

Applicability of nursing outcomes in patients with heart failure and fluid volume excessive



Aplicabilidade dos resultados de enfermagem em pacientes com insuficiência cardíaca e volume de líquidos excessivo
Aplicabilidad de los resultados de enfermería en pacientes con insuficiencia cardíaca y exceso de volumen de líquidos

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ABSTRACT

Objective: The purpose of this study was to test the clinical applicability of the Nursing Outcomes Classification in patients with decompensated heart failure and the nursing diagnosis of fluid volume excess.

Methods: This is a longitudinal study conducted in two stages at a university hospital, in 2013. During the first stage the consensus of experts was used to select the nursing outcomes and the indicators related to diagnosing fluid volume excess. The longitudinal study was conducted in the second stage to clinically evaluate the patients using the instrument containing the results and indicators produced in the consensus.

Results: A total of 17 patients were assessed. The nursing outcomes were measured during the clinical evaluation by analysing their indicators. The scores increased in six of the results, in comparison with the average results of the first and last assessment. The Nursing Outcomes Classification during medical practice revealed a clinical improvement among the patient who were admitted following decompensated heart failure.

Conclusion: The Nursing Outcomes Classification managed to detect changes in the clinical status of patients.

Keywords: Nursing diagnosis. Nursing process. Heart failure. Signs and symptoms, classification.

RESUMO

Objetivo: Testar a aplicabilidade clínica da *Nursing Outcomes Classification* em pacientes com insuficiência cardíaca descompensada e Diagnóstico de Enfermagem Volume de Líquidos Excessivo.

Métodos: Estudo longitudinal conduzido em duas etapas em um hospital universitário no ano de 2013. Na primeira etapa, utilizou-se a validação por consenso de especialistas para selecionar os resultados de enfermagem e os indicadores relacionados ao diagnóstico de enfermagem; na segunda, foi realizado um estudo longitudinal para avaliação clínica dos pacientes, utilizando-se o instrumento contendo os resultados e indicadores produzidos no consenso.

Resultados: Foram realizadas avaliações em 17 pacientes. Na avaliação clínica, mensuraram-se os resultados de enfermagem através da avaliação de seus indicadores. Seis resultados apresentaram aumento nos escores, quando comparados às médias da primeira e da última avaliação. A utilização da *Nursing Outcomes Classification* na prática clínica demonstrou melhora dos pacientes internados por insuficiência cardíaca descompensada.

Conclusão: A *Nursing Outcomes Classification* foi sensível às alterações no quadro clínico dos pacientes.

Palavras-chave: Diagnóstico de enfermagem. Insuficiência cardíaca. Sinais e sintomas, classificação.

RESUMEN

Objetivo: Testar la aplicabilidad clínica de la *Nursing Outcomes Classification* en pacientes con insuficiencia cardíaca descompensada y Diagnóstico de Enfermería Volumen de Líquidos Excesivo.

Método: Estudio longitudinal, realizado en dos etapas, en un hospital universitario, en 2013. En la primera etapa se utilizó la validación por consenso de especialistas para seleccionar los resultados de enfermería y los indicadores relaciones al diagnóstico de enfermería; en la segunda fue realizado un estudio longitudinal para evaluación clínica de los pacientes, utilizándose el instrumento que contiene los resultados y los indicadores producto del consenso.

Resultados: Fueron realizadas evaluaciones en 17 pacientes. Durante la evaluación clínica se midieron los resultados de enfermería a través de la evaluación de sus indicadores. Seis resultados mostraron un aumento en las puntuaciones, cuando se comparó las medias de los resultados de la primera y última evaluación. La utilización de la *Nursing Outcomes Classification* en la práctica clínica fue capaz de demostrar mejoría clínica de los pacientes internados por insuficiencia cardíaca descompensada.

Conclusión: La Clasificación de Resultados de Enfermería fue sensible a las alteraciones en el cuadro clínicos de los pacientes.

Palabras clave: Diagnóstico de enfermería. Proceso de Enfermería. Insuficiencia cardíaca. Signos y síntomas, clasificación.

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■ INTRODUCTION

Heart failure (HF) is a clinical syndrome characterised by a set of signs and symptoms of systemic and pulmonary congestion⁽¹⁾. The clinical manifestations often presented by 80.7% of patients admitted to emergency units are chiefly related to congestive conditions⁽²⁾. Corroborating this data, signs and symptoms of congestion such as dyspnoea, DPN, fatigue and oedema were also observed in a study that identified the main clinical manifestations among patients admitted for episodes of decompensated HF⁽³⁾. These findings make the clinical examination, which is the first step of the nursing process, the most important aspect when making clinical decisions to manage congestion⁽⁴⁾.

In literature there is a predominance of North American publications with many works carried out using the taxonomies NANDA-International (NANDA-I), Nursing Interventions Classification (NIC) and Nursing Outcome Classification (NOC), although half of the studies that address NOC target its clinical applicability⁽⁵⁾. This gap in the knowledge of NOC results causes concern and directly affects the last stage of the nursing process since it prevents nurses from previously establishing which outcomes can be measured during the clinical follow-up of these patients.

Studies on the applicability of nursing outcomes in clinical practice are in the early stages, especially in relation to decompensated HF (DHF). This study is important because it tests the applicability of the NOC in the clinical practice of patients with decompensated HF (DHF) and the nursing diagnosis of fluid volume excess (FVE). Identifying the outcomes that can be applied to the clinical practice of this diagnosis will help nurses determine the outcomes that can be assessed in this context. Therefore, the aim of this paper was to test the applicability of the Nursing Outcome Classification in patient with decompensated heart failure and the diagnosis of fluid volume excess.

■ METHODS

This study was conducted in two stages at a hospital in southern Brazil, in 2013. In the first step, validation based on the consensus of experts, was used to select the nursing outcomes and the indicators related to the FVE diagnosis⁽⁶⁻⁷⁾. This method is recommended to establish connections between the taxonomies of nursing and to establish standards of practice⁽⁸⁾. The second stage consisted of a prospective longitudinal study for the daily monitoring of patients with an FVE diagnosis using the instrument containing the results and indicators produced by consensus. The nurse and researcher of this study and a nurse who

specialises in HF performed the clinical evaluation of patients to verify the applicability of outcomes for the studied diagnosis. The study protocol proposed during the consensus included six suggested outcomes and three additional associated outcomes, namely: Renal function, Water balance (0601), Cardiopulmonary status (0414), Respiratory status (0415), Vital signs (0802), Severe fluid overload (0603); Acceptance behaviour: Prescribed diet (1622), Knowledge: control of congestive heart failure (1835), and Electrolyte and acid-base balance (0601). The outcomes selected by consensus were mostly located in the domain physiological health, with the exception of the outcomes Acceptance behaviour: Prescribed diet (1622), and Knowledge: control of congestive heart failure (1835), which belonged to the domain Knowledge and Health behaviour⁽⁷⁾. With regard to the indicators for the outcomes of the diagnosis FVE, 28 indicators of the suggested outcomes and 10 indicators of the associated additional outcomes were considered applicable in clinical practice.

In the first stage of the study, 18 NOC outcomes were selected for the FVE diagnosis⁽⁶⁻⁷⁾. After the selection, an instrument was built with the chosen nursing outcomes and their respective indicators to validate the consensus among the six experts⁽⁸⁾. After the two consensus meetings, the absolute frequencies of approval for each outcome and indicators were computed. The results and indicators that reached a consensus of 80 to 100% were considered validated, as established in a previous study that used a similar methodology⁽⁹⁾. After obtaining this final consensus, a second instrument containing the nursing outcomes and the indicators selected by the experts was prepared for clinical practice. The indicators that compose each result were assessed using four scales of the five-point Likert scale, ranging from serious deviation of the normal variation to no deviation from the normal variation; from seriously compromised to not compromised; from never demonstrated to consistently demonstrated; and from no knowledge to broad knowledge. For all four scales, "one" corresponded to the worse score and "five" to the best score⁽⁷⁾.

The second stage began with the selection of patients for the study. In this step, the patients admitted to the emergency sectors and clinical inpatient units were systemically monitored by the research team in order to assess the nursing outcomes for the studied diagnosis. To guarantee that the instrument was evenly applied, an assessment process of these results and their respective indicators was created and tested in the pilot study. The applicability of the outcomes for the FVE diagnosis was simultaneously and independently verified by two nurses who specialise in HF by

means of daily clinical assessment for seven days or until hospital discharge. The decision to monitor the patients for seven days was based on the time that patients with DHF take to reach clinical stability free from congestion⁽¹⁰⁾. The result titled Knowledge: control of decompensated heart failure (1835), depends on the apprehension of the information provided to the patients by the nursing team and was consequently assessed only on the first, third and sixth day of monitoring. After the clinical assessments, the prescription and presence of the FVE diagnosis were reviewed. Subsequently, the decision to maintain the diagnosis for the patients was notified by the care nurse. Weight, water intake control and low-sodium diet were checked every day in the nursing or medical prescription for all the patients of this study.

The patients observed in this study were admitted with the medical diagnosis of HF, class III and IV, according to the classification of the New York Heart Association (NYHA)⁽¹⁾; of any aetiology; with FVE established in the patient records. All the patients were included within 24 hours of the established FVE diagnosis. Patients with acute or acute chronic kidney failure, cardiorenal syndrome, and patients with communication barriers or difficulty understanding the informed consent statement were excluded from the study.

The sample calculation was estimated for the outcome of the improved NOC score, after 10 patients were included in a pilot study to observe the variation of indicators that make up the NOC outcomes for the studied diagnosis. Considering a difference of one point in the functional class of the admitted patients, according to the NYHA contemplated as a NOC indicator, with power of 95% and a 5% alpha type error, 17 patients had to be included in the study.

The project was approved by the ethics committee of the Hospital de Clínicas de Porto Alegre under protocol number 11-0091/20224. The patients read and signed an informed consent statement before participating in the study.

The analysis of the data produced by expert consensus observed the agreement criteria of 80 to 100% for selecting the nursing outcomes for the FVE diagnosis. The Statistical Package for Social Sciences version 17.0 was used for other analyses. The continuous variables were described as mean and standard deviation or median, and as interquartile range for those without normal distribution. Categorical variables were described as absolute numbers and relative frequencies. The Generalised Estimation Equations (GEE) model was used to compare the averages of the NOC outcomes and indicators. The Pearson correlation coefficient

was used to evaluate the correlation between the nurses who conducted the clinical assessment. A two-sided $P < 0.05$ was considered statistically significant. The paired t-test was used to compare the indicator scores of the first and last day of assessment.

■ RESULTS

A total of 93 patients with decompensated HF were assessed. Of these patients, 22 were excluded for HF decompensation due to low output without congestion, 32 presented congestion but did not have an established FVE diagnosis, and 22 were excluded for other reasons connected to the eligibility criteria of the study. At the end, 113 assessments were performed on 17 patients. The sample was constituted predominantly by male patients ($n = 13$; 76.5%), white ($n = 12$; 70.6%), with an average age of 60.5 (± 13.6). The most prevalent aetiology of HF was the ischaemic ($n = 8$; 47.1%) and the average ejection fraction of the left ventricle was 27.1 (± 12.4). In relation to the established diagnosis, the diagnosis of 17 patients was maintained until the end of the assessment. Of all patients, 11 (64.7%) were evaluated during the maximum monitoring period of seven days (Table 1).

Table 1 – Sociodemographic and clinical characteristics of patients with decompensated heart failure, Porto Alegre, RS 2013

Variable	Total n = 17
Age, years*	60.5 (± 13.6)
Sex, male[†]	13 (76.5)
Does not live alone[‡]	16 (94.1)
Family income in minimum wages[‡]	2 (1-3)
Schooling, years*	6.0 (± 2.7)
Ethnicity/Race, white[†]	12 (70.6)
Aetiology, ischaemic[†]	8 (47.1)
Left ventricular ejection fraction (%)	27.1 (± 12.4)
Comorbidities	
Diabetes [†]	8 (47.1)
Family history of ischaemic cardiopathy [†]	8 (47.1)
Smoking [†]	5 (29.4)
Systemic arterial hypertension [†]	4 (23.5)
Alcoholism [†]	4 (23.5)
Evaluation time, 7 days	11 (64.7)

Source: Research data

*Average \pm standard deviation; [†] n (%); [‡] median (25-75 percentiles).

Table 2 – Average results of the nursing domain Physiological Health for patients with decompensated heart failure. Porto Alegre, RS 2013

Nursing Outcomes	1 st D	2 nd D	3 rd D	4 th D	5 th D	6 th D	7 th D
Water Balance (0601)*	3.40 (± 0.51)	3.65 (± 0.9)	3.94 (± 0.50)	3.98 (± 0.47)	4.14 (± 0.40)	4.26 (± 0.37)	4.23 (± 0.34)
Cardiopulmonary Status (0414)*	2.20 (± 0.68)	2.47 (± 0.66)	2.70 (± 0.56)	2.69 (± 0.55)	2.71 (± 0.68)	2.86 (± 0.52)	3.15 (± 0.46)
Respiratory Status (0415)*	3.67 (± 0.35)	3.59 (± 0.34)	3.70 (± 0.39)	3.73 (± 0.38)	3.73 (± 0.34)	3.78 (± 0.34)	3.84 (± 0.32)
Vital Signs (0802)*	4.15 (± 1.06)	4.18 (± 1.01)	4.15 (± 1.06)	4.03 (± 1.00)	4.00 (± 1.12)	3.96 (± 1.08)	3.92 (± 1.04)
Severe Fluid Overload (0603)*	3.78 (± 0.55)	3.80 (± 0.51)	3.85 (± 0.62)	3.96 (± 0.73)	4.16 (± 0.61)	4.20 (± 0.58)	4.32 (± 0.58)
Electrolyte and Acid-base Balance (0600)*	4.79 (± 0.25)	4.87 (± 0.23)	4.65 (± 0.41)	4.75 (± 0.35)	4.56 (± 0.41)	4.83 (± 0.35)	4.87 (± 0.25)

Source: Research data.

* Numbers expressed in average (± standard deviation). Results followed by the codes suggested by NOC taxonomy.

Table 3 – Average results of the nursing domain Knowledge and Health Behaviour for patients with decompensated heart failure. Porto Alegre, RS 2013

Nursing Outcomes	1 st D	2 nd D	3 rd D	4 th D	5 th D	6 th D	7 th D
Acceptance behaviour: prescribed diet (1622)*	4.59 (± 0.62)	4.62 (± 0.52)	4.85 (± 0.29)	4.80 (± 0.37)	4.90 (± 0.21)	4.89 (± 0.21)	4.88 (± 0.22)
Knowledge: control of congestive heart failure (1835)*	2.73 (± 1.09)	-	3.06 (± 1.13)	-	-	3.55 (± 0.88)	-

Source: Research data.

* Numbers expressed in average (± standard deviation). Results followed by the codes suggested by NOC taxonomy.

Averages of the Nursing Outcomes of the Domains Physiological Health and Interventions

In relation to the averages of the daily clinical assessments during the study period for the nursing outcomes in the domain Physiological Health, severe fluid overload (0603) showed the most progressive daily improvement, going from 3.78 ± 0.55 on the first day to 4.32 ± 0.58 on the seventh day (P = 0.002), or from moderately compromised to slightly compromised. The average of the outcome Electrolyte balance and acid-base balance (0600) also improved in comparison with the first and last evaluation, from 4.79 ± 0.25 on the first day to 4.87 ± 0.25 on the last day of the

assessment. In relation to the Likert scale, the patients remained steady at slight deviation of the normal variation, when comparing the first and last assessments. Data is presented in Table 2. In this investigation the activities related to this intervention were also included in the nursing prescriptions. Weight control was prescribed for 88.2% of the sample, while water control and low-sodium diet were prescribed for 35.3% and 29.4% of the sample, respectively.

Averages of the Nursing Outcomes of the Domain Knowledge and Health Behaviour

In relation to the domain Knowledge and Health Behaviour, the average of the nursing outcome Knowledge:

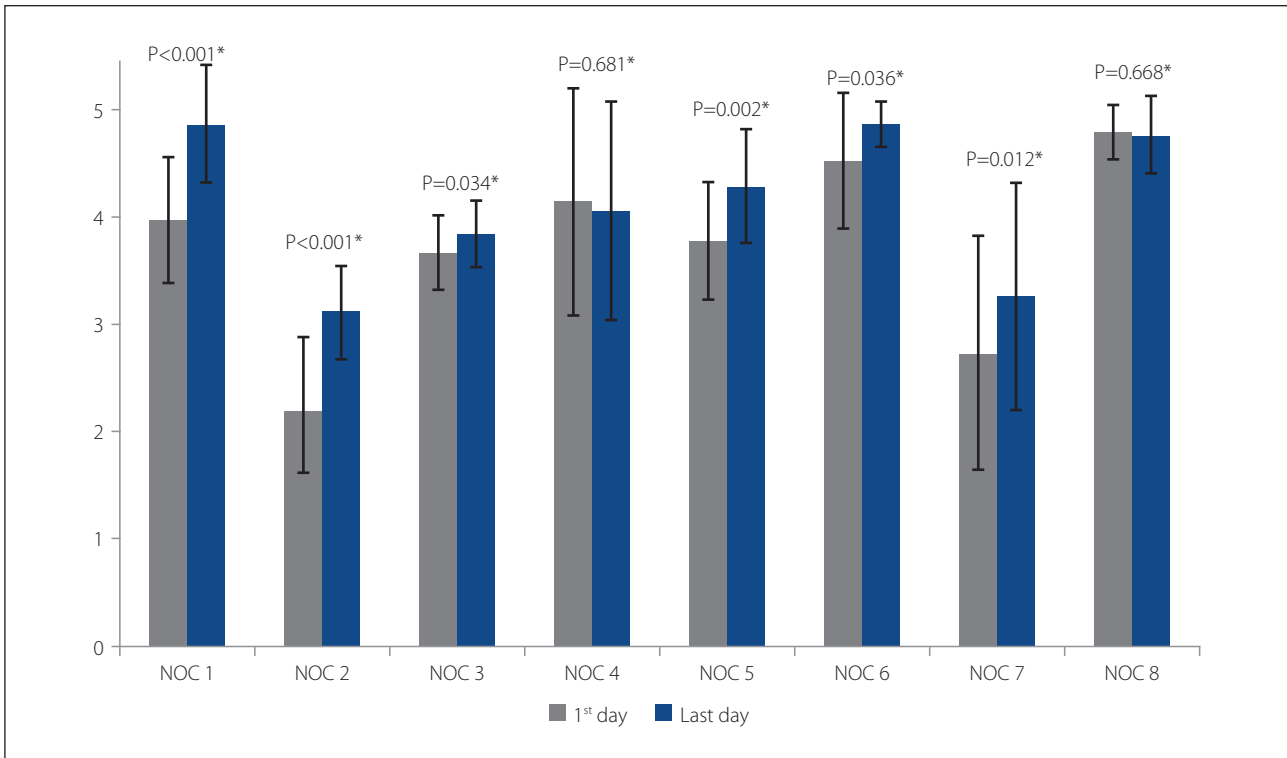


Figure 1 – Average of the nursing outcomes on the first and last day of evaluation.

Source: Research data.
* Paired t-test.

control of decompensated heart failure obtained the best progressive improvement of the daily averages, and passed from limited knowledge to moderate knowledge of heart failure. These data are found in Table 3.

Averages of the Nursing Outcomes on the First and Last Day of Evaluation

Figure 1 contains the averages of the indicators that made up each of the nursing outcomes on the first and last day of evaluation. When comparing the first and last day, the average of the patients improved in six nursing outcomes, namely: Water balance (NOC1), Cardiopulmonary status (NOC2), Respiratory status (NOC3), Severe fluid overload (NOC 5), Acceptance behaviour: prescribed diet (NOC 6), and Knowledge: control of congestive heart failure (NOC7).

DISCUSSION

This is the first study conducted in an actual clinical scenario to test the applicability of the NOC in patients with decompensated HF admitted for congestion and with a diagnosis of FVE.

Validation by consensus enabled the determination of results and indicators that could be evaluated in this clinical scenario. The consensus of experts to define results that can be measured in a practical context make the study more feasible. Of the eight results validated by expert consensus, six showed a significant improvement from the beginning to the end of the assessment period, indicating that the experts actually contributed to its refinement. In a previous study, the prior validation by expert consensus also proved to be a fundamental step that precedes the application of a theoretical classification in a practice scenario⁽¹¹⁾.

Eight nursing outcomes were validated, and 38 indicators related to studied diagnosis were evaluated and measured daily in all patients. The indicators that make up these eight outcomes include dyspnoea, DPN, fatigue, oedema, orthopnoea and jugular venous distension. These common clinical manifestations can be monitored during the clinical evaluation in the actual environment, and they were confirmed in patients with decompensated HF for congestive conditions^(3, 12).

The average of the nursing outcomes for the domain Physiological Health, with the exception of the outcome

Vital Signs, increased when comparing the first and last assessments. The daily average of the outcomes Water balance (0601) and Severe fluid overload (0603) showed a progressive improvement. The improved average score of the nursing outcomes is also related to the effectiveness of the interventions prescribed to the patients. Studies that evaluated nursing interventions related to the diagnosis of FVE showed that water monitoring, which includes activities regarding weight control, water and salt intake restriction – indicators that were assessed in this study – were effective for patients with this diagnosis^(9,13). In this investigation the activities related to this intervention were also included in the nursing prescriptions. Weight control was prescribed for 88.2% of the sample, and guidelines related to water and salt intake restrictions were prescribed for 35.3% and 29.4% of the patients, respectively. These findings suggest that these activities helped improve the scores of the expected outcomes for the study patients.

The indicators in the outcome Water balance (0601) include stable body weight, estimated central venous pressure, and jugular stasis. In the context of HF, although considered a secondary defining characteristic⁽¹⁴⁾, body weight or weight fluctuation are relevant and excellent indicative signs of congestion, and help to monitor and adjust the diuretic and vasodilator therapy of patients admitted with DHF⁽¹⁵⁾. A study that evaluated the relationship between weight change among patient with HF and the risk of hospitalisation showed that weight gain is associated with hospitalisation⁽¹⁶⁾. These findings show that daily information on body weight is important to monitor the level of congestion and identify a critical period of risk for hospitalisation. Data show that a gain of one to two kilos in a short period can indicate water retention⁽¹⁷⁾ and worsen the congestive state, which can trigger other symptoms, such as dyspnoea and fatigue, which are indicative of DHF. In the context of hospitalisation, daily weight monitoring is important to encourage patients to incorporate an easily benchmarked parameter and an important indicator of congestion in their daily lives.

The nursing outcome indicators Water balance (0601) that could not be evaluated on a daily bases are total water balance (TWB) and haematocrit. These indicators could not be assessed on a daily basis due to the absence of data in the patient records and the lack of daily haematocrit requests. As for TWB, a study that evaluated the prescription and realisation of this care for patients admitted with DHF showed that only 54% of the prescribed TWB were effectively carried out. These data demonstrate that the healthcare team is still unaware of the relevance and benefits of implementing these measures when monitoring patients^(12,15).

Consequently, these indicators were not part of the final score of this nursing outcome, which suggests that the inclusion of indicators that depend on daily laboratory results or the prescription of non-pharmaceutical measures that are not part of the daily practice is impracticable. However, if the prior definition of the measurement of similar indicators is planned by the care team, these indicators can be applied on programmed test days or the team can choose other measures.

The nursing outcome Cardiopulmonary status (0414) of the first day of evaluation showed a significant improvement ($P < 0.001$) in comparison with the last day of evaluation. An important indicator selected for this outcome, denominated fatigue, evaluated the functional class of patients using the NYHA classification, which categorises patients based on the intensity of the presented symptoms by stratifying the degree of limitation for daily activities¹. The isolated assessment of this indicator showed an improvement of one point in the functional class of patients, from Class III to Class II or from severe limitation to slight limitation of physical activity. This indicator went from scoring “moderately committed” to “mildly compromised”, with a significant increase between the initial and final evaluation ($P < 0.001$).

In spite of the significant improvement when comparing the average of the first and last day of assessment, the nursing outcome Cardiopulmonary state (0414), composed of five indicators selected by consensus, has two indicators that are considered applicable to the clinical setting in which the study was carried out, namely urine output and pulmonary oedema – the latter of which was evaluated by means of x-rays. Similarly to the indicators of the outcome Water balance (0601), the latter was not applicable since patients do this test on a daily basis. TWB and urine output were not applicable indicators given the absence of daily data for these controls. Although studies stress the importance of this care for patients with DHF, research that assesses the prescription and control of urine output show that this care is rarely included in the prescriptions and it is rarely executed among hospitalised patients with DHF^(12,15). The assumption of the healthcare team that congestive states are the main cause of decompensated HF and that the daily monitoring of blood volume (weight control, diuresis and water balance) is a parameter that guides treatment and must be effectively carried out are considered irrefutable.

In the outcome Severe fluid overload (0603), hand oedema, periorbital oedema, peripheral oedema, sacral oedema, ascites and rales are some of the indicators selected for this outcome. Although all these indicators were liable

to daily clinical evaluations, periorbital oedema, hand oedema, sacral oedema, and ascites were difficult indicators to classify in five grade levels, which certainly contributes to the subjectivity of monitoring.

In this study, the patients presented a progressive improvement for the indicator oedema, which shows the importance of thorough evaluations of this and other signs of congestion that may support nursing interventions. Results of a study that clinically validated the CD of the diagnosis of FVE classified oedema as the greatest CD for this diagnosis⁽¹³⁾. This sign is relevant in clinical assessments and it is identified in 63.7% of patients hospitalised for decompensated HF⁽³⁾. The presence of peripheral oedema in patients with systolic HF helps define different levels of pressure in the right atrium and can stratify patients according to prognosis of the disease⁽³⁾.

Regarding the domain Knowledge and Health behaviour, defined as "results that describe attitudes, understanding and actions"⁽⁷⁾, the following two results were selected by consensus: Acceptance behaviour: prescribed diet (1622) and Knowledge: control of heart failure (1835).

In this domain, the average result of the outcome Knowledge: control of heart failure, showed a progressive improvement and a significance difference was detected between the averages ($P = 0.012$) of the first and last assessments.

Unlike other nursing outcomes evaluated in this study, this was evaluated in the first, third and sixth day of evaluation since it corresponded to an outcome that depends on the patient understanding of the provided information on HF, its signs and symptoms, and its treatment by the health-care team. A study that evaluated the guidelines provided to patients during admission for DHF, with and without reinforcement through telephone contact, showed positive results for the outcome Knowledge of disease and self care for all patients receiving guidelines during the hospital stay, regardless of telephone contact⁽¹⁸⁾.

Although the daily averages did not show a satisfactory progressive improvement, the averages of the NOC Acceptance behaviour: prescribed diet (1622) did improve when comparing the first and last day of evaluation ($P=0.036$). This result, defined as "actions for the intake of food and liquid recommended by health professionals for a specific health condition"⁽⁷⁾, included two indicators in which the provided guidelines were related and specifically addressed water and sodium intake restrictions.

The findings of this study made it possible to test the clinical applicability of the NOC in a real environment. The prior definition by expert consensus of the outcomes and indicators is a critical step that precedes studies conducted in a clinical setting.

Limitations

The limitation of this study was the difficulty in establishing some of the indicators of the validated outcomes in a five-level scale. Similarly, in this scenario, some indicators could not be assessed on a daily basis, which might not be the case in another scenario.

CONCLUSIONS

Of the eight evaluated nursing outcomes, six showed improvements in the basal and final comparison, namely, Water balance (0601), Cardiopulmonary status (0414), Respiratory status (0415), Severe fluid overload (0603), Acceptance behaviour: prescribed diet (1622), and Knowledge: control of congestive heart failure (1835). There was also a progressive improvement of the daily average of the outcomes Water balance (0601), Severe fluid overload, and Knowledge: control of heart failure (0603). These findings show the feasibility of the clinical applicability of the nursing outcomes evaluated in patients with DHF admitted for congestive conditions and a diagnosis of FVE. However, further studies on this subject are required to compare other findings with the findings of this investigation.

Implications for clinical practice, teaching and research

This study demonstrates the feasibility of the application of a predominantly theoretical classification in a real environment. This shows the importance of teaching taxonomies in the nursing process. This set of information allows the organisation of critical thinking and diagnostic reasoning. The comparison of these findings with future studies will allow the refinement of this taxonomy in real clinical scenarios.

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