Chapter 22

Application of the scoring system and therapeutic interventions (TISS-28) in post cardiac surgery patients in the intensive care unit of a teaching hospital in western Pará

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ABSTRACT
Introduction: An Intensive Care Unit (ICU) is a critical area for the hospitalization of critically ill patients and for the classification of severely ill patients and who use instruments that demonstrate instability and likelihood of their recovery. Objective: To evaluate the use of the TISS-28 score from the direct and indirect observation of postoperative cardiac patients in an ICU. Methods: cross-sectional and prospective study, procedure with descriptive, analytical and quantitative approach performed in the ICU of a teaching hospital in western Pará with patients of both sexes, aged ≥ 18 years, in the postoperative period. cardiac surgery,. Results: females aged 40 to 79 years were the most prevalent and presented comorbidities such as systemic arterial hypertension and / or diabetes mellitus, performing mainly surgeries such as myocardial revascularization and as aortic and mitral valve replacement, where, as the main complications in the Post-cardiac surgery were decreased base vesicular murmurs and tachycardia, with an average ICU stay of 6 days per patient. Conclusions: It is concluded that the application of TISS-28 facilitates the evaluation process of the patient and contributes significantly to the determination of the best conduct of the multidisciplinary team.

Keywords: Patient care, Heart disease, Disease severity index

1 INTRODUCTION

According to the Resolution - RDC No. 7 of February 24, 2010 (BRASIL, 2010, p.2) the Intensive Care Unit (ICU) is a "critical area intended for the admission of critically ill patients who require continuous specialized professional attention, specific materials and technologies necessary for diagnosis, monitoring and therapy. Its main feature is the complex care function full of uninterrupted monitoring equipment prepared for the admission of critical patients or patients with imbalance of one or more organ systems, who from the intensive care assistance can establish homeostasis (HMEC, 2012, p. 3).

Such area aims to provide therapy to serious and high-risk patients, due to its personal and physical structure trained multiprofessional team, agile and effective and materials and equipment with the purpose of providing care support to restore the health of patients (ALVES, 2013, p. 115).

In addition to the aforementioned factors, the multidisciplinary intensivist team must have technical and scientific basis and be trained to deal with loss, pain, suffering and all the stress that working in this sector requires (HERCOS et al., 2014, p. 42).

The care team should be aware that the critically ill patient requires long periods of care, both when performing routine procedures upon admission and during their stay in the unit, due to the likelihood of presenting organic instabilities that are installed during their stay in the ICU. Thus, during the hospitalization period, the nursing team plays an important role due to its constant contact with the critically ill patient (ALTAFIN, 2014, p. 292).

Given this long follow-up, patient care in recent decades has been converted into a conventional and indispensable type of complex health care resource to monitor frequencies of the cardiovascular system, possible trauma and high incidence of emergencies (SEGURA et al., 2015).

In the process of monitoring the critically ill patient, identifying who needs intensive care and assessing the true severity of their conditions has become feasible with the development of indices or measurement systems and specific prognostic methods for their application (ROCCO et al., 1997).

In this direction, Perão et al., (2014a, p. 262) infer that to establish the classification of the severity of patients in the ICU "it is necessary to apply instruments that demonstrate the instability of these patients and the probability of their recovery".

In 1974, Cullen and collaborators created a therapeutic assessment instrument containing 57 interventions to assess severity of critically ill patients and to support reliable cost analyses. After several adaptations, in 1996, the TISS was expanded to 28 assessment items, resulting in the TISS 28 version [...]. In Brazil, the evaluation and translation of this instrument occurred in 2000 (PERÃO, 2013b, p. 27).

The *Therapeutic Intervention Scoring System-28* (TISS-28) is an instrument that was developed with the purpose of assessing the severity of ICU patients, defining their daily parameters in scores, assisting the multiprofessional team in the most adequate management of the patient's therapeutic regarding the decision of discharge, stay or transfer from this sector to another one or to a more specific unit. This instrument also enables nursing to perform competences of staff resizing, thus improving the quality of care to the critically ill patient (PADILHA et al., p. 230, 2005).

This instrument stands out as a technical-administrative tool for enabling the evaluation of the care process. Its application results, therefore, in an index that enables the dimensioning of nursing personnel by classifying patients according to the complexity of care (MIRANDA, RIJK, SCHAUFELI, 1996).

In a more simplified way, the Regional Council of Nursing (COREN, 2011, p. 2) of São Paulo (SP) describes: "the TISS, originally described by Cullen et al, in 1974, had as main objectives, to measure the severity level of patients and calculate the nursing workload in ICU.

This assessment instrument is composed of seven care and therapeutic categories, namely: basic activities, neurological support, ventilatory support, cardiovascular support, renal support, metabolic support, and specific interventions. Each category is composed of specific items, with variables ranging from one to eight points and using information regarding the last 24 hours of the patient's ICU stay (PERÃO et al., 2014a, p. 263).

To classify patients according to their severity during their ICU stay, Cullen et al (1974) established parameters. These are:

> Class I: physiologically stable patients requiring prophylactic observation, score from 0 to 19; Class II: patients requiring intensive care and continuous monitoring, score from 20 to 34; Class III: critically ill and hemodynamically unstable patients, score from 35 to 60 and Class IV, need for continuous and specialized assistance, score higher than 60 (CULLEN et al., 1974, p.1).

The TISS-28 total score ranges from zero to seventy-six points (0 - 76). The higher the score, the higher the number of therapeutic interventions and the patient's severity classification, requiring more hours of care from the nursing team (NUNES, 2000). Related to this, it is stated that the greater the number of procedures that the patient receives, the greater his or her organic severity (CHIANCA et al., 2015, p. 12-13).

In this direction, Osnabrugge et al. (2013) emphasize that critically ill patients benefit most from cardiovascular procedures, even if they have higher costs and risk of morbidity and mortality.

In Brazil, the procedures considered of high complexity are performed under the responsibility of the Unified Health System (SUS), which is responsible for about 80% of cardiac surgeries practiced in the country (TITINGER et al., 2015). This surgical specialty has undergone a major evolution process in recent years from the complexity of critically ill patients (PETTERSSON et al., 2013).

In this perspective, patients in the postoperative period of cardiac surgery justify the application of the TISS-28, because they are severe, hemodynamically unstable and require numerous therapeutic interventions (GUIMARÃES et al., 2010).

Based on these premises, the aim of this study was to evaluate the use of the TISS-28 score from direct and indirect observation of patients in cardiac postoperative period. To elucidate on such objective, it was sought to describe the types of cardiac surgeries performed, the most frequent complications in the cardiac postoperative period, registering their score from admission until the moment of discharge and the length of stay of patients in the ICU of a teaching hospital in western Pará.

2 MATERIAL AND METHODS

This is a field research with fundamental purpose, of observational nature, developed in a cross-sectional and prospective character. The technical documentary procedure was used, gathering data from patients' medical records using analytical, descriptive and quantitative approaches.

Held in the Adult Intensive Care Unit - Ward B, of the Hospital Regional do Baixo Amazonas Dr. Waldemar Penna in the municipality of Santarém in western Pará in the period from November 9, 2018 to June 14, 2019.

The study included all patients undergoing cardiac surgery admitted to the adult Intensive Care Unit. The inclusion criteria were patients with an indication for cardiac post-surgical recovery in the ICU, with a

length of stay greater than 24 hours during the data collection period, of both genders, aged 18 years or older.

Data was obtained by analyzing medical records from which information pertinent to demographic and clinical data was extracted, and by applying the TISS-28 instrument, which was applied daily from the immediate postoperative period until the patient's discharge from the ICU, this being the main variable tool used for analysis, and its classification followed the ordering of the score proposed by Cullen et al.

The immediate postoperative period was considered to be up to 24 hours after the patient's admission to the ICU, since this is a fundamental period for patient stabilization. We considered the information referring to the 24 hours of the previous day until 4:00 pm of the next day, the time established for data collection. The information on the researched user's admission and discharge were carried out and collected regardless of the completion of the 24 hours.

The data analysis was done with the help of descriptive statistics using the tabulation of variables in Microsoft Office Excel 2010 spreadsheets, in which all the information obtained was transformed into graphs and tables for a better visual analysis of the final results of the research.

Since this is a research without direct interventions and with data search in the user's medical records, the Informed Consent Form and the Commitment to Use of Data in Archives were used.

The present study was submitted for analysis and approval by the Research Ethics Committee (CEP), according to resolution 466/2012, which ensures the rights and duties of research participants.

3 RESULTS AND DISCUSSION

This section presents the demographic and clinical characteristics, the types of cardiac surgeries performed, as well as the complications identified in the post-cardiac surgery period in the ICU. Then, the main variable of this study will be exposed, the TISS-28, emphasizing the information of the average days of ICU stay, score at the time of admission and consequently at the time of discharge of intensive care patients and the percentage of discharges and deaths of these patients.

During the period of data collection, from November 2018 to June 2019, 48 cardiac surgeries were performed in that hospital. Of this total, 3 patients did not meet the inclusion criteria because they died before the minimum period of ICU stay after surgery; 12 patients were excluded for refusing to participate in the study. The final sample was composed of 33 patients.

To describe the demographic and clinical characteristics of patients admitted to the ICU after cardiac surgery, we investigated the variables according to gender, age group, and associated comorbidities, according to the following table:

Table 01 - Demographic and clinical characteristics of patients in the post cardiac surgery period admitted to the ICU. Hospital Regional do Baixo Amazonas do Pará Dr. Waldemar Penna, Santarém - PA (November 2018 - June 2019).

VARIABLES	RELATIVE FREQUENCY	ABSOLUTE FREQUENCY
SEX	**N**	**%**
Female	17	51,51
Male	16	48,49
Total	33	100
AGE RATE	**N**	**%**
18 to 39 years old	7	21,21
40 to 79 years old	25	75,76
80 to 100 years	1	3,03
Total	33	100
COMORBITIES	**N**	**%**
Systemic Arterial Hypertension	18	37,50
Diabetes Mellitus	6	12,50
Dyslipidemia	1	2,08
Obesity	2	4,18
Smoking	1	2,08
Senility	1	2,08
Coronary Insufficiency	2	4,18
Rheumatoid Arthritis	1	2,08
Bipolar Affective Disorder	1	2,08
Acute Respiratory Failure	1	2,08
Chronic Kidney Disease	1	2,08
No Comorbidities	13	27,08
Total	48	100

Source: research data (SANTOS, VIEIRA, and VALENTE, 2019).

After tabulating the collected data, it was possible to observe the predominance of females (51.51%) in submissions to cardiac surgical procedure with ICU admission.

With regard to age, in this research, the data reveal that the patients most affected by cardiovascular diseases are mainly those aged between 40 and 79 years (75.76%).

This result converges with the study conducted by Coppetti, Stumm and Benetti (2015) that through a descriptive, qualitative study on patients undergoing cardiac surgery, revealed that the age range of people affected by cardiovascular disease ranged from 32 to 76 years.

Based on these premises, this study found relevant data and that reiterate the data already found in other studies previously conducted in other Brazilian regions.

Eleven comorbidities were identified in this research. When analyzing them, we identified the prevalence of Systemic Arterial Hypertension (37.50%) and Diabetes Mellitus (12.50%). However, it is necessary to pay attention to those who did not present any comorbidity (27.08%). Other comorbidities such as obesity (4.18%) and coronary insufficiency (4.18%) did not present high rates.

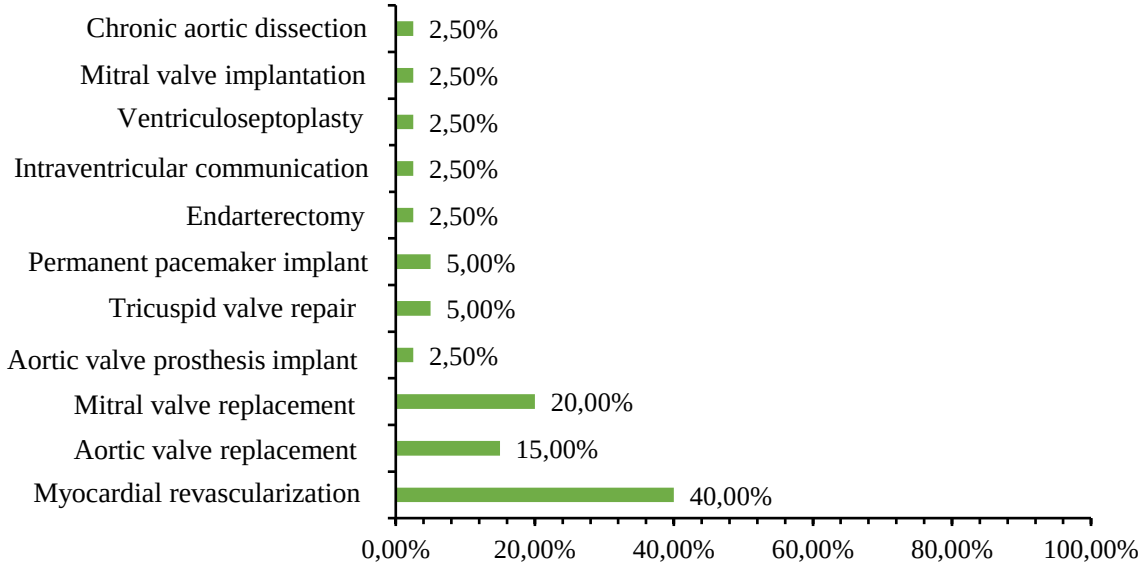
Soares and collaborators (2011) emphasize that patients with hypertension, diabetes mellitus, nephropathies, and the elderly have indications for heart surgery later in life and are more vulnerable to risk situations.

In the world, cardiac surgeries are ranked among the most performed. Each year, about 2,000 heart surgeries occur in the United States, 900 in Europe and 350 in Brazil, if compared to each 1,000,000 inhabitants (SOUZA, 2009).

Currently, data from DATASUS (2019) reveal that 279,854 heart surgeries were performed in Brazil in 2018. Of those, 8,244 were performed in the northern region.

In this context, chart 01 presents the types of cardiac surgeries most performed in the hospital under study.

Graph 01 - Types of cardiac surgeries performed. Hospital Regional do Baixo Amazonas do Pará Dr. Waldemar Penna, Santarém - PA (November 2018 - June 2019).



Source: research data (SANTOS, VIEIRA, and VALENTE, 2019).

The data reveal that coronary artery bypass graft surgeries and aortic and mitral valve replacement surgeries are the most incident surgeries in the teaching hospital unit.

According to Braz et al. (2018) CABG surgeries and those for heart valve replacement or implantation are the two most common types and can be performed separately or concomitantly.

Patients undergoing cardiac surgery need to be well prepared for the postoperative period, because diseases such as respiratory diseases and systemic arterial hypertension need to be controlled and require greater care in this period. In this direction, they are subjected to a series of preoperative tests, so that no complications occur because this type of surgery presents high morbidity (LAIZO, DELGADO, ROCHA, 2010).

One of the objectives of this research was to show which were the main complications with patients submitted to cardiac surgery. Such findings can be seen in the following table.

Table 02 - Complications in the cardiac postoperative period presented by patients admitted to the ICU. Hospital Regional do Baixo Amazonas do Pará Dr. Waldemar Penna, Santarém - PA (November 2018 - June 2019).

VARIABLES	RELATIVE FREQUENCY	ABSOLUTE FREQUENCY
POST-SURGICAL COMPLICATIONS	N	%
ST-segment elevation	2	3,63
Arrhythmias	2	3,63
Tachycardia	6	10,90
Hypotension	4	7,30
Decreased vesicular murmurs in bases	9	16,36
Dyspnea	1	1,82
Tachypnea	2	3,63
Crepitations	2	3,63
Stretchers	1	1,82
Snores	1	1,82
Pneumothorax	1	1,82
Constipation	1	1,82
Hyperglycemia	2	3,63
Anuria	2	3,63
Oliguria	1	1,82
Hyperthermia	3	5,45
Delirium	2	3,63
Pressure Injury	2	3,63
Limb edema	4	7,30
No post-surgical complications	7	12,73
Total	55	100

Source: research data (SANTOS, VIEIRA, and VALENTE, 2019).

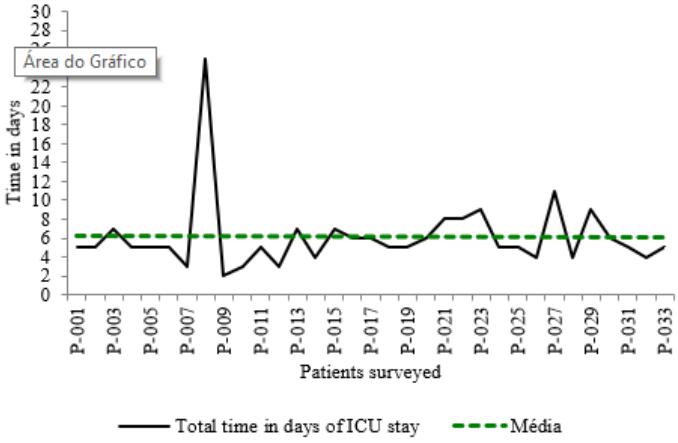
As evidenced above, the post-operative complication rates are significant, a fact that culminates in longer hospital stays and increased costs.

Uchoa, Brazil, and Pereira (2018), emphasize that ICU nurses should monitor and perform surveillance throughout the hospitalization, paying attention to the patient's responses and complications.

From this perspective, Barreta et al. (2017) emphasize that the healthcare team should promote actions with the goal of guaranteeing the post-cardiac surgery patient quality care, enabling an early recovery process and consequently discharge.

Since these are major surgeries, which require constant vigilance in order to prevent complications and avoid long hospital stays, a fact that will greatly influence costs and bed turnover, we tried to demonstrate the average number of days of ICU stay in the post-cardiac surgery period in the hospital under study, as shown in the graph below.

Graph 02 - Average length of stay of the post cardiac surgery patient in the ICU. Hospital Regional do Baixo Amazonas do Pará Dr. Waldemar Penna, Santarém - PA (November 2018 - June 2019).



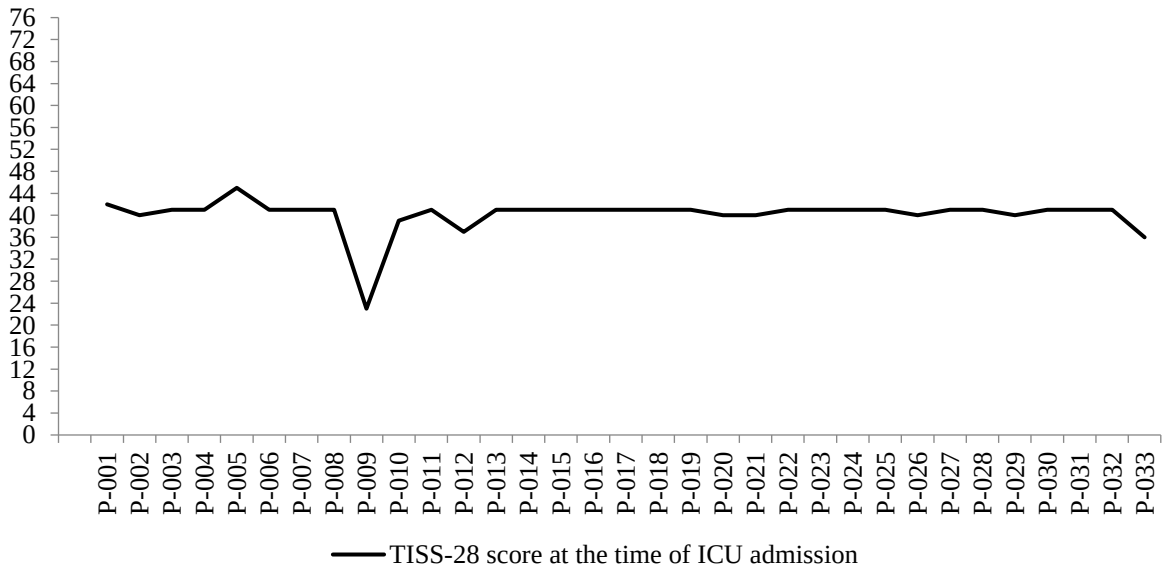
Source: research data (SANTOS, VIEIRA, and VALENTE, 2019).

By analyzing the chart above, it can be seen that there was an oscillation in the pattern of days of hospitalization, obtaining an average ICU stay of 6.12% of days per patient.

In a similar research in the state of Piauí, Silva and collaborators (2017), indicate data that corroborate with the findings of this research, since the mean hospital stay in the cardiac postoperative period in the aforementioned study was 8 days. However, the results of this research are more satisfactory, since a reduction in the percentile of days of hospitalization is observed in relation to the information from the aforementioned study.

Based on the assumptions of the days of hospitalization of post cardiac surgery patients in the ICU, we sought to analyze the TISS-28 score from admission to discharge of these patients. The graph below reveals the TISS-28 scores at the time of admission of the patients studied.

Chart 03 - TISS-28 score on admission of the post cardiac surgery patient in the ICU. Hospital Regional do Baixo Amazonas do Pará Dr. Waldemar Penna, Santarém - PA (November 2018 - June 2019).



Source: research data (SANTOS, VIEIRA, and VALENTE, 2019).

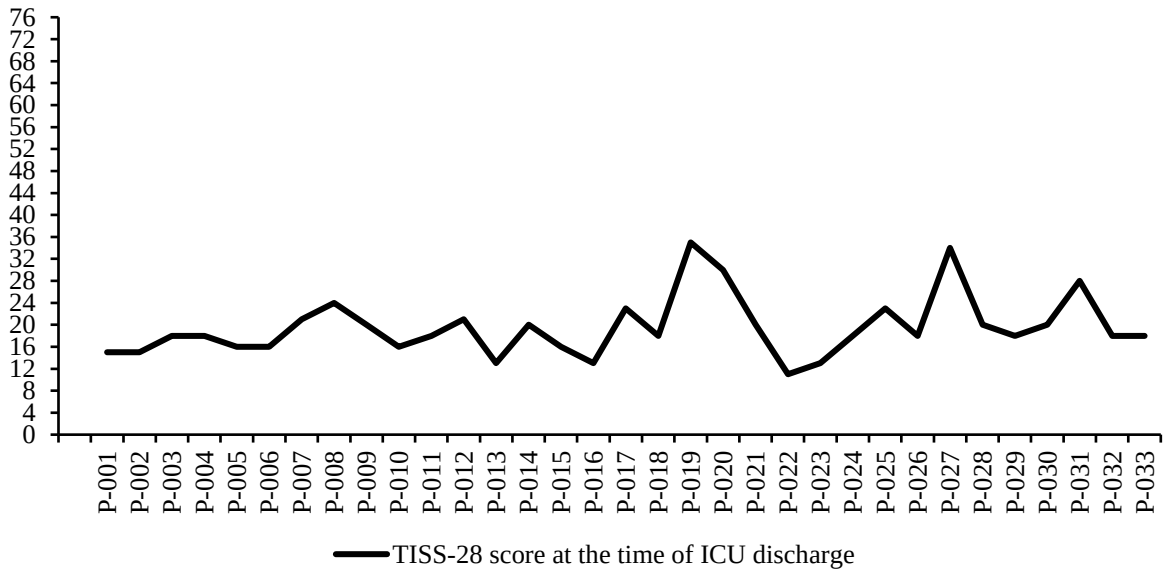
The data collected at the time of admission of the patient to the ICU correspond to the first 24 hours of the patient's stay in the unit. By analyzing the graph, it can be seen that there is a predominance of patients with scores above 40 points in the first 24 hours of ICU stay. According to the parameters of Cullen et al. (1974), the source for this study, these patients fit into the class III classification, where the score ranges from 35 to 60 points and the patients are severe and hemodynamically unstable.

The study by Guimarães et al (2010) corroborates this research, since they conducted a cohort study with 55 patients, whose objective was to verify the daily score of the TISS-28 in the postoperative period of cardiac surgery in a cardiac intensive care unit, and showed that in the immediate postoperative period the average TISS-28 was 41 points per patient.

For Barreta et al. (2017), the patient in the cardiac postoperative period has care complexity factors and presents hemodynamic instability, requiring continuous observation by the nurse and his team and fast and synchronized actions in the postoperative unit.

In this sense, it is believed that nursing actions have a direct impact on the patient's clinical evolution, which in turn will support, through scoring parameters, the decision to discharge or transfer these patients from the ICU. In this perspective, it was possible to register the TISS-28 scores of ICU patients' discharge and chart 04 presents the information found.

Chart 04 - TISS-28 score at the discharge of the post cardiac surgery patient from the ICU. Hospital Regional do Baixo Amazonas do Pará Dr. Waldemar Penna, Santarém - PA (November 2018 - June 2019).



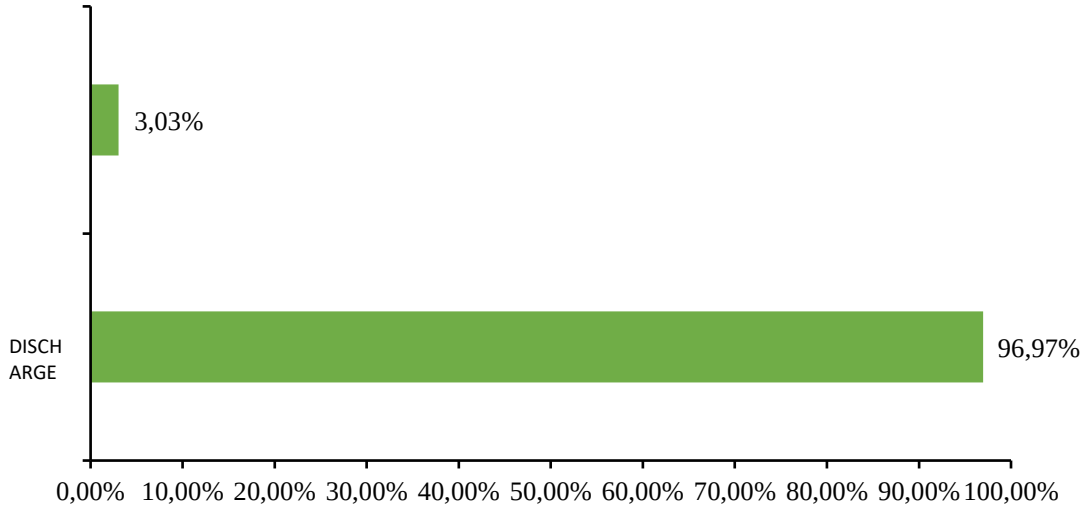
Source: study data (SANTOS, VIEIRA, and VALENTE, 2019).

The graph above shows a wide range of oscillation of discharge scores from the TISS-28 analysis. However, there is a predominance of patients with scores classified as class I, where the score ranges from 0 to 19 and the patients are physiologically stable and require prophylactic observation.

Ferreira et al. (2016) infer that the ICU nurse is required to quickly and accurately identify the health conditions of each patient, due to their severity, instability and complexity of care required, which in turn should be offered by the team in an organized manner, in order to promote the best patient outcomes.

The graph below shows the clinical outcome of patients who underwent heart surgery in the interior of the Brazilian Amazon.

Graph 05 - Percentage of discharge and death of the post cardiac surgery patient in the ICU. Hospital Regional do Baixo Amazonas do Pará Dr. Waldemar Penna, Santarém - PA (November 2018 - June 2019).



Source: own elaboration using Microsoft Office Excel program, 2019.

The graph above clarifies that the percentage of discharges (96.97%) recorded in this study was higher than the number of deaths (3.03%), being considered a positive point in relation to the patient's prognosis and the validity of the assistance provided. To elucidate such information, Silva et al. (2017) emphasize that mortality depends on factors related to the patient, the disease, and health care, and in Brazil this number has varied from 4 to 9%, a fact that places the institution under study within national parameters.

4 CONCLUSION

When addressing the application of the scoring system and therapeutic interventions (TISS-28) in patients after cardiac surgery**,** it is inferred that nurses need to have knowledge of methodologies that use prognostic scores in their care practices in a systematic and organized way, based on technical and scientific knowledge, in order to contribute to the definition of priorities of nursing diagnoses and better approach and clinical management of their patients.

Thus, the application of the Therapeutic Intervention and Scoring System (TISS-28) is recommended, since this tool facilitates the evaluation process of critically ill patients and contributes

significantly to determining the best conduct of the multiprofessional team regarding the discharge and/or transfer of these patients.

It is noteworthy that this study did not intend to exhaust this theme, thus, it is suggested that further research be conducted to include patients awaiting cardiac reoperation and who have the indication of urgent or emergency surgical procedures and with a length of stay less than 24 hours in the ICU. These inclusions may bring more comprehensive results about this population.

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