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Assessment Of Critical Care Nurses' Awareness Related To Patient Safety Receiving Vasoactive Medications

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Abstract

***Background**: Critical care nurses are accountable for dealing the preparation, timing of initiation, administration, titration, and weaning of vasoactive infusions based on the instructions of the physician so; to confirm patient safety, They need to be sufficiently informed on drugs, drug therapy objectives, and countermeasures to reduce side effects. **Aim of the study**: This study was conducted to assess nurses' awareness regarding patients' safety receiving vasoactive medication in critical care units **Design**: A descriptive exploratory was utilized to achieve the aim. **Setting**: This study was conducted at two ICUs as follows (Cardiovascular Care Unit, and Chest Care Unit) affiliated with Makkah Hospital, Saudi Arabia. **Sample**: A convince sample (50) of all available nurses working in critical care units as mentioned previously. **Tools**: Data was collected using t[1]hree tools 1) Nurses' Knowledge Interview Questionnaire.2) Nurses' level of Practice Observational Checklist.3) Nurses' Awareness of Medication Safety Scale. **Results**: The majority ofthe studied nurses had an unsatisfactory level of total knowledge and about a fifth had an incompetent level of practice. Meanwhile, most of the studied nurses had an unsafe level regarding patients' medication safety receiving vasoactive medication in critical care units. **Conclusion**: The expertise, experience, and medication safety of all the nurses in the study who were administering vasoactive medication to patients in critical care units were found to be statistically correlated. Recommendations: Provide nurses with educational and training opportunities to raise their knowledge of patients' medication safety when taking vasoactive medications in critical care units. These programs should be backed by evidence-based practices and guidelines.*

***Keywords**: Nurses' Awareness, Patients' Safety, Vasoactive Medication.*

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Introduction:

Special consideration When patients experience life-threatening changes, nurses must keep an eye on them and provide treatment. As a result, the emphasis is typically on using a range of technologies and treatments to keep a patient's physiologic function stable. Along with the ability to provide each patient with high-quality care, the role also requires the ability to include holistic and psychosocial approaches to care that are appropriate for the patient's state, as well as more recent options like as working in a Tele-ICU setting. **(Urden, et al., 2019).**

Because of this, the modern nurse needs to be well-versed in order to make quick choices about subtle or worsening illnesses. They also need to be extremely alert and capable of using their cognitive and intellectual faculties to go beyond duties and gather numerous pieces of data. Furthermore, in addition to the duties that nurses perform in the care of patients who are critically sick, such as interacting with patients, families, and the healthcare team, their main responsibility is to administer direct patient care. Expanded-role nursing employment can take several shapes, contingent upon the needs of patients and the resources available to each organization. **(American Association of Critical-Care Nurses, 2020).**

It has been demonstrated that vasoactive medications, such as inotropic and vasopressors, typically have a short half-life, are quickly metabolized after delivery, require continuous infusion, and must be titrated for optimal action. As a result, the pharmacokinetics of these medications are comparable, pharmacokinetic factors are rarely significant, and inotropic or vasopressors have distinct pharmacodynamic profiles based on the relative mechanisms of their respective receptors and modes of action. Giving the patient the active ingredient of a vasoactive medication usually entails an intravenous infusion. **(Hemmings, & Egan, 2019)**.

According to National Health Service (2022) defines patient safety as the prevention of unintentional or unwanted harm to a patient during healthcare. So, healthcare providers need to support reducing patient safety incidents and improving the quality of care. Patients should be treated in a safe environment and protected from preventable harm. Healthcare quality is generally viewed as being centered on patient safety. In other words, patient safety is about preventing errors, injuries, accidents, and infections from occurring at hospitals and other healthcare facilities. Both academic research and quality improvement continue to focus on patient safety.

Medication mishaps such medication errors, bad drug responses, and adverse drug events become more frequent with time. The term "adverse drug events" describes the unfavorable consequences of drugs, which are a major national health concern and include allergic reactions, side effects, overmedication, and medication errors. When a patient is in charge of their medication, these can lead to hazardous consequences or ineffective or inappropriate pharmaceutical use. Even said, unpleasant drug reactions are predictable side effects that are a necessary component of the medication's pharmacologic action (Hughes & Blegen, 2022). However, a few of the most frequent reasons for medication errors are heavy workloads, confusing drug names, interruptions, a shortage of support personnel, not having enough time to provide patients advice, and illegible handwriting **(Tariq et al., 2022).**

Significance of the study:

Patients' safety has received major attention in recent years, aiming to provide the best possible care and minimize the risk of harm. One way to improve patient care is the standardization of procedures and actions in administering vasoactive medication **(Paim, et al., 2017).** Nurses should strictly follow all instructions, procedures, and policies during administrating vasoactive medication **(Lappalainen, et al., 2019).** So, it's a critical issue to

assess nurses' awareness regarding patients' safety receiving vasoactive medicationin critical care units.

Aim of the study:

This study was conducted to fulfill the following aims: assess nurses' awareness regarding patients' safety receiving vasoactive medication in critical care units through the following:

1. Assess nurses' level of knowledgeregarding patients' safety receiving vasoactive medication in the critical care units.
2. Assess nurses' level of practice regarding patients' safety receiving vasoactive medication in the critical care units.
3. Assess nurses' awareness regarding applications of patients' medication safety scale in the critical care units.

Research Questions:

1. What is the nurses' level of knowledge regarding patients' safety receiving vasoactive medication in the critical care units?
2. What is the nurses' level of practice regarding patients' safety receiving vasoactive medication in the critical care units?
3. There is a relation between nurses' knowledge and awareness regarding application of medication safety scale in critical care units?

Operational definition:

The nurses' awareness in the current study refers to nurses' knowledge and practice regarding patients' medication safety.

Subject and MethodsResearch Design:

A descriptive exploratory study wasutilized in this study to achieve the aim.

Setting:

The study was conducted at two ICUs as follows (Cardiovascular Care Unit, and Chest Care Unit) affiliated with Makkah Hospital.

Subject:

A convenience sample (50) of all available nurses working in critical care units of them in the Cardiovascular Care Unit and a residual number (20) in the Chest Care Unit.

Tools for data collection:

Tool (I): Nurses' Knowledge InterviewQuestionnaire.

It was designed after reviewing recentliterature by the researcher in simple Arabic language, it consisted of two parts:

Part I: This part was concerned withassessing demographic data, which includes: nurses' age, gender, level of qualification, years of experience, and attending courses about vasoactive medication.

Part II: It was concerned with assessing nurses' level of knowledge regarding patients' safety receiving vasoactive medication in critical care units. Nurses' knowledge regardinggeneral

pharmacological concepts of vasoactive medication. It will include (action, indication, side effects, complications…., etc.). It adapted from **(Burchum, et al., 2019; Hemmings, & Egan, 2019).** It included General knowledge about medication administration., Specificknowledge about vasoactive medication administration and nursing care, and Patients' medication safety knowledge about vasoactive medication eight subtitles in the form of 50 MCQ questions as follows:

- General pharmacological conceptsinclude (eight questions).
- Nurses' knowledge about epinephrine medication includes (six questions).
- Nurses' knowledge aboutnorepinephrine medication includes (five questions).
- Nurses' knowledge about dobutamine medication includes (five questions).
- Nurses' knowledge about dopamine medication includes (four questions).
- Nurses' knowledge aboutphenylephrine medication includes (fourquestions).
- Nurses' knowledge about vasopressin medication includes (four questions).
- Nurses' knowledge about milrinone medication includes (four questions).
- Nurses' knowledge of patients' medication safety includes (ten questions).

Scoring system:

The total score of nurses' knowledge was calculated to be 50 questions. The respondent will give one point for each correct answer and zero for incorrect answers. A total score of ≥ 80 % (≥ 40 scores) was considered satisfactory, while < 80 % (< 40 scores) was considered unsatisfactory.

Tool (II): Nurses' Level of Practice Checklist.

It was designed by the researcher in the English language and adapted after reviewing recent literature **(Lynn, 2019; Smith & Pacitti, 2020).** This tool is used to assess nurses' level of practice regarding patients' safety receiving vasoactive medication in critical care units. It includes four subtitles:

- Preparation phase includes (18 steps).
- Administrating phase includes (15 steps).
    - Post-administrating phase and include(four steps).
    - Consideration points according to theused medication and it includes (five steps).

Scoring system:

The total score of nursing practice was calculated to be 42 steps. Each step will be done or not done. one score for step done and zero for that not done. A total score of ≥ 90 % (≥ 54scores) was considered competent, while < 90 %(<54 scores) was considered incompetent.

Tool (III): Nurses' Awareness of Medication Safety Scale.

This tool was modified by the researcher in the English language. It was adapted from **(ClinicalExcellence Commission., 2015; Institute for Safe Medication Practices., 2015)**to assess patients' safety receiving vasoactive medication in critical care units and it consisted of ten subtitles with 62 statements:

- Patient information (eight statements).
- Drug information (five statements).
    - Communication of drug orders and other drug information evaluation (four statements).
    - Drug labeling, packing, andnomenclature (eight statements).
    - Drug standardization, storage, and distribution evaluation (seven statements).
    - Medication delivery device acquisition,use, and monitoring (seven statements).
    - Environmental factors (fourstatements).
    - Staff competency and education (nine statements).
- Patient education (four statements).
    - Quality process and risk management (six statements).

Scoring system:

Likert Type Rating Scale: It was adapted(Clinical Excellence Commission.,2015;Institute for Safe Medication Practices., 2015), and it was modified by the researcher into three Likert scales (Never, Sometimes, and Always). As regards the Likert Type Rating Scale, scores of 1, 2, and 3 were respectively given to the responses: Never, Sometimes, and Always. The total score on the scale was 62, and a total score

≥ 90 % (≥ 176 scores) was considered safe, while below < 90 % (<176 scores) was considered unsafe.

Validity and reliability:

Validity of the suggested tools was done through a jury of seven experts. They reviewed the tools for clarity, relevancy, comprehensiveness, understanding, and easiness of administration. Monitoring modifications were required.

Reliability was tested statistically for the developed tools using Cronbach's coefficient alpha statistical test for the internal consistency of the tool items. The data were analyzed for knowledge (0.805), practice (0.825), andpatients' medication safety (0.764).

Ethical Consideration:

The researcher clarified the objectives and aims of the study to the nurses included in the study. Protected nurses' rights in the study before answering the self-administeredquestionnaire, oral consent was taken from eachnurse after being aware of the nature, objective, and benefits of the study. The nurses were aware that sharing is willing and could withdraw from the study without giving reasons. Confidentiality was assured by declaring that personal information was protected private after being shared with the investigator only and assured nurses that the information would be utilized only for research purposes..

Administrative design:

Official permission was obtained to the director of the, explained the purpose of the study to obtaintheir permission to conduct this study.

Pilot study:

A pilot study was carried out on 10 nurses from the sample size to test the applicability, clarity, and efficiency of tools, and appreciate the time needed to collect data parallel to detect any

possible obstacles that might face the researcher and interfere with datacollection. The nurses who participated in the pilot study were included in the final analysis ofthe sample, and there is no modification in tools.

Fieldwork:

The current study was carried out (about 3 months) from October 2022 to January 2023, the researcher was visiting the cardiac care unit and chest intensive care unit in the morning and afternoon shifts 3 days per week (Tuesday, Wednesday, and Thursday). The current study was carried out through three phases as follows:

First phase: The researcher interviewed the nurses and explained the aim of the study. They were assured that the information collected would be treated confidentially andwould be used only for research. Only codenumbers were used, and no names appeared. In addition, the researcher filled in the practice checklist in the morning and afternoon shiftsduring actual nurses' work. The practice checklist was completed by the researcher, andit was taken for 10-15 minutes for every nurse.

Second phase: The researcher asked each nurse individually about opinions regarding patients' medication safety through anassessment tool and it was taken for 30 minutes for every nurse.

Third Phase: The knowledge interview questionnaire was distributed to all respondents'nurses and the researcher was offered clarification, whenever confusing questions itwas taken for 40 minutes for every nurse.

Statistical design:

Data collected from the studied sample was revised, coded, and entered using a personal computer (PC). Fulfilled using (SPSS) version 21. Data were presented using descriptive statistics in the form of frequencies, percentages, and mean SD. The Chi-square test statistic is commonly used for testing the relation between categorical variables. The correlation coefficient ® test was used to test the relation between two quantitative variables.

Significance of the results:
Non- significance with a p-value ≥ 0.05 Statistical significance with a p-value < 0.05
High significance with a p-value < 0.01

Results:
Concerning demographic data of the study, **Table 1** showed that 68 % of the studied nurses their aged from 20 to less than 30 years with a mean of 28.5 ± 7.53 years. Regarding gender, 56% of them were female. Concerning the level of qualifications, 44% of them hadnursing institutes. Also, 54% of years of experience were less than 1 year, with a mean of 3.6 ± 4.16 years. Moreover, 84% didn't attend courses about vasoactive medication.

Data	**N**	**%**
Age (year)		
From 20 to less than 30 years.	34	68
From 30 to less than 40 years.	9	18
Above 40 years or more.	7	14
Mean ± S.D	28.5 ± 7.53	

Gender		
Female	28	56
Male	22	44
Level of Qualifications		
Nursing diploma.	10	20
Nursing institute.	22	44
Nursing bachelor.	18	36
Years of Experience		
Less than 1 year.	27	54
From 1 to 5 years.	8	16
More than 5 years.	15	30
Mean ± S.D	3.6 ± 4.16	
Attend courses about vasoactive medication		
Yes	8	16
No	42	84

Table 2 results showed that there was a statistically insignificant difference between correct and incorrect of the studied nurses' generalknowledge and patients' medication safety at P >0.05. While there was a highly statistically significant difference between correct and incorrect of the studied nurses' specific knowledgeabout vasoactive medication administration and nursing care at P ≤ 0.001.

Variables	**Total Nurses' level of knowledge**				**X^2**	**P-value**
	Correct		**Incorrect**			
	N	**%**	**N**	**%**		
General knowledge about medication administration.	27	54	23	46	1.198	0.2749
Specific knowledge about vasoactive medication administration and nursing care.	1	2	49	98	50.00	0.001**
Nurses' knowledge about patients' medication safety.	15	30	35	70	0.437	0.508

Figure (1) showed that 78% of the studied nurses had a competent level of practiceregarding administered of vasoactivemedication. While 22% of them had an incompetent level of practice regarding administered vasoactive medication.

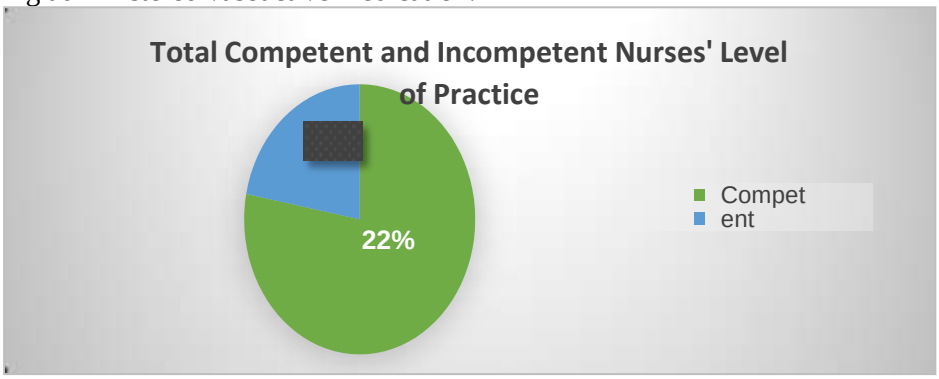

Table 3 showed that 100% of the studied nurses had always responded regarding drug standardization, storage, and distributionevaluation. 80% of the studied nurses have always responded regarding patient informationand environmental factors respectively. 50% of the studied nurses have always respondedregarding communication of drug orders andother drug information evaluation and staff competency and education respectively. While 82% of the studied nurses have sometimes responded regarding patient education and finally 20% of the studied nurses have neverresponded regarding environmental factors.

Total nurses' awareness regarding the application ofmedication safety scale	**Always**		**Sometime**		**Never**	
	N	**%**	**N**	**%**	**N**	**%**
Patient information	40	80	8	16	1	2
Drug information	38	76	5	10	7	14
Communication of drug orders and other drug information evaluation	25	50	25	50	0	0
Drug labeling, packing, and nomenclature	49	98	1	2	0	0
Drug standardization, storage, and distribution evaluation	50	100	0	0	0	0
Regarding medication delivery device acquisition, use, and monitoring	30	60	20	40	0	0
Environmental factors	40	80	0	0	10	20
Staff competency and education	25	50	21	42	4	8
Patient education	9	18	41	82	0	0
The quality process and risk management	19	38	31	62	0	0

Figure (2) showed that 22% of the studied nurses' aware regarding application of medication safety scale in the critical care units.While 78% of the studied nurses not aware regarding applications of medication safetyscale in the critical care units.

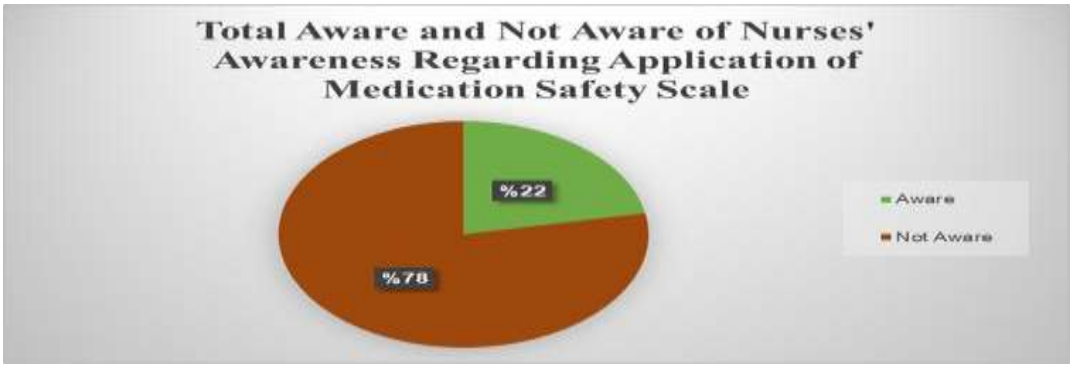

Table 4 illustrated a correlation between the total studied nurses' knowledge regarding vasoactive medication and their total nurses' awareness of medication safety in critical care units, which was statistically significant (r test =0.269 at $P \leq 0.05$). Meanwhile, this table showed that there was a negative correlation between the total nurses' practice regarding administered vasoactive medication and their total nurses' awareness of medication safety in

critical care units, which was statistically significant (r test = -0.301 at P ≤ 0.05). Moreover, no correlation between total nurses' knowledge regarding vasoactive medication andtotal nurses' practice regarding administered vasoactive medication, which was statistically insignificant (r test = 0.076 at P > 0.05).

Item	r test	P value
Total nurses' knowledge and total nurses' practice.	0.076	0.60
Total nurses' knowledge and total patients' medication safety.	0.269	0.05*
Total nurses' practice and total patients' medication safety.	-0.301	0.03*

Discussion:

With respect to the demographic information pertaining to the nurses under investigation, the research showed that almost two-thirds of the nurses under investigation were under 30 years old or younger. (Ibrahim et al., 2022) found that over half of the ICU nurses were between the ages of 25 and 30. This finding was corroborated by their study, "Effect of Medication Safety Guidelines on Prevention of Medication Errors among Nurses in the Intensive Care Unit." According to the study, this age group has the chance to pick up new information that will help them become more proficient..

According to the results of the current study, more than half of the nurses under investigation were female. This outcome was consistent with the findings of the study "Nurses' Performance Regarding Care of Patients with Tracheostomy" (Sabry, et al., 2020), which mentioned that the majority of the study nurses were female. It's possible that only women have worked in the nursing sector from its founding.

In terms of qualification, the findings of the current study indicate that two-fifths of the nurses under investigation hold a certificate from a nursing institute. The Central Agency for Public Mobilization and Statistics in Saudi Arabia (2022) reports that the number of graduates from technical nursing institutes increased to 5151 in 2020 from 4415 in 2019. This represents a 16.7% increase in Saudi Arabia, meaning that the number of graduates from this educational category increased annually, in addition to increasing the chance of being recruited by government hospitals. According to the researcher, education level has a significant impact on patient safety, particularly in the intensive care unit.

According to the findings of the current study, over half of the nurses who were examined had less than a year of experience. These findings ran counter to those of Lalujan and Musharyanti (2021) in their study "Factors Affecting the Role of Nurses in Medication Safety: A Literature Review," which suggested that a nurse's experience, particularly if they have less than ten years of experience, could have an impact on medication errors. According to the researcher, years of experience is a crucial factor for intensive care unit nurses because there are certain vital areas where they require more experience in order to deal with patients and handle urgent situations.

Most of the studied nurses do not **attend training courses** about vasoactive medication and this effect their knowledge and practice regarding the administration of vasoactive medication. These results agreed with **(Al-Zaru, et al., 2022)** In the study entitled

"Effectiveness of An Educational Program Regarding Vasoactive Drugs at The Level of Knowledge and Practices Among Nurses Working in Critical Care Units" which concluded the implemented teaching programconsiderably enhanced the critical care nurses' knowledge and practical skills regarding managing the administration of vasoactive medications. In the researcher's opinion,training courses must be applied in a frequent manner for all nursing staff, especially ICU nurses to always update their knowledge.

The current study assessed nurses' **level of knowledge** regarding patients' safety receiving vasoactive medication in the critical care units most of the studied nurses had incorrect knowledge. This result concurs with **(Bakr, et al., 2019)** in the study entitled "Nurses' Performance RegardingAdministration of Inotropic Medications for Critically Ill Patients" which concluded themajority of nurses have inadequate knowledge.
The study "Nurses' Knowledge and Understanding of Obstacles Encountered Them When Administering Resuscitation Medications: A Cross-Sectional Study from Palestine" (Qedan, et al., 2022) not only supported the study result, but it also demonstrated that nurses lack sufficient knowledge about life-saving medications.

The study "Comparison Across 12 Countries on Knowledge, Attitude, and Behavior Scores about Medication Errors in Intensive Care Units: An International Study" (Giannetta, et al., 2021) discussed the study illustrates that younger or less experienced nurses are more likely to have a level of sufficient information than older or more experienced nurses. However, the current study results were disagreed upon. According to the researcher, this outcome resulted from the fact that most of the nurses under study did not attend training sessions and were too busy to keep up with updates in their knowledge.

The current study assessed nurses' **level of practice** regarding patients' safety receiving vasoactive medication in the critical care units, less than a quartile of the studied nurses have incompetent level of practice. This result agreed with **(Fathy, et al., 2020)** in the study entitled "Nurse's Knowledge Practice Regarding Medication Errors in Critical Care Units: Descriptive Study" which showed Just over one-third of them performed completely effectively when administering drugs.

On the other hand, this result has interfered with **(Allawy, et al., 2020)** in the study entitled "Effect of Implementing Guidelines Regarding Administering Inotropic Medications for Critically Ill Patients on Nurses' Practice" which discussed the majority of the nurses who participated in the study had unacceptable procedures for giving inotropic.

Furthermore, this result contradicted the findings of the study "Knowledge, Attitude, and Practice of Nurses in Administering Medications at Mansoura University Hospitals" by Mostafa et al. (2020), which revealed that slightly over 75% of the nurses reported having poor practice evaluations for both preparing and administering drugs, as well as poor practice scores for administering drugs. Furthermore, just under 25% of the nurses practice inadequately after taking medication. Finally, the majority of nurses have inadequate overall practice scores.

Furthermore, the current study was contradicted by **(Elsayed, et al., 2022)** in the study entitled "Assessment of Nurses' Knowledge and Practice regarding Antiarrhythmic Medication at Critical CareUnits" which illustrated showed the overall practice score of many nurses have unsatisfactory. From the researcher's point of view, overall nurses have more practical skills than knowledge because they apply procedures daily as a routine of work.

The current study assessed **nurses' awareness regarding applications of medication safety scale in the critical careunits.** Most-studied nurses had an unsafe level of patients' medication safety. This result agreed with **(Abu Hussein, et al., 2022)** in the study entitled "Effect of Patient Safety Program for Nurses on Medication Administration" which showed that All of the staff nurses had insufficient levels of patient safety knowledge, which also indicated that most staff nurses had poor patient safety competencies.

However, the present study contradicted the findings of a study by Haddad et al. (2021) titled "Perceptions of Staff Nurses about Patient Safety Culture at Minia General Hospital," which found that over half of the staff nurses had high patient safety culture scores. According to the study, this outcome is the result of most nurses having a full caseload. The ratio of nurses to patients was also applied incorrectly.

In addition, the current study illustrated a correlation between the total studied nurses' knowledge and their total patients' safety, which was statistically significant (P= < 0.05). this result agreed with **(Abu Hussein, et al., 2022)** in the study entitled "Effect of Patient Safety Program for Nurses onMedication Administration" which showed that significance was found between patient safety attitude and medication administration knowledge. The researcher's opinion whennurses have the knowledge, they prevent errors and enhance patients' safety.

Finally, in the current study result, there was a negative correlation between the total nurses' practice medication and their total patients' medication safety receiving vasoactive medication in critical care units, which was statistically significant (P= < 0.05). This resultis through with **(Ahmed, et al., 2022)** in the study entitled "Nurses` Knowledge and Practice Regarding Patients` Safety Goals in Intensive Care Units" which concluded that there was a positive correlation between total nurses' knowledge and their total practice regarding patient safety goals in the intensive care units. From the researcher's point of view when nurses practice being more competent andaccurate, they improve patients' safety and avoid hazards.

Conclusion:

The majority of the nurses in the study had an inadequate degree of overall understanding, and roughly a fifth had insufficient levels of experience when it came to administering vasoactive medicine, according to the study's findings. When it came to the safety of patients taking vasoactive medicine in critical care units, the majority of the nurses who were studied had dangerous levels of knowledge.

Additionally, there existed a highly statistically significant correlation between the years of experience of the nurses under study and their overall knowledge of vasoactive medicine. Furthermore, a statistically significant correlation was found between the total knowledge of the investigated nurses about vasoactive medication and the medication safety of all of their patients receiving this medication in critical care units. Additionally, a correlation was found between the total practice of the nurses regarding administered vasoactive medication and their total patients' medication safety receiving vasoactive medication in critical care units.

Recommendation:

Based on the result of this study, theinvestigator recommended that:

- The study should be reapplied to a large sample and in a different hospital setting to generalize the results.
- Nurse supervisors should also monitor nurses' practicein relation to the administration of vasoactive medication to ensure the application of patients'medication safety.

- Developing a simplified and comprehensive booklet including basic information about vasoactive medication in the critical care units.
- Provide educational and training programs to improve nurses' awareness regarding patients' medication safety receiving vasoactivemedication in critical care units supported with evidence-based practices and guidelines.

References:

Abu Hussein, I., ELSaied, N., & Ghandour, S. (2022). Effect of Patient Safety Program for Nurses on Medication Administration.Port Said Scientific Journal of Nursing. Retrieved from: https://doi.org.10.21608/pssjn.2022.120647.1176

Ahmed, G. G., Mahmoud, F. H., & Ali, S. A. (2022). Nurses Knowledge and Practice Regarding Patients Safety Goals in IntensiveCare Units. Novelty journals. Com, 9, 115- 126.

Allawy, M. E. A., Sherief, W. I., Ata, A. B. A.
E. -., & Gaballah, S. (2020). Effect of Implementing Guidelines Regarding Administering Inotropic Medications forCritically Ill Patients on Nurses' Knowledge.American Journal of Nursing Research. Retrieved from: https://doi.org/10.12691/ajnr-8-3-10.

Al-Zaru, I., Mohammad, A. and Almutlaq, A. (2022). Effectiveness of an educational program regarding vasoactive drugs at the level of knowledge and practices among nurses working in Critical Care Units. Jordan Journal of Nursing Research, Retrieved from: https://doi.org/10.14525/jjnr.v1i2.02.

American Association of Critical-Care Nurses. (2020): AACN Scope andStandards for Acute and Critical Care Nursing Practice. Retrieved from: http://www.aacn.org.

Bakr Abo El – Ata, A., Hassan Ibrahim, M., Saad Mohamed, A., Elsayed Ahmed Allawy, M. (2019). Nurses' Performance Regarding Administration of Inotropic Medications for Critically Ill Patients. Port Said Scientific Journal of Nursing.Retrieved from: https://doi.10.21608/pssjn.2019.34699

Burchum, J., Rosenthal, L., & Lehne, R. (2019). Lehne's pharmacology for nursingcare; Elsevier, 10th ed., pp. 153-154.

Central Agency for Public Mobilization andStatistics in Egypt (2022). The number ofnursing staff members in the GovernmentalSector (2016 - 2020). Retrieved from: https://capmas.gov.eg/admin/news/PressRel ease/202251113261_%D8%A7%D9%84% D9%8A%D9%88%20%D9%85%20%D8% A7%D9%84%D8%B9%D8%A7%D9%84 %D9%85%D9%89%20%D9%89%D8%A7 %D9%86%D8%AC%D9%84%D9%8A%D 8%B2%D9%89%202020.pdf

Clinical Excellence Commission (CEC). (2015). Medication Safety Self- Assessment® for Australian Hospitals.Retrieved from: https://www.cec.health.nsw.gov.au/_data/assets/pdf_file/0011/326909/MSSA- Complete-Workbook-2015.pdf

Elsayed, A. S., Abd El-Moneem, D. S. E.-D., & Gaballah, S. H. (2022). Assessment of Nurses' knowledge and practice regardingantiarrhythmic medication at critical care units. Trends in Nursing and Health CareJournal. Retrieved from:https://doi.org/10.21608/tnhcj.2022.248091

Fathy, A. S., Khalil, N., Taha, N., & M.Abd-elbaky, M. (2020). Nurse's knowledge andPractice regarding Medication Errors inCritical Care Units: Descriptive study.Minia Scientific Nursing Journal. Retrievedfrom: https://doi.org/10.21608/msnj.2020.188051

Giannetta, N., Dionisi, S., Stievano, A.,Eltaybani, S., Abdelgawad, M. E.,Katigri, M. R., Azadboni, T. T., López-Soto, P. J., Morales-Cané, I., Ali, I.,Urban, J., Shrestha, S.,

Christensen, M.,Voutilainen, A., Vaajoki, A., Hamdan, K.,Rubicini, G., Rivera Pizarro, J. Y., Liquori, G., Cassar, M., … Di Muzio, M.(2021). Comparison across 12 countries onknowledge, attitude, and behavior scoresabout medication errors in Intensive CareUnits: an international study. Europeanreview for medical and pharmacologicalsciences. Retrieved from: https://doi.org/10.26355/eurrev_202112_27 415

Hadad, E., Abd Elrhmaan, S., Ahmad, F., & Ali, H. (2021). Perceptions of Staff Nurses about Patient Safety Culture at Minia General Hospital. Minia Scientific Nursing Journal. Retrieved from: https://doi.org.10.21608/msnj.2021.199347

Hemmings, H., & Egan, T. (2019). Pharmacology and physiology for anesthesia. Elsevier, 2nd ed., pp. 520-531.

Hughes, R., & Blegen, M. (2022). Medication Administration Safety. Agency for Healthcare Research and Quality (US). Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK2656

Ibrahim Abd Elgwad, S., Fouad Abdallah,K., & Khalil, B. (2022). Effect of Medication Safety Guidelines on Preventionof Medication Errors among Nurses in the Intensive Care Unit. Egyptian Journal of Health Care. Retrieved from: https:// doi.org.21608/ejhc.2022.251535.

Institute for Safe Medication Practices (ISMP). (2015). Medication Safety Self- Assessment ® for Hospitals. Retrievedfrom: https://www.ismp.org/assessments/hospitals.

Lalujan, F., & Musharyanti, L. (2021). FACTORS AFFECTING THE ROLE OFNURSES IN MEDICATION SAFETY: A LITERATURE REVIEW. Jurnal Keperawatan Respati Yogyakarta. Retrievedfrom: https://doi.10.35842/jkry.v8i3.622

Lappalainen, M., Härkänen, M., & Kvist, T. (2019). The relationship between nurse manager's transformational leadership style and medication safety. Scandinavian Journalof Caring Sciences, 34(2), 357-369.

Lynn, P. (2019). Taylor's clinical nursing skills.Wolters Kluwer Health, 5th ed., pp. 747-750.

Mostafa, E., Elmageed, Abd., Soliman, H., & Abdelhamed, H. (2020). Knowledge, Attitude, and Practice of Nurses in Administering Medications at Mansoura University Hospitals. Journal of Nursing andHealth Science. Retrieved from: https://doi.org/10.9790/1959-0904060616

National Health Service (NHS). (2022). Patient safety. Retrieved from https://www.england.nhs.uk/patient-safety/

Paim, A., Nascimento, E., Bertoncello, K., Sifroni, K., Salum, N., & Nascimento, K. (2017). Validation of an instrument regarding nursing intervention in patients in vasoactive therapy. Revista Brasileira De Enfermagem, 70(3), 453-460.

Qedan, R.I., Daibes, M.A., Al-Jabi, S.W. etal. (2022). Nurses' knowledge andunderstanding of obstacles encountered them when administering resuscitation medications: a cross-sectional study from Palestine. BMC Nursing. Retrieved from: https://doi.org/10.1186/s12912-022-00895-1

Sabry Naeem Beshay, I., Abdelaziz Mohamed, M., Ahmed Mohamed, H., & Fathy Mahmoud, S. (2020). Nurses' Performance Regarding Care of Patients with Tracheostomy. Egyptian Journal of Health Care. Retrieved from: https://doi.org.10.21608/ejhc.2020.274031

Smith, B., & Pacitti, D. (2020). Pharmacology for nurses. Jones & Bartlett Learning, 2nd ed., pp. 156-166.

Tariq, R., Vashisht, R., Sinha, A., &Scherbak, Y. (2022). MedicationDispensing Errors and Prevention. Retrievedfrom https://www.ncbi.nlm.nih.gov/books/NBK5 19065/

Urden, L., Stacy, K., & Lough, M. (2019).Priorities in critical care nursing; Elsevier, 8th ed., pp. 1-5.