RESEARCH | PESQUISA

Clinical indicators of nursing diagnosis *Impaired physiological balance syndrome* for organ donors[a]

Indicadores clínicos para o diagnóstico de enfermagem *Síndrome do equilíbrio fisiológico prejudicado* para doadores de órgãos

Indicadores clínicos para el diagnóstico de enfermería *Síndrome del equilibrio fisiológico deteriorado* en donantes de órganos

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ABSTRACT

Objective: To select clinical indicators for the developing nursing diagnosis of *Impaired Physiological Balance Syndrome* for potential brain-dead organ donors. **Method:** Expert consensus study, conducted using the Delphi technique, on clinical indicators of a developing nursing diagnosis. The study sample was intentional by invitation and consisted of 37 nurses who met the inclusion criteria. Clinical indicators that reached a consensus equal to or greater than 70% were considered validated. **Results:** The experts recommended 25 out of 44 evaluated indicators, of which eight belonged to the Endocrine-metabolic changes group, seven to the Hemodynamic and/or cardiovascular changes group, five to the Ventilatory changes group, two to the Nutritional changes group and three to the Coagulation, Inflammatory and/or immune changes group. **Conclusion and implications for practice:** This new nursing diagnosis can contribute to the development of nursing knowledge in the field of organ donation, thereby contributing to teaching and research. It also has implications for practice, providing diagnostic accuracy and supporting the implementation and evaluation of interventions that affect improving potential donor maintenance.

Keywords: Nursing Diagnosis; Tissue and Organ Procurement; Organ Transplantation; Classification.

RESUMO

Objetivo: Selecionar indicadores clínicos para o diagnóstico de enfermagem em desenvolvimento *Síndrome do equilíbrio fisiológico prejudicado* para potenciais doadores de órgãos em morte encefálica. **Método:** Estudo de consenso de especialistas, realizado através da técnica Delphi, dos indicadores clínicos de um diagnóstico de enfermagem em desenvolvimento. A amostra do estudo foi intencional mediante convite e constituída por 37 enfermeiros que atenderam a critérios de inclusão. Os indicadores que obtiveram um consenso igual ou maior que 70% foram considerados validados. **Resultados:** Especialistas recomendaram 25 dos 44 indicadores avaliados, dos quais oito pertenciam ao grupo Alterações endócrino-metabólicas, sete ao grupo Alterações hemodinâmicas e/ou cardiovasculares, cinco ao grupo Alterações ventilatórias, dois ao grupo Alterações nutricionais e três ao grupo Alterações de coagulação, inflamatórias e/ou imunológicas. **Conclusão e implicações para a prática:** Esse novo diagnóstico de enfermagem pode colaborar com o desenvolvimento de conhecimento da enfermagem na área de doação de órgãos, contribuindo para o ensino e pesquisa, além de acarretar implicações para a prática, proporcionando acurácia diagnóstica e embasando a implementação e a avaliação de intervenções que impactam na melhora da manutenção do potencial doador.

Palavras-chave: Diagnóstico de Enfermagem; Obtenção de Tecidos e Órgãos; Transplante de Órgãos; Classificação.

RESUMEN

Objetivo: Seleccionar indicadores clínicos para el diagnóstico de enfermería en desarrollo *Síndrome del equilibrio fisiológico deteriorado* en potenciales donantes de órganos con muerte encefálica. **Método:** Estudio de consenso de expertos, realizado por medio de la técnica Delphi, sobre los indicadores clínicos de un diagnóstico de enfermería en desarrollo. La muestra del estudio fue intencional por invitación y consistió en 37 enfermeros que cumplieron con los criterios de inclusión. Los indicadores clínicos que alcanzaron un consenso igual o superior al 70% se consideraron validados. **Resultados:** Los expertos recomendaron 25 de los 44 indicadores evaluados, de los cuales, ocho pertenecían al grupo Alteraciones endocrino-metabólicas, siete al grupo Alteraciones hemodinámicas y/o cardiovasculares, cinco al grupo Alteraciones respiratorias, dos al grupo Alteraciones nutricionales y tres al grupo Alteraciones de la coagulación, inflamatorias y/o inmunológicas. **Conclusión y implicaciones para la práctica:** Este nuevo diagnóstico de enfermería puede colaborar con el desarrollo del conocimiento de la enfermería en el campo de donación de órganos, y así contribuir a la enseñanza y a la investigación, además de tener implicaciones para la práctica, al proporcionar exactitud diagnóstica y apoyar la implementación y evaluación de intervenciones que impactan en la mejora del de mantenimiento del posible donante de órganos.

Palabras clave: Diagnóstico de Enfermería; Obtención de Tejidos y Órganos; Trasplante de Órganos; Clasificación.

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INTRODUCTION

The disproportion between the high demand for transplants and the low supply of organs is a worldwide reality.[1,2] It is estimated that the annual number of transplants represents less than 10% of the global need. Thus, the scarcity of organ supply is considered a serious public health problem.[1]

Due to various reasons, the percentage of effective organ donors is not higher, as failure to identify and report brain death, family authorization to donate, exclusion criteria, for example, contagious diseases, malignant tumors, among others. Among these reasons there are also failures in maintaining the potential donor. Thus, the proper maintenance of the potential donor through specific care is essential, since any dysfunction is capable to compromise the viability of the organs.[2]

Taking into account the importance of specific care for the proper maintenance of the potential organ donor, the Nursing Process (NP) is a methodology that can help in this context. Nursing, through the use of the NP, guides the health care practices in a systematic way seeking to qualify assistance in the production of care. In this context, the use of classifications with standardized language is important for the application of the NP from its stages as they offer a structure to organize nursing diagnoses, interventions and results.[3]

The nursing diagnoses (NDs) that are most used in the maintenance scenario of potential organ donors are: *Hyperthermia*, *Deficient liquid volume risk* , *Decreased cardiac output risk*, *Decreased cardiac output*, *Harmed gas-related exchange*, *Unstable glycemic risk* , *Bleeding risk*, *Infection risk* and *Diminished intracranial adaptive capacity*.[4,5]

It is observed that most of the NDs that are prevalent for potential organ donors are related to physiological changes. Due to the complexity of brain death, these patients often have all the mentioned NDs. However, it is believed that a very large number of NDs listed on the patient makes it difficult to prioritize care. However, NANDA *International* (NANDA-I) classification does not have unique ND that approach such condition. Thus, a ND syndrome with the main physiological changes in a single ND could treat them together and with more effective results.

ND is defined by NANDA-I as: "*a clinical judgment about a human response to health conditions/life processes, or a vulnerability to that response, from an individual, a family, a group or a community*".[6:88] ND can be directed to a problem, a health-promoting state or a potential risk. The use of syndromes can be found in these categories. NANDA-I defines a ND syndrome as: *"A clinical judgment related to a certain group of nursing diagnoses that occur together, being better treated through similar interventions"*.[6:82]

In view of the above, the ND referred to as *Impaired physiological balance syndrome* is being developed. In the first part of its development, an integrative literature review identified 44 possible defining characteristics. The related factor of this ND is brain death.[7] The ND definition is:

> *Impaired state of physiological balance that triggers a set of endocrine-metabolic symptoms, hemodynamic, cardiovascular, ventilatory, nutritional, coagulation, inflammatory and/or immunological symptoms that compromise the health and/or the functions of the organs*[7:664]

In order to refine new NDs, it is suggested that experts select their clinical indicators. It is noteworthy that defining characteristics are observable indicators that are grouped as manifestations of an ND (signs or symptoms). In the NANDA-I 2018-2020 edition, two new categories of indicators were introduced: populations at-risk and associated conditions. "*Populations at risk are groups of people who share some characteristic that makes each member susceptible to a specific human response...*". While "*the associated conditions correspond to medical diagnoses, injuries, procedures, medical devices or pharmaceutical agents*".[6:65]

It is believed that the development and future use of the ND *Impaired physiological balance syndrome* for potential brain-death organ donors, it will provide diagnostic accuracy favoring implantation of interventions adapted to this specific clinical group with the possibility of achieving the best results; as the proper maintenance of the potential donor contributing to the better viability of the organs offered for transplants. It is noteworthy that to use this ND, the nurse will need to use critical thinking and diagnostic reasoning in order to make an appropriate judgment, since not all brain-dead patients have the proposed ND syndrome.

Given the above, the research question of the study is: Which clinical indicators are suitable for developing ND *Impaired physiological balance syndrome* for potential organ donors in brain death? Thus, this study aimed to select clinical indicators for the developing ND *Impaired physiological balance syndrome* for potential organ donors in brain death.

From this investigation it is expected to qualify the application of the NP in the area of maintenance of the potential organ donor and to promote the production of knowledge in this field. In addition, the synthesis of this knowledge can increase the level of evidence of this ND in the taxonomy.

METHOD

This study consisted on selecting by consensus of specialists for the clinical indicators of the ND *Impaired physiological balance syndrome* through the Delphi technique. The consensus study is proposed as a research method used to develop standards of professional practice improving the professionalism of the area. This method allows nurses to review knowledge content

in their area of expertise and to identify or link relevant terms of nursing taxonomies for specific populations and clinical contexts. Thus, nurses seek to reach consensus or collective opinion on a phenomenon of practice through a research method in which the power to produce knowledge is in the contributions of the participants.[8,9] Likewise, the Delphi technique can be used as a method of data collection to reach consensus on a subject through expert opinions. The objective of this technique is to obtain maximum consensus from a group of experts on a given topic.[10]

The study sample was intentional by invitation and consisted of 37 nurses who met the inclusion criteria: Minimum clinical experience of two years working with potential organ donors in brain death and getting to know the NP and NANDA-I. Exclusion criteria have not en established. The sample calculation used a 95% confidence level, 70% expert proportion for the consensus and an acceptable sample error of 15%.[11] This calculation stipulated a minimum of 36 specialists.

Data collection was carried out between April and May 2018 using the Delphi technique. The experts were invited to take part in the study via email. Nurses interested in participating were directed to a virtual environment in *Google Forms,* where they had access to the Free and Informed Consent Form (FICF). The FICF's agreement directed to the data collection instrument.

The online instrument contains two sections. The first is in a form for recording the sample characterization data. The second contains the clinical indicators, their conceptual definitions and a space to indicate "recommend" or "do not recommend" for each of them, in addition to a space for observations below each variable. Before starting up the first round of opinions, a pre-test of the instrument was carried out with five judges who were not part of the sample. The pre-test had the purpose of verifying weaknesses and gaps in the instrument to correct them before definitive data collection.

The variables used in the data collection instrument were 44 clinical indicators identified in an integrative literature review for the developing ND *Impaired Physiological Balance Syndrome* for potential organ donors in brain death. In this integrative review, the indicators were divided into five groups: Endocrine-metabolic changes, Hemodynamic and/or cardiovascular changes, Ventilatory changes, Nutritional changes and Coagulation changes, inflammatory and/or immunological.[7] t is noteworthy that conceptual definitions were constructed for each indicator based on scientific literature in order to ensure the understanding of each variable and enable an adequate judgment of each indicator by the panel of experts.

Data collection took place through two rounds of sending the instrument to the panel of experts, which were carried out as needed to reach consensus. In the first round of opinions, the instrument was sent via e-mail. From its return, the answers were counted and analyzed. In the second round of opinions, the instrument was revised and sent again to the participants with information on the results achieved in the first round. In this way, the experts were invited to carry out a new evaluation of their judgments in view of the statistical forecast of each response of the group, being possible to maintain the opinion or modify it. Thus, the participants filled out the data collection instrument for the selection of clinical indicators applicable to the developing ND *Impaired physiological balance syndrome* for potential organ donors in brain death. At the end of the collection, a final report with the results from the rounds was sent to the specialists.

Data analysis was descriptive. The clinical indicators of ND that obtained a consensus equal to or greater than 70% among nurses were considered validated.

This study was registered on the Brazil platform (CAEE 72793817.6.0000.5327) and approved by the Research Committee of the School of Nursing at the Federal University of Rio Grande do Sul under number 33688 and by the Health Ethics Committee of Hospital de Clínicas de Porto Alegre under the number 170500.

RESULTS

Thirty-seven nurses (n=37) considered specialists for the study evaluated the ND diagnostic content *Impaired physiological balance syndrome* for potential organ donors. They recommended 25 of the 44 clinical evaluated indicators. A Table 1 displays sample characterization.

Table 2 shows the clinical indicators recommended by the specialists for the ND at issue, after two rounds of sending the instrument. A total of 25 indicators were recommended by more than 70% of experts, therefore, considered validated in terms of content.

Some experts modified their recommendations in the second round of shipment of the instrument. It is observed that metabolic acidosis and respiratory alkalosis obtained 25 recommendations (67.6%) in the first round. However, in the second round, no specialist recommended them, with the justification that they are included in the acid-base imbalance. Likewise, altered MAP in the first round obtained 31 (83.8%) recommendations and in the second none, justifying that the altered blood pressure already includes the altered MAP. Thus, altered blood pressure in the first round was recommended by 34 (91.9%) of the specialists and in the second round it obtained 100% of recommendation. Decreased ejection fraction obtained 21 recommendations (56.8%) in the first round and none in the second. The experts pointed out that decreased cardiac output is broader and includes the change in ejection fraction.

Table 1. Characterizing the sample of specialist nurses (n=37).

Variables	n (%)
Degree*	
Specialization	27 (73)
Master's degree	22 (59)
Doctor's degree	7 (19)
Degree area*	
Intensive therapy	24 (65)
Organ donation and transplants	8 (22)
Nursing process	6 (16)
Others	9 (24)
Time of training	
2 - 5 years	2 (5)
6 - 10 years	14 (38)
11 - 15 years	14 (38)
16 - 20 years	6 (16)
Over 21 years old	1 (3)
Professional Experience	
Critical care - maintenance of the potential donor	28 (76)
CIHDOTT	14 (38)
Team for removing multiple organs	11 (30)
Clinical OPO	4 (11)
Transplant Center	2 (5)
Time of experience in donor maintenance, organ donation and/or transplantation	
2 - 5 years	10 (27)
6 - 10 years	15 (41)
11 - 15 years	10 (27)
16 - 20 years	2 (5)
Use of NANDA-I	
Clinical Experience	29 (78)
Teaching	14 (38)
Conducting researches	12 (32)
State	
RS	24 (65)
PR	4 (11)
RJ	3 (8)
SC	2 (5)
SP	2 (5)
MA	1 (3)
ES	1 (3)

Source: Author (2018).
* Some specialists have more than one degree.

Table 2. Indicators of the ND *Impaired physiological balance syndrome* (n=37).

Clinical indicators	1st round	2nd round
Endocrine-metabolic changes	f (%)	f (%)
Validated		
Diabetes insipidus	32 (86.5)	32 (86.5)
Altered diuresis	31 (83.8)	31 (83.8)
Electrolyte imbalance	31 (83.8)	31(83.8)
Hypothermia (00006)	30 (81.1)	30 (81.1)
Hyperthermia (00007)	29 (78.4)	29 (78.4)
Acid Base Imbalance	28 (75.7)	29 (78.4)
Hyperglycemia	27 (73)	28 (75.7)
Dysfunction of endocrine regulation	27 (73)	26 (70.3)
Invalidated		
Keratinize serum increased	22 (59.5)	22 (59.5)
Alteration in liver function	22 (59.5)	22 (59.5)
Hyperosmolarity	21 (56.8)	21 (56.8)
High blood lactate	19 (51.4)	19 (51.4)
Metabolic Acidosis	25 (67.6)	0 (0)
Respiratory alkalosis	25 (67.6)	0 (0)
Hemodynamic and/or cardiovascular changes		
Validated		
Altered blood pressure	34 (91.9)	37 (100)
Decreased cardiac output (00029)	28 (86.5)	32 (86.5)
Ineffective peripheral tissue perfusion (00204)	28 (75.7)	28 (75.7)
Altered cardiac rate	27 (73)	27 (73)
Deficient liquid volume (00027)	27 (73)	27 (73)
Excessive liquid volume (00026)	26 (70.3)	26 (70.3)
Abnormal cardiac rhythm	26 (70.3)	26 (70.3)
Invalidated		
Altered pulse pressure variation	21 (56.8)	21 (56.8)
Altered cardiac index	19 (51.4)	19 (51.4)
Increased systemic and/or peripheral vascular resistance	17 (45.9)	17 (45.9)
Systemic or pulmonary vascular resistance 50% of baseline	16 (43.2)	16 (43.2)
Cardiac dysfunction	14 (37.8)	11 (29.7)
Altered central venous pressure (CVP)	11 (29.7)	11 (29.7)
Left ventricular stroke index $<15 \times g \cdot m / m2$	10 (27)	10 (27)
Altered mean arterial pressure (MAP)	31 (83.8)	0 (0)
Ejection fraction decreased	21 (56.8)	0 (0)
Ventilatory changes		
Validated		
Impaired spontaneous ventilation (00033)	29 (78.4)	32 (86.5)

Source: Author (2018).

Table 2. Continued...

Clinical indicators	1st round	2nd round
Impaired gas exchange (00030)	27 (73)	27 (73)
Arterial oxygen saturation (AoS$_2$) diminished	26 (70.3)	26 (70.3)
Arterial oxygen pressure (AoP$_2$) low	26 (70.3)	26 (70.3)
Impaired oxygenation (AoP$_2$/FiO$_2$ < 300)	26 (70.3)	26 (70.3)
Invalidated		
Change in breathing pattern	28 (75.7)	25 (67.6)
Pulmonary congestion	18 (48.6)	18 (48.6)
Oxygen extraction rate (TeO$_2$) reduced	13 (35.1)	13 (35.1)
Pulmonary capillary wedge pressure >12 mmHg	7 (18.9)	7 (18.9)
Nutritional changes		
Validated		
unbalanced nutrition; less than bodily needs (00002)	27 (73)	27 (73)
Anemia	26 (70.3)	26 (70.3)
Coagulation, inflammatory and/or immunological changes		
Validated		
Coagulation change	23 (70.3)	23 (70.3)
Inflammatory changes	23 (70.3)	23 (70.3)
Immunological changes	23 (70.3)	23 (70.3)

Source: Author (2018).

DISCUSSION

This study enabled the selection by consensus by 37 specialists of 25 clinical indicators for developing ND *Impaired physiological balance syndrome* for potential organ donors in brain death. These indicators may in practice assist nurses in the diagnostic inference process, allowing greater security in the choice of diagnosis. In addition, the results and interventions listed will present greater chances of targeting and effectiveness. The originality of this pioneering study in ND development in the theme of maintaining the potential organ donor stands out.

This study was relevant since, even if the patient is brain dead, there is a need for targeted care to maintain the potential organ donor in order to achieve the best viability of the organs offered for transplantation. In this sense, studies of this nature contribute to the improvement of nursing classifications taking into account the studied population.

In relation to the results of the study, the sample of specialists is considered qualified since all nurses are postgraduates. Allied to this, the time of formation was considered expressive (range 6-10 years and 11-16 years obtained 38% predominance, each). It is noteworthy that all specialists reported professional experience in the area of donor maintenance, donation and/or organ transplants. In addition, 78% of the sample reported clinical experience with the use of NANDA-I, in addition to teaching and research experience.

The nine clinical indicators that have a numerical code next to them are NDs already existing in NANDA-I. The definition of syndrome stands out for this classification: "*clinical judgment regarding a particular cluster of NDs that occur together, being better treated through similar interventions*".[6:82]

In the endocrine-metabolic disorders group, clinical indicators were recommended: Acid-base imbalance, electrolyte imbalance, diabetes insipidus, altered diuresis, endocrine regulatory dysfunction, hyperglycemia, hypertension and hypothermia.

Acid-base disorders impair organ function and can be serious in potential organ donors. Metabolic acidosis leads to hypotension and vasodilation. It is caused by tissue hypoperfusion and causes worsening cardiac contraction and reduced endothelial response to catecholamines. While respiratory alkalosis is commonly due to hyperventilation and diuretic treatment administered in an attempt to decrease intracranial pressure.[12-14]

The literature shows that among the physiological changes resulting from brain death in the potential organ donor, diabetes insipidus occurs in 46 to 78% of the cases.[15,16] Diabetes insipidus without intervention causes polyuria and leads to hypernatremia and hypovolemic shock.[15] Studies indicate that, among metabolic disorders, hypernatremia is frequent, being a failure to maintain potential organ donors and subsidizing graft failure . Electrolyte imbalance is usually the result of large urinary losses. It is noteworthy that ions have important roles in cell physiology

and also contribute to the viability of the organs offered for transplantation.[12,13]

Gluconeogenesis increases with the "sympathetic storm" caused by brain death due to greater insulin resistance in peripheral tissues and reduced pancreas insulin secretion, causing hyperglycemia. The brain death also causes damage to the pituitary gland which can lead to hormonal deficiencies and also affects the central thermoregulation, and may result both in hypothermia as well as hyperthermia.[13-15,17,18]

In the group hemodynamic and/or cardiovascular changes, clinical indicators were recommended: Decreased cardiac output, altered cardiac rate, ineffective peripheral tissue perfusion, altered blood pressure, altered cardiac rhythm, deficient fluid volume and excessive fluid volume.

The "nice storm" in the donors with brain death releases catecholamines that produces vasoconstriction and initially leads to hypertension and tachycardia and can lead to cardiac arrhythmia. After the same, the result is loss of sympathetic tone, with profound vasodilation which induces hypotension, bradycardia and hypovolemia, which are the main problems during the maintenance of the potential donor. Hypotension should be avoided as it results in hypoperfusion, which contributes to the rapid deterioration of organ function. As a result of high intracranial pressure, a cardiovascular instability occurs, which can lead to myocardial injury. CVP and MAP should be monitored. CVP monitoring helps to control excessive fluid infusion that can cause pulmonary edema.[13,15,17]

In the group Ventilatory changes, clinical indicators were recommended Impaired oxygenation, Arterial oxygen pressure (AoP$_2$) altered, Arterial oxygen saturation (AoS$_2$) diminished, Impaired gas exchange and Impaired spontaneous ventilation. The brain death triggers a series of pathophysiological changes (arterial hypotension, hypothermia, diabetes insipidus, hyperglycemia, myocardial injury, coagulopathy), of which the literature highlights with a 62% incidence of moderate to severe respiratory dysfunction in potential organ donors.[16] Thus, brain death can cause a series of ventilatory changes, such as: Neurogenic pulmonary edema, increased risk for aspiration, ventilator-associated lung injury, among others. Although all solid organs are affected, the lungs are particularly sensitive to these events. Thus, for organ viability, especially the lung, it is important to control AoP$_2$, AoS$_2$ and oxygenation (AoP$_2$/FiO$_2$), in addition of gas-state exchange.[12,13,19]

In the group Nutritional changes, the clinical indicators Anemia and Imbalanced Nutrition were recommended: Less than the bodily needs. The literature points out that coagulopathy, fluid administration and bleeding can cause anemia in the potential organ donor.[20] In addition, guidelines for maintaining the potential donor recommend the use of nutritional support[21] to provide exogenous fuel in order to maintain lean mass and immune function, as well as avoid metabolic complications. Enteric nutrition should be continued, as it increases the supply of glycogen and has the potential to optimize graft function.[12,22]

In the group Coagulation changes, inflammatory and/or immunological, clinical indicators were recommended Coagulation changes, inflammatory changes and immunological changes. Brain injury releases the plasminogen activator which can have consequences on coagulation (thrombocytopenia, thromboplastin time and activated prothrombin) and can lead to hemorrhagic complications.[15] In addition, a systemic and local inflammatory response also occurs as a result of brain death. This response consists in the activation of complement and endothelium, in the release of cytokines and chemokines and in the flow of leukocytes to the organs, which can cause tissue damage and ischemia lesions in the organs, collaborating in graft rejection.[23] Brain damage can also cause immune changes. Leukocytes may be elevated as a result of systemic inflammatory state or nosocomial infection.[15]

The literature highlights that brain death (a related factor of this ED) causes deleterious effects on potential donors, causing several physiological changes. These changes, when not properly treated, are the main causes of the potential donor not being effective, in addition to impacting the quality of the transplanted organs.[13,16]

Thus, the maintenance of the potential organ donor includes full knowledge and immediate handling of the main complications resulting from brain death, in addition to the assistance of the multidisciplinary team. Nursing plays an important role in this scenario, since adequate assistance is essential to make the donation effective. Finally, it is considered that the use of ND is important, since through it the nurse prescribes interventions that will make a difference in patient maintenance and, consequently, in organ viability.[4]

Taxonomies *Nursing Outcomes Classification* (NOC) and *Nursing Interventions Classification* (NIC) have results and interventions that may be applied to this population with the ND proposed in this study. It is noteworthy that making connections between the ND and NOC results can suggest aspects of the problem or the patient's condition that are expected to be improved or resolved through an intervention, while NIC interventions suggest the relationship between the problem and nursing actions that can solve or alleviate this problem. In this way, in practice, nurses can, with the help of the NOC, control the effectiveness of NIC interventions.[24,25]

The 25 clinical indicators recommended in this study require greater direction of nursing interventions in maintaining the potential organ donor in patients with the proposed ND syndrome. However, this does not mean that non-validated indicators will receive less attention. The importance of multidisciplinary and interdisciplinary work is emphasized to focus on these indicators that are not recommended and are less sensitive to nursing interventions, but also important for the better viability of the organs offered for transplants. Therefore, nurses can intervene with requests for consultations, referrals, as well as request evaluations and support from other professionals when deemed necessary.

Thus, it is believed that not using NP and standardized languages in care practice, as well as the lack of tools and instruments to direct the maintenance of the potential organ donor, makes clinical reasoning difficult, being able to affect the

quality of care due to its complexity.[7] In this way, the ND *Impaired physiological balance syndrome* may assist the nurse in choosing interventions that enable the achievement of the best results.

CONCLUSION AND IMPLICATIONS FOR PRACTICE

This study made it possible to select, by consensus of experts, the main clinical indicators for developing the ND *Impaired physiological balance syndrome*. In order to increase the ND evidence level, it is suggested to carry out concept analysis and clinical validation in order to define which indicators give more support and precision to the ND. In addition, given the changes published in NANDA-I 2018-2020, it will be necessary to review which indicators will be conceptualized as defining characteristics or associated conditions or populations at risk. The ND must also be structured within the seven axes of NANDA-I, including domain and class. It is also relevant to develop studies with links between the proposed ND and the NOC and NIC taxonomies. It is noteworthy that the ND *Impaired physiological balance syndrome* will be forwarded to NANDA-I for publication in order to collaborate with the taxonomy qualification.

It is suggested to replicate this research with other related factors such as circulatory death (provided for in the legislation of some countries), for example, as well as with other possible patient populations that this new ND proposal can be applied to. However, using just brain death as a related factor and only in the context of maintaining the potential organ donor was considered a limitation of this study.

It is noteworthy that the results of this investigation portray an advance in nursing care, teaching and research practice. In healthcare practice, the use of this new ND will provide diagnostic accuracy supporting the implementation and evaluation of interventions that impact the improvement of the maintenance of the potential organ donor. In teaching, the use of elements from this ND can contribute to the construction of knowledge about the theme, especially with regard to the physiological changes caused by brain death and the care provided to maintain the potential donor. In addition, this ND can be explored in future research by applying the ND in a real environment. Also, the development of this ND can collaborate with the qualification of the NANDA-I taxonomy, and contribute to the construction of nursing knowledge in the area of maintenance of the potential organ donor.

Thus, nursing has investigated best clinical practices and innovative tools to support the care plan. Using this ND may come to provide better care systematization, assisting in the proper maintenance of the potential donor, and consequently contribute to the better viability of the organs offered for transplants, reflecting on the number of used organs, in addition to improving post-transplant survival.

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AUTHORS' CONTRIBUTIONS

Study conception and design. Data collection, data analysis and interpretation. Findings discussion. Content writing and/or critical review. Approval of the final version of the article. Responsibility for all aspects of the content and integrity of the published article: Luciana Nabinger Menna Barreto, Miriam de Abreu Almeida. Data analysis and interpretation. Findings discussion. Content writing and/or critical review. Approval of the final version of the article. Responsibility for all aspects of the content and integrity of the published article: Éder Marques Cabral, Natália Chies.

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