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Cross-mapping of nursing diagnoses and interventions in decompensated heart failure

Mapeamento cruzado dos diagnósticos e intervenções de enfermagem na insuficiência cardíaca descompensada

Mapeo cruzado de diagnósticos e intervenciones de enfermería en insuficiencia cardíaca descompensada

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ABSTRACT

Objective: To map the terms recorded in medical records of patients with decompensated heart failure for nursing diagnoses and interventions from the NANDA International and Nursing Interventions Classification.

Method: This is an exploratory and descriptive research, carried out by a cross-mapping study. Data were collected from 107 medical records of a Hospital Institute in the city of Rio de Janeiro/Brazil, in a period between October 2017 to February 2019. The diagnoses and interventions mapped were assessed by four clinical experts. Data analysis was performed using the content validation index and the Fleiss Kappa.

Results: The most frequent nursing diagnoses were: risk for infection (74.8%), decreased cardiac output (55.1%) and excessive fluid volume (49.5%). The interventions were: vital signs monitoring (79.4%), fluid monitoring (72.9%) and positioning (52.3%).

Conclusion: The research mapped 32 titles of nursing diagnoses from NANDA-I and 21 nursing interventions from NIC. The diagnoses and interventions mapped will contribute to the quality of the nurses' records and patient safety.

Keywords: Nursing process. Nursing records. Heart failure.

RESUMO

Objetivo: Mapear os termos registrados em prontuários de pacientes com insuficiência cardíaca descompensada para diagnósticos e intervenções de enfermagem da NANDA Internacional e Classificação de Intervenções de Enfermagem.

Método: Pesquisa exploratória, descritiva, realizada através do mapeamento cruzado. Os dados foram coletados em 107 prontuários de um hospital do município do Rio de Janeiro/RJ, no período entre outubro de 2017 e fevereiro de 2019. Os diagnósticos e intervenções mapeados foram avaliados por quatro peritos. A análise dos dados foi realizada pelo índice de validação de conteúdo e o Kappa de Fleiss.

Resultados: Os diagnósticos de enfermagem mais frequentes foram: risco de infecção (74,8%), débito cardíaco diminuído (55,1%) e volume de líquidos excessivo (49,5%). As intervenções foram: monitoração de sinais vitais (79,4%), monitoração hídrica (72,9%) e posicionamento (52,3%).

Conclusão: A pesquisa mapeou 32 títulos de diagnósticos de enfermagem da NANDA-I e 21 intervenções de enfermagem da NIC. Os diagnósticos e intervenções mapeados irão contribuir para a qualidade do registro de enfermeiros e segurança do paciente.

Palavras-chave: Processo de enfermagem. Registros de enfermagem. Insuficiência cardíaca.

RESUMEN

Objetivo: Mapear los términos registrados en los registros médicos de pacientes con insuficiencia cardíaca descompensada para los diagnósticos e intervenciones de enfermería de NANDA International y la clasificación de las intervenciones de enfermería.

Método: Investigación exploratoria, descriptiva, realizada mediante mapeo cruzado. La recolección de datos se realizó en 107 historias clínicas de un hospital de la ciudad de Río de Janeiro / RJ, en el período comprendido entre octubre de 2017 y febrero de 2019. Los diagnósticos e intervenciones mapeados fueron evaluados por cuatro expertos. El análisis de los datos se realizó utilizando el índice de validación de contenido y el Kappa de Fleiss.

Resultados: Los diagnósticos de enfermería más frecuentes fueron: riesgo de infección (74,8%), disminución del gasto cardíaco (55,1%) y volumen excesivo de líquidos (49,5%). Las intervenciones mapeadas fueron: monitoreo de signos vitales (79.4%) y posicionamiento (52.3%).

Conclusión: La investigación mapeó 32 títulos de diagnóstico de enfermería NANDA-I y 21 intervenciones de enfermería NIC. Los diagnósticos y las intervenciones mapeadas contribuirán a la calidad del registro de enfermeras y la seguridad del paciente.

Palabras clave: Proceso de enfermería. Registros de enfermería. Insuficiencia cardíaca.

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INTRODUCTION

The chronic decompensated heart failure (HF) is associated with the need for immediate hospitalization due to the acute or gradual exacerbation of signs and symptoms of HF at rest, requiring immediate hospitalization due to the high risk of mortality[1]. Therefore, nurses working in cardiology hospital units must quickly recognize signs and symptoms and provide effective interventions, establishing priorities, to ensure better stability and better nursing outcomes[2].

In this context, the Resolution No. 358/2009, of the Federal Nursing Council (COFEN) considers the Nursing Care Systematization (NCS) and includes the Nursing Process (NP) as a method to achieve nursing results, with the nurse exclusively responsible for the nursing diagnosis, as well as the prescription of nursing interventions[3]. The recording of clinical decisions by the NP is essential for the care of patients with chronic decompensated HF and, when supported by standardized language systems (SLS), it enables interdisciplinary communication, facilitates quality assessment and promotes patient safety[4].

Despite this, non-standardized language has still been widely used in the records of nurses working in clinical practice. The use of these terms, although also accepted in the NP, makes it difficult to provide health information, the assessment of results and the quality of the care provided.

This problem has driven researchers, who have developed studies and methodologies that refine the terms, concepts and languages used in different areas of professional practice for SLS of nursing diagnoses, interventions, and outcomes.

From the point of view of HF, studies in Brazil have addressed SLS, especially the classification of nursing diagnoses from the NANDA International (NANDA-I), nursing interventions from the Nursing Interventions Classification (NIC) and nursing outcomes from the Nursing Outcome Classification (NOC)[5–8].

An integrative review identified the nursing diagnoses in hospitalized patients with heart failure described in the literature: decreased cardiac output (00029), excessive fluid volume (00026), activity intolerance (00094), impaired skin integrity (00046), impaired gas exchange (00030), deficient knowledge (00126), risk for falls (00155) and impaired physical mobility (00085)[5]. A cross-sectional study with 303 patients with HF identified as priority nursing diagnoses decreased cardiac output (00029) and excessive fluid volume (00026)[6]. Another study with 62 patients with HF identified the nursing diagnoses of decreased cardiac output (00029) (87.3%), activity intolerance (00094) (79.4%) and ineffective breathing pattern (00032) (38.1%)[7].

In the United States of America (USA), a study described the combinations between diagnoses, interventions, and nursing outcomes of hospitalized patients with HF. Almost 50% of the total combinations originated from the nursing diagnoses of deficient knowledge (00126), decreased cardiac output (00029), risk for impaired skin integrity (00004) and ineffective breathing pattern (00031). The combined interventions were emotional support, teaching: procedure/treatment, nutrition management, fluid monitoring, hydroelectrolytic monitoring, respiratory monitoring, cardiac care, fall prevention, infection control[8].

Validation and diagnostic accuracy studies also addressed hospitalized HF patients and discussed the NANDA-I nursing diagnoses, fatigue (00093), activity intolerance (00094), excessive fluid volume (00026), decreased cardiac output (00029) and ineffective health maintenance (00099)[2,9–12].

Despite advances in studies on nursing diagnoses and interventions in patients with decompensated HF, in clinical practice, nurses' records on NP are still described in many institutions with non-standardized language.

Therefore, further studies are needed to refine vocabulary terms related to nurses' records regarding patients with chronic decompensated HF and list diagnoses and interventions for existing SLS. This study aimed to map the terms recorded in medical records of patients with decompensated heart failure to NANDA-I nursing diagnoses and nursing interventions from the NIC Nursing Interventions Classification.

METHOD

Exploratory, descriptive research carried out through cross-mapping. It is a technique that made it possible to compare data from non-standardized languages for nursing diagnoses and interventions with the standardized languages of NANDA-I and NIC.

115 medical records of patients over 18 years old were selected who were hospitalized for chronic decompensated HF, with ICD 10 – I50.0, in the Cardiac Intensive Care Unit (CICU) of the *Instituto Nacional de Cardiologia*, in Rio de Janeiro-RJ, in the period between October 2017 and February 2019. This period was chosen due to the beginning of the implementation of the use of electronic medical records through the MV2000 software that took place in October 2017, which facilitated the mapping carried out in this study. Data were collected in the "CICU Admissions Record Book" through name, medical record number and admission date. From the 115 records selected, eight records were excluded

because they were not available for viewing. Therefore, the sample of this study consisted of 107 medical records.

The CICU receives patients with chronic decompensated HF, despite its non-emergency nature, it offers intensive support to patients with this demand from other units of the institution. It consists of 10 beds and has two teams per day (day and night). Each team has two nurses and five nursing technicians, who work on a 12-hour shift for every 60 hours of rest. In addition, three nurses are day workers in the morning.

The NP nursing records are described in non-standardized language in electronic medical records. In addition to the evolution, it is also the nurse's responsibility to manually fill in the nursing care checklist, deep venous puncture and indwelling bladder catheterization bundles, peripheral venous access control, mechanical ventilation control, management of the indwelling urinary catheter and the deep venous catheter, in addition to the Braden and Morse scales.

Data collection was conducted between May and June 2019. It was opted to collect information regarding the first 12 hours of hospitalization, characterizing the period of admission of the patient with decompensated HF to the CICU. This decision was linked to the most robust period of information in the electronic medical record about HF decompensation.

The research was divided into three stages. The first stage was related to documental research in nursing records. In this, the following data were collected from the nursing records: information on sociodemographic variables (age, gender, marital status, self-declared color, and education) and clinical variables (etiology of HF, functional class of the New York Heart Association – NYHA, comorbidities, surgeries and previous cardiac procedures, length of stay, complication on admission, medications on admission, and Simpson's ejection fraction). The nursing evolutions in full and the care prescribed by nurses were also extracted from the records. For the organization of these data, it was used an instrument elaborated by the authors, which made available for the second stage of the research concerning the cross-mapping.

The cross-mapping, the second stage, was based on the rules described by Lucena and Barros in 2005[13], which were adapted and synthesized in seven rules: 1) map the meaning of words, not just words; 2) ensure the meaning of the terms and expressions contained in the admissions records; 3) analyze the terms and expressions against the defining characteristics, related and risk factors of the diagnostic concepts; 4) use the verbs contained in the prescribed nursing care to select the NIC intervention/activity; 5) use the "keyword" in the intervention, to map the NIC intervention; 6) map the intervention from the NIC intervention label to the activity; 7) map the nursing prescriptions that use two verbs, in two different NIC interventions, when the actions are different.

To this end, all nursing evolutions and care prescribed by nurses were transcribed and read. The non-standardized terms found in these transcripts were extracted by the main researcher and recorded in the data collection instrument during the documentary research. Subsequently, these terms were organized in a database in the Microsoft Office Excel 2007 software.

Repeated terms with the same significance were excluded, such as: shortness of breath that resulted in dyspnea and hypotensive due to hypotension. Then the terms were categorized into synonym groups. Two groups were established for nursing diagnoses: procedures and clinical; and two groups for nursing interventions: monitoring and procedures. After categorizing these terms, they went through the normalization process through the analysis of combinations, being considered in partial or exact combinations.

To perform the Cross-Mapping, the 107 instruments, with the information and standardized terms, were analyzed by three researchers, authors of this study, PhDs in nursing, members of the Study Group on Nursing Care Systematization at *Universidade Federal Fluminense* (GESAE_UFF). The researchers consensually decided that the mapping of nursing diagnoses would be performed by comparing the terms with the defining characteristics or associated conditions of each NANDA-I diagnosis. In case of risk diagnoses, risk factors would be used. In the mapping of nursing interventions, this comparison was performed between NIC terms and activities. Not only the terms were mapped, but their meaning.

The third and final stage was related to the validation of the cross-mapping results by experts. In this one, the cross-mappings were sent for analysis by four expert nurses. These were invited by email and made their assessments blindly. Selection criteria were based on Fehring's criteria and adapted for adherence to the study area. The characterization of the experts and their respective scores are presented in Chart 1.

For the analysis of agreement, there was a column in the instrument for each nursing diagnosis and nursing

Characterization of the Expert	Expert 1	Expert 2	Expert 3	Expert 4
Master in Nursing (four points)	X	X	X	X
Master in Nursing with dissertation in HF or NCS (one point)	X	X	-	X
Published research on nursing diagnosis or HF (two points)	X	X	X	X
Having an article published on diagnosis in an indexed journal (three points)	X	X	X	X
Doctorate in Nursing or related areas (two points)	X	-	X	X
Clinical practice of at least 1 year in HF (2 points)	X	X	X	X
Having a specialization in cardiology (2 points)	-	-	X	X
Total Points – Fehring (1987)	13	11	14	15

Chart 1 – Characterization of the experts participating in the study. Rio de Janeiro, Rio de Janeiro, Brazil, 2019
Source: Research data, 2019.

interventions with their activities mapped. This column consisted of a four-point Likert scale, where 1- not relevant; 2- relevant with need for adjustments; 3- relevant and 4- extremely relevant[14].

The research instruments were organized and analyzed using the SPSS software (Statistical Package for the Social Sciences), version 20.0. Statistical analysis was descriptive for clinical and sociodemographic variables, expressed in frequency distributions, calculation of minimum, maximum, mean, standard deviation, median and percentile statistics.

The I-CVI (content validation index) was calculated as: number of experts with "3" or "4" responses divided by the total number of responses. The I-CVI determined as valid the nursing diagnoses that reached a CVI greater than 80%. The S-CVI/Ave was also described in the analysis, that is, all the I-CVI calculated separately from the diagnoses were summed up and divided by the number of items considered in the evaluation[14].

The degree of agreement between the evaluators was calculated using the Fleiss Kappa index (K), which can have positive or negative values. Thus, for values in which the kappa was positive, if $K = 0$, there is null agreement; $0 \leq K \leq 0.21$, there is little agreement; $0.21 \leq K \leq 0.41$, weak agreement; $0.41 \leq K \leq 0.61$, moderate agreement; $0.61 \leq K \leq 0.81$, substantial agreement; $0.81 \leq K \leq 1.0$, almost perfect agreement. If the K value was negative, the degree of disagreement was evaluated, using the same rules as above[15]. A p-value < 5% was adopted as significance level of the statistical tests.

This study was approved by the Ethics Committee of the *Hospital Universitário Antônio Pedro*, *Universidade Federal Fluminense* and the Co-Participating Institution *Instituto Nacional de Cardiologia* under Opinion number 3,324,664. The study guarantees the assumptions of Resolution 466/2012 of the National Health Council.

RESULTS

From the 107 medical records analyzed, 67.3% were in NYHA functional class IV during admission. The sociodemographic and clinical characteristics of the patients are described in Table 1.

During the mapping phase, 107 non-standardized terms were extracted from the nurses' evolution, from which eight terms repeated were excluded. From the 99 terms that were normalized, 34 were present in the mapping of the most frequent NANDA-I nursing diagnoses. Chart 2 presents the mapping of the most frequent NANDA-I nursing diagnoses: Risk for infection (00004), Decreased cardiac output (00029) and Excessive fluid volume (00026).

Nine nursing diagnoses occurred in only one patient, making statistical analysis unfeasible: Nausea (00134), Deficient fluid volume (00027), Hypothermia (00006), Risk for hypothermia (00253), Sleep deprivation (00096), Dysfunctional gastrointestinal motility (00196), Ineffective health management (00078), Constipation (00011), Imbalanced nutrition more than body requirements (00001).

In the mapping regarding nursing interventions, 60 non-standardized terms were extracted from the care prescribed by nurses, of which eight were excluded by repetition. From the 52 terms that were normalized, 47 were present in the mapping of NIC nursing interventions: Vital Signs Monitoring (6680), Invasive Hemodynamic Monitoring (4210), Respiratory Monitoring (3350), Cardiac Care: Acute (4044), Care Cardiac: Rehabilitative (4046), Pain Management (1400), Fluid Monitoring (4130), Urinary Elimination Management (0590), Medication Administration (2300), Infection Control (6540), Wound Care (3660), Intravenous Insertion (4190), Self-Care Assistance: Bathing/Hygiene (1801), Hyperglycemia Management (2120), Hypoglycemia Management (2130), Nutrition Therapy (1120), Oxygen Therapy (3320), Mechanical Ventilation Management: Non-Invasive (3302), Airway Suctioning (3160), Positioning (0840), Pressure Ulcer Prevention (3540).

During the data tabulation, it was observed that the four experts evaluated the 21 interventions (100%) as extremely relevant (CVI=1). The most frequently mapped interventions were: Vital Signs Monitoring (79.4%), Fluid Monitoring (72.9%) and Positioning (52.3%), for these the mapping had 20 terms compared to NIC activities, as shown in Chart 3.

Normalized non-standardized terms (34 terms)	Defining characteristics/ Related Factors	NANDA-I nursing diagnoses and their associated conditions
peripheral vein puncture/hemodialysis catheter/ arteriovenous fistula/central venous catheter puncture/invasive blood pressure	Change in skin integrity	**Risk for Infection** (NANDA-I Code- 00004) **(74.8%)** **Associated conditions:** Invasive procedure
tachyarrhythmia/ irregular heart rhythm/ atrial fibrillation rhythm/ weak pulse/ bradycardia	Electrocardiogram changes	**Decreased cardiac output** (NANDA-I Code- 00029) **(55.1%)** **Associated conditions**: change in preload, change in afterload, change in heart rate, change in contractility, change in heart rate, change in stroke volume.
tachycardia	Tachycardia	
decreased mvua/ wheezes/ crackles rales/ low urine output/ ascitic abdomen	Edema	
jugular distention	Jugular vein distention	
normophonetic sounds in 3 beats	Presence of 3rd heart sound (B3)	
systolic murmur	Heart murmur	
hypotension/ hypertension	Changes in blood pressure	
anxious/ agitated	Restlessness	
cough	Cough	
dyspnea	Dyspnea	
pale/cyanosis	Abnormal skin color	
sweating/cold extremities/slow capillary perfusion	Sticky skin, decreased peripheral pulses	
tiredness/fatigue	Fatigue	

Chart 2 – Cross-Mapping between non-standardized terms and the most frequent NANDA-I nursing diagnoses (ND) of patients with decompensated HF. Rio de Janeiro, Rio de Janeiro, Brazil, 2019

Normalized non-standardized terms (34 terms)	Defining characteristics/ Related Factors	NANDA-I nursing diagnoses and their associated conditions
edema/ tiredness/ jugular swelling/ ascitic abdomen	Edema, Anasarca	**Excessive fluid volume** (NANDA-I Code- 00026) **(49.5%)** **Associated conditions:** compromised regulatory mechanism.
dyspnea	Dyspnea	
wheezes/ crackles/ rales	Adventitious respiratory sounds	
Low urinary output/anuric/dyspnea/ cough	Pulmonary congestion	
palpable liver	Hepatomegaly	
normophonetic sounds in 3 beats	Presence of 3rd heart sound (B3)	
tachypnea	Change in respiratory pattern	
cough	Cough	
hemodialysis	Azotemia, Electrolyte imbalance	
hypotension/ hypertension	Change in pressure	

Chart 2 – Cont.
Source: Research data, 2019.

Table 1 – Clinical and sociodemographic characteristics of patients admitted for decompensated heart failure (N=107). Rio de Janeiro, Rio de Janeiro, Brazil, 2019

Variable	N=107
Gender*, male	57 (53.3)
Age (years) ‡	61 (53 – 72)
Marital status*, married	46 (43.0)
Education*, complete elementary school	45 (42.1)
Self-Declared Color*, brown	44 (41.1)
Etiology of HF*, idiopathic	46 (43.0)
NYHA Functional Class*, IV	72 (67.3)
Comorbidity*, Systemic Arterial Hypertension	72 (67.3)
Surgeries and previous cardiac procedures*	53 (49.5)
Length of stay (days) ‡	16 (9 – 30)
Complication on admission*, dyspnea	71 (66.4)
Medications on admission*, diuretics	72 (67.3)
Echocardiogram*, Simpson's Ejection Fraction†	31.7 (± 13.8)

Source: Research data, 2019.
Legend: * n (%), ‡ Median (quartile 25-quartile 75), † Mean± standard deviation, NYHA: New York Heart Association.

Normalized non-standard terms (20 terms)	NIC Activities	NIC Interventions
pressure monitoring/thermal curve/ vital signs monitoring*	Monitoring blood pressure, pulse, temperature, respiratory status as appropriate.	**Vital Signs Monitoring** (NIC Code – 6680)
clinical surveillance	Monitoring respiratory rate and rhythm.	
respiratory monitoring	Monitoring respiratory rate and rhythm; Monitoring pulse oximetry.	
continuous monitoring	Monitoring skin color, temperature, and moisture.	
monitor low output signal	Monitoring BP, HR, and respiratory status.	**Fluid Monitoring** (NIC Code – 4130)
fluid balance	Keep accurate record of all intake and elimination.	
monitor fluids/ record diuresis	Monitoring intake and elimination.	
fluid restriction	Monitoring serum electrolyte values.	
weigh in fasting/IBC/monitor diuresis	Administering pharmacological agents to increase urinary output as appropriate.	
positioning*	Place the patient in the prescribed therapeutic position.	**Positioning** (NIC Code – 0840)
body decompression/change of decubitus	Turn the immobilized patient every 2 hours, according to a specific routine, in the appropriate way.	
elevated headboard	Elevate the head of the bed as appropriate. Positioning to relieve dyspnea. Positioning to facilitate ventilation-perfusion when appropriate.	
use cushions	Using appropriate equipment to support limbs.	
elevate LL	Elevating affected body part when appropriate.	
*terms that showed an exact match with the intervention BP (blood pressure), HR (heart rate), IBC (indwelling bladder catheter), LL (lower limbs).		

Chart 3 – Cross-Mapping between original terms and the most frequent NIC nursing interventions of patients with decompensated HF. Rio de Janeiro, Rio de Janeiro, Brazil, 2019
Source: Research data, 2019.

Table 2 presents the results of the S-CVI analysis and the application of Fleiss' Kappa for each diagnosis. In the analysis of the S-CVI, it was found that the most frequent nursing diagnoses and with the highest agreement rates were: Risk for Infection (00004), Excessive Fluid Volume (00026) and Decreased Cardiac Output (00029). It can be observed that in addition to these, other nursing diagnoses stand out with agreement values above 80.00%, however, they were present in a very low number of patients.

Table 2 – Analysis of the S-CVI and the Fleiss Kappa on the agreement between the experts in the mapping of the NANDA-I nursing diagnoses. Rio de Janeiro, Rio de Janeiro, Brazil, 2019

NANDA-I Nursing diagnoses	N	S-CVI	Fleiss' K	Z Test	P- value
Risk for infection (00004)	80	100.00%	0.02720	0.5952	0.5517
Decreased cardiac output (00029)	59	92.37%	0.01120	0.2821	0.7778
Excessive fluid volume (00026)	53	94.81%	-0.09840	-2.1637	0.0305**
Impaired gas exchange (00030)	23	89.13%	-0.12930	-2.1232	0.0337**
Acute pain (00132)	18	84.72%	-0.07270	-1.0794	0.2804
Impaired skin integrity (00046)	17	95.59%	0.05710	0.7123	0.4763
Ineffective Breathing Pattern (00032)	15	96.67%	-0.13010	-1.3802	0.1675
Risk for shock (00205)	14	94.64%	-0.25130	-2.7242	0.0064**
Imbalanced nutrition: less than body requirements (00002)	14	76.79%	-0.01900	-0.2509	0.8019
Risk for unstable blood glucose level (00179)	10	95.00%	-0.10650	-1.0161	0.3096
Ineffective peripheral tissue perfusion (00204)	7	85.71%	-0.12180	-1.1306	0.2582
Risk for impaired skin integrity (00047)	6	83.33%	-0.07460	-0.6526	0.5140
Acute confusion (00128)	5	85.00%	-0.12280	-0.9831	0.3256
Risk for bleeding (00206)	3	83.33%	-0.09090	-0.5183	0.6042
Hypothermia (00006)	3	66.67%	-0.27660	-1.8253	0.0679
Impaired urinary elimination (00016)	3	66.67%	-0.14290	-0.8847	0.3763
Impaired physical mobility (00085)	3	66.67%	-0.20930	-1.3769	0.1685
Risk for constipation (00015)	3	66.67%	-0.19150	-1.2637	0.2063
Activity intolerance (00092)	2	100.00%	-0.14290	-0.4949	0.6207
Risk for falls (00155)	2	100.00%	0.11110	0.3849	0.7003
Obesity (00232)	2	87.50%	-0.12280	-0.5487	0.5832
Impaired spontaneous ventilation (00033)	2	75.00%	-0.25490	-1.1547	0.2482
Anxiety (00146)	2	75.00%	-0.09800	-0.4441	0.6570
Mean S-CVI/Ave 32 diagnoses	-	83.95%	-	-	-

Source: Research data, 2019.
**Diagnoses with statistically significant disagreement

The Fleiss' Kappa showed three diagnoses with significant results, which were: Risk for Shock (00205) (p=0.0064), Impaired Gas Exchange (00030) (p=0.0337) and Excessive Fluid Volume (00026) (p=0.0305), but these results do not show confidence, as the Kappa values were lower than zero, in this sense, a disagreement was considered in the application of the test. This fact can be explained by the observation that many experts chose the same answers in all or almost all patients, impairing the result of the Kappa test. The other results were not significant.

DISCUSSION

This study mapped the nursing diagnoses Risk for Infection (00004), Decreased Cardiac Output (00029) and Excessive Fluid Volume (00026) of NANDA-I and the nursing interventions Vital Signs Monitoring (6680), Fluid Monitoring (4130) and Positioning (0840) of the NIC among the most frequent in the nursing admission records of patients with decompensated heart failure from a cardiology reference hospital in the city of Rio de Janeiro, Brazil.

The nursing diagnosis present in almost all records of nurses with 100% CVI agreement was Risk for infection (00004), which is linked to the most frequent term "peripheral venipuncture". In a retrospective international study with records of 272 patients hospitalized for decompensated HF, this diagnosis was present in 10.7% of the patients[8]. However, national studies based on NANDA-I did not identify the risk for infection in patients with decompensated HF[6,7].

Data in the Brazilian literature on the diagnosis Risk for Infection in hospitalized patients are still divergent. This diagnosis was mapped with high frequency (100%) in a prospective study with adult patients hospitalized in a generalist intensive care unit[16]. However, another retrospective study with 256 medical records showed that this diagnosis was present in only 47.2% of high-complexity patients[17].

The fact that the diagnosis proved to be the most frequent in this study may be related to the sector in which the data collection was performed, since it is an intensive care unit, a place where admitted patients commonly receive many invasive procedures due to high therapeutic complexity.

Through this perspective, we can understand that patients with any underlying disease, who are hospitalized in a critical care unit, are exposed to invasive procedures, however, they are at risk of acquiring infections related to health care.

Patients with decompensated HF during hospitalization are favorable to get infections, usually these infections have a pulmonary and urinary focus. However, Mesquita (2018) states that in his clinical experience, the skin, infections in intracardiac devices and resulting from deep venous catheters represent important foci that should be sought in every patient with suspected infection[18].

In the present study, the diagnosis Risk for Infection was mapped and indicated as a priority diagnosis for patients with decompensated HF. Even though it is considered an extremely important nursing diagnosis in the field of health, this fact is fragile in relation to the specificity of HF, that is, what led to the diagnosis in question was not the HF syndrome, regardless of the underlying disease any patient admitted to intensive care units can present the diagnosis risk for infection.

When resuming the HF context, one perceives the need for a reflection on how nurses conduct clinical judgment and the care provided to this specific clientele. These are critically ill patients, who require specialized decision-making for hemodynamic stabilization and continuity of care. Thus, the need arises for the presence of trained nurses within the hospitalization units who work in the management of patients with decompensated HF, ensuring specific and effective care.

Nursing care planning, considered a care management action, happens through choices of evidence-based practice, and thus, developing care plans to implement an action. This involves a very detailed and specific assessment of patients' health conditions, in order to direct care actions[19].

However, due to the recognition of nurses' skills in care management, changes have been recommended both in the work organization and in the professional mapping of nurses, aiming to boost the resolution of people's and communities' health problems[19].

A perspective linked to the nurse's autonomy for decision-making in order to bring improvements in the patient's prognosis is advanced nursing practice, "which consists of a formal level of professional qualification, corresponding to the base of specialized knowledge, with the ability to complex decision-making, clinical skills for advanced practice in their area of expertise/specialty, whose characteristics are shaped by the context or country in which they are accredited to work"[19].

For this, they are named advanced practice nurses. These, in turn, have high levels of education, with master's and doctoral degrees in specific areas, capable of managing all actions aimed at nursing care in chronic patients who need specialized care[19].

In Brazil, the official discussion about advanced nursing practices began in November 2015 with the support of the Federal Nursing Council. This nursing model is not a reality within the hospitalization units in our country, but

they become indispensable, since patients admitted with decompensated HF need specific care and based on a clinical reasoning focused on the clinical picture of HF, in order to ensure effective improvement of their symptoms, as well as transition care to outpatient care and specialized clinics.

The nursing diagnosis Decreased Cardiac Output (DCO) (00029) also showed high agreement by the CVI and was present in more than 50% of the records, a result that corroborates other studies carried out in patients with HF.

This diagnosis is defined as the blood volume pumped by the heart inadequate to meet the metabolic demands of the body and was clinically validated in 2010 in Brazil, as well as its defining characteristics, among them the most prevalent in patients with decompensated HF: fatigue, dyspnea, and edema. Therefore, it could be a priority the clinical judgment of the patients' responses to the HF decompensation[11,20].

In a study with hospitalized patients with cardiovascular diseases, DCO is present in 56.7% of the population[20]. When, in the context of decompensated HF, it has a high prevalence, with rates that range between 50%[9].

The most frequent defining characteristics of this diagnosis in this study were Changes in the electrocardiogram, Changes in blood pressure and Edema. This result partially corroborates other studies. A study determined the three most prevalent DCO defining characteristics in hospitalized HF patients, namely: Arrhythmia (62.5%), Fatigue (61.5%), reduced left ventricular ejection fraction (56.5%)[9]. Another study presented edema as one of the six most prevalent defining characteristics based on the signs and symptoms of patients with decompensated HF[7].

An integrative review without time cut showed that the most prevalent nursing diagnoses in hospitalized patients with HF were: Decreased Cardiac Output, Excessive Fluid Volume, Activity Intolerance, Impaired Skin Integrity, Impaired Gas Exchange and Risk for Falls[5].

Although the nursing diagnosis Excessive Fluid Volume had a "discordant" Kappa value (p=0.0305), it was presented in a high number of nursing records (53) and a high level of agreement between the experts (S -CVI/Ave = 94.81%), which is why it was kept in the study.

This diagnosis is defined by NANDA-I as excessive intake and/or fluid retention. In this study, the most frequent defining characteristics were Edema (25.2%) and Dyspnea (18.7%), with the related factor Excessive fluid intake (29%), associated with the condition Impaired regulatory mechanism (22.4 %).

Excessive Fluid Volume was clinically validated in patients with decompensated HF and the defining characteristics Dyspnea and Edema were considered the main ones, corroborating the findings of the present study[20,21].

The identification of major or most defining characteristics such as dyspnea, orthopnea, edema, hepatojugular reflux, pulmonary congestion and elevated central venous pressure were the main clinical indicators for the diagnosis of excessive fluid volume. These signs and symptoms portray the manifestations most commonly presented by decompensated patients, which are mainly related to congestive conditions, with a percentage of 80.7% in patients admitted to the emergency unit[21].

Another study in patients with HF admitted to an emergency care unit identified that Excessive Fluid Volume appeared in 28.6% of the sample, related to the factors: compromised regulatory mechanisms (66.7%) and Excessive fluid intake (11.1 %), which corroborate the findings of this study[6]. However, in another international study in the same context, this diagnosis did not demonstrate prevalence(4,6%)[8].

The knowledge of the evidence mentioned above allows nurses to conduct a better investigation in the phase of data collection, in the diagnostic proposal and in the nursing planning, in a specific, accurate, logically structured, and organized way. With substantial data for the selection of the best nursing interventions.

This study also identified the terms related to nursing care provided to the aforementioned clientele,21 NIC interventions were mapped in this study, and only the interventions vital signs monitoring and positioning showed exact combinations with the mapped terms.

These NIC interventions have already been evidenced in an international study carried out in the USA with 272 patients admitted for decompensated HF[8]. In another study in patients with chronic heart failure who received home care, the nursing intervention fluid monitoring was the only one found that corroborates the present study[21]. However, it cannot be compared, as they were results from populations with different clinical characteristics. But it is extremely relevant that this intervention is present in both populations of patients with HF.

Identifying the nursing interventions most frequently used by nurses for a specific population helps to determine those that should be included in the institution's nursing information system, as well as in continuing education programs for caregivers. In addition, this information is also useful in the construction of nursing care plans, determining the costs of services and planning for the allocation of resources[8].

When the terms recorded in the nursing care prescribed by nurses were mapped, it was noted that these are similar to the activities proposed by the NIC, and are in line with the titles of the interventions mapped. In this context, although the activities proposed by the NIC are extremely important,

both for teaching and for practice relevant to the execution of a given intervention, they do not represent the essence of the classification. The titles and definitions presented in the intervention are considered the "key" for the classification, these alone are capable of allowing the nurse to put into practice relevant activities and transmit the nature of care[22].

Identifying terms referring to diagnoses and nursing interventions related to Heart Failure provides subsidies for a language about the nature of nursing practice in this specialty and demonstrates its efficiency. The identified terms allow the construction of a practice documentation; the simplification of the use of the NANDA-I Classification, the use of terminology that subsidizes the critical thinking of nurses that makes their actions visible. It will allow the development of clinical protocols aimed at the care of patients with Heart Failure independently or with the multidisciplinary team.

CONCLUSION

The present study, carried out through the clinical practice of nurses working in the intensive care unit for patients with decompensated heart failure, showed an accurate clinical judgment, well described in the nursing evolutions and mapped 32 titles of NANDA-I nursing diagnoses and 21 NIC nursing interventions, of which the Risk for Infection (00004), Decreased Cardiac Output (00029) and Excessive Fluid Volume (00026) stood out as priority diagnoses and Vital Signs Monitoring (6680), Fluid Monitoring (4130) and Positioning (0840).

With this, it is possible to include nursing diagnoses and interventions in electronic medical records of patients in cardiology units, enabling improvement in the quality of nursing records, continuity of care and evaluation of results, increasing patient safety and quality in health care.

This study used data from records previously elaborated in medical records, limiting the identification of information and variables. In addition, the Fleiss Kappa test was not sufficient for analysis due to the number of experts. Studies are suggested that can better investigate the statistical analysis and agreement with a greater number of experts.

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