

ISSN on-line: 1984-7513

DOI: 10.4025/ciencuidsaude.v22i0.65882



NURSING DIAGNOSIS "HYPOTHERMIA" IN ELDERLY PATIENTS WITH HEART DISEASE: CROSS-SECTIONAL STUDY NESTED TO THE COHORT

Ericles Lopes de Moura* Dase Luyza Barbosa de Sousa Alves** Hanna Priscilla da Silva Medeiros*** Cyntia Leenara Bezerra da Silva**** Thuanny Nayara do Nascimento Dantas***** Jéssica Naiara de Medeiros Araújo****** Allyne Fortes Vitor******

ABSTRACT

Objective: to estimate the clinical profile and the prevalence of nursing diagnosis hypothermia and to identify its clinical indicators in elderly patients with cardiopathies. Method: cross-sectional study nested in the single retrospective cohort. Data were obtained from medical records of elderly patients admitted to the cardiological ward of a university hospital in the Brazilian Northeast, with collection and extraction from July to October 2018. The sample consisted of all participants aged over 60 years in the original study, resulting in 50 medical records. We applied a semi-structured script for data collection, which received descriptive statistical treatment and univariate association test with use of Pearson's chi-square and Fisher's exact test. For all analyses, IBM SPSS V 20.0 was used. Results: 54% of the sample presented hypothermia. The most prevalent clinical indicators were: use of pharmacological agent (100%), hypertension (86%) and inactivity (86%). Conclusion: the outcome of unintentional hypothermia in elderly patients with cardiopathies presented an important prevalence, having occurred in more than half of the sample. In this sense, nursing should be attentive to hypothermia in order to verify it accurately, prevent it or actively intervene in the thermal comfort of patients.

Keywords: Hypothermia. Body Temperature Regulation. Heart Diseases. Aged. Nursing Diagnosis.

INTRODUCTION

The World Health Organization (WHO) considers the elderly population to be composed of individuals aged 60 years or older in developing countries, a profile in which Brazil fits. In the World Report on Aging and Health, the WHO estimates that a child born in Brazil in 2015 has a life expectancy 20 years more than a child born 50 years⁽¹⁾.

Aging is understood as a heterogeneous process that, at the biological level, is associated with the accumulation of a wide variety of molecular and cellular damage. Over time, this damage leads to a gradual loss of physiological reserves, increased risk of contracting diseases and general decline in the intrinsic capacity of the individual⁽²⁾. The cardiovascular system is

the most commonly affected, so that its alterations account for the large number of deaths among the elderly, and the diseases that arise are the main causes of morbidity and mortality in the world $^{(3-4)}$.

Therefore, because it is a vital parameter of clinical importance, capable of predicting organic dysfunctions, body temperature also deserves attention, since its decrease clinically known as "hypothermia" — can result in significant cardiac repercussions⁽⁵⁾. Human beings are homeothermic animals capable of maintaining body temperature within a relatively narrow range, so that values below 36 degrees Celsius (°C) escape normal standards, and can configure varying degrees of hypothermia⁽⁶⁾.

Body temperature is controlled by the balance between production and heat loss. While

^{*}Nurse. Master's student in Nursing at the Graduate Program of the Federal University of Rio Grande do Norte (UFRN). Natal, Rio Grande do Norte, Brazil. E-mail: ericlesIm@gmail.com.ORCID:0000-0002-3364-4609.

^{**}Nurse. Master in Nursing. Natal, Rio Grande do Norte, Brazil. E-mail:daseufrn@gmail.com. ORCID:0000-0003-0462-9220.

***Nurse. Doctoral student in Nursing at the Graduate Program of UFRN. Natal, Rio Grande do Norte, Brazil. E-mail:silvahannap@gmail.com.ORCID:0000-0002-0847-4644.

****Nurse. Master's student in Nursing by the Graduate Program of the UFRN. Natal, Rio Grande do Norte, Brazil. E-mail:cyntialeenara@gmail.com. ORCID:0000-0001-5254-1536.

^{*****}Nurse. Master's student in Nursing by the Graduate Program of UFRN. Natal, Rio Grande do Norte, Brazil. E-mail:thuts.nayara1@gmail.com.ORCID: 0000-0001-5530-9871
*****Nurse. PhD in Nursing. Professor of the Graduate Course at the UERN. Natal, Rio Grande do Norte, Brazil. E-mail: *******Nurse. PhD in Nursing. Professor of the Undergraduate and Postgraduate Nursing Course at UFRN. Natal, Rio Grande do Norte, Brazil. E-mail:allynefortes@gmail.com. ORCID:0000-0002-4672-2303

metabolic reactions respond to a large extent by energy generation, conduction speed and heat transfer determine the pace of their loss. Heat loss of the body is promoted by skin vasodilation sweating. The regulation of body temperature has central origin and derives from hypothalamic responses modeled based on reflexes, through feedback mechanisms, which interfere with the integrator circuit. Thus, the capture of sensory signals obtained by thermoreceptors present in viscera, muscles, spinal cord and brain provide an accurate assessment of the thermal changes faced by the body and assist in the development thermoeffector responses, inhibition stimulation of thermogenesis^(2,7).

Unintentional hypothermia, the focus of this study, presents multiple causal factors that may be isolated or associated, and may result from excessive heat loss, inhibition of physiological thermoregulation or lack of adequate care for its prevention. It is known that changes in central temperature are related to changes in heart rate, systolic blood pressure, and respiratory rate, and that such parameters may assist in the decisionmaking of health professionals⁽⁵⁻⁸⁾. cardiopathic specifically, patients several adverse events caused by hypothermia can aggravate the clinical situation of population, such as: progressive depression of the central nervous system, electrocardiographic changes, ischemic cardiac episodes, impairment of coagulation, thrombocytopenia, fibrinolysis, hemorrhage⁽⁹⁾.

Thus. recognizing the complexity in intervening diagnosing, and preventing unwanted human responses, nursing taxonomies aim to classify and organize the care employed by professionals in the area. NANDA International, Inc. 2021 2023 (NANDA-I 2021-2023) presents the nursing diagnosis (ND) hypothermia (00006) as a condition in which "the central body temperature is below the normal daytime range in individuals above 28 days of life". Its related factors range from low environmental temperature to insufficient knowledge of the caregiver about the prevention of hypothermia. Also according to taxonomy, the populations most susceptible to occurrence of the phenomenon are composed of economically disadvantaged individuals, in

extremes of weight or age⁽¹⁰⁾.

Given that unintentional hypothermia is a complicating factor, with adverse results and proven consequences for the patient, the search for means and interventions is an essential assumption for nursing in the care environment, in which scientific research is shown as a salutary tool for problem solving⁽¹¹⁾.

In this sense, the occurrence of accidental or not induced hypothermia in other clinical contexts, as can be observed in neonatal and perioperative hypothermia, is already well described in the literature. However, the presence of this condition in elderly patients hospitalized with cardiopathies in inpatient units is still a subject little explored in the scientific community, constituting a fertile field for research, especially in nursing⁽¹²⁾.

That said, it is important to consider relevant the search for evidence related to the occurrence of hypothermia in the elderly population, given the valuable contributions of this investigation to subsidize care actions in control, prevention and treatment of this important clinical problem. Thus, it is questioned: What is the prevalence of the diagnosis of nursing *hypothermia* in elderly patients with cardiopathies and what are the clinical indicators of this diagnosis in this population? Thus, this study aimed to estimate the clinical profile and prevalence of nursing diagnosis *hypothermia*, as well as to identify its clinical indicators in elderly patients with cardiopathies.

METHOD

This is a cross-sectional study nested in a single retrospective cohort, with data obtained from computerized medical records of elderly patients hospitalized in a cardiological ward of a university hospital in the Brazilian Northeast. The cohort to which this study is nested aimed to analyze the phenomenon of hypothermia in patients with heart disease between the period of admission and the occurrence of this outcome, after empirical observations of the human response in the study sector. The cross-sectional study was based on the need to study this response in the elderly population considering its particularities. The Strengthening the Reporting of Observational Studies in Epidemiology

(STROBE) guideline was used to ensure a description of methodological quality⁽¹³⁾.

As for the population and sample, in the cohort to which this study is nested, the analysis resulted in 1,006 medical records, of which 645 were from patients hospitalized for heart disease and 361 for vascular diseases or from other units, which, for some reason, occupied a hospital bed in the cardiology sector from August 2016 to July 2018.

Data collection and extraction took place from July to October 2018. This period was determined because of the implementation, in August 2016, of a new system in the institution that records the medical records more carefully and with didactic tools that facilitate the obtaining of the data necessary for research. For purposes of this cross-sectional analysis, the sample was formed and composed of all patients aged over 60 years in the original study and who obeyed the other eligibility criteria, resulting in 50 medical records.

In the research institution, the nursing process is partially implemented, being used digital language system of previous and surpassed editions of NANDA-I, in addition to standardized interventions, without common use of the terms of the Nursing Outcomes Classification (NOC) professionals to establish nursing outcomes⁽¹⁴⁾.

All medical records were analyzed and those that met the pre-established eligibility criteria were selected. The inclusion criteria adopted were: (a) medical records of patients admitted to the institution's cardiac hospitalization unit in the proposed period; (b) age greater than or equal to 60 years; patients who could be followed up before undergoing surgical procedures (because the nested cohort required follow-up); and (c) those who did not present hypothermia at admission (since the outcome would be studied at the site). In addition, to compose the cohort sample, the medical records should contain records of at least two days of follow-up of individuals admitted to the cardiological ward, since the cut was made on the second day.

The following were excluded from the study:
(a) medical records of patients without conclusive medical diagnosis of heart disease (due to the public of interest); (b) patients

admitted to the cardiological unit exclusively for surgery in view of the impossibility of monitoring these patients and/or for other reasons, such as vascular diseases (because the nested cohort requires monitoring).

The data were extracted from two systems adopted by the hospital for the recording of information from patients' medical records. The tools available in them made it easier to obtain the information of interest to the research. For data collection, an instrument composed of three segments was elaborated by the authors of this research: 1. Sociodemographic characterization data (sex; age in full years; place of birth; place of residence; schooling; religion; and family income at minimum wages); 2. General clinical data (reason for hospitalization; associated comorbidities; vital signs - blood pressure, heart rate, respiratory rate and axillary temperature; peripheral oxygen saturation; capillary glycemia; and drug therapy); 3. Clinical indicators of nursing diagnosis hypothermia, of NANDA-I characteristics -acrocyanosis, (defining bradycardia with heart rate less than 50 beats per minute, cyanosis of nail beds, reduction of blood glucose level, hypoglycemia with glycemia less than 70 mg/dL, hypoxia, slow capillary filling being greater than 3 seconds and tachycardia with heart rate greater than 100 beats per minute; related factors – alcohol consumption and low ambient temperature; population at risk extremes of age considering the elderly person those aged 60 years or more; and associated conditions - damage to the hypothalamus, pharmacological agents, radiation therapy and trauma).

Variables related to the clinical indicators of hypothermia and present in NANDA-I 2021-2023 — such as increased metabolic rate, increased oxygen consumption, cold tremor, cold skin to the touch, piloerection, slow capillary filling, reduction in ventilation and peripheral vasoconstriction — were not observed in the records of medical records of elderly patients, so were not analyzed in this study. Therefore, data censored in medical records were considered in the statistical treatment and signaled in this research.

Thus, the clinical indicators of ND hypothermia evaluated regarding the defining characteristics were hypertension, bradycardia,

acrocyanosis, reduction in blood glucose, tachycardia, cyanotic nail beds, hypoxia; for the related factors were inactivity, alcohol consumption; regarding the population at risk, were extreme age and extreme weight; finally, regarding the associated conditions, the pharmaceutical agent, trauma and damage to the hypothalamus were evaluated.

The diagnosis of hypothermia was considered present when observed: the record of axillary temperature below 36 °C, according to the American Society of Perianesthesia Nurses and the Brazilian Ministry of Health; and the characteristics recorded in medical records^(6, 15-16) Thus, this variable was analyzed transversally obeying the presence or absence of hypothermia, based on data obtained on the second day of follow-up of the cohort to which this cross-sectional study is nested, that same day the highest mean incidence of hypothermia in the cohort was generated.

The data were categorized and organized in a spreadsheet built in Microsoft Excel and exported to statistical package Statistical Package for the Social Sciences (SPSS), version 20.0. Frequencies, measurements of the distribution center and their variabilities were analyzed. The normality of the data of parameters such as vital signs was verified by the Shapiro-Wilk test, in order to verify the null hypothesis that there was normality of distribution of the values of this variable in the study sample.

Since the p-value for the Shapiro-Wilk test was less than 0.05 for axillary temperature (p = 0.045) and respiratory rate (p = 0.000), the null hypothesis should be rejected and assume the alternative hypothesis that there was no normal distribution for these variables. Therefore, for axillary temperature and respiratory rate, the median was taken into account. The other variables dispensed with the Shapiro-Wilk normality test because they did not present statistical significance; therefore, the mean for the other continuous variables was considered.

In order to verify the relationship between categorical variables, we used the chi-square test or the Fisher's exact test, when the expected frequencies were less than five, since this parameter shows significance in the tests. The magnitude of association was performed by calculating the odds ratio (OR).

This study was approved by the Research Ethics Committee of the Federal University of Rio Grande do Norte, under number 2,574,889 and CAAE 85607418.3.0000.5537, and all the ethical requirements established by Resolution n. 466 of 2012 of the National Health Council were respected.

RESULTS

The evaluation of the results found in the medical records of the 50 participants of this research identified that 54% had hypothermia as an outcome. It is worth noting that axillary temperature below 36 °C was considered for the inference of the outcome "hypothermia".

Of the 50 medical records evaluated, the average age of the patients was 71.30 years (±8.18), 58% were male, 60% lived with a partner, 72% were born in Rio Grande do Norte (RN), and 54% lived in the interior of this state. Regarding patients' education, it was observed that the majority (32%) were not literate, followed by 24% with incomplete elementary school and 18% with complete high school. As far as religion is concerned, 64% were Catholics. Regarding family income, we obtained a percentage of 58% of patients with a prescription of up to two minimum wages in the family, with a minimum of one and a maximum of six salaries.

Regarding the clinical characterization/reason for hospitalization of patients in the cohort to which this cross-sectional study is nested, it was observed that heart failure (HF) was the most frequent cause of hospitalization in the investigated medical records (22%), followed by angina (20%) and valvulopathies (18%). Regarding the general comorbidities recorded in the medical records, there was a predominance of systemic arterial hypertension (SAH), present in 86% of the elderly patients, followed by diabetes *mellitus* (DM) in 40%.

Regarding the vital signs collected during the period of hospitalization of the patient until the development of the outcome "hypothermia", it was found that the median axillary temperature of elderly patients with cardiopathies was 35.9 °C, with a minimum of 34.6 °C and a maximum of 37.2 °C. Heart rate averaged 72.2 (±12.2)

beats per minute (bpm). The respiratory rate recorded a median of 19 respiratory incursions per minute (irpm), with a minimum value of 15 irpm and a maximum of 26 irpm. Blood pressure presented mean systolic blood pressure (SBP) and diastolic blood pressure (DBP) around 116 67 mmHg, respectively.

Regarding the values of capillary glycemia, obtained by hemoglycoteste (HGT), a median of 133.5 mg/dLwas observed, with a minimum value of 99 and maximum of 336 mg/dL. For

peripheral oxygen saturation, parameter measured based on pulse oximetry, a mean of 95.4% (±2.0) was obtained.

On the clinical indicators of nursing diagnosis *hypothermia*, of NANDA I, variables related to defining characteristics, related factors, populations at risk and associated conditions were analyzed. Table 1 shows the elements of these clinical indicators of nursing diagnosis *hypothermia* (NANDA-I) observed in patient records.

Table 1. Elements of clinical indicators of nursing diagnosis hypothermia, NANDA-I, considered in the study and recorded during the follow-up period in the medical records of elderly patients admitted to the cardiological ward — Natal, Rio Grande do Norte, Brazil, 2016-2018, N = 50

Clinical indicators of nursing diagnosis hypothermia (NANDA-I)					
Variables	N (%)				
Defining characteristics(NANDA-I)					
Hypertension	43 (86.0)				
Bradycardia	3 (6.0)				
Acrocyanosis*	2 (4.0)				
Reduction in blood glucose levels*	2 (4.0)				
Tachycardia*	2 (4.0)				
Cyanoticnailbeds*	1 (2.0)				
Hypoxia*	1 (2.0)				
Factors related(NANDA-I)					
Inactivity	43 (86.0)				
Alcoholconsumption	2 (4.0)				
Populations at risk (NANDA-I)					
Age extremes	50 (100.0)				
Weight extremes*	4 (8.0)				
Conditions attached (NANDA-I)					
Pharmaceutical agent	50 (100.0)				
Trauma	2 (4.0)				
Damage to the hypothalamus	1 (2.0)				

^{*}Data absent in some sample records.

According to Table 1, hypertension (86%) was the defining characteristic of *hypothermia* most prevalent in elderly patients with heart disease. Of the related factors, the one with the highest predominance in the sample was inactivity (86%). Of the populations at risk, the one that stood out most was the age extremes (100%), considering the age group of the participating public. Regarding the associated conditions, all hospitalized elderly people used pharmaceutical agents (100%).

Some medical records had missing indicators because there were no records of their occurrence in the patient and it was not possible to evaluate their existence, because it is a crosssectional study nested in the retrospective cohort, which makes gauge bias one of its limitations.

Table 2 describes the relationships between the drugs that were associated with the human response "hypothermia" in this study. There was a statistically significant association between the occurrence of hypothermia and two classes of drugs (antibiotics and antilipids).

Regarding antilipemics, it was observed that the odds ratio that elderly patients with Cardiopathies have to develop hypothermia when in antibiotic therapy is 6.2 times higher (OR = 6.2) when compared to those who do not use this therapeutic resource. In addition, there was also a 5.4 times higher odds ratio of elderly patients with Cardiopathies using antilipemic

drugs to develop the outcome than those without this type of pharmacotherapy. It is worth mentioning that antibiotics were used by 24% of the sample; and antilipidemics by 56%.

The other classes of drugs included in the

study, as well as the other clinical variables, sociodemographic variables and clinical indicators of ND hypothermia (NANDA-I) did not show statistically significant associations with the outcome.

Table 2. Relationships between the drugs that were associated with the occurrence of hypothermia in the medical records of elderly patients admitted to the cardiological ward — Natal, Rio Grande do Norte, Brazil, 2016-2018, N = 50

Medicines	Hypothermia		Pearson'sχ ² *		OR§ (CI95%)
	Yes	No	Statistical [†]	p [‡]	OK' (C195%)"
Antibiotics					
Yes	10	02	4.04	0.044	6.2 (1.3; 28.4)
No	17	21			0.2 (0.04; 0.7)
Antilipemic					
Yes	20	08	6.26	0.012	5.4 (1.7; 17.4)
No	07	15		0.012	0.2(0.06;0.6)

^{*} Pearson's chi-square test; † value of the chi-square statistic; ‡ significance value of the test at the 95% confidence level, use of the Yates continuity correction; §odds ratio; || 95% confidence interval of the odds ratio

DISCUSSION

The elderly population is a risk group for the occurrence of hypothermia, since the aging process causes changes in the efficiency of the thermoregulatory center (the one responsible for maintaining body temperature at adequate levels) reducing the competence of this group for thermoregulation — this is one of the classes of the Security and Protection domain of NANDA-I⁽¹²⁾.

According to the Brazilian Society of Cardiology, cardiovascular diseases (CVD) are among the leading cause of death worldwide; and, in the national scenario, they represent about 30% of the deaths recorded, an equally alarming figure^(4,17). In the middle of the second decade of the 21st century, about half of Brazil's elderly population (48.6%) reported having one or two diseases, while 29.1% reported having three or more. Among the diseases observed, cardiovascular diseases were the most prevalent, such as hypertension and hypercholesterolemia⁽¹⁸⁾.

In the perioperatory context, the patient may present the response or vulnerability to hypothermia, causing unnecessary suffering and prolonging hospital stay. In the sample, the most prevalent reason for hospitalization was heart failure. The same was found in another study whose objective was to characterize the profile of patients readmitted to the cardiac

ward due to heart failure, which was the main heart disease related to hospital readmission of patients — most of them were female and had a mean age of 77.5 years(19-20).

In another study, based on a retrospective cohort, which aimed to investigate the prognostic factors of patients with accidental (or unintentional) hypothermia from a multi-institutional perspective, we observed that if more than half of the hypothermic patients were male and elderly, with a median age of 79 years. In addition to this finding, the research also revealed that cardiovascular diseases were the most found in the patients' personal history⁽²¹⁾.

A multicenter study conducted in Japan with 537 patients of different ages showed that approximately 80% of the sample that developed hypothermia was older than 65 years⁽²²⁾. These results are corroborated by the findings of this cross-sectional analysis, in which the occurrence of hypothermia was a prevalent outcome in the geriatric population.

SAH and DM were the most prevalent general comorbidities in the present study. In recent years, there has been an increase in the rates of chronic non-communicable diseases (NCDs) — for example, SAH and DM — by the change in the population's living habits: increased exposure to common risk factors, such as inadequate diet and abuse of industrialized diets; alcoholism; and sedentary

lifestyle⁽²³⁾.

The presence of hypothermia in this study presented an important prevalence of 54%. In another study, performed in a post-anesthetic recovery room, it was demonstrated that elderly patients had a greater tendency to present hypothermia and a lower ability to recover from this condition when compared to young patients⁽²⁴⁾.

Regarding vital signs, all presented with means and/or medians mostly within the normal values during the follow-up period. However, it is said that when the temperature drops below 36 °C, catecholamine levels rise, which consequently increases heart rate and average blood pressure. Also, the respiratory system changes under hypothermia, hyperventilations are observed. Right from the start, oxygen consumption and metabolic rate can increase considerably. Finally, the release of catecholamines also induces glycogenolysis and, consequently, hyperglycemia, so that important cardiac repercussions may arise⁽²⁵⁾.

It is worth noting that elevated systemic pressure was the only defining characteristic present in more than half of the population. In this sense, it is suggested the production of studies that work more specifically these variables in all audiences, especially nursing professionals directly involved in the evaluation, treatment and prevention of this human response⁽²⁶⁾. It is understood that the fact that other variables related to the clinical indicators of the nursing diagnosis in study, such as inactivity and use of pharmaceutical agents, stood out, mainly due to the patients' own state, once they were hospitalized for unfavorable clinical conditions.

However, it is important to note that 56% and 24% of the medical records indicated the use of drug therapy with antibiotics and antilipids, respectively. In addition, there was a significant statistical relationship regarding the increased occurrence of hypothermia in patients who used antilipids. According to the observed results, it was not possible to obtain studies that dealt with some of these associations or relationships with statistical significance between most variables with the outcome "hypothermia". These findings can be justified by the lack of sufficient data to determine

variables and generate probable significant associations.

However, it is worth mentioning the fact that oral lipid-lowering agents are among the drugs commonly used among older people, because they act in the stabilization of atheromatous plaques and decrease the (re)incidence of cardiovascular diseases, in therapeutic regimens provided in protocols of care for patients with cardiopathies. Through scientific evidence, it is already known, for example, that the reduction of low Density lipoprotein (LDL) cholesterol through the use of antilipid resources is effective in reducing the risk of cardiovascular disease in the elderly, especially in those over 75 years⁽²⁷⁾. That said, it is assumed that drugs lipid-lowering potential are often prescribed to this audience, which may have skewed the outcome of this study.

The findings sow discussions and research needs about the studied response in other contexts that are not only linked to therapeutic and perioperatory use — still the vast majority. Therefore, studies that seek to understand the consequences of hypothermia and provide therapies to it in the wards are lacking, since, as is known, in the perioperatory context, it can produce adverse clinical outcomes, longer hospitalization time and increased costs⁽²⁸⁾.

The incessant search for scientific knowledge in the area of nursing should integrate the skills of the professional nurse from their training, stimulating the effort to develop and improve the work of their class, in order to ensure safe care, quality and grounded in science.

Hypothermia is a clinical condition in whose identification, treatment and prevention nursing can act, since body temperature is a vital sign capable of helping in the prediction of cardiovascular dysfunctions. In addition, it is necessary to disseminate studies that contribute to the development of taxonomies such as NANDA International, especially regarding the elements that make up the diagnosis: risk populations (elderly) and associated conditions (cardiopathies). Thus, the research presents contributions to the advancement of nursing science and evidence-based practice (EBP).

Nursing, dedicated to multidimensional care to the individual, family and community, must

be attentive to unwanted human responses, such as hypothermia, to verify it accurately, prevent it or actively intervene in the thermal comfort of patients.

Despite the clarity of the data and the scientific rigor applied to the development of this research, it is necessary to consider some of its limitations. Insufficiency of data, erroneous annotations, inaccuracy of information and lack standardization of the method measurement of axillary temperature of hospitalized patients were limiting factors. In addition, the lack of knowledge about the model and calibration of the thermometer used, technique measurement and impossibility of evaluating environmental factors due to the absence of this type of data in the medical records also showed as limitations, aspects can directly influence the values obtained by body thermometry of patients.

CONCLUSION

We conclude that the outcome of

unintentional hypothermia in elderly patients with cardiopathies presented prevalence, having occurred in more than half of the sample. Regarding the presence of clinical indicators of DN *hypothermia*, NANDA-I, hypertension, inactivity, extremes of age and pharmaceutical agents were the most prevalent elements in this study.

Regarding the establishment of associations between variables and the occurrence of hypothermia, this study showed suggestive results: the chance of developing hypothermia in elderly patients with cardiopathies was higher in those who used antibiotics and antilipids as drug therapy.

Thus, the need to implement interventions to prevent unintentional hypothermia in elderly patients with cardiopathiesis emphasized. In this line, both in relation to the scenario in which this research was developed and the target audience of this study, the role of nurses is indispensable for the improvement of care for hospitalized patients.

DIAGNÓSTICO DE ENFERMAGEM "HIPOTERMIA" EM PACIENTES IDOSOS COM CARDIOPATIAS: ESTUDO TRANSVERSAL ANINHADO À COORTE RESUMO

Objetivo: estimar o perfil clínico e a prevalência do diagnóstico de enfermagem *hipotermia* e identificar seus indicadores clínicos em pacientes idosos com cardiopatias. **Método:** estudo transversal aninhado à coorte única retrospectiva. Os dados foram obtidos em prontuários de pacientes idosos internados em enfermaria cardiológica de um hospital universitário do Nordeste brasileiro, com coleta e extração de julho a outubro de 2018. A amostra foi composta por todos os participantes com idade superior a 60 anos no estudo original, resultando em 50 prontuários. Aplicou-se um roteiro semiestruturado para a coleta de dados, os quais receberam tratamento estatístico descritivo e teste de associação univariada com uso de qui-quadrado de Pearson e teste exato de Fisher. Para todas as análises, utilizou-se o IBM SPSS V 20.0. **Resultados:** da amostra, 54% apresentaram hipotermia. Os indicadores clínicos mais prevalentes foram: uso de agente farmacológico (100%), hipertensão (86%) e inatividade (86%). **Conclusão:** o desfecho da hipotermia não intencional em pacientes idosos com cardiopatias apresentou importante prevalência, tendo ocorrido em mais da metade da amostra. Nesse sentido, a enfermagem deve estar atenta à hipotermia, a fim de verificá-la com precisão, preveni-la ou intervir ativamente no conforto térmico dos doentes.

Palavras-chave: Hipotermia. Regulação da Temperatura Corporal. Cardiopatias. Idoso. Diagnóstico de Enfermagem.

DIAGNÓSTICO DE ENFERMERÍA "HIPOTERMIA" EN PACIENTES MAYORES CON CARDIOPATÍAS: ESTUDIO TRANSVERSAL ANIDADO A COHORTE

RESUMEN

Objetivo: estimar el perfil clínico y la prevalencia del diagnóstico de enfermería *hipotermia* e identificar sus indicadores clínicos en pacientes ancianos con cardiopatías. **Método**: estudio transversal anidado a la cohorte única retrospectiva. Los datos fueron obtenidos en registros médicos de pacientes ancianos internados en enfermería cardiológica de un hospital universitario del Nordeste brasileño, con recolección y extracción de julio a octubre de 2018. La muestra fue compuesta por todos los participantes con edad superior a 60 años en el estudio original, resultando en 50 registros. Se aplicó un guion semiestructurado para la recolección de datos, los

cuales recibieron tratamiento estadístico descriptivo y prueba de asociación univariada con uso de chi-cuadrado de Pearson y prueba exacta de Fisher. Para todos los análisis, se utilizó el IBM SPSS V 20.0. Resultados: de la muestra, 54% presentaron hipotermia. Los indicadores clínicos más prevalentes fueron: uso de agente farmacológico (100%), hipertensión (86%) e inactividad (86%). Conclusión: el resultado de la hipotermia no intencional en pacientes mayores con cardiopatías presentó importante prevalencia, habiendo ocurrido en más de la mitad de la muestra. En este sentido, la enfermería debe estar atenta a la hipotermia, a fin de verificarla con precisión, prevenirla o intervenir activamente en el confort térmico de los enfermos.

Palabras clave: Hipotermia. Regulación de la Temperatura Corporal. Cardiopatías. Anciano. Diagnóstico de Enfermería.

REFERENCES

- 1. Organização Mundial da Saúde. Relatório Mundial de Envelhecimento e Saúde. 2015 [cited 2019 Nov 19]. Available from: https://sbgg.org.br/oms-divulga-relatorio-sobre-envelhecimento-esaude/.
- 2. Ibraimov AI. Cell thermoregulation and origin of homeothermic animals. CRBMB. 2019:1(1):10–13. http://dx.doi.org/10.33702/crbmb.2019.1.1.3.
- 3. Roth GA, Mensah GA, Johnson CO, Addolorato G, Ammirati E, Baddour LM, et al. Global Burden of Cardiovascular Diseases and Risk Factors, 1990-2019. J. Am. Coll. Cardiol. 2020;76(25):2982-3021. http://dx.doi.org/10.1016/j.jacc.2020.11.010.
- 4. Passinho RS, Pereira RSF, Pimenta AM. Factors associated with high cardiovascular risk according to Framingham score: integrative Ciênc.,Cuid. Saúde. 2023;22(0):e64364. http://dx.doi.org/10.4025/ciencuidsaude.v22i0.64364.
- 5. Collins S, Budds M, Raines C, Hooper V. Risk Factors for Perioperative Hypothermia: A Literature Review. J.PeriAnesth.Nurs. 2019;34(2):338-346.
- Doi:http://dx.doi.org/10.1016/j.jopan.2018.06.003.
- 6. Rauch S, Miller C, Bräuer A, Wallner B, Bock M, Paal P. Perioperative hypothermia—a narrative review. Int. Environ. Res. Public Health. 2021; 18(16):8749. https://doi.org/10.3390/ijerph18168749.
- 7. Morrison SF, Nakamura K. Central Mechanisms for Annu.Rev. Physiol. 2019;81(0):285-308. Thermoregulation. Doi:http://dx.doi.org/10.1146/annurev-physiol-020518-114546.
- 8. Pasquier M, Cools E, Zafren K, Carron P, Frochaux V, Rousson V. Vital Signs in Accidental Hypothermia. High Alt. Med. Biol. 2021 Jun 1;22(2):142-7. Doi:https://doi.org/10.1089/ham.2020.0179.
- 9. Sari S, Aksoy SM, But A. The incidence of inadvertent perioperative hypothermia in patients undergoing general anesthesia and an examination of risk factors. Int.J. Clin. Pract. 2021; 75(6): e14103.Doi:https://doi.org/10.1111/ijcp.14103.
- 10. Herdman TH, Kamitsuru S. Diagnósticos de Enfermagem da NANDA: Definições e Classificação 2021-2023. Porto Alegre: Artmed; 2021. 568p.
- 11. Cunha RGB, Guimarães SM, Schneider DS, Bongiorni GT. Revisão Integrativa: Hipotermia não intencional com a incorporação de evidências na prática clínica. Aletheia [Internet]. 2020 Jun [cited Feb 19];53(1):13-28.Available from: http://pepsic.bvsalud.org/scielo.php?script=sci arttext&pid=S1413-03942020000100003.
- 12. Ribeiro E, Ferreira RC, Montanari FL, Botelho MT, Correia MD, Duran EC. Conceptual and operational definition of the components of the nursing diagnosis hypothermia (00006) in the perioperative period. Rev. Bras. Enferm. 2021;74(2). Doi: https://doi.org/10.1590/0034-7167-2019-0684.
- 13. Cuschieri S. Cuschieri S. The STROBE guidelines. Saudi 2019;13(1):31-34. Doi:http://dx.doi.org/10.4103/sja.SJA 543 18.
- 14. Moorhead S, Swanson E, Johnson M, Maas ML. Classificação dos Resultados de Enfermagem NOC. 6a ed. Rio de Janeiro: Editora

- Guanabara Koogan Ltda; 2020. 1714 p.
- 15. Li C, Zhao B, Li L, Na G, Lin C. Analysis of the Risk Factors for the Onset of Postoperative Hypothermia in the Postanesthesia Care Unit. J. PeriAnesth. Nurs. 2021; 36(3):238-242. Doi: https://doi.org/10.1016/j.jopan.2020.09.003.
- 16. Rauch S, Miller C, Bräuer A, Wallner B, Bock M, Paal P. Perioperative Hypothermia—A Narrative Review. Int. J. Environ. Res. Public Health. 2021;18(0):8749. Doi: https://doi.org/10.3390/ijerph18168749.
- 17. Précoma DB, Oliveira GMM, Simão AF, Dutra OP, Coelho OR, Izar MCO, et al. Atualização da Diretriz de Prevenção Cardiovascular da Sociedade Brasileira de Cardiologia - 2019. Arq. Bras.Cardiol. [Internet]. 2019[cited 2022 Nov 15]; 113(4):787-891. Available

from:http://publicacoes.cardiol.br/portal/abc/portugues/aop/2019/aop -diretriz-prevencao-cardiovascular-portugues.pdf.

- 18. Feitosa-Filho GS, Peixoto JM, Pinheiro JES, Neto AA, Albuquerque ALT, Cattani AC, et al. Atualização das Diretrizes em Cardiogeriatria da Sociedade Brasileira de Cardiologia. Arq. 2019;112(5):649-705. Bras.Cardiol. Doi:http://www.dx.doi.org/10.5935/abc.20190086.
- 19. Honkavuo L, Loe SAK. Nurse Anesthetists' and Operating Theater Nurses' Experiences with Inadvertent Hypothermia in Perioperative Nursing Care. J.PeriAnesth.Nurs. Clinical 2020;35(6):676-81. Doi: https://doi.org/10.1016/j.jopan.2020.03.011.
- 20. Wideqvist M, Cui X, Magnusson C, Schaufelberger M, Fu M.Hospital readmissions of patients with heart failure from real world: timing and associated risk factors. ESC HeartFailure. 2021;8(2):1388-1397.Doi: https://doi.org/10.1002/ehf2.13221.
- 21. Okada Y, Matsuyama T, Morita S, Ehara N, Miyamae N, Jo T, et al. Prognostic factors for patients with acidental hypothermia: A multi-institutional retrospective cohort study. Am. J. Emerg. Med. 2019;37(4):565-570. Doi:https://doi.org/10.1016/j.ajem.2018.06.025.
- 22. Wiberg S, Mortensen AF, Kjaergaard J, Hassager C, Wanscher M. Accidental hypothermia in Denmark: A nationwide cohort study of incidence and outcomes. BMJ Open. 2021; 11(0):e046806. Doi: https://doi.org/10.1136/bmjopen-2020-046806.
- 23. Labegalini CMG, Aguirre HC, Peruzzo HE, Christinelli HCB, Souza RR, Marcon SS, et al. Health care for hypertensive and diabetic people: nurses' perception. Ciênc., Cuid. Saúde. 2022; 21(0):e61580. https://doi.org/10.4025/ciencuidsaude.v21i0.61580.
- 24. Mendonça FT, Lucena MC, Quirino RS, Govêia CS, Guimarães GMN. Risk factors for postoperative hypothermia in the post-anesthetic care unit: a prospective prognostic pilot study. Rev. Anestesiol. 2019; 69(2):122-130.
- 25. Bjertnæs LJ, Næsheim TO, Reierth E, Suborov EV, Kirov

Doi:https://doi.org/10.1016/j.bjane.2018.11.002.

- MY, Lebedinskii KM, et al. Physiological Changes in Subjects Exposed to Accidental Hypothermia: An Update. Front. Med. 2022; 9(0):824395. Doi: https://doi.org/10.3389/fmed.2022.824395.
- 26. Tang P, Jiang Z. Application of Predictive Nursing Intervention in Prevention of Hypothermia in Elderly Patients During Surgery. Rev. Invest. Clín. [Internet]. 2019 [cited 2020 Jan 10]; from: 60(3):595-602. Available https://link.gale.com/apps/doc/A626676053/IFME?u=anon~ba58b2c

a&sid=googleScholar&xid=fafee0f1.

27. Lee SH, Lee YJ, Heo JH, Hur SH, Choi HH, Kim KJ,et al. Combination Moderate-Intensity Statin and Ezetimibe Therapy for Elderly Patients With Atherosclerosis. J. Am. Coll.Cardiol. 2023 [cited 2023 July 02];81(14):1339-49. Doi:

https://doi.org/10.1016/j.jacc.2023.02.007.

28. Mendes MA, Barros NKRO, Carmo TG. Risk of perioperative hypothermia: An integrative review. Rev. SOBECC. 2021;26(1):60-67.Doi: https://doi.org/10.5327/Z1414-4425202100010009.

Corresponding author: Ericles Lopes de Moura. Lagoa Nova, S/N. Natal, Rio Grande do Norte, Brasil. Telefone: 55 84

9 9433-3750, E-mail: ericleslm@gmail.com

Submitted: 18/11/2022 **Accepted:** 20/08/2023

Finacial support:

This work was partially funded by the National Council for Scientific and Technological Development, process number 306106/2022-1.