



KNOWLEDGE OF NURSES ABOUT VASOACTIVE DRUGS
CONHECIMENTO DOS ENFERMEIROS SOBRE DROGAS VASOATIVAS
CONOCIMIENTO DE LOS ENFERMEROS SOBRE DROGAS VASOACTIVAS

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ABSTRACT

Objective: to describe the knowledge of the nurses of a postoperative unit of cardiac surgery on vasoactive drugs. **Method:** this is a quantitative, descriptive, cross-sectional study based on the postoperative ICU of cardiac surgery at a school hospital. The sample was composed by nurses. A questionnaire was used to collect the data and, for the analysis, the absolute and percentage frequencies. Results were presented in tables. **Results:** it was recorded that 75% of respondents stated that VADs are denominated vasoactive amines or sympathomimetic drugs. As regards the classifications of VADs as vasopressors and vasodilators, 87.5% answered that the vasopressor drugs are dopamine and dobutamine; already in relation to vasodilator drugs, all nurses pointed to nitroglycerin and sodium nitroprusside. **Conclusion:** it is shown that the issues addressed corroborate with other larger, current and relevant research in the field of intensive care. It is considered that nursing education still leaves gaps related to the subject, representing a challenge for educators to improve didactics on the subject. **Descriptors:** Knowledge; Nurses and Nurses; Nursing; Patient safety; Intensive Care Units; Nursing Care.

RESUMO

Objetivo: descrever o conhecimento dos enfermeiros de uma unidade de pós-operatório de cirurgia cardíaca sobre drogas vasoativas. **Método:** trata-se de um estudo quantitativo, descritivo, transversal, tendo como cenário a UTI de pós-operatório de cirurgia cardíaca de um hospital escola. Constituiu-se a amostra por enfermeiros. Utilizou-se um questionário para a coleta dos dados, e, para a análise as frequências absolutas e percentuais. Apresentaram-se os resultados em tabelas. **Resultados:** registrou-se que 75% dos pesquisados afirmaram que DVA's são denominadas de aminas vasoativas ou drogas simpaticomiméticas. Verifica-se, quanto às classificações das DVA's como vasopressoras e vasodilatadoras, que 87,5% responderam que as drogas vasopressoras são a dopamina e a dobutamina; já em relação às drogas vasodilatadoras, todos os enfermeiros apontaram a nitroglicerina e o nitroprussiato de sódio. **Conclusão:** demonstram-se que as questões abordadas corroboram com outras pesquisas maiores, atuais e relevantes para o âmbito da assistência intensivista. Considera-se que o ensino de Enfermagem ainda deixa lacunas relativas ao assunto, representando um desafio para os educadores no sentido de aprimorar a didática sobre o tema. **Descritores:** Conhecimento; Enfermeiras e Enfermeiros; Enfermagem; Segurança do Paciente; Unidades de Terapia Intensiva; Cuidados de Enfermagem.

RESUMEN

Objetivo: describir el conocimiento de los enfermeros de una unidad de postoperatorio de cirugía cardíaca sobre las drogas vasoactivas. **Método:** se trata de un estudio cuantitativo, descriptivo, transversal, teniendo como escenario la UTI de postoperatorio de cirugía cardíaca de un hospital escolar. Se constituyó la muestra por enfermeros. Se utilizó un cuestionario para la recolección de los datos, y para el análisis las frecuencias absolutas y porcentuales. Se presentaron los resultados en tablas. **Resultados:** se registró que el 75% de los encuestados afirmó que DVA's son denominadas aminas vasoactivas o drogas simpaticomiméticas. Se observa, en cuanto a las clasificaciones de las DVA como vasopresoras y vasodilatadoras, que el 87,5% respondió que las drogas vasopresoras son la dopamina y la dobutamina; ya en relación a las drogas vasodilatadoras, todos los enfermeros señalaron la nitroglicerina y el nitroprusiato de sodio. **Conclusión:** se demuestra que las cuestiones abordadas corroboran con otras investigaciones más grandes, actuales y relevantes para el ámbito de la asistencia intensiva. Se considera que la enseñanza de enfermería todavía deja huecos relativos al asunto, representando un desafío para los educadores en el sentido de mejorar la didáctica sobre el tema. **Descritores:** Seguridad del Paciente; Conocimiento; Enfermeros; Enfermería; Unidades de Terapia Intensiva; Vasodilatadores; Atención de Enfermería.

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INTRODUCTION

The Intensive Care Unit (ICU) is characterized as a complex hospital unit, equipped with equipment that provides continuous monitoring, specific materials and technologies that assist the management of the severe patient. It is a unit that has a multiprofessional team whose objective is to recover the patient's health in a timely and adequate way.¹

It is known that the patient admitted to an ICU is in a serious state of health, with the compromise of one or more self-regulation systems, requiring continuous surveillance and, often, artificial replacement of the organic functions. It is pointed out that most are at imminent risk of death, but with the possibility of recovery, therefore, the importance of uninterrupted health care by the multiprofessional team.²

It is necessary, considering that, in the ICU, the majority of patients have a high degree of complexity due to hemodynamic imbalance and metabolic disorders that interfere in the normal physiology of the organism, the use of drugs that promote a reversion of the instability and a positive outcome on the risk of death, among which are vasoactive drugs (VAD's).^{1,3}

It is understood that VADs have peripheral, pulmonary and / or cardiac vascular effects, with a dose-dependent response, and since they have a short half-life, if their administration is not strictly controlled, there may be a marked hemodynamic imbalance, compromising circulatory and respiratory parameters.^{1,4}

It has been observed that the disturbances that lead to the alterations of these parameters cause reduced oxygen supply, decreasing cardiac output and altering cellular functions. The purpose of the use of VADs is to increase vascular tone, improve microcirculation, reduce capillary permeability, improve blood viscosity and improve oxygen pressure, thus ensuring greater efficiency in venous return.^{1,4-5} Among the VADs, vasopressors, consisting of catecholamines (epinephrine, dopamine, dobutamine and noradrenaline), vasopressin and terlipressin, and vasodilators (sodium nitroprusside, nitroglycerin and milrinone lactate).⁶

It is considered that the majority of the patients hospitalized in the ICU need the use of VAD's and that its administration is the responsibility of the Nursing team; Therefore, adequate knowledge about drugs (pharmacokinetics and pharmacodynamics), the objectives of drug therapy, and interventions aimed at minimizing adverse events, ensuring patient safety.⁶

It is observed that, for the nurse, inadequate knowledge about the drugs can result in

complications for both the patient and the professional responsible for the administration process, taking into account that the most frequent errors are those related to administration. It is evidenced by the Nursing Professionals' Code of Ethics (NPCE) that the Nursing professional must know the administration and indication of the drugs, interactions, mechanisms of action and adverse reactions, so that he can fully develop his activities and aware.^{5,7-8}

It is pointed out that the choice of the ICU intended for the postoperative care of cardiac surgery was based on the premise that this scenario, composed of particularities and complexities related to the care of patients with severe cardiac diagnoses, has a differentiated multidisciplinary team that needs updates on the handling of drugs to promote customer rehabilitation. It should be noted that cardiology patients in ICUs are the main users of vasoactive drugs.⁶

The objective of this study was to investigate the relevance of the topic chosen for health professionals, especially for nurses, to describe their knowledge about VADs in an Intensive Care Unit in Recife, Pernambuco. It is hoped that, from the dissemination of results, the team of Nursing professionals will seek to improve the adequate knowledge about VADs in order to provide quality patient care in a safe and effective way.

OBJECTIVE

- To describe the knowledge of the nurses of a postoperative unit of cardiac surgery on vasoactive drugs in a school hospital.

METHOD

This is a quantitative, cross-sectional study, carried out in August 2017, in a postoperative ICU of cardiac surgery at a school hospital, reference in cardiac surgery and transplantation.

The study was developed at the Professor Fernando Figueira Integral Medicine Institute (IMIP), considered a national reference center of the Ministry of Health for comprehensive care and care for small, medium and high complexity diseases. It is a public, non-profit entity that works in the areas of social-medical care, teaching, research and community outreach, focused on the care of the needy population in Pernambuco. The ICU is constituted by ten nurses, acting in a dynamic, specific and diversified routine, with 11 beds destined for adult patients and several cardiac surgical corrections.

As inclusion criteria, nurses of both sexes, over 18 years of age, who were willing to participate in the study, with an explanation of the subject, object of research and relevance, who agreed with the process of free and informed consent, by

means of the signature of the FICT, who worked in the ICU postoperative of adult cardiac surgery of the institution and who had been working for more than six months in the sector.

Data was collected through a semistructured instrument in two parts: the first one consisted of seven questions about characteristics according to the variables (sex, age, education, training time, specialization) and, in the second part, 14 questions specific drugs containing the definition, types of vasoactive drugs, indications, contraindications, preparation and administration and specificities of vasoactive drugs. The semistructured form was developed by the researchers of the study, based on the current literature on the profile of nurses. It should be emphasized that the professionals answered the form in a reserved room and received guidelines for the performance.

It is verified that the information collected through the application of the questionnaires was typed, tabulated and checked by the researcher and the work collaborators, and managed through the *Excel Microsoft Corporation® software*,

version 360/2017. For the descriptive analysis, for the categorical variables, the absolute and percentage frequencies were used.

For this study, the authorization of the hospital's management was requested, through a letter of agreement from the ICU's coordination, followed by submission of the project to the Research Ethics Committee (REC) of the Professor Fernando Figueira Institute of Integral Medicine (IMIP), initiating the research after the authorization of CEP, under the CAAE 70493317.8.0000.5201.

RESULTS

It is pointed out that the study counted on the participation of eight nurse assistants in the age group of 20 to 30 years (50%) and 31 to 40 years (50%). The predominance of the female sex was registered, with a percentage of 75% of the participants and, in relation to the marital status, 87.5% stated that they were single. The professional profile of the nurses working in the postoperative unit of cardiac surgery was described, as shown in table 1.

Table 1. Description of the professional profile of the nurses of the postoperative unit of cardiac surgery, IMIP. Recife (PE), Brazil, 2017. (N=8)

Questions related to nurses' professional profile	Profile of the nurses (%)	
Working time as a nurse in the Intensive Care Unit (ICU).	6 years to 10 years	50% (N=04)
	6 months to 5 years	37.5% (N=03)
	11 years to 15 years	12.5% (N=01)
Weekly workload completed at the Intensive Care Unit (ICU)	Less than 20 hours	12.5% (N=01)
	30 to 40 hours	37.5% (N=03)
	Over 40 hours	50% (N=04)
Complementary training	Specialization	100% (N=8)

It was observed that, among the nurses interviewed, 50% reported having between six and ten years of ICU work. It was observed that all the participants (100.00%) had Lato sensu specialization, there were none with Stricto sensu training, and the most cited specialization was Cardiology, with 62.5%. As with the other mentioned specializations, Emergency, Urgency and ICU are listed, all corresponding to 12.5% of the participants. Table 2 shows the results regarding the knowledge of nurses in the postoperative unit of cardiac surgery on the concept, indication and contraindication of vasoactive drugs.

Table 2. Description of the nurses' knowledge of the cardiac surgery postoperative unit on the concept, indication and contraindication of vasoactive drugs, IMIP. Recife (PE), Brazil, 2017. (N=8)

Questions related to concept, indication and counter-indication	Answers (%)	
Purpose of vasoactive drugs.	Correct	62.5% (N=05)
	Incorrect	37.5% (N=03)
Indication of vasoactive drugs	Correct	75% (N=06)
	Incorrect	25% (N=02)
Definition of vasodilators	Correct	87.5% (N=07)
	Incorrect	12.5% (N=01)
Definition of vasopressors	Correct	100% (N=08)
	Incorrect	0% (N=00)
Meaning of inotropes	Correct	100% (N=08)
	Incorrect	0% (N=00)

It is noted that 75% of the participants affirmed that the VADs are denominated vasoactive amines or sympathomimetic drugs, while the others, 25%, answered that the vasoactive drugs have as main objective to balance the relation between supply and consumption of oxygen, of according to the altered metabolic demand of the different organs and tissues.

As regards catecholamines, 87.5% of respondents answered that the correct options were those that stated that catecholamines are drugs that act by stimulating α and/or β adrenergic receptors and that the catecholamine group includes the noradrenaline drugs, adrenaline, dobutamine and dopamine; only 12.5% answered that the administration of dobutamine is performed exclusively through the central venous catheter, and there can be no exception.

It is scored, associating the name of the drugs according to the action and clinical indication, that 75% of the nurses affirmed that noradrenaline is a vasoconstrictor and indicated in cases of shock

and hypotension; that isoproterenol is a bronchodilator and cardiac stimulant, being indicated in situations of shock, digitalis intoxication and bronchospasm; that dobutamine is an inotropic heart stimulant; that dopamine is a vasopressor indicated for cases of shock and hypotension and, finally, that adrenaline is a vasoconstrictor, bronchodilator and cardiac stimulant used in anaphylaxis and cardiac arrest.

It should be noted that all nurses stated that dopamine can be used in low doses, associated with the use of dobutamine and / or noradrenaline in the treatment of cardiogenic shock and septic shock, in order to increase hepatic, splenic and renal flow; for patients whose treatment is based on increased myocardial contractility without interference in systemic vascular resistance, dobutamine was reported by 100% of the participants.

Table 3. Description of the knowledge of the nurses of the postoperative unit of cardiac surgery on the concept, indication and contraindication of vasoactive drugs, IMIP. Recife (PE), 2017. (N=8)

Questions related to classification of vasoactive drugs	Answers (%)	
Classification of drugs as vasopressors.	Correct	87.5% (N=07)
	Incorrect	12.5% (N=01)
Classification of drugs as vasodilators.	Correct	100% (N=08)
	Incorrect	0% (N=00)
Classification of nitroglycerin	Correct	87.5% (N=07)
	Incorrect	12.5% (N=01)

As regards the classifications of vasoactive drugs as vasopressors and vasodilators, 87.5% answered that vasopressor drugs are dopamine and dobutamine, and only 12.5% cited vasopressin and nitroglycerin. It was recorded, in relation to vasodilator drugs, that 100% of the sample pointed

to nitroglycerin and sodium nitroprusside; nitroglycerin, 87.5% of the interviewees classified it as a vasodilator, while only 12.5% classified it as an antianginal drug.

Finally, the knowledge of the nurses of the cardiac surgery postoperative unit on the

administration, mechanism of action and adverse

effects of vasoactive drugs, as observed in table 4.

Table 4. Description of the knowledge of the nurses of the postoperative unit of cardiac surgery on the administration, mechanism of action and adverse effects of vasoactive drugs, IMIP. Recife (PE), Brazil, 2017. (N=8)

Question related to administration, mechanism of action and adverse effects of vasoactive drugs	Answers (%)				
Administration of vasopressors.	<table border="1"> <tr> <td>Correct</td> <td>25% (N=02)</td> </tr> <tr> <td>Incorrect</td> <td>75% (N=06)</td> </tr> </table>	Correct	25% (N=02)	Incorrect	75% (N=06)
Correct	25% (N=02)				
Incorrect	75% (N=06)				
Mechanism of action of vasodilators.	<table border="1"> <tr> <td>Correct</td> <td>75% (N=06)</td> </tr> <tr> <td>Incorrect</td> <td>25% (N=02)</td> </tr> </table>	Correct	75% (N=06)	Incorrect	25% (N=02)
Correct	75% (N=06)				
Incorrect	25% (N=02)				
Mechanism of action of vasopressors	<table border="1"> <tr> <td>Correct</td> <td>12.5% (N=01)</td> </tr> <tr> <td>Incorrect</td> <td>87.5% (N=07)</td> </tr> </table>	Correct	12.5% (N=01)	Incorrect	87.5% (N=07)
Correct	12.5% (N=01)				
Incorrect	87.5% (N=07)				
Adverse reactions to vasopressors.	<table border="1"> <tr> <td>Correct</td> <td>62.5% (N=05)</td> </tr> <tr> <td>Incorrect</td> <td>37.5% (N=03)</td> </tr> </table>	Correct	62.5% (N=05)	Incorrect	37.5% (N=03)
Correct	62.5% (N=05)				
Incorrect	37.5% (N=03)				

It is verified that 25% of the participants answered that the administration of noradrenaline should be done through the central venous catheter, the risk of extravasation and tissue necrosis, and that it should not be performed concomitantly with alkaline solutions, which may alter their stability.

As regards the mechanism of action of sodium nitroprusside, 75% of the nurses stated that it acts directly on the arteriolar and venular smooth muscle, promoting vasodilatation, being the drug of choice in the hypertensive crisis associated with insufficiency cardiac; On the other hand, 25% chose, as a correct option, the dilution of an ampoule containing 50 mg of sodium nitroprusside in 250 mL of a 5% or physiological 0.9% glucose solution, with the use of simple equipment specific for the infusion pump.

Dopamine and dobutamine were found to have adverse effects on norepinephrine, dopamine, and dobutamine, whereas only 12.5% of the participants chose, as correct options, the symptoms related to noradrenaline, dopamine and dobutamine overdose, respectively including cerebral haemorrhage and seizures; hypertension, arrhythmias and acute renal failure; dyspnoea, hypertension, hypotension, angina and palpitation.

DISCUSSION

It was evidenced by the study that nursing assistants were in the age groups of 20 to 30 years (50%) and 31 to 40 years (50%), predominantly female (75%), a fact that coincides with the findings⁵ that relate the historical context to the representativeness of women in the context of health. It is identified a strong influence of historical events, considering that the first assistance activities were developed by Christian entities, in which the female figure was the protagonist of the care.

It is known, according to the findings related to the profile of the participating professionals, that 50% had six to ten years of ICU time, a result that differs from the studies⁹ in which the sample was

composed of professionals who had more than 25 years of work in the area, however, the same study presented a weekly workload of 40 hours, which corroborates this article, where 50% of the participants also affirmed having a long working day.

It is noteworthy, corroborating the findings,¹⁰ regarding the working day, that many professionals work in more than one job. It is found that work overload impairs the performance of effective care, contributing to the occurrence of adverse events. It is understood that the complexity of the activities performed by an ICU nurse requires dedication, attention, responsibility and knowledge, and the lack of motivation, valorization, adequate remuneration, inputs and infrastructure are factors that trigger professional exhaustion.

It can be observed that in a study carried out¹¹ that the majority of nurses had little time to perform, with an average of five years, and 75% of their sample was composed of postgraduate nurses, coinciding with the results of this study, in which all the nurses had postgraduate degrees in several areas, such as Cardiology, Emergency, Urgency and ICU.

It is important to complement the professional training, which should seek its scientific improvement to provide health care free of errors and damages to the client, however, the time of performance and training should not be associated with skill and technical development scientific, since these depend on the constant and individual search of all nurses, in order to obtain evidence-based practice.¹²

It is pointed out that the purpose of the use of VADs, according to 62.5% participants, is to promote the elevation of venous wall tone, reduce blood viscosity and improve oxygen pressure, leading to an efficient venous return. This statement is contained in the manual of the National Sanitary Surveillance Agency,⁴ of the year 2013, and also in a study developed.¹³ It is important that the team has knowledge about the

mechanism of action of the drugs, since, from this, it will be able to intervene in the possible complications that may occur.⁸

It is noteworthy that a large part of the sample, 87.5%, stated that catecholamines are drugs that act by stimulating α and / or β adrenergic receptors, and that the catecholamine group includes the drugs noradrenaline, adrenaline, dobutamine and dopamine. It is known that catecholamines act to increase the heart rate and, consequently, raising blood pressure, however, hypotension may occur due to the relaxation of the blood vessels as an antagonistic response of the organism.¹⁴ It was also recorded that the drugs most used in ICUs are dobutamine, dopamine and noradrenaline.

Vasoactive drugs are classified as vasodilators and vasopressors.¹⁵ It is observed in this study that 87.5% of the nurses stated that the drugs considered vasopressors were dopamine and dobutamine and 100% chose vasopressin and milrinone lactation as vasodilator drugs. It is evaluated that the chosen assertions were correct, according to the 3rd Brazilian Directive of Cardiac Transplantation.¹⁶

Regarding administration, the mechanisms of action and adverse effects of vasoactive drugs were detected, in the participants' answers, the difficulty in choosing the correct assertion, and divisions of opinions were found. In a 2014 study, it was verified that less than half of the sample, 42.5%, responded correctly to questions about VADs. There was a deficiency regarding the deepening of the knowledge about the subject studied. It is suggested to reduce incidents related to the handling of medications in ICUs by continuing education for intensive care professionals.¹⁷

It is noted that a little more than half of the nurses answered that norepinephrine administration should be performed through the central venous catheter, the risk of extravasation and tissue necrosis, and that it should not be performed concomitantly with alkaline solutions, which may alter its stability. It is indicated that the vasoactive drugs should be infused through the central venous catheter and the Nursing team should pay attention to the extravasation of the substance, which can cause tissue necrosis.⁵ It is argued that nurses should assess the need for lumens, which may be double or triple, by observing signs of infection at the catheter site.¹⁸

It is known that knowing the possible adverse reactions to certain drugs is important for a safe care to the patient. It is pointed out that the nurse must hold the theoretical and practical knowledge to guide the team led by him and contribute to the improvement of the multidisciplinary team.¹⁹ Communication was identified as the key piece to decrease the rate of

adverse events related to administration, which should occur safely, without gaps and with the aim of simplifying the professional's attributions.¹¹

Noradrenaline and dopamine are said to be vasoconstrictor drugs indicated in the treatment of hypotensive or shock states. Such definitions are found in the studies, however, all respondents incorrectly answered the question related to the subject.^{5,14} It is necessary, as some authors reported in their research, a greater commitment of the professional to improve their knowledge and update themselves in their area of performance.^{7,9}

It is observed that this study contributes to the theoretical development of health professionals regarding vasoactive drugs in the context of intensive therapy, to correlate the results and other scientific works, evidencing the need to enhance the professionals' learning about the proposed theme and, thus, to develop a service free of errors and damages.²⁰

The main difficulties encountered during the study were a reduced sample of eight participants and the limitation of research related to the topic, but the issues addressed for the analysis included the studied population and demonstrated support for other larger, relevant to the scope of critical patient care.

It is evaluated that the nurse who works in the ICUs needs to hold pharmacological knowledge, since it is an area in which there are high vigilance drugs, however, the current Nursing education still leaves gaps on this subject, representing a challenge for educators in order to improve the didactics on the subject.

The study is expected to contribute to the improvement of nurses' knowledge about vasoactive drugs, encouraging them to seek specializations that improve evidence-based nursing care, reducing the occurrence of adverse events and complications, favoring the recovery of patient.

CONCLUSION

It was possible, with this study, to describe the theoretical knowledge of nurses working in a postoperative ICU of cardiac surgery on vasoactive drugs, in a reference school hospital in cardiac surgery and transplants in Recife, Pernambuco. The environment for the care of the critically ill patient was chosen to select the topic, reaffirming the importance of the theoretical improvement on these drugs that are routinely used and that present a potential reversion index and improvement of patients' prognosis.

It was identified, as far as the nurses' knowledge about the VADs, that there is difficulty in the theoretical deepening of the same ones. It is noted that the basic issues, such as indication, contraindication and classification of vasoactive

drugs, had a greater number of correct answers, which demonstrated mastery over the subject, but, in relation to the preparation, administration, mechanisms of action and the adverse effects of vasoactive drugs, the professionals did not demonstrate security in answering the questions, the index of correct answers being much smaller than the one mentioned above.

Based on the limitations described and found in the reference studies, it is suggested that, in relation to the pharmacological knowledge deficit of nurses, new researches on the proposed theme should be carried out, with the aim of contributing to the training of nursing professionals. Nursing, promoting new alternatives and information pertinent to the use of vasoactive drugs and obtaining, thus, a continuous education, with the accomplishment of trainings for the improvement of the quality of the services rendered.

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