



DEFINING CHARACTERISTICS OF THE NURSING DIAGNOSIS DECREASED CARDIAC OUTPUT: INTEGRATIVE REVIEW

CARACTERÍSTICAS DEFINIDORAS DO DIAGNÓSTICO DE ENFERMAGEM DÉBITO CARDÍACO DIMINUÍDO: REVISÃO INTEGRATIVA

CARACTERÍSTICAS DEFINITORIAS DEL DIAGNÓSTICO DE ENFERMERÍA BAJO GASTO CARDIACO: REVISIÓN INTEGRADORA

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ABSTRACT

Objective: to analyze the main defining characteristics of the nursing diagnosis Decreased Cardiac Output (DCO). **Method:** this is a descriptive study based on the guiding question << *What are the most commonly used defining characteristics for the nursing diagnosis Decreased Cardiac Output?*>>, without time limitation to capture the publications in the following electronic databases/libraries: Scopus, CINAHL, PubMed, Cochrane, LILACS, SciELO, CAPES, Wiley, Science Direct, Nature, Cambridge, Academia Search Premiere e International Journal of Nursing. The papers were critically assessed according to the components of the nursing diagnosis Decreased Cardiac Output, according to the taxonomy of the NANDA-I. The data were analyzed by means of descriptive statistics and were synthetically presented in text. **Results:** nine studies were selected, whose the most found defining characteristics (>44%) were: swelling, low arterial pressure, cold/ moist skin, altered cardiac frequency/rhythm, dyspnea and altered central venous pressure. **Conclusion:** 93% of the surveyed defining characteristics are advocated by the NANDA-I. **Descriptors:** Nursing; Decreased Cardiac Output; Defining Characteristics.

RESUMO

Objetivo: analisar as principais características definidoras do diagnóstico de enfermagem Débito Cardíaco Diminuído (DCD). **Método:** estudo descritivo a partir da questão norteadora << *Quais as características definidoras mais utilizadas para o diagnóstico de enfermagem Débito Cardíaco Diminuído?*>>, sem limite temporal para captura das publicações nas seguintes bases de dados/bibliotecas virtuais: Scopus, CINAHL, PubMed, Cochrane, LILACS, SciELO, CAPES, Wiley, Science Direct, Nature, Cambridge, Academia Search Premiere e International Journal of Nursing. Os artigos foram avaliados criticamente de acordo com os componentes do diagnóstico de enfermagem Débito Cardíaco Diminuído, segundo a taxonomia NANDA-I. Os dados foram analisados por meio de estatística descritiva simples e apresentados sinteticamente em texto. **Resultados:** foram selecionados nove estudos, cujas características definidoras mais encontradas (>44%) foram: edema, pressão arterial baixa, pele fria/úmida, frequência/ritmo cardíaco alterado, dispneia e pressão venosa central alterada. **Conclusão:** 93% das características definidoras levantadas estão preconizadas pela NANDA-I. **Descritores:** Enfermagem; Débito Cardíaco Diminuído; Características Definidoras.

RESUMEN

Objetivo: analizar las principales características definitorias del diagnóstico de enfermería Bajo Gasto Cardíaco (BGC). **Método:** estudio descriptivo basado en la pregunta orientadora << ¿Cuáles son las características definitorias más utilizadas para el diagnóstico de enfermería Bajo Gasto Cardíaco? >>, sin límite de tiempo para la captura de las publicaciones en las siguientes bases de datos/bibliotecas virtuales: Scopus, CINAHL, PubMed, Cochrane, LILACS, SciELO, CAPES, Wiley, Science Direct, Nature, Cambridge, Academia Search Premiere e International Journal of Nursing. Los artículos fueron evaluados críticamente en sintonía con los componentes del diagnóstico de enfermería Bajo Gasto Cardíaco, según la taxonomía NANDA-I. Los datos fueron analizados a través de estadística descriptiva simples y presentados sintéticamente em texto. **Resultados:** nueve estudios fueron seleccionados, cuyas características definitorias más encontradas (>44%) fueron: edema, presión arterial baja, piel fría/húmeda, frecuencia/ritmo cardíaco modificado, disnea y presión venosa central modificada. **Conclusión:** 93% de las características definitorias encontradas son defendidas en la NANDA-I. **Descriptores:** Enfermería; Bajo Gasto Cardíaco; Características Definitorias.

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INTRODUCTION

The object of this study refers to the defining characteristics of the nursing diagnosis of Decreased Cardiac Output of the NANDA-I.¹ The Nursing Diagnosis (ND) is one of the most important phases of the Nursing Process (NP), because, through this step, the professional can identify the main problems existing in the patient, in order to start the implementation of care actions. Nevertheless, in order to perform the diagnosis in a satisfactory way, it is necessary that nursing professionals have a critical thinking strongly grounded in scientific evidence.²

It is worth emphasizing that the ND differs from the medical diagnosis, since, while this last one deals with the pathological condition, the ND addresses the human responses resulting from pathological conditions or a vital process on the activities and lifestyle of the customer.³ According to a study, the term “diagnosis” was firstly mentioned by Mac Manus, in 1950, who defined it as the activity that outlines the responsibilities of the nursing professional. Since then, additional studies have been developed with the aim at producing an international classification of nursing diagnoses.⁴

Some classification systems have been used in the steps of the NP as a way of conducting the care actions in a clearer manner, as well as of providing a standardized parlance for all nursing professionals. Such systems are presented as structured knowledge, where their elements are organized in groups or classes with basis on similarities.⁵ One of the most known and recognized systems of the step of ND is the NANDA-I. Its last edition was launched in the period 2009-2011 and is structured in 13 domains, 47 classes and 201 diagnoses. For each diagnosis, title, definition, defining characteristics (signs and symptoms) related factors (factors that can cause or contribute to the problem) or risk factors (conditions that increase the likelihood of onset and/or worsening of diseases).^{1,6}

Among the several ND in the NANDA-I (2010), one can find “Decreased Cardiac Output” (DCO), which is inserted in the domain 4, called activity/rest, and in the class 4, referring to the cardiovascular/pulmonary responses.¹ The DCO is defined as “insufficient quantity of blood pumped by the heart to meet the body metabolic demands”. This diagnostic condition might be related to the following cardiac alterations: contractility, frequency, after-load, pre-load, rhythm and amount of ejection.¹

The signs and symptoms capable to identify the nursing diagnosis of DCO are called Defining Characteristics (DC) and are grouped by means of the following criteria: behavioral/emotional; altered contractility, altered frequency/cardiac rhythm; altered after-load and pre-load.¹ The characteristics that are inserted in the behavioral group are agitation and anxiety; the related to the group of altered contractility are crackling, decreased cardiac output, nocturnal paroxysmal dyspnea, decreased ejection fraction, decreased systolic work index of the left ventricle, decreased systolic volume index, orthopnea, B3 sounds, B4 sounds and cough; regarding the frequency/rhythm, one can list the following DC: alterations in the electrocardiogram (ECG) arrhythmias, bradycardia, palpitations and tachycardia.¹

With respect to the DC of the altered after-load, one can cite: dyspnea, changes in skin color, oliguria, cold and clammy skin, prolonged peripheral capillary perfusion, decreased peripheral pulses, increased pulmonary vascular resistance, decreased increased pulmonary vascular resistance, increased systemic vascular resistance, decreased systemic vascular resistance and variations in the arterial pressure reading. Finally, the DC that meet the group of altered pre-load are: jugular venous distension, swelling, tiredness, weight gain, murmurs, decreased pulmonary capillary pressure (PCP), increased PCP and increased or decreased Central Venous Pressure (CVP).¹

The defining characteristics of the aforementioned diagnosis were developed by a group of nurses in the Second Conference Group on of Nursing Classification Diagnosis, in 1975, whose acceptance took place in 1980. Since then, it was reviewed only two times by the NANDA-I, in 1996 and in 2000. This means that many of its DC might have fallen into disuse, while others might have been included in the clinical practice to identify the ND at stake.⁷ Furthermore, the nursing professional needs to be trained for holding specific judgment and immediate interventions, especially when it comes to a patient in critical condition. Thus, it is crucial that this professional has knowledge of the defining characteristics capable to identify the diagnosis. From this perspective, the integrative review becomes an excellent guiding, which encourages a type of health care based on scientific knowledge and with qualitative results.⁸

Therefore, one should consider that an accurate inference of nursing diagnoses might provide to the nursing professional a greater

continuity of the performed actions, besides autonomy in decision-making processes, since this practitioner will be based on a rigorously developed taxonomy and on a constant process of validation and refinement.

Through this exposure, we have realized the need to deepen the knowledge related to the use of the ND DCO. This investigation was conducted through the following questioning: What are the most commonly used defining characteristics for the nursing diagnosis Decreased Cardiac Output?

By observing that various clinical manifestations of DCO used in practice are not included in the NANDA-I (2010), it became necessary to perform this integrative review to synthesize the studies, in an attempt to “identify the most frequently DC used in clinical practice, as well as comparing them with those listed by the NANDA-I”.

Hence, the objective of this study is:

- To analyze the main defining characteristics of the nursing diagnosis Decreased Cardiac Output.

METHOD

This is an integrative review, which is a technique that gathers and synthesizes the knowledge produced on a theme and incorporates the results of significant studies in practice.⁹

There are several ways of conducting integrative reviews. In order to operationalize this review, we followed the steps hereinafter: 1) identification of theme and formulation of guiding questions, 2) literature search in certain databases, with established descriptors, 3) definition of criteria for inclusion and exclusion of papers and 4) definition of strategies for data collection; 5) selection of researches; 6) analysis; 7) synthesis of knowledge evidenced in researches.⁸

The guiding question raised to start this study was: What are the most commonly used defining characteristics for the Nursing Diagnosis Decreased Cardiac Output? Next, there was a bibliographical survey of papers published and indexed in the related databases and journals: Scopus, CINAHL, PubMed, Cochrane, LILACS, SciELO, CAPES, Wiley, Science Direct, Nature, Cambridge, Academia Search Premiere e International Journal of Nursing. The descriptors used in this survey were: ‘Nursing’ and ‘Decreased Cardiac Output’. The aforementioned descriptors were used in the English language, namely: ‘Nursing’ and ‘Low Cardiac Output’/‘Decreased Cardiac Output’. For

database Wiley, besides these descriptors, ‘Defining Characteristics’ was used. The capture of papers took place through the intersection of the descriptors, which were not controlled, when applying Boolean operator AND, between March and June 2012. In order to hold the sample analysis, we have developed and applied a descriptive instrument that approached: publication year, place, journal, objective, results, method, scenario, population and defining characteristics for the ND DCO.

The selection of publications obeyed the following inclusion criteria: being in electronic format and indexed in one of the aforementioned locations; being freely available in Portuguese, English or Spanish languages and with focus on the theme of Defining Characteristics for the ND DCO, whose approach was able to answer the guiding question of this study. We excluded editorials, letters to the reader and those who had no relevant approach to achieve the proposed objective.

In order to assess the quality of paper, we made use of a structured instrument of the evidence level according to the Agency for Healthcare Research and Quality (AHRQ), which considers the production of scientific knowledge of evidence-based practices and fit them into hierarchical levels, namely: in the level I, the evidence is made through a systematic review or meta-analysis of all relevant randomized trials, or even resulting from clinical guidelines based on systematic reviews of controlled randomized clinical trials; in the level II, the evidence is derived from at least one controlled randomized and well-designed clinical trials; in the level III, well-designed clinical trials without randomization are obtained. The level IV has evidence of cohort and well-defined case-control studies. As for the level V, it corresponds to systematic reviews of descriptive and qualitative studies; the level VI has evidence of a single descriptive or qualitative study. Finally, the level VII has evidence of opinion of authorities and/or the report of committee of experts. Accordingly, all nine selected studies had Evidence Level (EL) VI due to their references to descriptive studies with low inferential and associative power.¹⁰

The papers were initially submitted to the reading of the titles, and we read the summaries of those that could meet the guiding question. Subsequently, the publications that reported the DC of the Nursing Diagnosis Decreased Cardiac Output were selected and, since they were relevant

to be fully read. Nonetheless, despite the thorough search, only nine articles were selected, as they strictly met the established criteria.

After the analysis of the selected studies, the assessed content was analyzed by means of descriptive statistics and synthesized in text. At the end of the review, we pointed out the main DC used by nursing professionals, besides to correlating the DC found with those listed by the NANDA-I.

RESULTS

Through the bibliographical survey, only nine fully and freely accessible works were identified in the literature. Of these, five (55,5%) were published in Portuguese and four (44,5%) in English.

Most studies were conducted in Brazil, except one, which is from the United States of America. Regarding the publication year, two were conducted in the period between 1997 and 2002, one between 2003 and 2008 and six between 2010 and 2011.

The age range of the populations involved in the studies is predominantly elderly and in a critically ill status, with Decompensated Cardiac Failure (DCF).

As for the design of the studies, nine are descriptive, being that, from these, five are validation and four are bibliographical reviews.

Most of the selected publications presented theme "Validation of DC/symptomatology for the ND DCO, which corresponds to approximately 78% of the studies. Two works prioritized other issues of diagnosis, but were included in this review due to their extreme importance. Of these, one (11%) emphasized the interventions of ND, while another (11%) highlighted the risk factors for development of DCO.

Regarding the hemodynamic manifestations related to Decreased Cardiac Output, we identified in the review studies that the most common are: arrhythmias, alterations in Central Venous Pressure (CVP), increased pulmonary artery pressure, increased systemic and pulmonary vascular resistance, decreased arterial pressure, decreased ventricular systolic work, ejection fraction and decreased systolic volume index.¹¹

Concerning the typical signs and symptoms of this clinical phenomenon, it has been found in cross-sectional and clinical validation studies that the most common are: decreased ejection fraction, decreased peripheral perfusion, decreased pulse pressure, low arterial pressure, low venous oxygen

saturation, sweating, cyanosis, oliguria/anuria, discrepancies between the pulse of carotids or femoral and radial, jaundice, metabolic acidosis, swelling, orthopnea and jugular distention.^{3,12}

This is in line with a review study adding the frequent prevalence of certain signs and symptoms such as: palpitations, dizziness, vertigo, syncope, hepatomegaly, ascites, nausea/vomiting, abdominal fullness, tiredness/weakness, murmurs, altered cardiac frequency, nocturnal paroxysmal dyspnea, cough, B3 and B4 sounds, anxiety, rales and restlessness.¹¹

Concerning the determinants defining characteristics, it was found in a systematic review and content validation that the most common are: decreased cardiac index, decreased peripheral pulse, increased serum level of lactate, decreased venous saturation of oxygen (SvO₂), dyspnea, tiredness, swelling, orthopnea, nocturnal paroxysmal dyspnea (NPD) and high CVP. Two are not included in the NANDA-I: increased serum level of lactate and decreased venous saturation of oxygen. Reported as secondary CD, one can find: oliguria/anuria, decreased systolic index of the left ventricle, decreased ejection fraction, altered cardiac frequency, low arterial pressure, altered systemic and pulmonary vascular resistance, altered filling pressure of the left ventricle, altered breathing pattern, increased oxygen consumption, jugular stasis, cold skin, metabolic acidosis, increased cardiac chambers, level of atrial natriuretic, catecholamines and increased cerebral natriuretic, drowsiness, cardiac cachexia, 3rd heart sound, hypoxemia, hepatomegaly, weight gain, palpitations and crackling.^{2, 4,13-4}

A clinical validation study found, regardless of cardiac index, the most common DC, namely: altered CVP, altered hemoglobin and hematocrit, slow intestinal peristalsis and hyperglycemia. Altered cardiac enzymes, arrhythmias, decreased peripheral perfusion, decreased arterial pressure, alterations in chest X-ray, swelling and filiform peripheral pulse compose a group of secondary DC.⁴

Concerning the defining characteristics for establishing the diagnosis, in a review study 79 DC were identified, being that 28 were approved by the NANDA-I. They were divided into five groups: dependent on clinical assessment, dependent on laboratory assessment, dependent on image-related assessment, dependent on assessment by invasive hemodynamic monitoring and dependent on minimally invasive assessment.⁷

In the analysis of publications, we selected the most cited DC/symptomatology for the ND DCO, both the determinant and the secondary. In this regard, it was noted that swelling was the most evidenced, with a frequency of 89%. Low arterial pressure, cold/moist skin and altered cardiac frequency/rhythm were presented in 78% of the studies. Dyspnea, altered CVP, decreased peripheral pulse, decreased peripheral perfusion and changes in skin color consisted of 66,6% of the publications. Oliguria/anuria, jugular distention and tiredness/exhaustion obtained a frequency of 55,5%.

Other DC, such as decreased cardiac index and decreased ejection fraction were repeated at a value of 44,4%, but, even though, have produced a significant impact. The other DC showed frequencies below 30% and, due to being highlighted in few studies, were considered irrelevant for the analysis.

At the end of the synthesis of knowledge evidenced in the publications, it was shown that, among the most frequent DC presented, that is to say, with repetition above 44%, only the cardiac index (6,7%) is not advocated by the NANDA-I, while the other ones (93%) are inserted in the taxonomy.

DISCUSSION

The contents of the publications alluded to the validation of the DC/symptomatology for the ND DCO. With the exception of two works that prioritized other issues of diagnosis, but were inserted in this review due to their extreme relevance. In view of the subject Nursing Diagnosis exclusively refers to the area of nursing, all the studies were specific for this professional field.

The age range of the population involved in the studies is predominantly elderly and with Cardiac Failure (CF). This fact is related to the increase in the life expectancy of the population, which generates a progressive increase of CF rates as the time goes by.¹⁵

Publications, according to the model of hierarchical classification of evidence AHRQ, presented potentially lower EL. As the study reports, knowing the classification systems of evidence, as well as the hierarchical levels in that these are fitted into a paper, helps the nursing professional in the critical assessment of the results of a research and, consequently, in decision-making about the incorporation of evidence to the clinical practice.¹⁶ In this context, the EL found in the surveyed papers demonstrate that it is crucial that one develops new works on the issue, with sights that these levels might be properly reflected

from the theoretical benchmark for the nursing practice.

Approximately 50% of the studies had the clinical and content validation as their methodological design. The validation becomes important to identify the defining characteristics that have a strong association with the ND, which helps to improve it. Moreover, the very NANDA-I recommends the accomplishment of studies for validating this diagnosis, as a way of fitting it to the current practice.²

In the synthesis of the studies, it was found that swelling was the most prevalent ND (89%). This results from compensatory mechanisms, since the decrease in cardiac output stimulates the sympathetic nervous system to release epinephrine and norepinephrine, which try to increase the cardiac frequency and the contractility. Nonetheless, the continued stimulation causes vasoconstriction of several organs, including the kidneys.¹⁷

Then, the decreased renal perfusion stimulates the rennin-angiotensin-ACE system, whose outcome is to release angiotensin II, a strong vasoconstrictor capable to increase the arterial pressure and the after-load, as well as stimulating the release of aldosterone by the adrenal cortex, which generates retention of sodium and fluids.¹⁷⁻⁸ Although it is a strong evidence to identify the ND DCO, swelling cannot be very specific if analyzed in a separate manner. That is why it is necessary to analyze other signs and symptoms to establish the condition.²

The defining characteristics that achieved a frequency of 78% were: low arterial pressure, cold/ moist skin and altered cardiac frequency/rhythm. Individuals with CF at an advanced stage have difficulty to maintain the stability of the arterial pressure. Initially, low cardiac output allows the activation of the sympathetic system, which causes increased arterial pressure and after-load. However, as the condition worsens, the cardiac pumping becomes increasingly flawed and the mechanisms generated can no longer provide the balance. Therefore, it provokes the decline of the arterial pressure. Accordingly, hypotension is an indicator of tissue hypoperfusion.^{7,11,18-9}

Compensatory mechanisms caused also culminate in peripheral vasoconstriction, as a way of trying to increase the volume and the blood supply to essential organs. Thus, the skin becomes cold and moist.^{17,20}

One of the earliest alterations of the CF takes place in the cardiac frequency/rhythm, which is justified by the action of effects of

the sympathetic activation in the heart, in an attempt to increase the cardiac output. In the analysis of publications, it was found that tachycardia and arrhythmias are the most common.^{17,21}

Regarding the DC that achieved a frequency of 66,6%, it is reported: dyspnea, altered CVP, decreased peripheral pulse, decreased peripheral perfusion and changes in skin color. Dyspnea is characterized by respiratory distress and takes place when a great volume of blood returns to the ventricle, thereby provoking an increase in the pulmonary venous pressure and, consequently, a pulmonary congestion. This symptom is considered an important limiting factor towards the quality of life, associated, for example, to sleep disturbances and intolerance to physical activity.^{3,17,22-3}

The measurement of CVP is used to assess the function of the right ventricle and its filling pressure. Normal values are between 8 and 12 cmH₂O, where any change, whether upwards or downwards, is an important parameter in identifying the ND DCO.²⁴ A study emphasizes that the measurement of CVP is one of the first steps in the assessment of cardiac volume and function in critically ill patients and that, despite the limitations in the assessment of blood volume, it is a simple method, little invasive and available quickly at the bedside.²⁵

The tissue perfusion, in turn, might be conceptualized as the product of the capillary flow by the content of nutrients and oxygen offered to the tissues. Such flow might be understood as cardiac output, whose decrease results in a lower blood distribution to the tissues and, consequently, in the inability to meet the bodily metabolic demands. Commonly, patients with DCO have compromised tissue perfusion, since there is no enough amount of blood pumped by the heart.²⁶

Another manifestation related to the reduction of blood volume is the decreased peripheral pulse. This DC, along with decreased peripheral perfusion, has been described in studies as statistically higher in individuals who had low cardiac index, which was obtained by the term 'dilution', when compared to patients who had normal values when submitted to the same method. This led the authors to conclude that both are extremely valid for the ND DCO.¹²

Alluding to the change in skin color, a study claims that it takes place due to the blood withdrawal of this organ, which might become pale or cyanotic. Due to being an easily observable condition, inspection of the

patient's skin is a simple way of identifying the condition.²⁶

The defining characteristics that reached 55,5% were oliguria/anuria, jugular distention and tiredness/exhaustion. A reduction in urinary volume to less than 400 mL/day is characterized as oliguria, while anuria corresponds to a value below 100 mL in the same period of time. Both oliguria and anuria might affect an individual who has a low cardiac output due to the decreased renal perfusion.^{12,17}

The jugular distention, in turn, is a measure that indicates the change of the right cardiac chambers and must be assessed with the patient in dorsal decubitus at 45°. The turgidity in the congested might present more than one or two centimeters above the sternal angle. A study emphasizes that the clinical examination of the jugular distention is a simple method and with low cost, which provides important knowledge for individuals in critical conditions.^{2,11}

As for tiredness/exhaustion, it is a factor that limits the daily activities and the patient's autonomy. Its high incidence in individuals with the ND DCO takes place due to inefficient supply of oxygen to the tissues and is associated with more severe functional classes of CF.^{2,13,17,27}

Finally, cardiac index and decreased ejection fraction were repeated in 44,4% of the studies. The cardiac index is a more individualized measure than the measurement of the cardiac output, since it considers the bodily area and, therefore, is most commonly used in clinical practice. Its determination is held through the cardiac output divided by the bodily surface area (CO/BSA). The cardiac output, in turn, is obtained by the product of the cardiac frequency with the systolic volume (CO = CF x SV).^{11,24}

A study reports that a cardiac index is considered low when the values are below 2,5 liters/min. Nevertheless, the same considers that this parameter alone is not effective in identifying the nature of the problem.¹¹ Ejection fraction corresponds to the quantification of blood that is ejected from the heart in each ventricular contraction. In light of this definition, it becomes clear the reason by which a decrease might be considered an important DC for the nursing diagnosis DCO.¹⁷ Therefore, one should note that the clinical manifestations of decreased cardiac output represent a phase in which the compensatory mechanisms produced by the body start to fail or become ineffective in the face of the severity of the illness. This is a "vicious cycle", where the heart does not

pump blood enough to meet metabolic demands, which causes the body to stimulate the heart to work harder and, consequently, further exacerbates the inability.^{11,17}

Under this perspective, it is important that the nursing professional becomes qualified in identifying the problem as soon as the symptoms start, in an attempt to minimize the damages entailed to the individual. When analyzing the most frequent DC in publications, we have observed that professionals have replaced more invasive methods by clinical procedures to determine the ND. This is particularly beneficial, since studies have associated the use of invasive techniques in determining the ND as responsible for the increased indexes of infection and mortality.^{7,28}

A very invasive method used to determine the ND DCO was the Pulmonary Artery Catheter (PAC), which allows obtaining several data that reflect the hemodynamic status of the patient. Nevertheless, in the current approach, the practice seems to be in progressive disuse because of the inherent risks related to the use of invasive procedures. Furthermore, the high cost and the little applicability in clinical practice have contributed to its decline.^{7,28}

In fact, the production of this review shows that nurses are increasingly leaving the use of PAC, in such a way that the defining characteristics measured through this method have obtained a relatively low frequency, such as, for example, the very decreased cardiac output and the pulmonary vascular resistance. Nonetheless, the cardiac index appears in a relatively significant manner, which suggests that many professionals still consider the data arising from the catheter as essential to the diagnosis.

CONCLUSION

Through the synthesis of the publications, the present study has highlighted that the most frequent defining characteristics (in more than 44% of publications) for the ND DCO were swelling low arterial pressure, cold/moist skin, altered cardiac frequency/rhythm, dyspnea, altered central venous pressure, decreased pulse and peripheral perfusion, change in skin color, oliguria/anuria, jugular distention, tiredness/exhaustion, decreased cardiac index and decreased ejection fraction.

Through this, it was found that nursing professionals are prioritizing the clinical methods in identifying the diagnosis, which is particularly beneficial to reduce the risks

inherent to invasive procedures, such as infections.

Furthermore, it is worth highlighting that, among the surveyed characteristics, only the cardiac index is not included in the NANDA-I. Nonetheless, few studies were conducted, which suggests that further researches must be carried out in the area so that possible updates of diagnosis can be done.¹

The shortage in literature in relation to publications focused on this theme prevented the full development of this work. However, it becomes important to perform integrative reviews for classifying the publications with regard to evidence levels and, therefore, guide students and professionals on the matter and its development in the last few years, by using those with stronger evidence in clinical practice.²⁹

The potentially low evidence levels of the selections, in turn, have restricted the transfer to a practical scope in order to advice the exercise of the professional towards the patients affected by this condition.

The other gap of this study is the lack of possibility to insert dissertation theses and conference abstracts that addressed the matter at stake, which further reduced the researches focused on the theme.

Finally, we have concluded that this review has demonstrated the importance of the development of further studies on the DC of the ND DCO, as well as these studies have greater power of evidence to be properly recognized. Thus, it will be possible to enhance the diagnosis at stake.

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Submission: 2013/07/02

Accepted: 2014/04/12

Publishing: 2014/05/01

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