table 2 reveals that the mean score of their patient safety competency (PSC) is 162.74±23.56 in the total cases, with 159.22±24.32 in males, and 164.31±23.10 (±SD) in females, as illustrated in Table 2. The average score of knowledge/awareness dimension of patient safety competency is

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21.03±4.79 in the whole population, with 20.87±4.24 in males, and 21.10±5.03 (±SD) in females. Also, the mean score of skills dimension of patient safety competency in the surveyed nurses is 85.08±13.17 with the "safe nursing practice" as the highest mean value (21.38±3.75) in males, and (22.04±3.67) in females. Regarding the attitudes dimension of patient safety competency, the mean score for total studied nurses is 56.64±8.11, with the "responsibility of health care professionals for patient safety culture" as the greatest average score (16.55±2.80 in males, and 17.01±2.68 in females).

Concerning the levels of patient safety competencies among the studied nurses, 72.7% of them exhibited high level of patient safety competencies compared to 25.6% of them who had moderate level of PSC and only 1.7% of them had low level of PSC, as observed in **Table 3**. More than half (52.9%) of studied nurses had high level of PSC knowledge/awareness. Also, 74.4% of total nurses possess high level of PSC skills, with "Infection prevention" as the highest skill level among them (85.5%), followed by "safe nursing practice" (83%). High level of PSC attitudes was determined 79.6% in total population, with "responsibility of health care professionals for patient safety culture" as highest attitude level (83%) among participants, followed by "components of patient safety culture" (80.6%).

Table 4 illustrates that there is statistically significant difference between nurses' perceived level of patient safety competencies and their age ($F=6.677$, $p=0.001$), years of experience in nursing profession ($F=3.214$, $P=0.013$), years of experience in current department ($F=10.082$, $P=0.001$), qualifications ($F=63.582$, $p=0.001$).

Concerning age; the same table reveals the highest mean score (174.52±20.68) of patient safety competencies was found at those who aged 40-<50 years old while the lowest mean score was found at those who aged 50+ years old. According to years of experience in nursing profession, the table show the greatest mean score (170.28±19.47) of patient safety competencies was identified among those with years of experience 10-<20

years whereas those with <1 years of experience have the lowest mean score. Regarding years of experience in current department, the table displays the highest mean score (171.81 ± 23.48) of patient safety competencies was found among those with years of experience 10-<20 years whereas those with 30+ years of experience have the lowest mean score.

Concerning qualifications as evident in the table, the greatest mean score (177.05 ± 12.94) was identified among those who held bachelor's degree of nursing whereas those with diploma degree of nursing has the lowest mean score (141.82 ± 25.50). Regarding previous attendance of patient safety courses, the table shows the highest mean score (168.80 ± 24.15) of nurses who attended courses related to patient safety. Also, the nurses who did not attend any workshops related to patient safety recorded the lowest mean score (162.10 ± 23.04).

Discussion

Patient safety competency encompasses a range of abilities that are essential for delivering safe and quality care. Clinical expertise is fundamental, as it provides the foundation for making sound clinical judgments and decisions. Effective communication is vital for conveying important information, collaborating with interdisciplinary teams, and engaging patients in their care (*Mugerauer, 2021*).

The current study aims to examine the level of patient safety competencies among nurses and test the effect of system thinking on shaping these competencies. The current study highlights that system thinking is a powerful determinant and predictor of patient safety competencies among nurses.

The current study revealed that nurses possess moderate levels of patient safety competencies. This finding is significant as it underscores the crucial role that nurses play in ensuring patient safety within healthcare settings. The competencies encompass a broad range of skills and knowledge areas, including infection control, medication management, and the ability to identify and mitigate potential safety risks. The moderate level of competency observed among nurses is a testament to the rigorous training and continuous professional development they undergo, emphasizing the importance of well-educated and skilled nursing staff in maintaining and enhancing patient safety standards.

In the researchers point of view, the reasons for this moderate level of patient safety competencies

among nurses is emphasizing on patient safety within nursing education and professional practice standards as it is likely contributed to these findings. Nursing curricula often include comprehensive training on patient safety principles, risk management, and the implementation of evidence-based practices. Furthermore, continuous professional development opportunities, such as workshops, certifications, and in-service training, help nurses stay updated with the latest safety protocols and innovations in patient care. The collaborative nature of healthcare teams also fosters an environment where nurses can learn from other professionals, share best practices, and collectively work towards improving patient outcomes.

In the Egyptian context, several specific factors may contribute to the high patient safety competencies among nurses. The healthcare sector in Egypt has been undergoing reforms and improvements, focusing on enhancing the quality of care and patient safety. Initiatives such as the establishment of accreditation bodies and the implementation of quality standards in hospitals have emphasized the importance of patient safety. Additionally, Egyptian nurses often face challenging working conditions, including high patient-to-nurse ratios and limited resources. These challenges may necessitate a higher level of competence and resourcefulness among nurses to ensure patient safety despite the constraints.

The moderate competency levels among nurses in Egypt have important implications for the broader healthcare system. For one, it highlights the need for continued investment in nursing education and professional development. By supporting ongoing training and development, healthcare administrators can ensure that nurses remain equipped with the latest knowledge and skills to maintain high safety standards. Moreover, recognizing and leveraging the expertise of nurses can lead to more effective interdisciplinary collaboration, where nurses play a key role in developing and implementing safety protocols. This can enhance overall patient care quality and reduce the incidence of medical errors and adverse events.

Furthermore, these findings could influence policy and decision-making at both the

institutional and national levels. Policymakers might consider developing targeted strategies to support and enhance nursing competencies, such as increasing funding for nursing education programs and creating incentives for professional development. Hospitals and healthcare institutions might implement more robust patient safety programs that actively involve nurses in safety planning and decision-making processes. Ultimately, the recognition of nurses' high patient safety competencies can drive systemic changes that promote a culture of safety, leading to better patient outcomes and a more resilient healthcare system in Egypt.

Supporting studies corroborate this finding. A systematic review of existing literature on nurses' patient safety competencies consolidated evidence from multiple studies and confirmed a consistent pattern of moderate competency levels among nurses across different healthcare settings and specialties. This review provides a comprehensive overview of the current state of nurses' abilities in ensuring patient safety (Okuyama et al, 2011). In addition, a comprehensive skill-based assessment conducted in a simulation setting demonstrated that while nurses exhibited a moderate level of patient safety competencies overall, specific skills such as error reporting and communication showed strengths or areas for improvement, providing valuable insights for targeted training programs (Alreshidi et al., 2021). Moreover, a multinational investigation involving healthcare systems from various countries found that nurses across different regions consistently demonstrated a moderate level of patient safety competencies, suggesting a universal trend that can serve as a foundation for targeted global interventions (Karanikas et al., 2022). Likewise, a comparative study analyzing the patient safety competencies of nurses against those of other healthcare professionals revealed that while nurses exhibited a moderate level of competency, they outperformed certain groups, reinforcing the significance of their training and experience in patient safety (Illig, 2022).

Conclusion:

This study highlights that nurses exhibit a moderate to high level of patient safety competencies. By possessing the necessary competencies, healthcare professionals can identify, prevent, and manage medical errors and adverse events, contributing to a culture of safety within the healthcare system.

Recommendations :

Based on the findings of this study the policy makers and nurse leaders should fund training programs by allocating funding for the development and implementation of training programs that focus on patient safety competencies. Mandate continuing education by requiring ongoing professional development in patient safety as part of licensure renewal for nurses, ensuring continuous improvement in these critical areas. Promote a safety culture by encouraging healthcare organizations to cultivate a culture of safety, where patient safety is core values supported by leadership and embedded in daily practices. Standardize competency assessments through establish standardized tools and methods for regularly assessing nurses' patient safety competencies, ensuring consistency and accountability.

Table (1): Personal and Professional characteristics of the studied nurses

Items	Males (n=89)		Females (n=200)		Total (n=289)		
	n	%	N	%	n	%	
Age Group	20-<30	64	71.9%	98	49.0%	162	56.1%
	30-<40	22	24.7%	68	34.0%	90	31.1%
	40-<50	2	2.2%	25	12.5%	27	9.3%
	50+	1	1.1%	9	4.5%	10	3.5%
	Mean ± S.D.	27.38 ± 5.79		31.39 ± 8.68		30.15 ± 8.11	
Qualification	Diplom degree of nursing	18	20.2%	61	30.5%	79	27.3%
	Associated degree of nursing	18	20.2%	60	30.0%	78	27.0%
	Bachelor's degree of nursing	53	59.6%	78	39.0%	131	45.3%
	Master's degree of nursing	0	0.0	1	0.5%	1	0.3%
Years of experience	<1 Year	3	3.4%	13	6.5%	16	5.5%
	1-<10 Years	71	79.8%	105	52.5%	176	60.9%
	10-<20 Years	12	13.5%	49	24.5%	61	21.1%
	20-<30 Years	3	3.4%	25	12.5%	28	9.7%
	30+ Years	-	0.0%	8	4.0%	8	2.8%
	Mean ± S.D.	5.23 ± 4.96		9.33 ± 8.33		8.07 ± 7.69	
Years of experience in Current working unit	<1 Year	19	21.3%	43	21.5%	62	21.5%
	1-<10 Years	66	74.2%	108	54.0%	174	60.2%
	10-<20 Years	3	3.4%	28	14.0%	31	10.7%
	20-<30 Years	1	1.1%	19	9.5%	20	6.9%
	30+ Years	-	0.0%	2	1.0%	2	0.7%
	Mean ± S.D.	3.07 ± 3.53		6.16 ± 7.59		5.21 ± 6.37	
Marital Status	Single	61	68.5%	94	47.0%	155	53.6%
	Married	27	30.3%	92	46.0%	119	41.2%
	Widowed	0	0.0	7	3.5%	7	2.4%
	Divorced	1	1.1%	7	3.5%	8	2.8%
Previous attendance of Patient Safety Courses	No	51	57.3%	137	68.5%	188	65.1%
	Yes	38	42.7%	63	31.5%	101	34.9%
Usefulness of Patient Safety Courses	No benefit at all	1	2.6%	-	0.0%	1	0.3%
	Benefited to some extent	22	57.9%	27	42.9%	49	17.0%
	Very beneficial	15	39.5%	28	44.4%	43	14.9%
Place of attendance of courses	Educational Institution	17	44.7%	9	14.3%	26	25.7%
	Health Care Setting	17	44.7%	38	57.6%	55	52.9%
	Other	4	10.5%	3	4.5%	7	6.7%
Previous attendance of patient safety workshops	No	51	57.3%	134	67.0%	185	64.0%
	Yes	38	42.7%	66	33.0%	104	36.0%
Usefulness of workshops	No benefit at all	-	0.0%	-	0.0%	26	9.0%
	Benefited to some extent	15	39.5%	11	16.7%	26	9.0%
	Very beneficial	21	55.3%	45	68.2%	66	22.8%
place of attendance of workshops	Educational Institution	17	44.7%	9	14.3%	26	25.7%
	Health Care Setting	17	44.7%	38	57.6%	55	52.9%
	Other	4	10.5%	3	4.5%	7	6.7%

Table (2): Mean Scores of patient safety competencies among the studied nurses.

Dimensions	Males (n=89)		Females (n=200)		Total (n=289)	
	Mean	± S.D.	Mean	± S.D.	Mean	± S.D.
PSCSE	159.22	24.32	164.31	23.10	162.74	23.56
Knowledge/Awareness	20.87	4.24	21.10	5.03	21.03	4.79
Patient Safety Culture	13.56	2.94	13.89	3.37	13.79	3.24
Error & Cause Analysis	7.30	1.69	7.21	2.01	7.24	1.92
Skills	83.16	14.01	85.93	12.72	85.08	13.17
Error Reporting & Response to an Error	14.66	3.30	15.47	3.58	15.22	3.51
Communication Related to Error	11.24	2.40	11.43	2.10	11.37	2.19
Resource Utilization/Evidence-Based Practice	10.33	2.42	10.02	2.14	10.11	2.23
Safe Nursing Practice	21.38	3.75	22.04	3.67	21.84	3.70
Infection Prevention	17.20	3.28	18.11	2.82	17.83	2.99
Precise Communications During Hand-Offs	8.35	1.97	8.87	1.61	8.71	1.74
Attitudes	55.20	8.80	57.28	7.71	56.64	8.11
Patient Safety Promotion/Prevention Strategy	16.03	2.94	16.24	2.76	16.18	2.81
Responsibility of Health Care Professionals for Patient Safety Culture	16.55	2.80	17.21	2.61	17.01	2.68
Error Reporting & Disclosing	14.30	2.99	14.86	2.72	14.69	2.81
Components of Patient Safety Culture	8.31	1.89	8.98	1.34	8.77	1.56

Table (3): Levels of patient safety competencies among the studied nurses.

	Males (n=89)						Females (n=200)						Total (n=289)					
	Low		Moderate		High		Low		Moderate		High		Low		Moderate		High	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
PSCSE	3	3.4%	24	27.0%	62	69.7%	2	1.0%	50	25.0%	148	74.0%	5	1.7%	74	25.6%	210	72.7%
Knowledge/Awareness	6	6.7%	40	44.9%	43	48.3%	22	11.0%	68	34.0%	110	55.0%	28	9.7%	108	37.4%	153	52.9%
Patient Safety Culture	8	9.0%	49	55.1%	32	36.0%	29	14.5%	74	37.0%	97	48.5%	37	12.8%	123	42.6%	129	44.6%
Error & Cause Analysis	6	6.7%	40	44.9%	43	48.3%	24	12.0%	73	36.5%	103	51.5%	30	10.4%	113	39.1%	146	50.5%
PSCSE Skills	3	3.4%	23	25.8%	63	70.8%	2	1.0%	46	23.0%	152	76.0%	5	1.7%	69	23.9%	215	74.4%
Error Reporting & Response to an Error	5	5.6%	38	42.7%	46	51.7%	12	6.0%	60	30.0%	128	64.0%	17	5.9%	98	33.9%	174	60.2%
Communication Related to Error	6	6.7%	22	24.7%	61	68.5%	7	3.5%	47	23.5%	146	73.0%	13	4.5%	69	23.9%	207	71.6%
Resource Utilization/Evidence-Based Practice	7	7.9%	40	44.9%	42	47.2%	14	7.0%	97	48.5%	89	44.5%	21	7.3%	137	47.4%	131	45.3%
Safe Nursing Practice	3	3.4%	12	13.5%	74	83.1%	3	1.5%	31	15.5%	166	83.0%	6	2.1%	43	14.9%	240	83.0%
Infection Prevention	3	3.4%	14	15.7%	72	80.9%	2	1.0%	23	11.5%	175	87.5%	5	1.7%	37	12.8%	247	85.5%
Precise Communications During Hand-Offs	6	6.7%	22	24.7%	61	68.5%	6	3.0%	30	15.0%	164	82.0%	12	4.2%	52	18.0%	225	77.9%
PSCSE Attitudes	4	4.5%	17	19.1%	68	76.4%	4	2.0%	34	17.0%	162	81.0%	8	2.8%	51	17.6%	230	79.6%
Patient Safety Promotion/Prevention Strategy	3	3.4%	17	19.1%	69	77.5%	7	3.5%	36	18.0%	157	78.5%	10	3.5%	53	18.3%	226	78.2%
Responsibility of Health Care Professionals for Patient Safety Culture	4	4.5%	12	13.5%	73	82.0%	3	1.5%	30	15.0%	167	83.5%	7	2.4%	42	14.5%	240	83.0%
Error Reporting & Disclosing	3	3.4%	43	48.3%	43	48.3%	8	4.0%	79	39.5%	113	56.5%	11	3.8%	122	42.2%	156	54.0%
Components of Patient Safety Culture	5	5.6%	21	23.6%	63	70.8%	2	1.0%	28	14.0%	170	85.0%	7	2.4%	49	17.0%	233	80.6%

(Scores range from 41<95 low level, 95<150 moderate level and 150-205 high level)

Table (4): The Relationship between nurses' characteristics and their patient safety competencies.

Items		Patient safety competencies
		Mean ± SD
Gender	Male	159.22±24.32
	Female	164.31±23.10
	t (p)	1.700 (0.090)
Age Group	20-<30	158.31±24.57
	30-<40	168.22±19.64
	40-<50	174.52±20.68
	50+	153.40±27.19
	F (p)	6.677* (<0.001*)
Qualifications	Diploma degree of nursing	141.82±25.50
	Associated degree of nursing	159.36±17.38
	Bachelor's degree of nursing	177.05±12.94
	Master's degree of nursing	205.0
	F (p)	63.582* (<0.001*)
Years of experience	<1 Year	148.63±13.06
	1-<10 Years	161.55±24.71
	10-<20 Years	170.28±19.47
	20-<30 Years	161.93±26.30
	30+ Years	162.63±17.05
	F (p)	3.214* (0.013*)
Years of experience in Current working unit	<1 Year	147.90±24.56
	1-<10 Years	165.90±21.25
	10-<20 Years	171.81±23.48
	20-<30 Years	169.33±20.75
	30+ Years	140.0±18.38
	F (p)	10.082* (<0.001*)
Marital Status	Single	158.17±25.0
	Married	167.06±21.02
	Widowed	168.86±19.03
	Divorced	181.88±9.45
	F (p)	5.436* (0.001*)
Previous attendance of Patient Safety Courses	No	162.10±24.15
	Yes	168.80±22.40
	t (p)	1.038 (0.300)
Usefulness of Patient Safety Courses	No benefit at all	171.0
	Benefited to some extent	155.80±22.03
	Very beneficial	164.26±23.12
	F (p)	1.735 (0.182)
Place of attendance of courses	Educational Institution	162.75±22.65
	Health Care Setting	163.96±22.43
	Other	147.50±62.93
	F (p)	0.959 (0.515)
Previous attendance of patient safety workshops	No	164.10±23.04
	Yes	160.34±24.37
	t (p)	1.304 (0.193)
Usefulness of workshops	No benefit at all	-
	Benefited to some extent	151.15±22.57
	Very beneficial	160.35±24.72
	t (p)	1.705 (0.104)
place of attendance of workshops	Educational Institution	172.53±11.06
	Health Care Setting	164.64±27.62
	Other	166.50±6.36
	F (p)	2.668* (0.009*)

t: Student t-test F: F for ANOVA test *: Statistically significant at p ≤ 0.05

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