

NURSING CARE IN HYPERTENSIVE CRISIS: AN INTEGRATIVE REVIEW

CUIDADOS DE ENFERMAGEM EM CRISE HIPERTENSIVA: UMA REVISÃO INTEGRATIVA

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ABSTRACT

Acute forms of hypertension constitute hypertensive crises (HC), which represent a frequent cause of emergency and primary care consultations. This study aims to analyze scientific evidence relating to nursing care in HC published in the literature in the last ten years. This is an integrative review developed based on the stages proposed in the literature. The databases used were Public Medline or Publisher Medline (PubMed), Latin American and Caribbean Health Sciences Literature (LILACS) and Scientific Electronic Library Online (SCIELO), selecting articles published between 2008 and 2018. Ten articles were found; 40% from Brazil, 50% from the United States and 10% from Mexico. The findings indicate that the nursing care of patients in hypertensive crisis relate to the initial approach to the patient in the emergency room, initial evaluation, nursing interventions related to emergency care, health education and blood pressure measurement. Studies are needed that address nurses' actions in relation to HC care, in order to construct evidence to ensure the best form of evaluating the patient, identify the nursing diagnoses, and then propose effective interventions.

Keywords: Hypertension/complications; Emergencies; Urgency; Emergencies/nursing.

RESUMO

As formas agudas de hipertensão arterial constituem-se nas crises hipertensivas (CH), as quais representam uma causa frequente de emergência e consultas de atenção primária. O presente estudo teve como objetivo analisar as evidências científicas sobre os cuidados de enfermagem em CH publicadas na literatura nos últimos 10 anos. Trata-se de uma revisão integrativa desenvolvida a partir das etapas propostas pela literatura. Foram utilizadas as bases de dados Public Medline ou Publisher Medline (PubMed), Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS) e Scientific Electronic Library Online (SCIELO) e selecionados os artigos publicados entre 2008 e 2018. Foram encontrados 10 artigos, sendo 40% deles nacionais, 50% dos Estados Unidos e 10% do México. Os achados apontam que os cuidados de enfermagem com o paciente em crise hipertensiva se referem à abordagem inicial do paciente em sala de emergência, avaliação inicial, intervenções da enfermagem relacionadas aos cuidados emergenciais, educação em saúde e medida de pressão arterial. É necessária a realização de estudos que abordem a atuação do enfermeiro frente aos cuidados prestados em CH, a fim de construir evidências para garantir a melhor forma de avaliar o cliente, identificar os diagnósticos de enfermagem para, então, propor intervenções eficazes.

Descritores: Hipertensão/complicações; Emergência; Urgência; Emergência /enfermagem.

INTRODUCTION

The hypertensive crisis (HC) consists of a rapid and symptomatic elevation in blood pressure (BP), with rapid deterioration of target organs and a high risk of death when the diastolic blood pressure (DBP) readings exceed 120 mmHg.¹ HCs are caused by an imbalance between cardiac output and peripheral vascular resistance, with increased

intravascular blood volumes, endothelial lesion, and platelet and fibrin deposition in the blood flow.^{1,2}

HCs can be classified as hypertensive urgencies (HUs) or hypertensive emergencies (HEs).¹⁻⁴ The first is a symptomatic clinical condition that is characterized by severe elevations in BP without acute target organ damage and can be treated with oral drugs and reduced in up to 24 hours.^{5,6}

Patients with HU are more likely to develop cardiovascular events in the future compared to hypertensive individuals who never had significant BP elevations.⁶

On the other hand, an HE is a symptomatic clinical condition that is characterized by severe elevations in BP with acute and progressive target organ damage. In this case, the BP should be reduced in minutes or a few hours, not necessarily to normal levels, using parenteral drugs.^{3,6} To avoid cerebral, coronary and renal ischemia, studies have shown that the mean BP should be reduced to 30% of the final target value in six to 12 hours, 30% in 24 hours, with final adjustment in two to four days.³

HCs account for 0.45% to 0.59% of all hospital emergency room visits worldwide, with a special emphasis on HE that alone accounts for 25% of all cases of HC, and ischemic stroke and acute pulmonary edema are the most frequent target organ damage events.^{7,8}

HEs usually affect chronic hypertensive patients, illicit drug users with acute glomerulonephritis, and pregnant women with eclampsia and can be associated with stroke, hypertensive encephalopathy, hemorrhagic retinal lesions, papilledema, acute pulmonary edema, acute myocardial ischemic syndromes, and acute aortic dissection.^{1,3,6}

The rapid BP reduction in HE can decrease the blood flow in the vascular system and consequently cause ischemia, target organ infarction and increased mortality.^{4,6} This clinical condition requires intensive care unit admission and continuous and rigorous BP monitoring.⁴

Although there is no ideal medication, an increasing number of drugs is available for the treatment of HCs and the most used in clinical practice are sodium nitroprusside, nitroglycerin, esmolol, labetalol, fenoldopam, hydralazine, and nicardipine.^{1,3,6}

The initial evaluation of patients with HC should be quick and objective to avoid potential target organ damage and complications resulting from the treatment. The patient should be questioned about his clinical history, previous HCs, continuous-use medications, and degree of adherence to the treatment of any condition that affects his health.^{3,4}

According to the literature, the purpose of nursing care is to reduce and control the BP by monitoring it at regular intervals to detect variations that indicate the need to change the ongoing therapy. Moreover, the physical examination performed by the nurse can identify symptoms that indicate target organ damage, such as: angina; dyspnea; changes in speech, vision or balance; epistaxis; headache; dizziness; and nocturia.⁹

Therefore, the role of the multi-disciplinary team, especially of the nursing team, is crucial for the clinical improvement of patients and can prevent serious complications. However, the scientific evidence on the subject is scarce, especially regarding the initial approach, definition of nursing diagnoses, preparation of prescriptions, individualized interventions and management of the treatments proposed in emergency units.¹⁰

In view of the above, the present study aimed to analyze the scientific evidence on nursing care in HCs published in the literature in the last 10 years.

MATERIALS AND METHODS

This is an integrative review of the literature based on a broad methodological approach to reviews, allowing the inclusion of experimental and non-experimental studies for a complete understanding of the phenomenon analyzed and can include the definition of concepts, review of theories and evidence, and analysis of methodological problems of a specific topic.¹¹

Considering the study design, the following steps were followed: establishing the objectives of the study, determining the inclusion criteria of the articles, defining the information to be extracted from the articles, selecting the articles, descriptive analysis of the results, discussion of the findings, and presentation of the review.

The guiding question for this review was: "Which scientific evidence on nursing care in HCs has been published in the literature in the last 10 years?"

The search was conducted in June 2018 on the Public Medline or Publisher Medline (PubMed), Latin American and Caribbean Health Sciences Literature (LILACS) and Scientific Electronic Library Online (SCIELO) databases. The inclusion criteria were: primary and secondary studies published in full that described the nursing care in HCs; studies published in Portuguese, English and Spanish, from 2008 to 2018; articles indexed by the MeSH/DeCS terms: Nursing Care; Blood Pressure/complications; Blood Pressure; Hypertension; Malignant; Hypertensive Encephalopathy; Acute Coronary Syndrome/complications; Pulmonary Edema/complications; Aneurysm, Dissecting; Subarachnoid Hemorrhage/complications; Cerebral Hemorrhage/complications; Brain Infarction/complications; Acute Kidney Injury/complications; Hypertension; Stroke; Pheochromocytoma/complications; Guillain-Barre Syndrome/complications; Spinal Cord Injuries/complications; Postoperative Complications; Pre-Eclampsia; Eclampsia; and articles indexed by the following non-standard terms as keywords: hypertensive crisis; hypertensive urgency; and hypertensive emergency.

The keywords were combined in different ways using the Boolean operator "AND" for simultaneous occurrence of topics.

The data were analyzed and summarized in a descriptive manner and it was thus possible to classify and collect the available knowledge on the topic with the following variables: title and authors of the study, year, country and journal, methods of the study, results on nursing care and discussion of the results.

The information was exported, stored in a database in table format and organized in ascending numerical order by year of publication and alphabetical order in a specific file of the Microsoft® Excel 2010 software (Microsoft Corp., Redmond, WA, USA).

RESULTS

Ten articles, published between 2009 and 2016, were analyzed. Of these, five were North American, four were Brazilian and one was Mexican. The articles were published by nurses in the following journals: *Critical Care Nursing*, *Fundamental Care*, *Guía de práctica clínica*, *Journal of Cardiovascular Nursing*, *Journal of Nursing UFPE*, *Nursing*, and *The University of São Paulo Nursing School Journal*.

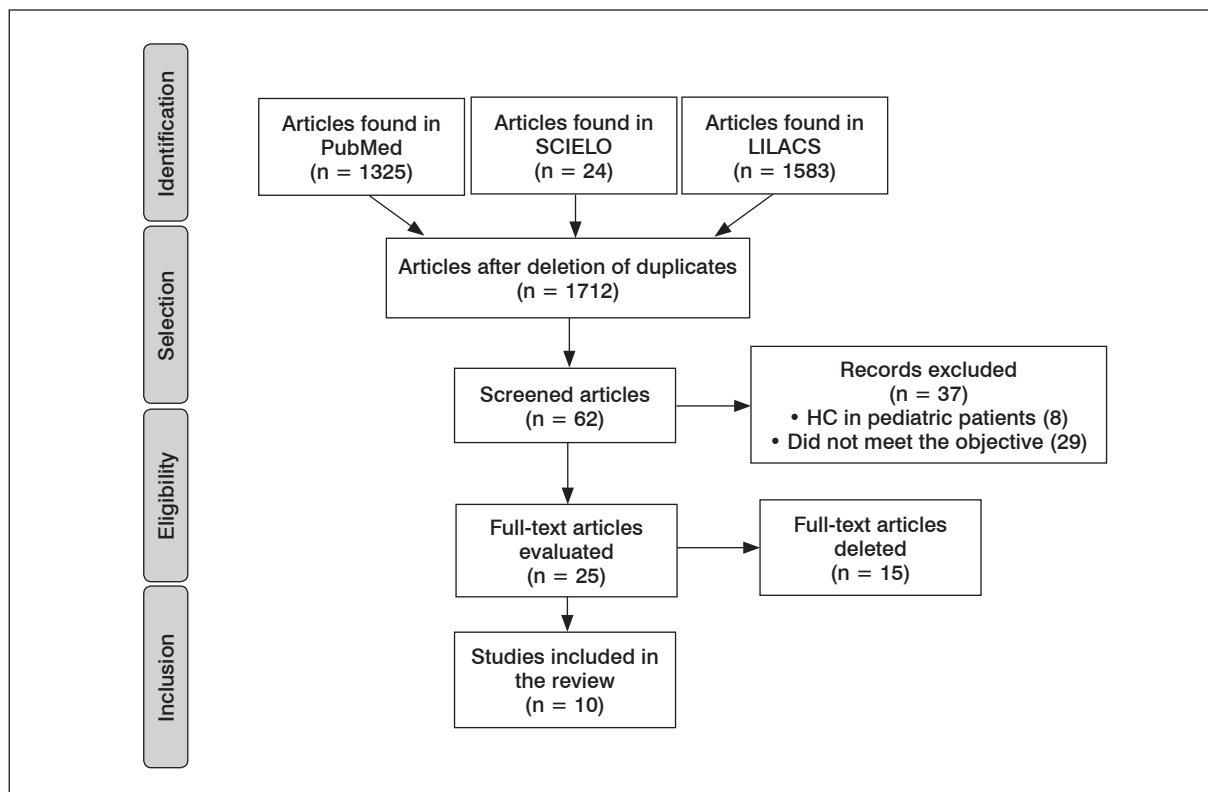


Figure 1. Selection process of the studies included in the review according to the PRISMA model.¹²

Regarding the methodology, review studies predominated and represented 50% of the sample, followed by case studies (20%). The other articles were retrospective studies (10%) and quantitative (10%) and qualitative (10%) exploratory studies.

As for the studied topics, two studies aimed at studying HCs, two studies were restricted to HE, one study addressed the concept of severely elevated BP and the others focused on nursing care in neurological (subarachnoid hemorrhage and spinal cord injury) and gestational (pre-eclampsia and eclampsia) HEs.

Chart 1 summarizes the results of the integrative review and shows the nursing interventions described in each of the studies analyzed.

In the analyzed articles, the most frequently cited nursing care services provided during the initial treatment of HCs are related to the importance of checking the vital signs, which includes measurement of BP in both arms, temperature, oxygen saturation, and heart and respiratory rates.^{13-18,20,22}

Obtaining the patient's specific complaints and medical history while providing nursing interventions in the emergency room, such as puncture to obtain a large-caliber peripheral venous access, non-invasive cardiac monitoring, installation of a supplemental oxygen system and starting the clinical evaluation with the other members of the multi-disciplinary team, constitute the immediate care that should be given to patients with HC.^{13,15,19-22}

Performing a 12-lead electrocardiogram, collecting samples for laboratory tests, administering antihypertensive drugs intravenously and referring patients for other imaging tests, such as chest X-ray and computed tomography, were

identified as secondary care and should be performed as soon as possible by the nursing team to help with diagnosis and to start early treatment.^{13,14,18,20-22}

Hemodynamic monitoring using a central catheter was mentioned as complementary care in patients admitted to the intensive care unit, in order to guarantee continuity of care, strict control of BP levels, and individualized monitoring of therapeutic results.^{14,15,20}

Patient orientation during the hospitalization and before hospital discharge was the most cited nursing care in the analyzed articles, mainly regarding BP control, recognition of HC symptoms, adherence to drug and non-drug arterial hypertension treatment and treatment follow-up in basic health units and reference outpatient specialty clinics.^{13,21,22}

The nursing care found in this review was divided into five categories and is shown in Chart 2.

DISCUSSION

The results of the present study showed that the literature on nursing care in HC is scarce and not sufficient to meet the challenges faced by nurses and the multi-disciplinary team regarding the management of this medical condition in emergency units.

A recently published study showed similar results and stated that HE management is based on the consensus of experts and not on scientific evidence due to the lack of high impact clinical trials on the topic.¹⁴

One of the most important nursing care services in HC is the monitoring and follow-up of BP levels, which should occur in a predetermined time interval according to institutional

Chart 1. Summary of the results found in the integrative review regarding title, year, country, study design, objective and nursing interventions. São Paulo, 2018.

| N | Title | Year and Country | Study design | Objective | Nursing interventions |
|---|--|------------------|-------------------------------------|---|--|
| 1 | Taking aim at hypertensive crises ¹³ | 2009 USA | Case study | not described | <ul style="list-style-type: none"> • Check vital signs; • Install cardiac monitoring; • Puncture peripheral venous access; • Immediately report emergency medical staff; • Install supplemental oxygen system; • Administer intravenous infusion of nitroprusside according to medical prescription; • Perform 12-lead electrocardiogram; • Refer patient to chest X-ray and computed tomography according to medical request; • Collect samples for laboratory tests; • Collect patient's medical history and assess the symptoms that suggest target organ damage; • Guide the patient regarding blood pressure monitoring at home; • Guide the patient on weight control, healthy diets, reduced salt intake, physical activity and smoking cessation; • Guide the patient on the signs and symptoms of hypertensive crises; • Guide the patient on the importance of the adherence to the treatment for arterial hypertension. |
| 2 | Recent Advances in the Treatment of Hypertensive Emergencies ¹⁴ | 2010 USA | Literature review | Provide intensive care nurses with updates on the management of hypertensive emergencies | <ul style="list-style-type: none"> • Install hemodynamic monitoring; • Collect and follow markers of progressive target organ damage; • Perform diuresis control; • Perform electrocardiogram; • Follow findings from chest X-ray, ophthalmologic and neurological examinations; • Monitor blood pressure every 5 to 10 minutes until achieving goals; • Refer the patient to an intensive care unit. |
| 3 | Hypertensive emergency ¹⁵ | 2011 USA | Case study | Not mentioned | <ul style="list-style-type: none"> • Install continuous cardiac monitoring; • Install oxygen mask with a reservoir at 100%; • Puncture peripheral venous access for sodium nitroprusside infusion; • Check vital signs; • Refer patient to an Intensive Care Unit. |
| 4 | Severely Elevated Blood Pressure When Is It an Emergency? ¹⁶ | 2011 USA | Literature review | Help nurses to recognize when severely elevated blood pressure is an emergency | <ul style="list-style-type: none"> • Carry out a complete medical history, including the drugs that the patient is taking; • Question the patient on the history of arterial hypertension, angina, acute myocardial infarction, transient ischemic attack, stroke, kidney disease or retinal problems. |
| 5 | Aneurysmal subarachnoid hemorrhage: follow the guidelines ¹⁷ | 2013 USA | Literature review | Review the current guidelines that address the incidence, prevalence, treatment and prevention of complications associated with the subarachnoid aneurysm | <ul style="list-style-type: none"> • Check vital signs; • Perform neurological evaluation; • Monitor the patient who is at risk of having seizures; • Ensure bed rest with headboard raised 30 degrees; • Perform continuous cardiac monitoring; • Immediately report changes in the patient's medical condition to the health care team. |
| 6 | Autonomic dysreflexia and nursing interventions for patients with spinal cord injury ¹⁸ | 2013 Brazil | Retrospective cross-sectional study | Identify the nursing interventions used to treat and prevent autonomic dysreflexia. | <ul style="list-style-type: none"> • Administer antihypertensive drugs according to medical prescription; • Monitor the vital signs and physical condition of the patient. |

| N | Title | Year and Country | Study design | Objective | Nursing interventions |
|----|--|------------------|--------------------------------|---|--|
| 7 | Clinical Practice Guidelines Nursing Interventions in the patient with Preeclampsia/ Eclampsia ¹⁹ | 2013 Mexico | Literature review | Provide nursing professionals with recommendations, based on the best available evidence, that standardize their actions to identify risk factors, signs and alarm symptoms of preeclampsia/ eclampsia during prenatal care, labor and delivery | <ul style="list-style-type: none"> • Use calibrated blood pressure device; • Measure blood pressure with the correct technique and use cuff of adequate size; • Weigh patient daily; • Evaluate the location and extent of the edema; • Maintain permeable peripheral venous access; • Record capillary perfusion; • Monitor skin turgor, ingestion and excretion of liquids; • Monitor respiratory pattern, oxygen saturation, airway permeability and presence of cyanosis; • Monitor neurological status and presence of seizures. |
| 8 | Hypertensive crisis: competencies listed by the nurse to care hospitals in Curitiba-PR ²⁰ | 2014 Brazil | Quantitative exploratory study | Identify the skills listed by the nurse to attend the patient with hypertensive crisis and to analyze the action described by the nurse in the patient with a hypertensive crisis | <ul style="list-style-type: none"> • Inform the medical team; • Check vital signs; • Perform physical examination; • Perform peripheral venous puncture; • Maintain hemodynamic monitoring; • Maintain the patient at rest in bed; • Perform and follow electrocardiogram and ophthalmoscopy. |
| 9 | Nursing care for women with pre-eclampsia and/or eclampsia: integrative review ²¹ | 2016 Brazil | Integrative review | Analyze the evidence available in the literature on the topic: nursing care for women with pre-eclampsia and/or eclampsia | <ul style="list-style-type: none"> • Use a validated and calibrated blood pressure device; • Measure the blood pressure with an appropriate cuff to the patient's brachial circumference; • Measure the blood pressure with the patient in a seated position; • Deflate the cuff slowly (2 to 3 mmHg per second and total emptying in 30 seconds); • Measure the blood pressure at least twice and calculate the mean value of the two measurements; • Collect detailed data and perform a thorough physical examination; • Collect samples for laboratory tests and monitor the results; • Administer oxygen; • Establish large-caliber venous access; • Start intravenous medication; • Guide the patient on the prevention of late complications; • Guide the patient on long-term outpatient follow-up; • Guide the patient on adopting healthy lifestyle habits. |
| 10 | Nursing assistance to parturients affected by pre-eclampsia ²² | 2016 Brazil | Qualitative exploratory study | Evaluate the nursing care provided to women affected by preeclampsia and to know from nurses the complaints, conflicts and fears of women during pregnancy | <ul style="list-style-type: none"> • Check vital signs; • Assess the presence of edema; • Control diuresis; • Collect and monitor the results of laboratory tests; • Perform fetal monitoring; • Perform strict control of blood pressure; • Puncture peripheral venous access and initiate drug infusion; • Record all care provided; • Guide the patient on the importance of the low sodium diet and daily blood pressure measurement; • Guide the follow-up of the puerperium in Family Health Unit and outpatient follow-up if necessary. |

Chart 2. Categorization of nursing care according to the initial approach, patient assessment, nursing interventions, interventions for health education and recommendations for BP measurement procedures.

| | |
|---|---|
| <p>Initial approach</p> <ul style="list-style-type: none"> • Collect patient's medical history; • Evaluate symptoms that suggest target organ damage; • Check vital signs; • Install multiparameter monitoring; • Inform medical and multi-professional team; • Puncture peripheral venous access; • Install supplemental oxygen; • Administer intravenous medication as prescribed. | <ul style="list-style-type: none"> • Monitor the results of laboratory and imaging tests; • Monitor the patient who is at risk of having seizures; • Refer the patient to the Intensive Care Unit as requested; • Record and document the care provided. |
| <p>Patient assessment</p> <ul style="list-style-type: none"> • Perform physical examination; • Perform neurological evaluation; • Assess capillary perfusion; • Assess the presence of edema. | <p>Interventions for health education</p> <ul style="list-style-type: none"> • Guide the patient on the signs and symptoms of hypertensive crises and delayed complications; • Guide the patient on the importance of the adherence to the treatment for arterial hypertension; • Guide the patient on the blood pressure monitoring at home; • Guide the patient on the adoption of healthy lifestyle habits; • Guide the patient on the long-term outpatient follow-up. |
| <p>Nursing interventions</p> <ul style="list-style-type: none"> • Monitor vital signs; • Assess and monitor BP levels; • Collect samples for laboratory tests as requested; • Perform a 12-lead electrocardiogram as requested; • Refer to chest X-ray or computerized tomography as requested; • Control diuresis; • Ensure that the patient is at rest in bed; • Keep the headboard with an inclination of 30 degrees; | <p>Recommendations for BP measurement procedures</p> <ul style="list-style-type: none"> • Use a validated and calibrated blood pressure device; • Measure the blood pressure with an appropriate cuff to the patient's brachial circumference; • Measure the blood pressure with the patient in a seated position; • Deflate the cuff slowly (2 to 3 mmHg per second and total emptying in 30 seconds); • Measure the blood pressure at least twice and calculate the mean value of the two measurements. |

protocols or to follow-up early-warning scores and guidelines regarding arterial hypertension.^{23,24} For Smithburger et al.¹⁴, BP monitoring in HE should occur every five to 10 minutes until therapeutic goals are reached. It is important to reduce the BP in a controlled manner to avoid an abrupt reduction in target organ perfusion and an increased risk of complications, such as infarction and ischemia.¹⁴

The initial therapeutic goal is to reduce the mean BP by no more than 25% to obtain Systolic Blood Pressure (SBP) levels close to 160 mmHg and DBP of 100 mmHg within two to six hours after diagnosis or to decrease the DBP by 10–15%, to approximately 110 mmHg, within 30 to 60 minutes.²⁵

There is no consensus in the literature about HU treatment nor a rigorous protocol to follow. In the hospital, patients with HU are maintained at rest, preferably in the supine position, for 30 to 45 minutes before administering any drugs. It is important to monitor BP levels for 48–76 hours until values considered optimal are reached.⁴

Evidence indicates that the health professional should be able to perform a correct identification, anamnesis, physical examination, and treatment of HC in an environment where this condition frequently occurs, as this positively influences the care provided, optimizes the dynamics of the care and prevents long stays in the emergency services.⁴

Nursing care is essential to patients' prognoses and requires the nurse's scientific and practical knowledge. Nursing assessment in patients with HC should be performed in an

individualized manner, providing safe, effective and short-term care, since it is crucial to decrease the BP to treat the disease.⁴

It is important to highlight that the interdisciplinary work is fundamental to recognizing and treating HC, since HE is associated with target organ damage, especially in the nervous, cardiovascular and renal systems. Therefore, it is important to diagnose HE correctly and to differentiate it from HU and/or chronic uncontrolled hypertension with appropriate BP measurement techniques, a pertinent patient interview, a physical examination, and further investigation, if available. In addition, after hospital discharge, it should be ensured that patient are closely monitored in follow-up care to prevent further HC episodes.⁶

This study had limitations, such as not considering the results of studies published in other languages in the inclusion criteria and presentation of studies with different methodological approaches that prevented standardization of the results for comparative purposes.

CONCLUSION

This study analyzed the published scientific evidence on nursing care in HC in the last 10 years in a descriptive manner and concluded that the studies available in the literature do not provide effective contributions with strong evidence for nursing care, since they approach the proposed objective in a vague and implicit manner. The results of this study indicate that the main nursing care services consist of the initial approach to patients in the emergency room, initial assessment, nursing interventions related to emergency care, health education, and BP measurement.

The results obtained in this study suggest that studies that more thoroughly address the nurses' performance in emergency units, mainly regarding the care provided in HC, should be conducted. It is necessary to develop studies that provide evidence on the best way to assess patients, that is, that define the data to be collected, suggest best methods to conduct the clinical examination of patients, and indicate the most frequent nursing diagnoses in patients with HC. Studies that assist in the establishment of goals for the care and identification of effective nursing interventions could support the nursing care plan in urgent and

emergency situations. The results obtained in this type of study could provide effective and adequate means for the establishment and follow-up of therapeutic measures aimed at the quality of care for health promotion and recovery in patients with HC.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest in conducting this study.

AUTHORS' CONTRIBUTIONS: Study design: ACQGD, RBSP, EVV; data collection and analysis: ACQGD, RBSP, EVV; and manuscript preparation: ACQGD, RBSP, EVV.

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