Review

Nursing diagnoses of patients with heart failure: a scoping review

Diagnósticos de enfermagem de pacientes com insuficiência cardíaca: revisão de escopo
Diagnósticos de enfermería en pacientes con insuficiencia cardíaca: una revisión de alcance

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Abstract
Objective: To map the nursing diagnoses of patients with heart failure. **Methods:** A scoping review, using the Joanna Briggs Institute approach. Studies describing nursing diagnoses of patients with heart failure in health services were included. Twelve databases/directories were used to search for publications. **Results:** Forty-two nursing diagnoses were mapped in 40 studies included in the qualitative synthesis. **Conclusion:** The most researched nursing diagnoses were: decreased cardiac output; excessive fluid volume; activity intolerance; and fatigue.

Descriptors: Heart Failure; Nursing Diagnoses; Health Services**.**

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What is known about the subject?
Many studies have been carried out to identify nursing diagnoses in patients with heart failure, using a variety of methods and providing different expressions of these patients' responses to the disease and treatment.

What does the study add to the subject?
Mapping and summarizing the evidence available in the literature on the nursing diagnoses of patients with heart failure in different severities and health services around the world.

Resumo

Objetivo: *Mapear os diagnósticos de enfermagem de pacientes com Insuficiência Cardíaca.* **Métodos:** *Revisão de escopo, com abordagem do Joanna Briggs Institute. Foram incluídos estudos que descreviam diagnósticos de enfermagem de pacientes com insuficiência cardíaca em serviços de saúde. Foram utilizadas 12 bases/diretórios de dados para a busca de publicações.* **Resultados:** *Foram mapeados 42 diagnósticos de enfermagem em 40 estudos incluídos na síntese qualitativa.* **Conclusão:** *Os diagnósticos de enfermagem mais pesquisados foram: débito cardíaco diminuído; volume de líquidos excessivo; intolerância à atividade; e fadiga.*

Descritores: *Insuficiência Cardíaca; Diagnósticos de Enfermagem; Serviços de Saúde.*

Resumén

Objetivo: *Mapear los diagnósticos de enfermería de los pacientes con insuficiencia cardiaca.* **Métodos:** *Una revisión de alcance, utilizando el enfoque del Instituto Joanna Briggs. Se incluyeron los estudios que describían los diagnósticos de enfermería de pacientes con insuficiencia cardiaca en los servicios sanitarios. Se utilizaron doce bases de datos/directorios para buscar publicaciones.* **Resultados:** *Se mapearon 42 diagnósticos enfermeros en 40 estudios incluidos en la síntesis cualitativa.* Conclusión: *Los diagnósticos de enfermería más investigados fueron: disminución del gasto cardíaco; volumen excesivo de líquidos; intolerancia a la actividad; y fatiga.*

Descriptores: *Insuficiencia Cardíaca; Diagnóstico de Enfermería; Servicios de Salud.*

INTRODUCTION

Heart failure (HF) is considered a serious public health problem and, due to its multifaceted nature and association with multiple comorbidities, since 1997 it has also been considered an epidemic.(1) In 2022, more than 199,000 hospital admissions were recorded in Brazil due to HF, with a mortality rate of approximately 12.8%.(2)

In this context, many studies recommend multi-professional follow-up in specialized clinics to improve self-care and reduce hospital readmissions.(3-4) Nurses work in this scenario by carrying out nursing consultations, in which nursing diagnoses (ND) are made, which are the basis for planning interventions and achieving better results.

Standardized Language Systems (SLP) are used to standardize the ND and allow them to be documented and computerized. Researchers around the world have carried out studies on these diagnoses in order to provide a basis for quality and safe nursing care.(5-6)

One study developed a new ND focusing on self-care in patients with heart failure, through a concept and content analysis. The ND – labeled self-care deficit in heart failure – was validated with a definition, eight defining characteristics, 15 related factors and five risk populations.(5)

Another study described the priority ND for nursing care for individuals in different stages of HF in primary care using the Delphi technique. Of the 176 ND analyzed, 144 were identified as non-priorities and 32 were selected as priorities.(6)

The use of the standardized language of nursing diagnoses has been considered an important tool for clinical judgment and decision-making by nurses. Despite this, studies with different methods and proposals make it difficult for nurses working in clinical practice to understand the phenomenon as a whole. Therefore, synthesizing the knowledge produced on ND can elucidate concepts and uncover gaps in knowledge. This raises the following question: What are the defining characteristics, signs and symptoms and risk factors of ND in patients with heart failure, as identified in the scientific literature? This study aimed to map the nursing diagnoses of patients with heart failure.

METHODS

Registration Protocol

A scoping review based on the model proposed by the Joanna Briggs Institute (JBI)(7) and conducted using the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR).(8) The protocol was registered on the OSF platform (id osf-registrations-kbh45-v1), available at: https://archive.org/details/osf-registrations-kbh45-v1

Eligibility criteria

The PCC mnemonic was used, with P (Population), C (Concept) and C (Context), which for this review was: P – Heart Failure, C – Nursing Diagnosis (signs and symptoms; defining characteristics) and C – Health Services. From these elements, the Health Sciences Descriptors (DECS), Medical Subject Heading (MESH) and Emtree (Embase subject headings) were identified, in addition to the standardized

terms and their variations. Terms found in the titles, abstracts and keywords of the articles in the preliminary search were added.

Articles related to heart failure patients; adults (over 18 years old); with defining characteristics of NANDA-I nursing diagnoses (ND); methodological; observational; clinical; experimental; quasi-experimental; case-control; review and qualitative were included. Master's dissertations and doctoral theses were also included.

No specifications were set regarding language or year of publication, but only completed studies were included. Duplicate articles, studies without a clear methodology and which did not address the phenomenon of interest were excluded.

Sources of information

The searches were completed in November 2021, in the reference and gray literature databases: Latin American and Caribbean Literature in Health Sciences (LILACS), Bibliográfico Español en Ciencias (IBECS) and Nursing Database – Brazilian Bibliography (BDENF) among others from the Regional Portal of the Virtual Health Library (VHL). Also, in Pubmed and Pubmed/Medline of the National Library of Medicine (NLM); Scientific Electronic Library Online (Scielo).

The Capes Periodicals Portal used the databases Embase and Scopus (Elsevier); Web of Science (Clarivate Analytics); Cumulative Index to Nursing and Allied Health Literature (CINAHL), Academic Search Premier (ASP), Fonte Acadêmica and Open Dissertations (EBSCO). Epistemonikos was also added: Database of the best Evidence-Based Health Care, information technologies and a network of experts.

Search strategy

The search strategy was: "Heart Failure" AND "Nursing Diagnosis" AND ("Defining Characteristics" OR "Signs and Symptoms"). No terms were used for Context. The search strategy used in Pubmed is shown below: (("Heart Failure"[mh] OR Heart Failure[tiab] OR Cardiac Failure[tiab] OR Heart Decompensation[tiab] OR Myocardial Failure[tiab] OR cardiac backward failure[tiab] OR cardiac decompensation[tiab] OR cardiac incompetence[tiab] OR cardiac insufficiency[tiab] OR cardiac stand still[tiab] OR cardial decompensation[tiab] OR cardial insufficiency[tiab] OR heart insufficiency[tiab] OR decompensatio cordis[tiab] OR heart backward failure[tiab] OR heart decompensation[tiab] OR heart incompetence[tiab] OR insufficientia cardis[tiab] OR myocardial insufficiency[tiab]) AND ("Nursing Diagnosis"[mh] OR Nursing Diagnos*[tiab] OR "Nanda International"[tiab] OR "Nanda-I"[tiab] OR "NANDA I"[tiab] OR NANDA International*[tiab] OR ((Terminologies[tiab] OR diagnosi*[tiab] OR diagnose*[tiab])) AND (NANDA[tiab] OR nursing*[tiab] OR nurse*[tiab])))) AND ("Signs and Symptoms"[mh] OR "Signs and Symptoms"[tiab] OR "Symptoms and Signs"[tiab] OR Symptom*[tiab] OR Signs[tiab] OR "defining characteristic"[tiab] OR "defining characteristics"[tiab])

Selection of studies

The process of selecting the studies was presented through an explanatory flowchart containing the following topics: Identification; Eligibility; Selection; and Inclusion.

The selected studies were listed and tabulated according to authors, country, year of publication, objective, type of study/method, population, conceptual/theoretical framework and SLP used.

Data collection process

The search results were imported into the Endnote reference manager to identify duplicates and then exported to the Qatar Computing Research Institute's (QCRI) Rayyan application, which allows blind selection by the team of collaborators who can conduct the selection individually by simultaneously activating the Blind On or Blind Off buttons. The process was carried out by two collaborators and, in Rayyan, the documents were selected by title and abstract. To select the full texts, the records included were exported to an Excel spreadsheet generated from Rayyan.

Data extraction

The Excel spreadsheet with the full texts was made available on Google Drive so that two reviewers could access it together. Data extraction from the selected full texts was organized in table form, as recommended by Younas and Alli.[9]

Critique of individual sources of evidence

As this was a mapping exercise, the level of evidence of the studies included in this review was not assessed.

Synthesis of results

The data was synthesized to present a mapping of nursing diagnoses and their defining characteristics and risk factors, according to the NANDA-I domains. A weighted visual design list (word cloud) was also used to represent the most prominent terms.

RESULTS

The PRISMA-ScR flowchart (figure 01) shows the totality of the searches and the process of selecting and including studies. A total of 2048 articles were identified in the 12 databases/directories. Were excluded 737 duplicates, leaving 1311 for titles and abstracts reading. Of these, 1,250 were excluded: 513 for not meeting any of the PCC items; 41 for not meeting the Population; 689 for not meeting the Concept, and; 07 for not meeting the Context of the study. Therefore, 61 articles were read in full by the two independent reviewer. However, after reading the full text, 21 studies did not meet the PCC and were excluded. Thus, 40 articles were included for this scoping review.

Figure 1. Flowchart of evidence selection based on the PRISMA-ScR guidelines. Niterói, RJ, Brazil, 2021.
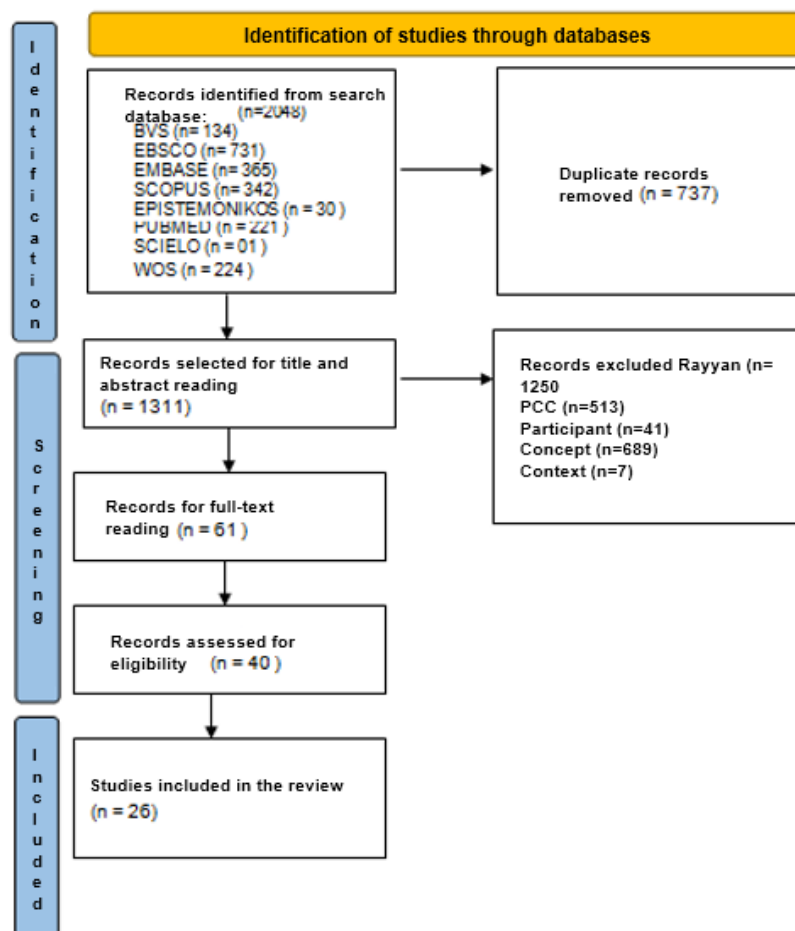
Source: Adapted by the authors.[7-8]

Of the 40 studies mapped, 16 (40%) were cross-sectional, eight (20%) methodological, six (15%) review studies, five (12.5%) longitudinal, three (7.5%) descriptive and two (5%) case studies. There was a large predominance of studies carried out in Brazil (87.5%), as well as two studies in the USA, followed by one in Colombia, one in Sweden and one in the Netherlands.

Table 01 shows the characterization of the 40 studies that met the eligibility criteria and were mapped in this review.

Table 1. Characterization of the studies mapped on nursing diagnoses of adult patients with HF. Niterói, RJ, Brazil, 2021.

Author (Year/Country)	Objective	Type of Study/ Method	Population	Classification
E1[10] Futrell, A.G. (1990/USA)	To refine the definition and DC of decreased cardiac output ND	Methodological	NA	NANDA
E2[11] Tiesinga, L. J. et al. (2001/NetherlaND)	To test the sensitivity, specificity and usefulness of the Dutch Fatigue Scale (DUFS)	Cross-sectional	N= 213 138 (HF)	DUFS
E3[12] Ekman, I. & Ehrenberg, A. (2002/Sweden)	To compare descriptions of fatigue obtained from interviews with patients with chronic HF	Cross-sectional	N=158 (HF)	NA
E4[13] Martins, Q.C.S (2010/Brazil)	Clinically validate the defining characteristics of decreased cardiac output in patients with CHF	Cross-sectional	N= 29 (HF)	NA
E5[14] Brandao, S. M. G.; et al.,(2011/Brazil)	To conduct a review of the defining characteristics of Decreased Cardiac Output	Review	NA	NA
E6[15] Martins, Q.C.S; et al.,(2011/Brazil)	Clinically validate the ND Excessive Fluid Volume in HF patients	Cross-sectional	N=32 (HF)	NANDA-I
E7[16] Aliti, G.B. et al.,(2011/Brazil)	To identify the signs and symptoms of patients admitted for HF in order to infer the priority (ND)	Cross-sectional	N=303 (HF)	NANDA-I
E8[17] Pereira, J. M. V; et al.,(2011/Brazil)	To identify the frequency of ND and DC in cardiovascular patients	Cross-sectional	N=30 (HF)	NA
E9[18] Silva, R.S. et al.,(2011/Brazil)	To describe the application of NP based on standardized terminologies	Case study	N=01 (HF)	NA
E10[19] Martins, Q.C.S. (2012/Brazil)	To elaborate the conceptual definitions of Decreased Cardiac Output ND	Methodological	NA	NA
E11[20] Matos, L.N et al.,(2012/Brazil)	To identify the prevalence of DC in individuals with HF being evaluated	Cross-sectional	N=38 (HF)	NANDA-I
E12[21] Azzolin, K. et. al.(2012/Brazil)	To select nursing diagnoses, interventions and outcomes for patients with HF	Methodological	NA	NA
E13[22] Amorim, L.E.O. et al.(2013/Brazil)	To identify the most frequently encountered nursing diagnoses in patients with HF	Cross-sectional	N=17 (HF)	NA
E14[23] Azzolin K. et al.,(2013/Brazil)	To evaluate the effectiveness of nursing interventions using nursing outcomes based on the NANDA-I ND in patients with HF	Longitudinal	N=23 (HF)	NA

E 15[24] Cavalcanti, A.C.D., et al.,(2013/Brazil)	To identify and clinically validate the DC of the anxiety in patients with HF nursing diagnosis	Cross-sectional	N=50 (HF)	NANDA-I
E16[25] Souza, V. et al.,(2014/Brazil)	To carry out consensual validation of the ND Intolerance to activity, Excessive Fluid Volume and Decreased Cardiac Output	Methodological	NA	NANDA-I
E17[26] Silva, V.A. et al.,(2014/Brazil)	Clinically validate the nursing diagnosis of sexual dysfunction in patients with HF	Methodological	N=30 (HF)	NANDA-I
E18[27] Cavalcanti, A.C.D. & Pereira, J. M. V(2014/Brazil)	To identify Brazilian and international studies on ND in HF patients	Review	NA	NA
E19[28] Souza, V. et al.(2015/Brazil)	To evaluate the clinical usefulness of the defining characteristics of NANDA-I ND	Descriptive	NA	NA
E20[29] Pereira, J. M.; et al.(2015/Brazil)	To verify accuracy in determining nursing diagnoses in patients with HF	Descriptive	NA	NANDA-I
E21[30.] Pereira, J. M.; et al.(2016/Brazil)	To identify the ND in hospitalized HF patients and verify the association between the DC	Longitudinal	N=72 (HF)	NA
E22[31] Gonçalves, L.W.P. & Pompeo, D.A (2016/Brazil)	Identify, using the Outcome Present State Test clinical reasoning model	Case study	NA	Marjory Gordon
E23[32] Galvão, P.C.C et al. (2016/Brazil)	To identify priority ND for HF patients	Cross-sectional	N=62 (HF)	NA
E24[33] Sanchez, L. Z. R.; et al. (2017/Colombia)	Clinical and construct validation of the ND in HF patients	Cross-sectional	NA	NA
E25[34] Trojahn, M. M.; et al. (2017/Brazil)	To analyze the behavior of natriuretic peptide type in the presence of ND DC	Longitudinal	NA	NANDA-I
E26[35] Silva, L.M.A.S. et al., (2017/Brazil)	To investigate the association between the ND identified in HF patients	Cross-sectional	N=100 (HF)	NA
E27[36] Souza, C.C. et al. (2017/Brazil)	Construct conceptual and operational definitions for the DC and RF of the ND of Ineffective Health Control for people with HF	Review	NA	NA
E28[37] Park, H. & Tucker, D. A. (2017/USA)	To identify the main ND with RF and signs/symptoms for patients with HF	Descriptive	NA	NANDA-I
E29[38] Ernandes, C.M. et al., (2019/Brazil)	To analyze nursing diagnostic accuracy in patients with decompensated HF	Longitudinal	N=43 (HF)	NA
E30[39] Padua, B.L.R. et al., (2019/Brazil)	To identify the NANDA-International activity intolerance ND in patients with HF	Cross-sectional	N=56 (HF)	NA
E31[40] Padua, B.L.R. et al., (2019/Brazil)	Map the ND of the NANDA International and the nursing interventions of the NIC	Methodological	N=107	NA

				(HF)	
E32[41] Silva, V.A. et al., (2019/Brazil)	To develop the Sexual Function Assessment Scale for men with HF	Methodological	NA		NA
E33[42] Costa, M.B. et al., (2019/Brazil)	To identify the most frequent NANDA-I ND in a HF clinic	Longitudinal	N=102 (HF)		NANDA-I
E34[43] Matos, L.N. et al., (2019/Brazil)	To identify the non-invasive accuracy of DC for ND Decreased cardiac output in patients with HF	Cross-sectional	N= 17 (HF)		NANDA-I
E35[44] Santos, V. B. et al. (2020/Brazil)	To identify the prevalence of ND Fatigue in HF patients and analyze the accuracy of its DC	Cross-sectional	NA		NA
E36[45] Santos, J.P.S. & Cruz, I. (2020/Brazil)	Review nursing guidelines for diagnoses and care prescriptions in patients with HF	Review	NA		NA
E37[46] Correia, D.M.S., et al. (2021/Brazil)	To estimate the prevalence of priority ND in individuals with RF for HF	Cross-sectional	N=603 (HF)		NANDA-I
E38[47] Vianna, T.A. et al., (2021/Brazil)	To analyze the main ND of Excessive Fluid Volume	Review	NA		NA
E39 [5] Sanson, G. et al., (2021/Brazil)	To develop a new ND that focuses on the self-care of HF patients	Review	NA		NANDA-I
E40[6] Correia, D.M.S., et al. (2021/Brazil)	Describe and analyze the process of selecting priority HF ND	Methodological	NA		NANDA-I

Legend: BNP - Brain natriuretic peptide; DC - Defining characteristics; DCO - Decreased Cardiac Output; ND - Nursing diagnoses; DUFS - Dutch Fatigue Scale; SFAS - Sexual Function Assessment Scale; RF - Related Factors; CHF - Congestive Heart Failure; NA - Not applicable; NOC - Nursing Outcomes Classification; NIC - Nursing Intervention Classification; OPT - Outcome Present State Test;
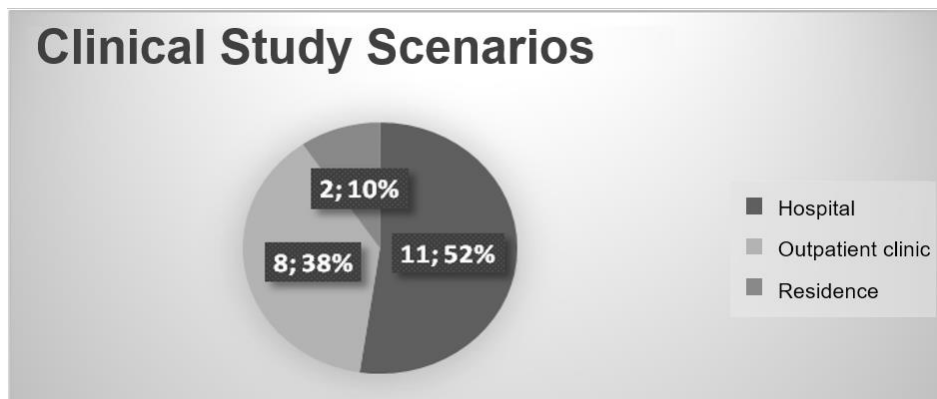**Source:** Prepared by the authors, 2021.

Figure 2 represents, from a word cloud, the frequency of citation of ND of patients with HF in the mapped studies.

**Figure 2.** Word cloud of ND of patients with HF. Niterói, RJ, Brazil, 2021.

Source: Prepared by the authors, 2023.

Figure 3 shows the characterization of the clinical study scenarios.[21]

Figure 3. Characterization of clinical study scenarios on ND of patients with HF. Niterói, RJ, Brazil, 2021.

Source: Prepared by the authors, 2023.

Figure 04 shows the number of studies per year of publication, from 1990 to 2021.

Figure 4. Characterization of the number of studies published on ND of patients with HF per year. Niterói, RJ, Brazil, 2021.
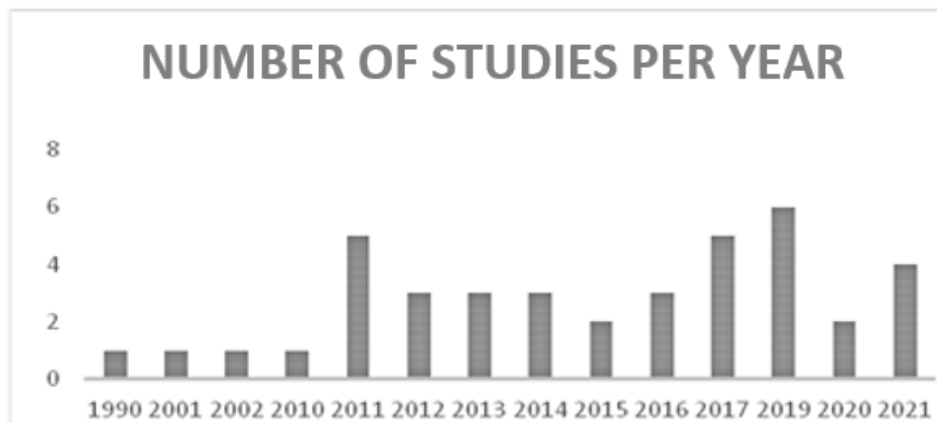
Source: Prepared by the authors, 2023.

DISCUSSION

This study mapped 42 ND of 1,892 HF patients through the qualitative synthesis of 40 studies published between 1990 and 2021. The origin of the studies was predominantly Brazilian (87.5%), with most of the research taking place in a real clinical setting (65%), from cross-sectional studies (40%), longitudinal studies (12.5%), descriptive studies (7.5%) and case studies (5%).

There has been a significant increase in studies since 2011. Of the 40 studies mapped, 36 were published in the last decade (2011-2021). The number of NP and ND study groups in Brazil has grown significantly since the 1970s, when Wanda de Aguiar Horta began her studies. Brazilian researchers are recognized worldwide and represent the country in international associations, such as the NANDA International Nursing Diagnosis Association and the European Association of Nursing Diagnoses, Interventions and Outcomes (ACENDIO). Many studies come from national and international partnerships, sandwich doctorates and post-doctorates, which have strengthened Brazilian production.

Corroborating this statement, a recent study characterized the development of research on ND in postgraduate nursing programs in Brazil. A total of 216 dissertations and theses were analyzed, most of which used the NANDA-I classification.[48] Also, considering the large number of Brazilian studies, it was found that, according to the Directory of Research Groups of the National Council for Scientific and Technological Development (CNPq), seven study groups on ND were registered in 2022.

The high prevalence of descriptive exploratory and observational studies demonstrates the pursuit by researchers for methods that allow patients to truly represent the population being cared for, observing the causes of nursing diagnoses and their defining characteristics in real clinical environments. Thus, information collected directly from patients during their health care journey ensures that the ND analyzed

reflect the responses of patients with HF to their health problem. The hospital environment was used in (52%) of the observational studies.

Methodological, concept analysis and validation studies also provided solid and reliable results for this evidence synthesis. Of the studies mapped, only two were based on theoretical references; this fact was also noticed in a Brazilian study carried out in 2019, which set out to characterize studies on ND.[49]

The ND most cited in the studies were: Decreased cardiac output; Excessive fluid volume (15); Activity intolerance (12); and Fatigue (11).[22] These are found in most patients hospitalized due to clinical decompensation of HF, thus obtaining a diagnostic triad that facilitates and directs the planning of interventions to achieve health outcomes that are related to hemodynamic compensation through interventions focused on fluid and sodium control to reduce congestion.[50-51]

Heart failure guidelines and consensuses[52-54] have confirmed the prevalence of signs and symptoms similar to these ND in patients with HF. This is because most of the diseases that lead to HF present with decreased cardiac output at rest or on exertion. However, it should be noted that some high output clinical situations can also lead to HF, such as thyrotoxicosis, anemia, arteriovenous fistulas and beriberi.[52] However, it is important to stress that there are patients who have both systolic and diastolic dysfunction.

To assess the severity of symptoms, the HF guidelines and consensus[52-54] point to exercise tolerance. Therefore, the Activity Intolerance ND and the Fatigue ND represent a judgment on the severity of symptoms in patients with HF and should be considered essential in the clinical assessment of these patients. Many studies have pointed out this importance and the factors associated with functional capacity and activity tolerance in HF patients, highlighting the need to better elucidate these research phenomena.

Excessive fluid volume, another frequently researched ND,[6,15-16,22,25,28,32,34,37,42,47] is related to the complexity of HF, which is linked to altered cardiac function, with signs and symptoms of low output and/or pulmonary or systemic congestion, at rest or on exertion. In chronic patients being monitored on an outpatient basis, congestion may be absent due to an adaptive process. However, signs such as a third heart sound or orthopnea can be indicative of such ND.

The ND mapped in this study are increasingly close to the reality found in real-life HF patients and highlight the importance of a detailed clinical assessment of these patients in order to identify abnormal responses that may indicate the presence of ND of decreased cardiac output, severity of symptoms and pulmonary or systemic congestion in these patients.

This study is relevant to both the academic sphere and nursing professionals, since knowing the main ND of patients with HF makes it possible to plan more assertive care, aimed at solving the real problem the patient has.

Therefore, the main limitation was the small number of articles found that addressed both the ND and their respective DC/RF, thus reducing the plurality of ND of patients with HF. It is understood that there is a need to publish new studies on this subject.

CONCLUSION

This study mapped 42 ND of HF patients from studies conducted between 1990 and 2021. The ND "Decreased Cardiac Output", "Excessive Fluid Volume" and "Activity Intolerance", as well as "Fatigue", were frequently cited and widely discussed, being identified as ND present in compensated and decompensated HF conditions of varying severity.

The synthesis of the studies presented in this scoping review contributes to nursing education by enabling the construction and discussion of clinical cases based on evidence, as well as providing a basis for the development of simulation scenarios for training in diagnostic reasoning.

For nurses working in clinical practice, this study has strong implications for the validation of information collected in interviews and physical examination, facilitating the inference of diagnostic hypotheses through critical thinking.

Finally, for nursing researchers in the area of technology and innovation in the Nursing Process, it provides a conceptual basis for the development of products and processes for patients with HF.

CONTRIBUITIONS

Contributed to the conception or design of the study/research: Borges AS, Jardim PP, Cavalcanti ACD. Contributed to data collection: Borges AS, Jardim PP, Cavalcanti ACD. Contributed to the analysis and/or interpretation of data: Borges AS, Jardim PP, Cavalcanti ACD. Contributed to article writing or

critical review: Borges AS, Jardim PP, Cavalcanti ACD. Final approval of the version to be published: Borges AS, Jardim PP, Cavalcanti ACD.

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