● **Original article**

NURSING DIAGNOSIS APPLIED TO PATIENTS WITH DECOMPENSATED HEART FAILURE

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ABSTRACT: The present study aimed to identify the priority nursing diagnoses for patients with decompensated heart failure. Quantitative study conducted in a cardiac emergency service of a university of Pernambuco, between October 2014 and February 2015. The study sample was composed of 62 patients admitted for the treatment of acute decompensated heart failure, emergency inpatients and patients from any functional class. The main nursing diagnoses were Decreased Cardiac Output (87.3%), Activity Intolerance (79.4%) and Ineffective Breathing Pattern (38.1%). The signs and symptoms of decompensation caused by systemic or pulmonary congestion provided the basis for the recognition of defining characteristics that made it possible to formulate priority nursing diagnoses for these patients.
DESCRIPTORS: Cardiovascular Nursing; Heart Failure; Nursing Diagnosis; Nursing Processes.

DIAGNÓSTICOS DE ENFERMAGEM APLICADOS A PACIENTES COM INSUFICIÊNCIA CARDÍACA DESCOMPENSADA

RESUMO: Objetivou-se identificar os diagnósticos de enfermagem prioritários para pacientes com insuficiência cardíaca descompensada. Trata-se de uma com abordagem quantitativa, realizada em pronto-socorro cardiológico de uma universidade de Pernambuco, entre outubro de 2014 e fevereiro de 2015. A amostra do estudo foi composta de 62 pacientes admitidos por insuficiência cardíaca descompensada, internados de emergência e de qualquer classe funcional. Os principais diagnósticos de enfermagem foram: Débito Cardíaco Diminuído (87,3%), Intolerância à Atividade (79,4%) e Padrão Respiratório Ineficaz (38,1%). Os sinais e sintomas da descompensação, oriundos da congestão sistêmica ou pulmonar, serviram como base para o reconhecimento das características definidoras que permitiram a elaboração dos diagnósticos de enfermagem prioritários para esses pacientes.
DESCRITORES: Enfermagem Cardiovascular; Insuficiência Cardíaca; Diagnóstico de Enfermagem; Processos de Enfermagem.

DIAGNÓSTICOS DE ENFERMERÍA APLICADOS A PACIENTES CON INSUFICIENCIA CARDÍACA DESCOMPENSADA

RESUMEN: Fue objetivo del estudio identificar los diagnósticos de enfermería prioritarios para pacientes con insuficiencia cardíaca descompensada. El abordaje fue cuantitativo y se realizó en la emergencia cardiológica de una universidad de Pernambuco, entre octubre de 2014 y febrero de 2015. La muestra del estudio fue compuesta de 62 pacientes admitidos por insuficiencia cardíaca descompensada, internados en emergencia y de cualquier clase funcional. Los principales diagnósticos de enfermería fueron: Débito Cardíaco Disminuido (87,3%), Intolerancia a la Actividad (79,4%) y Patrón Respiratorio Ineficaz (38,1%). Las señales y síntomas de la descompensación, que vienen de la congestión sistémica o pulmonar, fueron utilizadas como base para el reconocimiento de las características determinantes, las cuales posibilitaron la elaboración de los diagnósticos de enfermería prioritarios para eses pacientes.
DESCRIPTORES: Enfermería Cardiovascular; Insuficiencia Cardíaca; Diagnóstico de Enfermería; Procesos de Enfermería.

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INTRODUCTION

Heart Failure (HF) is a chronic and progressive syndrome associated to hospital readmissions, low quality of life, risk for early mortality that generates high costs for the health system. It is a systemic disease defined as a cardiac dysfunction that causes insufficient blood supply to meet tissue metabolic needs, under normal pulmonary venous return, or only after high filling pressures[1]. Expressed by a series of signs and symptoms of pulmonary and systemic congestion, it is characterized as the end-stage of all cardiovascular diseases[2].

This syndrome affects 1.5 to 2% of the world population and its incidence has been increasing over the past three decades, especially among individuals over 65 years. Despite the benefits obtained with the evolution in the treatment of HF, this syndrome is still responsible for high mortality rates and decreased functional capacity of sufferers[1-2].

Increased incidence of HF is related to therapeutic advances in the treatment of acute myocardial infarction and HF itself, resulting in longer survival and increased prevalence of hospital admissions, generating high costs for countries whose elderly population is growing[3].

Considered a major health problem, HF entails significant costs to the health system, as it contributes to increase in readmission rates, in addition to high morbidity and mortality rates[4]. These rates are significantly increased after the first hospitalization to treat decompensated heart failure, particularly 30 to 90 days after discharge[1,3].

Therefore, the role of specialist heart failure nurses has been significantly focused on therapeutic, educational and self-care interventions. The effectiveness of the nursing diagnosis of home health care patients, outpatients and inpatients with heart failure should be explored, given its relevance to clinical practice.

The Nursing Process (NP) is a key tool in clinical practice that determines the establishment of the nursing diagnosis (ND). It guides the choice of the most appropriate interventions, in order to obtain the expected results for each individual in the context of health care. Systematization of Nursing Care is an activity of exclusive responsibility of nurses based on internationally validated taxonomies for all the stages of the process[5].

The Nursing Process (NP) is a sort of evidence-based practice because it involves training and development of skills in clinical assessment. The Nursing Diagnoses taxonomies favor the use of critical thinking in the NP, particularly regarding the defining characteristics of the diagnosis, based on the signs and symptoms observed, and the selection of priority nursing diagnoses[6].

An appropriate clinical assessment can identify patients with congestive or hypovolemia symptoms with considerable reliability, as well as with decreased or normal cardiac debit. Studies corroborate that nurses are able to perform a reliable clinical assessment of these patients with heart failure, improving clinical outcomes[7].

This research emphasizes the importance of the establishment of nursing diagnoses in decompensated heart failure, making a comparison between the clinical manifestations observed and the nursing process. Therefore, the present study is aimed to identify, through analysis of the symptoms of patients, the priority nursing diagnoses for patients with decompensated heart failure.

METHOD

Exploratory-descriptive study, of quantitative approach conducted at cardiac emergency service Professor Luiz Tavares of a University of Pernambuco (PROCAPE/UPE) between October 2014 and February 2015. The institution is a midsized university hospital that provides medium and high complexity services in Cardiology, attached to the Unified Health System (SUS), with inpatient and outpatient facilities.

Convenience sampling was used, and the patients who met the inclusion/ exclusion criteria were

selected. The study population was composed of patients admitted for the treatment of decompensated heart failure of any functional class, according to the classification of the New York Heart Association (NYHA), of any cause and with an ejection fraction ≤ 45%, in hospitalization following pulmonary or systemic congestion and its effects (1). The classification of NYHA allows stratifying the degree of limitation imposed by heart failure to daily activities, depending on the symptoms. According to the classification, individuals suffering from heart failure are classified into four classes, as follows: class I – absence of symptoms during daily activities, with physical activity limitations similar to what is expected in healthy individuals; class II – symptoms triggered by daily activities; class III – symptoms triggered in less intense activities than daily activities; class IV – symptoms at rest.

The following inclusion criteria were established for participation in this study: be over 18 years, with medical diagnosis of heart failure, on the first day of hospital admission, patient with communication/verbal expression skills, preserved neurological/cognitive status and who accepted to participate in the study by signing the Free Informed Consent form.

Patients who HF after acute myocardial infarction during the three months prior to admission, patients with HF secondary to sepsis, patients who underwent coronary artery by-pass grafting 30 days before admission and patients with cognitive sequelae were excluded from the study.

Data related to patient's identification, demographic and clinical variables related to the functional class and etiology of HF, as well as the main signs and symptoms upon admission were collected through interviews (anamnesis), physical examination and examination of the medical record, to infer the priority nursing diagnoses (ND). Data related to previous admissions were not assessed.

The clinical reasoning and diagnostic judgment to infer the ND based on the signs and symptoms identified was performed with the use of standardized language of Taxonomy II of North American Nursing Diagnoses Association (NANDA)[8]. The instrument of collection contained 33 possible ND, with the possibility of including others. The nursing diagnoses included contemplated the following domains: 2 – Nutrition; 3 – Elimination and Exchange; 4 – Activity/Rest; 9 – Stress coping/tolerance; 11 – Safety/Protection [7-8].

The variables were tabulated and analyzed using Statistical Package for the Social Sciences (SPSS), 20.0 version, based on descriptive statistics.

The present study was previously approved (May 2013) by the Research Ethics Committee of the institution under no. 255.064, CAAE: 03198212.1.0000.5201.

● **RESULTS**

In the study, 62 interviews were conducted with the participants. Of these, 61.3% were male individuals, 56.5% reported being brown and 54.84% were over 60 years of age. Most of them were married or had a partner (48.4%), lived in an urban area (82.3%), were self-employed (41.9%) or retired (32,3%), according to Table 1.

The main factors that triggered the latest episode of decompensated heart failure were medication discontinuation (27.4%), arrhythmias (24.4%), excessive fluid or sodium intake (17.7%), and hypertensive crisis (17.7%). The main causes reported as predisposing to a medical diagnosis of HF were Cardiomyopathy (35.5%), Chagas disease (27.4%) and Hypertension (9.7%). Among the respondents, 41.7% were in functional class III and 35.5% in functional class IV (Table 2).

The main risk factors for HF investigated include hypertension (66.1%), alcohol consumption (61.3%), family history of HF (56.5%), smoking (54.8%), diabetes (32.3%) and dyslipidemia (17.7%). During physical examination, the main signs and symptoms observed were fatigue (77.4%), paroxysmal nocturnal dyspnea (69.4%) and dyspnea (48.4%), according to Table 2.

After patient assessment, the main ND listed are shown in Table 3 with the respective frequencies and related factors, considering the possibility of multiple diagnoses per patient.

Table 1 – Sociodemographic characterization of patients with heart failure. Recife, PE, Brazil, 2015

Variables	N	%
Male	38	61.3
Female	24	38.7
Up to 60 years	28	45.16
More than 60 years	34	54.84
Married/ Stable relationship	30	48.4
Single	19	30.6
Widowed	10	16.1
Separated/ Divorced	1	1.6
Other	2	3.2
White	12	19.4
Black	13	21
Brown	35	56.5
Yellow	2	3.2
Urban area	51	82.3
Rural area	11	17.7
Retired	20	32.3
Employee	12	19.4
Self-employed	26	41.9
Without a fixed income	4	6.5

Table 2 – Distribution of patients in variables related to heart failure. Recife, PE, Brazil, 2015

Variables	N	%
Factors that trigger decompensation		
Medication discontinuation	17	27.4
Arrhythmias	15	24.4
Excess water or sodium intake	11	17.7
Hypertension	11	17.7
Alcohol	7	11.3
Kidney failure	6	9.7
Infection	4	6.5
Drugs	3	4.8
Anemia	1	1.8
Previous hospitalization	46	74.2
Etiology of Heart Failure		
Cardiomyopathy	22	35.5
Chagas disease	17	27.4
Others	10	16.1
Hypertension	6	9.7
Ischemic disease	1	1.6
Functional Class		
I	6	9.7
II	9	15
III	25	41.7
IV	22	35.5
Risk factors for HF		
Hypertension	41	66.1
Alcohol consumption	38	61.3
Family history of HF	35	56.5
Smoking	34	54.8
Diabetes	20	32.3
Dyslipidemia	11	17.7
Signs and symptoms at physical examination		
Swelling	49	79
Fatigue	48	77.4
Paroxysmal nocturnal dyspnea	43	69.4
Dyspnea	30	48.4
Chest pain	12	19.4
Orthopnoea	5	8.1
Palpitation	4	6.5
Others – unspecific	20	32.2

Table 3 – Nursing diagnoses and respective related factors applied to patients with heart failure. Recife, PE, Brazil, 2015

Nursing Diagnosis (n(%))	Related Factor	N	%
(00029) Decreased Cardiac Output 55 (87.3%)	Stroke Volume Variability	40	72,7
	Change in Cardiac Frequency	22	40
	Change in Heart Rate	5	9.1
	Change in Myocardial Contractility	2	3.2
(00026) Excessive Fluid Intake 18 (28.6%)	Impaired Regulation of Physiological Mechanisms	12	66.7
	Excessive Fluid Intake	2	11.1
	Excessive Sodium Intake	2	11,1
(00032) Ineffective Breathing Pattern 24 (38.1%)	Hyperventilation	22	91.7
	Respiratory muscle fatigue	8	33.3
	Pain	6	25
	Obesity	3	12.5
	Metabolic factors	1	4.2
(00092) Activity Intolerance 50 (79.4%)	Imbalance between oxygen supply and demand	49	98
	Generalized weakness	1	2
(00085) Impaired Physical Mobility 30 (47.6%)	Activity Intolerance	26	86.7
	Discomfort	6	20
	Decreased muscle strength	5	16.7
	Anxiety	2	6.7
	Pain	2	6.7
(00046) Impaired Skin Integrity 14 (22.2%)	Impaired circulation	13	92.9
	Changes in turgor	2	14.3
	Hyperthermia	1	7.1
	Hypothermia	1	7.1
	Impaired metabolic state	1	7.1
(00033) Impaired Spontaneous Ventilation - 9 (14.3%)	Anxiety	2	8.3
(00146) Anxiety 2 (3.2%)	Threat of death	1	50
	Stress	1	50

● DISCUSSION

The study patients had sociodemographic and clinical profiles similar to those of patients of other Brazilian studies [9-10]. A national study with a similar sample demonstrated that 75.7% of the patients are not informed of the diagnosis of HF and 40.5% only seek health services in cases of urgency[9].

The nurse plays a key role in the management of patient with decompensated heart failure, being the main responsible for guidance to patient on adherence to treatment (drug or non-drug treatment). A nation-wide survey with nurses revealed that they report lack of time as the main reason for not performing their educational activities (87%), suggesting that their involvement in other activities prevent them from performing this essential activity [11].

In this study, respondents listed eight priority ND for the patients. A literature review showed that, in addition to the referred diagnoses, Risk of falling and Deficient knowledge were also very frequent [12].

In a study with patients admitted for the treatment of heart disease, including patients with HF and myocardial infarction, the main ND applied were: Anxiety (76.7%), Acute pain (70.7%), Decreased

Cardiac Output (56.7%), Disturbed Sensory Perception – Visual (53.3%), Insomnia (46.7%), Activity Intolerance (36.7%), Sexual Dysfunction (36.7%) and Impaired Urinary Elimination (36.7%), with anxiety and pain being more frequent in myocardial infarction patients [13].

In another nation-wide survey on ND inferred from signs and symptoms observed, the authors found three ND considered priority for a sample of 303 patients with HF, which were also reported in our findings: Decreased Cardiac Output, Excessive Fluid Intake. Ineffective Breathing Pattern [6].

Decrease Cardiac Output, reported by 87.3% of the participants is mainly related to decrease in left ventricular ejection fraction. This ND is validated to Portuguese and has objective operational definitions for all the defining characteristics, which are correlated with signs and symptoms [6, 14-16]. A retrospective study with 38 patients with HF assessed for transplant found that 71.1% had this ND, and the odds ratio for occurrence of the diagnosis were increased systemic vascular resistance (OR=4.53), third heart sound (OR=3.429), and decreased ejection fraction (OR=2.85) [17].

Ineffective breathing pattern has high prevalence among patients with HF, causing sleep problems. A study with 400 patients in Functional classes II and III and sleep problems showed that respiratory distress was present in 40.5% of the sample, less frequent than nocturia (72.2%), waking up in the middle of the night or early in the morning (67.7%), difficulty falling asleep within 30 minutes (56.5%). The authors suggest that nocturia can be related to Excessive Fluid Intake or inappropriate use of diuretics [18]. In the reported findings, the ND Excessive Fluid Intake was applied to 28.6% of the patients, and in 66.7% of them the related factor was impaired regulation of physiological mechanisms, which might be caused by inappropriate use of diuretics.

In a study with a sample of 37 patients with HF admitted to hospital that aimed to assess the degree of gas exchange impairment in these patients, the clinical indicators respiratory rate and depth, orthopnea, chest pains, drowsiness and urea were the most impaired. According to the authors, the patients were either diagnosed with HF or had the potential risk for this diagnosis [19].

The defining characteristic of Activity Intolerance is the report of fatigue, very common in patients with HF [6,8]. Another study indicates that fatigue in HF is related to low muscle perfusion and is usually accompanied by dyspnea, and associated to psychosocial variables. In the literature review, the incidence was 69% to 88% [20], and in the present study, it was 79.4%. The main factor related to this ND for most patients that participate in our sample (98%) was imbalance between oxygen supply and demand, which is probably associated to decreased cardiac output that reduces the supply of oxygen to the body tissues.

Finally, it should be stressed that nurses are responsible for the management of HF in primary care to minimize complications and improve the quality of life of patients. Other publications demonstrated the high frequency of the nursing diagnosis Deficient Knowledge [12]. Many patients admitted for the treatment of HF in palliative care need counseling and monitoring. Nurses should advise them on changes in their lifestyle and other aspects [1].

Health education regarding these patients has focused on information about the disease, monitoring of signs and symptoms of decompensation, use of medications and adherence to non-pharmacological measures [21]. These topics should be addressed during hospitalization, after hospital discharge and during outpatient monitoring.

In a survey conducted in home visits to patients with HF it was found that the patients had deficient knowledge of issues related to medications and side effects. This study detected the a substantial increase in knowledge of these patients, in a second home visit, after an initial educational intervention, suggesting that such actions in primary care may impact treatment adherence and reduce hospitalization rates [22]. Another study with a more robust design, conducted in Colombia, with a control group, not blinded, found that an educational nursing protocol for patients with HF resulted in an increase of at least 20% in the score of self-care in 66% of the intervention group compared to 26.6% in the control group [23].

● **FINAL CONSIDERATIONS**

Patients with heart failure have specific care demands. The signs and symptoms of decompensation originated from systemic or pulmonary congestion were the basis for the recognition of the defining characteristics that allowed the elaboration of the priority nursing diagnoses.

The diagnoses of the respondents were similar to those of other studies. It is recommended the investigation of diagnoses for other domains of NANDA II taxonomy not yet considered such as domains 7 – Roles and relationships, 8 - Sexuality, 10 – Life Principles and 12 - Comfort. These domains are composed by ND related to forms of coping with and adapting to disease. The investigated domains address basic human needs related to physiological aspects, while the investigation of the suggested domains may shed light on a comprehensive (holistic) understanding of the patients with these health problems.

The present study is a reference for nurses that provide care to such patients, and is aimed to contribute to the improvement of the implementation of the Nursing Process (NP).

Finally, it is worth stressing the nursing role and responsibilities in primary care or in hospitalization, which involve patient guidance and counselling in order to improve the quality of life, treatment adherence and prevent new decompensations of the referred patients.

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