

NANDA-I NURSING DIAGNOSIS FOR CRITICAL PATIENTS WITH COVID-19 AND ON HEMODIALYSIS: CROSS-SECTIONAL STUDY

DIAGNÓSTICO DE ENFERMAGEM DA NANDA-I PARA PACIENTES CRÍTICOS COM COVID-19 E EM HEMODIÁLISE: ESTUDO TRANSVERSAL

DIAGNÓSTICO DE ENFERMERÍA NANDA-I PARA PACIENTES CRÍTICOS CON COVID-19 Y EN HEMODIÁLISIS: ESTUDIO TRANSVERSAL

Talita Ferreira Ribeiro Fagundes¹
Lara Malta Febrônio²
Ricardo Otávio Maia Gusmão³
Diego Dias de Araújo⁴

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Objective: to identify the nursing diagnoses of NANDA-I in critical patients hospitalized with COVID-19 and on hemodialysis. **Method:** a descriptive study, conducted with 61 patients from a university hospital in Minas Gerais between 2020 and 2021. For data collection, an instrument was used based on the theoretical model of Basic Human Needs, and after, there was the identification of nursing diagnoses from the NANDA-I Taxonomy and validation by experts with support in the diagnostic reasoning of Risner. **Results:** 49 diagnoses were obtained, distributed in eight domains. The prevalent nursing diagnoses were: excessive fluid volume, impaired skin integrity, impaired comfort, ineffective respiratory pattern, impaired physical mobility, risk of infection and risk of pressure injury. **Conclusion:** the study is innovative and provides evidence that allows the advancement of science in nursing regarding language standardization, clinical practice, teaching, research and management of critical patient care.

Descriptors: COVID-19. Renal Dialysis. Intensive Care Units. Nursing Diagnosis. Critical Care Nursing.

Objetivo: identificar os diagnósticos de enfermagem da NANDA-I em pacientes críticos internados com COVID-19 e em hemodiálise. Método: estudo descritivo, realizado com 61 pacientes de um hospital universitário em Minas Gerais entre 2020 e 2021. Para coleta de dados utilizou-se um instrumento fundamentado no modelo teórico das Necessidades Humanas Básicas, e após, ocorreu a identificação de diagnósticos de enfermagem da Taxonomia da NANDA-I e validação por especialistas com suporte no raciocínio diagnóstico de Risner. Resultados: foram obtidos 49 diagnósticos distribuídos em oito domínios. Os Diagnósticos de Enfermagem prevalentes foram: Volume de líquido

Corresponding author: Talita Ferreira Ribeiro Fagundes, talitarf40@gmail.com

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¹ Universidade Estadual de Montes Claros. Montes Claros, MG, Brazil. <https://orcid.org/0009-0006-8621-6604>.

² Hospital Municipal de Januária. Januária, MG, Brazil. <https://orcid.org/0000-0002-9375-6856>.

³ Universidade Estadual de Montes Claros. Montes Claros, MG, Brazil. <https://orcid.org/0000-0001-9941-1114>.

⁴ Universidade Estadual de Montes Claros. Montes Claros, MG, Brazil. <https://orcid.org/0000-0002-8927-6163>.

excessivo, Integridade da pele prejudicada, Conforto prejudicado, Padrão respiratório ineficaz, Mobilidade física prejudicada, Risco de infecção e Risco de lesão por pressão. Conclusão: o estudo é inovador e fornece evidências que permitem o avanço da ciência em enfermagem quanto à padronização da linguagem, na prática clínica, ensino, pesquisa e na gestão de cuidados de pacientes críticos.

Descritores: COVID-19. Diálise Renal. Unidades de Terapia Intensiva. Diagnóstico de Enfermagem. Enfermagem de Cuidados Críticos.

Objetivo: identificar los diagnósticos de enfermería de la NANDA-I en pacientes críticos internados con COVID-19 y en hemodiálisis. Método: estudio descriptivo, realizado con 61 pacientes de un hospital universitario en Minas Gerais entre 2020 y 2021. Para la recogida de datos se utilizó un instrumento basado en el modelo teórico de las Necesidades Humanas Básicas, y después se realizó la identificación de diagnósticos de enfermería de la Taxonomía de NANDA-I y validación por especialistas con apoyo en el razonamiento diagnóstico de Risner. Resultados: se obtuvieron 49 diagnósticos distribuidos en ocho dominios. Los Diagnósticos de Enfermería prevalentes fueron: Volumen de líquido excesivo, Integridad de la piel perjudicada, Conforto perjudicado, Patrón respiratorio ineficaz, Movilidad física perjudicada, Riesgo de infección y Riesgo de lesión por presión. Conclusión: el estudio es innovador y proporciona evidencias que permiten el avance de la ciencia en enfermería en cuanto a estandarización del lenguaje, en práctica clínica, enseñanza, investigación y en la gestión de cuidados de pacientes críticos.

Descriptores: COVID-19. Diálisis Renal. Unidades de Cuidados Intensivos. Diagnóstico de Enfermería. Enfermería de Cuidados Críticos.

Introduction

Global health was challenged in the years from 2019 to 2022 by COVID-19. Disease caused by the SARS-CoV-2 virus, which emerged in Wuhan, China, with high transmissibility and infected millions of people worldwide⁽¹⁾. The reaction caused by the virus ranges from mild, moderate and severe. In severe cases, some complications affect morbidity and mortality. Severe patients usually initiate Acute Respiratory Distress Syndrome (ARDS) and, as a result, develop injury and cascade failure of several organs⁽²⁾.

Among the organs with high risk of injury, the kidneys stand out, responsible for the regulation and extinction of toxicity present in blood. Although there are discussions about the direct relationship of SARS-CoV-2 virus and Acute Kidney Injury (AKI), pathophysiology lacks studies, but the cytokine storm is pointed out. AKI is directly related to higher mortality and worse prognosis. In approximately 3% of the cases of patients hospitalized with COVID-19 and AKI, renal replacement therapy, such as hemodialysis, is indicated as a form of treatment⁽³⁾.

The critical patient needs multiprofessional, specialized and advanced care for maintenance and recovery of life. In order to offer a holistic

care with scientific foundation, nursing uses as clinical method the Nursing Process (NP). The NP aims to promote nursing care focused on health prevention, promotion and rehabilitation⁽⁴⁾. This method consists of five stages: Nursing Evaluation, Nursing Diagnosis (ND), Nursing Planning, Implementation and Evolution of Nursing⁽⁵⁾. It is emphasized that taxonomies or nursing classifications can be used to designate the elements of nursing practice.

Among the nursing taxonomies, NANDA International (NANDA-I) is recognized as a worldwide reference for the identification of ND. This is defined as the clinical judgment of information obtained in nursing evaluation, related to unwanted human responses to a health condition or life process of an individual, family, group or community. ND has the potential to help reduce clinical complications, risks and advance the practice of nursing based on scientific evidence⁽⁶⁾.

Previous study⁽⁷⁾ of NANDA-I ND in critical patients with COVID-19 was investigated. However, there is evidence in the literature of lack of studies related to NANDA-I ND in critically hospitalized patients with COVID-19, especially

those on renal dialysis. Given the knowledge gap, as well as the recent and emerging nature of this problem, it is suggested, therefore, the survey of ND in critical patients with COVID-19 and hemodialysis, which may favor the advancement of nursing science in the documentation of nursing care and indicators based on standardized language. In addition, it can positively affect nursing care, teaching, research and management of critical patient care by enabling the planning and implementation of evidence-based practices. Thus, the present study aims to identify the nursing diagnoses of NANDA-I in critical patients hospitalized with COVID-19 and on hemodialysis.

Method

This is a cross-sectional and descriptive research, which evaluated the medical records of patients with COVID-19 diagnosis and dialysis therapy, admitted to the Intensive Care Unit (ICU) of a university hospital in northern Minas Gerais, between 2020 and 2021. The guidelines of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guided the conduct and reporting of this study.

The hospital where the study was conducted has 157 beds registered 100% in the Unified Health System (UHS). It is classified in the areas of urgency and emergency as Trauma Level II and has a Neonatal and Pediatric ICU, an adult ICU and the Emergency Room with 24-hour care.

The inclusion criteria were: medical records of patients aged 18 years or older, admitted to the ICU of the hospital in question, with a confirmed diagnosis of COVID-19 and who underwent dialysis therapy. The exclusion criteria were applied to medical records that presented incomplete or inaccurate information.

In the period from 2020 to 2021, 595 patients with suspected COVID-19 were admitted to the study hospital. Among these, 543 were excluded from the research because they did not meet the inclusion criteria, being: 308 patients who presented negative results for COVID-19 and 247 that were not admitted to the ICU or did not

require therapeutic intervention by dialysis. Thus, the final sample consisted of 61 medical records.

The data collection was carried out by a nursing student from a public state university in Minas Gerais. It should be noted that she was trained through a previous training on the subject and the study method.

The medical records were submitted to analysis by means of an instrument developed based on the approach of Wanda Aguiar Horta, that is, based on the Theory of Basic Human Needs (BHN)⁽⁸⁾. The instrument was composed of the following topics: identification and health history, including information such as sex, age, marital status, level of education and history of previous diseases or comorbidities, as well as hospitalization characteristics, such as total duration, the need or not for mechanical ventilation, hemodialysis sessions and the outcome of hospitalization (discharge or death). Psychobiological needs: oxygenation, nutrition, mobility, elimination, cutaneous-mucosal integrity, therapeutics, perception, physical security, environment, body care, vascular regulation, neurological, immunological, thermal and electrolytic. Psychosocial needs: social assessment and emotional security. Finally, psycho-spiritual needs: identification of spirituality.

During the research, initially, the terms or expressions corresponding to the appropriate human responses of interventions and nursing care were identified in the records. After that, nursing diagnoses were mapped and selected in the NANDA-I taxonomy, 2021/2023⁽⁶⁾. Therefore, the process of cross-mapping was carried out by terms that had similar meanings, facilitating the explanation or expression of ideas. This is done using equivalent words in a standard language, allowing comparisons and evaluations between terms of different categories in nursing⁽⁹⁾.

The validation of the ND was carried out by means of the consensus validation technique⁽¹⁰⁻¹¹⁾, which consists in an analysis performed by a group of experts from a certain area, at least three and at most five participants, with the objective of establishing a consensual opinion,

100% in this study, on the relevance of the ND identified in the survey⁽¹¹⁾.

The selection of experts for validation consisted of the following inclusion criteria: be a nurse; have professional experience or health residency in the area of intensive care; have at least two years as an intensivist, be the author, co-author or advisor of studies related to critical patients and/or the nursing process, including nursing taxonomies and/or classifications.

Based on the inclusion criteria, three experts were selected, who performed the validation of the terms found in two face-to-face meetings. The validation was based on the diagnostic reasoning of Risner, which consists in the interpretation of the data collected and, based on the scientific knowledge and experience of nurses, results in the identification, elaboration and validation of ND⁽¹²⁾.

At the end, the data were inserted into a spreadsheet in Microsoft Excel 2013® software. Then, a descriptive analysis was performed, determining the absolute and relative frequency of the data, as well as calculating the confidence intervals (CI) of 95% for the relative frequencies.

The current research was approved by the Research Ethics Committee of a Public University of Minas Gerais, under the Opinion n. 4.214.376 and Certificate of Presentation of Ethical Appreciation (CAAE) 31311320.1.0000.5146.

Results

Of the 61 participants, 62.3%⁽³⁸⁾ were male, aged between 29 and 89 years old, with an average age of 65.93 years and a standard deviation of 15.45 years.

NANDA-I⁽⁶⁾ has 267 nursing diagnoses, grouped in 13 domains and 47 classes. There were 777 titles of ND in the 61 hospitalized patients, with an average of 15.8 diagnoses per patient, and excluding repetitions, 49 different diagnostic titles were obtained, distributed in eight domains. Of these, 30 (61.2%) are real ND and 19 (38.7%) are risk diagnoses. It is noteworthy that no diagnoses were identified in the following domains: 1. Health promotion; 5. Perception/Cognition; 6. Self-perception; 7. Roles and relationships; 10. Principles of life; and 13. Growth/Development (Table 1).

Table 1 – Distribution of nursing diagnostic titles identified in patients admitted to the Intensive Care Unit with COVID-19 on hemodialysis, according to the NANDA-I domains. Montes Claros, Minas Gerais, Brazil – 2023. N=61

Domain	Nursing diagnostic titles (code)	n (%)	(95%) CI
2. Nutrition	Impaired swallowing (00103)	20 (33)	0.21-0.46
	Obesity (00232)	2 (3)	0.00-0.12
	Risk of impaired liver function (00178)	4 (6)	0.02-0.16
	Risk of unstable blood glucose (00179)	1 (2)	0.00-0.09
	Risk of fluid volume imbalance (00028)	1 (2)	0.00-0.09
	Risk of electrolyte imbalance (00195)	5 (8)	0.03-0.18
	Deficient fluid volume (00027)	2 (3)	0.00-0.12
	Excessive fluid volume (00026)	61 (100)	0.92-1
	Risk of fluid volume imbalance (00025)	1 (2)	0.00-0.09

Table 1 – Distribution of nursing diagnostic titles identified in patients admitted to the Intensive Care Unit with COVID-19 on hemodialysis, according to the NANDA-I domains. Montes Claros, Minas Gerais, Brazil – 2023. N=61

			(conclusão)
Domain	Nursing diagnostic titles (code)	n (%)	(95%) CI
3. Elimination and exchange	Impaired urinary elimination (00016)	37 (61)	0.47-0.72
	Urinary retention (000230)	3 (5)	0.01-0.14
	Constipation (00011)	9 (15)	0.07-0.26
	Diarrhea (00013)	23 (38)	0.25-0.51
	Dysfunctional gastrointestinal motility (00196)	3 (5)	0.01-0.14
4. Activity/rest	Impaired gas exchange (00103)	26 (43)	0.30-0.55
	Insomnia (00095)	1 (2)	0.00-0.09
	Impaired physical mobility (00085)	55 (90)	0.79-0.95
	Fatigue (00093)	3 (5)	0.01-0.14
	Decreased cardiac output (00029)	25 (41)	0.28-0.54
	Ineffective breathing pattern (00032)	61 (100)	0.85-0.98
	Ineffective peripheral tissue perfusion (00204)	25 (41)	0.28-0.54
	Risk for unstable blood pressure (00267)	4 (6)	0.02-0.16
	Activity intolerance (00092)	3 (5)	0.01-0.14
	Impaired spontaneous ventilation (00033)	1 (2)	0.00-0.09
	Bathing self-care deficit (00108)	21 (34)	0.23-0.47
5. Perception / Cognition	Acute confusion (00128)	9 (15)	0.07-0.26
	Impaired verbal communication (00051)	5 (8)	0.03-0.18
8. Sexuality	Risk of ineffective perinatalogical process (00227)	1 (2)	0.00-0.09
9. Coping / Tolerance	Anxiety (00146)	4 (6)	0.02-0.16
	Risk for ineffective activity planning (00226)	1 (2)	0.00-0.09
	Impaired mood regulation (00241)	1 (2)	0.00-0.09
	Risk of acute substance withdrawal syndrome (00259)	1 (2)	0.00-0.09
11. Safety / Protection	Risk of infection (00004)	54 (89)	0.77-0.94
	Risk of aspiration (00039)	27 (44)	0.31-0.57
	Impaired oral mucous membrane integrity (00045)	2 (3)	0.00-0.12
	Impaired skin integrity (00046)	61 (100)	0.92-1
	Impaired skin tissue integrity (00044)	3 (5)	0.01-0.14
	Risk of impaired skin integrity (00047)	2 (3)	0.00-0.12
	Risk of corneal injury (00245)	1 (2)	0.00-0.09
	Risk of pressure injury (00049)	43 (70)	0.57-0.81
	Risk of falls (00155)	11 (18)	0.09-0.30
	Risk of dry eye (00219)	4 (6)	0.02-0.16
	Risk of bleeding (00206)	13 (21)	0.12-0.34
	Risk of venous thromboembolism (00268)	2 (3)	0.00-0.12
	Hyperthermia (00007)	42 (69)	0.55-0.79
	Hypothermia (00006)	4 (6)	0.02-0.16

Table 1 – Distribution of nursing diagnostic titles identified in patients admitted to the Intensive Care Unit with COVID-19 on hemodialysis, according to the NANDA-I domains. Montes Claros, Minas Gerais, Brazil – 2023. N=61

Domain	Nursing diagnostic titles (code)	n (%)	(95%) CI
12. Comfort	Impaired comfort (00214)	60 (98)	0.90-0.99
	Acute pain (00132)	28 (46)	0.33-0.59
	Nausea (00134)	4 (6)	0.02-0.16

Source: created by the authors.

The most common ND identified in at least 70% of patients were: Excessive fluid volume (00026) (n=61, 100%), Impaired skin integrity (00046) (n=61, 100%), Impaired comfort (00214) (n=60, 98%), Ineffective respiratory pattern (00032) (n=58, 95%), Impaired physical mobility (00085) (n=55, 90%), Risk of infection (00004) (n=54, 89%), Risk of pressure injury (00249) (n=43, 70%).

Discussion

In the Intensive Care Unit, where critically ill patients are treated, the nursing team should perform a precise and thorough identification of the health conditions of each patient under their care. In this scenario, the nurse plays a crucial role not only in the evaluation and execution of the Care Plan (CP), but also in the leadership of coordinated care, promoting the exchange of knowledge and strategies between the nursing team and the multidisciplinary team⁽⁵⁻⁶⁾.

After analyzing the results of the research, 49 nursing diagnoses were identified. Of these, 30 related to real ND and 19 risk ND. It should be noted that, in the assistance, it is indicated that ND are classified according to their priority, that is, according to the potential risk to life or maintenance of the physiological, social, psychological and spiritual balance of the people. After, nursing interventions should be planned and implemented with the objective of minimizing, preventing or treating the identified problems.

In the Nutrition domain, the diagnosis with higher prevalence was excessive fluid volume⁽⁰⁰⁰²⁶⁾ (N = 61, 100%), defined as excessive intake and/or retention of fluids⁽⁶⁾. It is emphasized that due to AKI, there are negative impacts on the hydroelectrolytic control, thus, it can happen difficulty in the elimination of body fluids and consequent increase and accumulation of fluid in the extracellular space, clinically represented by the generalized body edema (anasarca). This symptom causes an increase in the permeability

of the vessels, negatively reflecting on the patient's clinical conditions, having as its main cause an electrolyte imbalance, confirmed by the study⁽³⁾.

In the Activity/Rest domain, the most frequent ND were Ineffective respiratory pattern⁽⁰⁰⁰³²⁾ (N= 61, 100%), defined as *Inspiration and/or expiration that does not provide adequate ventilation*⁽⁶⁾, and Impaired physical mobility⁽⁰⁰⁰⁸⁵⁾ (N= 55, 90%) determined as the *Limitation in independent and voluntary movement of the body or one or more extremities*⁽⁶⁾.

As for the ND Ineffective respiratory pattern⁽⁰⁰⁰³²⁾, it is understood that severely critical individuals due to complications of COVID-19 commonly have SARA, which may result in changes in the respiratory pattern and the need for temporary artificial mechanical ventilation, in order to preserve vital functions. This diagnosis was observed in a study conducted at the height of the pandemic in the state of Rondônia, being one of the main diagnoses in patients with suspected or affected by COVID-19. The importance of this diagnosis in the treatment of critical patients as a predictor of complications is highlighted⁽¹³⁾.

Regarding ND Impaired physical mobility⁽⁰⁰⁰⁸⁵⁾, it is noted that due to the clinical profile of patients in the ICU, as well as the use of sedative medications and neuromuscular blockers, they usually present dependence or movement limitation. It is emphasized that in this patient profile, diffuse and symmetrical muscle weakness is a recurrent complication in

patients admitted to the ICU; the study presented 32.8% of patients with the diagnosis of impaired physical mobility. The author also states that this diagnosis increases the length of hospitalization and consequently the risk of infection⁽¹⁴⁻¹⁵⁾.

In the Safety/Protection domain, there was a prevalence of the ND Risk of infection⁽⁰⁰⁰⁰⁴⁾ (N=54, 89%), defined as *Susceptibility to invasion and multiplication of pathogenic organisms that can compromise health*⁽⁶⁾. The critical clinical profile, as well as invasive procedures performed in patients admitted to the ICU may increase their vulnerability to developing Health Care-Related Infections (HCRI)⁽¹⁶⁾. In this perspective, it is essential that nurses identify early in the nursing evaluation the risk factors for infection and implement measures for the prevention and control of problems, avoiding complications and damage.

Domain 11, Safety/Protection, more precisely in the category of physical injury, presented high frequency of ND Impaired skin integrity⁽⁰⁰⁰⁴⁶⁾ (N=61, 100%), defined as altered *Epidermis and/or dermis*⁽⁶⁾. The skin is known as the largest organ of the body, having as its main function the protection of the organism against external aggressions. A previous study⁽¹⁴⁾ found 25.4% of patients with impaired skin integrity and 54.9% with impaired skin integrity risk. It should be noted that the critical patient is often exposed to internal and external risk factors that increase his/her vulnerability to compromise in skin integrity.

In addition to the previously mentioned ND, in the same domain and class, the ND Risk of pressure injury⁽⁰⁰²⁴⁹⁾ (N = 43, 70%) still stands out, described as *Susceptibility to localized injury of skin and/ or underlying tissue, usually on bone protrusion, as a result of pressure, or pressure combined with shear forces*⁽⁶⁾. It is understood that patients restricted to the bed have a high risk of developing pressure lesions and the critical patient has greater vulnerability because of being exposed to factors that increase skin susceptibility/ fragility, such as excessive fluid volume, use of sedatives or muscle relaxants and physical limitation or immobility. In a previous

study⁽¹⁷⁾ in critical patients with COVID-19, the incidence of the ND pressure lesion was 30.2% and the risk factors identified were age ($p<0.001$), diabetes mellitus ($p=0.005$), length of hospitalization ($p<0.001$), immunosuppression ($p=0.034$), nutritional risk ($p=0.015$) and mechanical ventilation ($p<0.001$).

In the Comfort domain, the ND Impaired Comfort⁽⁰⁰²¹⁴⁾ (N=60, 98%) is highlighted, whose definition is *Perception of lack of comfort, relief and transcendence in physical, psycho-spiritual, environmental, cultural and/or social dimensions*⁽⁶⁾. The ICU is perceived as a cold and hostile environment, where patients require constant painful examinations and are separated from their loved ones. Moreover, during the COVID-19 pandemic, discomfort may be exacerbated by uncertainty of diagnosis, observation of other patients' clinical worsening and lack of eye contact with caregivers due to physical barriers. Therefore, the nurse's role in humanizing care is crucial by adopting measures to reduce discomfort and in collaboration with the multidisciplinary team, making the patient's experience more comfortable and welcoming, even in challenging situations such as COVID-19⁽¹⁸⁾.

A diversity of outcomes may occur in critical patients under intensive care. The use of the nursing process in identifying these profiles is fundamental to provide a qualified and organized assistance, thus contributing to an efficient management of care. The conditions presented by critical patients in the ICU strongly direct to biological needs, however, it is essential that the nurse understands and treats patients in a holistic and integral way, in a biopsychosocial and spiritual perspective.

Regarding the limitations of the study, there is the lack of data and information in the medical records evaluated, which prevented a complete socioeconomic analysis, as well as the accurate definition of related factors, defining characteristics and risk factors.

Another limitation concerns the lack of comparison with researches with the same

theme in other scenarios, since in the literature researched, nationally and internationally, there was a scarcity of previous studies. Therefore, it cannot be concluded that the results found in this study are entirely corresponding to the existing literature. However, despite these limitations, the study has methodological rigor to mitigate its biases.

Unlike previous studies^(7,13-14), the present research innovates in the survey of ND in critical patients with COVID-19 and on hemodialysis, based on the evaluation of medical records and validation by specialists, which provides the identification of nursing phenomena accurate to the specific clinical profile and favors the planning and implementation of precise interventions. The profile of ND found can also contribute to the scope of knowledge of nursing in intensive care.

Conclusion

The study identified the main clinical situations that can be treated in nursing care and their correspondence with 49 NANDA-I diagnostic nursing titles.

The profile of ND for critical patients with COVID-19 on hemodialysis may assist nurses in clinical and critical reasoning, directing assistance, as well as planning and implementing effective care. Furthermore, disseminating the use of the NANDA-I taxonomy promotes professional autonomy, increased visibility and strengthens the identity and scientificity of nursing.

Collaborations:

1 – conception and planning of the project: Talita Ferreira Ribeiro Fagundes and Diego Dias Araújo;

2 – analysis and interpretation of data: Talita Ferreira Ribeiro Fagundes, Lara Malta Febrônio and Diego Dias Araújo;

3 – writing and/or critical review: Talita Ferreira Ribeiro Fagundes, Lara Malta Febrônio, Ricardo Otávio Maia Gusmão and Diego Dias Araújo;

4 – approval of the final version: Talita Ferreira Ribeiro Fagundes, Lara Malta Febrônio,

Ricardo Otávio Maia Gusmão and Diego Dias Araújo.

Competing interests

There are no competing interests.

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Data Availability Statement

The data that support the findings of this study are available in the article itself.

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