artigo

Bezerra, F. M. C., Brunori, E. H. F. R., Simonetti, S. H.
Clinical predictors of complications in heart surgery and the main nursing patterns in carepredictores clínicos de complicaciones en

Clinical predictors of complications in heart surgery and the main nursing patterns in carepredictores clínicos de complicaciones en

Preditores clínicos de complicações em cirurgia cardíaca e os principais padrões de enfermagem na assistência

Predictores clínicos de complicaciones en cirugía cardiaca y principales patrones de enfermería en la atención

RESUMO

Objetivo: Descrever o perfil e preditores de complicações no pós-operatório de revascularização do miocárdio de pacientes internados em unidade de terapia intensiva (UTI) e os principais diagnósticos, metas e intervenções de enfermagem. Método: Trata-se de uma pesquisa transversal e retrospectiva, realizada de agosto de 2019 a dezembro de 2020. Realizada em hospital especializado em cardiologia, participaram 300 elegíveis. Sob aprovação CAAE: 26535819.5.0000.5462. Resultado: Das complicações foi sangramento (11,7), Fibrilação atrial de alta resposta (11,6%) acidose metabólica (4,4%), congestão pulmonar (3,4%), derrame pleural (4,1%), óbito após 72h (3,7%). Identificou-se que o diagnóstico, meta e intervenção predominante foram: (75,7%) Risco de Sangramento, (30,3%) Recuperação Cirúrgica pós-operatório imediato e (26%) Controle de Infecção. Conclusão: É imprescindível que o enfermeiro conheça os preditores de complicações no pós-operatório cardíaco e garanta a continuidade da assistência segura e de qualidade através do processo de enfermagem e raciocínio clínico.

DESCRITORES: Revascularização Miocárdica; Complicações; Cuidados de Enfermagem.

ABSTRACT

Objective: To describe the profile and predictors of complications in the postoperative period of myocardial revascularization in ICU patients and the main diagnoses, goals and nursing interventions. Method: This is a cross-sectional and retrospective research held from August 2019 to December 2020. Performed in a hospital specializing in cardiology, 300 eligible participants. Under CAAE approval: 26535819.5.0000.5462. Result: Complications were bleeding (11.7%), High-response atrial fibrillation (11.6%), metabolic acidosis (4.4%), pulmonary congestion (3.4%), pleural effusion (4.1%), death after 72h (3 .7%). It was identified that the diagnosis, goal and predominant intervention were: (75.7%) Risk of Bleeding, (30.3%) Immediate Postoperative Surgical Recovery and (26%) Infection Control. Conclusion: It is essential that nurses know predictors of complications in the cardiac postoperative period and ensure the continuity of safe and quality care through the nursing process and clinical reasoning.

DESCRIPTORS: Myocardial Revascularization; Complications; Nursing Care

RESUMEN

Objetivo: Describir el perfil y predictores de complicaciones en el postoperatorio de revascularización miocárdica en pacientes de UCI y los principales diagnósticos, objetivos e intervenciones de enfermería. Método: Se trata de una investigación transversal y retrospectiva, celebrada de agosto de 2019 a diciembre de 2020. Realizado en un hospital especializado en cardiología, participaron 300 participantes elegibles. Bajo aprobación CAAE: 26535819.5.0000.5462. Resultado: Las complicaciones fueron sangrado (11,7%), Fibrilación auricular de alta respuesta (11,6%), acidosis metabólica (4,4%), congestión pulmonar (3,4%), derrame pleural (4,1%), muerte a las 72h (3,7%). Se identificó que el diagnóstico, objetivo e intervención predominante fueron: (75,7%) Riesgo de Sangrado, (30,3%) Recuperación Quirúrgica Postoperatoria Inmediata y (26%) Control de Infecciones. Conclusión: Es fundamental que los enfermeros conozcan predictores de complicaciones en el posoperatorio cardíaco y aseguren la continuidad de un cuidado seguro y de calidad a través del proceso de enfermería y el raciocinio clínico.

DESCRIPTORES: Revascularización Miocárdica; Complicaciones; Cuidados de Enfermería.

Francisca Milka da Costa Bezerra
Nurse. Surgical Center of the Dante Pazzanese Institute of Cardiology (IDPC). Residency Program in Cardiovascular Nursing.
ORCID: 0000-0003-0240-7819

artigo

Bezerra, F. M. C., Brunori, E. H. F. R., Simonetti, S. H.
Clinical predictors of complications in heart surgery and the main nursing patterns in carepredictores clínicos de complicaciones en

Evelise Helena Fadini Reis Brunori
Nurse. Head of Neo-Pediatric Intensive Care Unit-IDPC. PhD and Master in Sciences from UNIFESP, São Paulo-SP– Brazil.
ORCID: 0000-0002-1396-9393

Sérgio Henrique Simonetti
Nurse. Coordination of Residency Program in Cardiovascular Nursing and Research Advisory. Post-Doctorate in Sciences by
IDPC-USP. Doctor and Master in Sciences from EEUSP-EERP-USP. Cardiovascular Nursing Residency-IDPC.
ORCID: 0000-0001-7840-8004

INTRODUCTION

In Brazil, ischemic cardiovascular diseases are the main causes of morbidity and mortality. [1] Coronary artery bypass graft (CABG) is a reconstructive cardiac surgery as it allows the area to have adequate blood flow again. [2] Age, lung disease, impaired heart function, diabetes, chronic kidney failure and coronary artery disease are linked to increased risk of death associated with surgery. [3]

Studies show that despite advances in cardiac surgery and perioperative care, postoperative complications remain frequent, leading to a substantial increase in mortality in patients undergoing these surgical procedures. The complications that may occur in the postoperative period of CABG are widely discussed in the literature and their incidence varies according to individual factors, such as comorbidities and clinical condition in the surgery, in addition to the steps related to the surgical process, such as duration of surgery, use of cardiopulmonary bypass and complications in the transoperative period. [4, 5, 6, 7, 8]

According to the Brazilian Society of Cardiology, the overall mortality associated with coronary artery bypass graft surgery is around 3%. Evidently, this percentage includes long-lived and debilitated patients, those with good health, mortality is less than 1%. In about 5% of cases, myocardial infarctions can occur during surgery, which is the main risk factor for procedure-related death. Age, lung disease, impaired heart function, diabetes, chronic kidney failure, and coronary artery disease are all linked to an increased risk of operative-related death. [9]

> According to the Brazilian Society of Cardiology, the overall mortality associated with coronary artery bypass graft surgery is around 3%

In view of this, the nurse's knowledge about the predictors of complications enables adequate planning of care based on diagnoses, goal and nursing interventions, supported by a language system standardized by NANDA/NIC/NOC that will directly impact the prevention of postoperative complications. Such interventions favor standardization in interdisciplinary communication with the team involved in order to improve the quality of patient-focused care. [10]

Thus, the Nursing Process (NP) is the method in which the Systematization of Nursing Care (SNC) is used to guide the team's work in the individual care of this client, through a methodical and judicious planning, following a scientific method. [10,11] Considering that the nurse is one of the main agents of care, it is necessary to be alert to the risks and problems that affect the patients under their care and to identify possible complications. [11, 12, 13, 14]

In this context, the objective of this study was to analyze the clinical predictors of complications in the postoperative period of myocardial revascularization in patients hospitalized in the Intensive Care Unit (ICU) and to identify the main diagnoses, goals and nursing interventions for this profile of patients.

METHOD

It is an analytical, transversal, retrospective research with a quantitative approach. The research was developed in a public institution of reference in cardiology, of great size linked to the secretary of health of the State of São Paulo.

An integrative review was carried out in July 2019 in order to contextualize and

artigo

Bezerra, F. M. C., Brunori, E. H. F. R., Simonetti, S. H.
Clinical predictors of complications in heart surgery and the main nursing patterns in carepredictores clínicos de complicaciones en

identify scientific evidence related to the theme, using the descriptors: Myocardial Revascularization; Complications; Nursing care. Articles published in Portuguese, English and Spanish found in SciELO, Lilacs, Medline databases and in the virtual library of international health, PUBMED in the last 10 years were included in the bibliographic search.

The sample size calculation was based on the event rate of complications in the immediate postoperative period of myocardial revascularization, which is close to 20% 15 and based on the number of surgeries, 483 patients underwent CABG throughout the year 2019. To detect a difference of 15% with a significance level of 5% and test power of 80%, a minimum sample size of 300 patients was required.

Data were collected from medical records of the Hospital Medical Archiving System (SAME), from January 2020 to December of the same year, with extraction of perioperative and postoperative data, at the following times: 12:00; 24h; 48h and 72h. We identified all the complications that occurred and each stage of the nursing process. Considering the eligibility criteria: patients admitted to the ICU in the immediate postoperative period of myocardial revascularization.

The extracted and stored information was managed by REDCap electronic data capture tools. [16,17] REDCap (Research Electronic Data Capture) is a secure, web-based software platform designed to support data capture for research studies. [18,19]

For data analysis, Fisher's exact test was used for quantitative data and for the analysis of qualitative data with continuous variables, the t-Student test was used. The results were presented in frequency and percentage.

The research was submitted and approved by the research ethics committee of the proposing institution and the rules established by resolution nº 466/12 of the National Health Council-MS were complied with, with approval under protocol nº 5005 and CAAE: 26535819.5.0000.5462.

RESULTS

Males predominated (77.3%) with a mean age of 62.3 years; self-reported white skin color (75.7%), married (68.7%), with elementary education (41.87%) and muscle mass index (BMI) with a mean of (27.5%). Previous clinical history with ex-smoker (35.7%), active smoker (13.3%), diabetics (55.3%), dyslipidemic (53.7%), hypertensive (79.3%), previous cerebrovascular accident (CVA) (6.3%), chronic obstructive pulmonary disease (3.3%) and with deep venous disease (3%), had some type of previous surgery (2.7%), other comorbidities (15%). Regarding the left ventricular ejection fraction (LVEF) in the preoperative period, he had an ejection fraction above 50 (63.7%), between 30-50 (34.3%), below 30 (2%). As for coronary obstructions, there were 3 obstructions (59.3%), up to 2 obstructions (21.3%), more than 3 before the procedure (19.4%).

Intraoperatively, it was found that they performed 3 anastomoses, 1 mammary and 2 saphenous (47.3%), 2 anastomoses, 1 saphenous and 1 mammary (29%), performed 4 or more anastomoses (15%), performed 1 anastomosis (8.7%). Regarding CPB time, they remained with time of up to 100 min (74%), with CPB time between 101 and 220 minutes (26%). Related to body temperature, it varied between 22±32. For the time of anoxia, it presented anoxia of up to 40 minutes (23%), between 41 and 155 minutes (77%). Considering that (39%) of the patients had some type of intraoperative complication, these being bleeding (16.7%), pres-

Table 1: Data related to the surgical procedure. São Paulo, SP, Brazil, 2019.		
Intraoperative variables	**N**	**%**
Number of Anastomoses		
1 mammary 2 saphenous	142	47,3
1 saphenous vein 1 mammary	87	29,0
4 ≥ anastomosis		
45	15,0	
1 anastomosis	36	8,7
ECC Time		
100≤ minutes		
222	74	
101 - 220 minutes	78	26
Temperature	22±32	
Anoxia time.		
40 ≤ minutes		
69	23	
41- 155 minutes	231	77
Intraoperative Complications	117	39
Bleeding	50	16,7
High Response Atrial Fibrillation	7	2,3
Pressure Lability	35	11,7
Others	26	8,3

Source: Prepared by the researcher, 2021.

artigo

Bezerra, F. M. C., Brunori, E. H. F. R., Simonetti, S. H.
Clinical predictors of complications in heart surgery and the main nursing patterns in carepredictores clínicos de complicaciones en

sure lability (11.7%), high-response atrial fibrillation (2.3%) and other unspecified complications (8.3%).

As for the main complications in the postoperative period, there were complications in different physiological systems (57%). Related to arrhythmias, high-response atrial fibrillation stood out with 11.6% followed by atrial flutter with 1.2%. The increased bleedings were 11.7%, metabolic acidosis (4.4%), pleural effusion (4.1%), bronchospasm with (2.2%), pulmonary congestion (3.4%) and septic shock with 1.5%. Regarding the outcome of deaths, it was identified during the period of up to 72 hours (1%) and also after 72 hours (3.7%).

The main nursing diagnoses listed were: risk of infection (99%), risk of bleeding (75.7%), pressure injury (69.3%), impaired tissue integrity (66.3%), acute pain (59.3%), deficit in self-care for food (46.7%), deficit in self-care for bathing (52.7%) and risk of decreased cardiac output (45.3%). The goals used were: immediate postoperative recovery from surgery (30.3%), circulatory status (27.3%), first-intention healing (16%) and pain control (15%). The predominant interventions are: infection control (26%), bleeding precaution (24.7%), cardiac care (18%), pain management and injury care (14.7%) each.

Table 2 shows the correlation of complications and the nursing process in the postoperative period of CABG. The variable increased bleeding was significant when related to the diagnoses of impaired spontaneous ventilation (p:0.029), excessive fluid volume (p:0.043) and deficit in self-care for bathing (p:0.045). As for arrhythmias, significance was observed with the diagnosis of impaired physical mobility with p value (p≥0.001), anxiety (p:0.014) and risk of bleeding (p:0.012). The most prevalent nursing interventions were: assistance in bath/hygiene self-care (p≥0.001), anxiety reduction (p≥0.001), bleeding precaution (p:0.032) and injury care (p:0.045). When the death variable was analyzed, we obtained the following diagnoses and interventions: Risk of de-

creased cardiac output (p≥0.001), Acute pain (p:0.005), Decreased Cardiac Output (p:0.047), Impaired Spontaneous Ventilation (p:0.051), intervention Infection Control (p:0.028) and Injury Care (p:0.002).

DISCUSSION

Table 2: List of diagnosis, goals and interventions in the postoperative period in the ICU up to 72 hours. São Paulo, SP, Brazil, 2019.		
Variables	**N**	**%**
Nursing Diagnosis		
Risk of bleeding	227	75,7
Risk of pressure injury	208	69,3
Risk of infection	297	99,0
Risk of decreased cardiac output	136	45,3
Impaired tissue integrity	199	66,3
Acute pain	178	59,3
Deficit in bathing self-care	158	52,7
Deficit in self-care for food	140	46,7
Decreased cardiac output	77	25,7
Nursing Goals		
Immediate postoperative surgical recovery	91	30,3
Circulatory status	82	27,3
First intention healing	48	16
Tissue integrity, skin and mucosa	48	16
Pain Control	45	15
Cardiac pump effectiveness	19	6,3
Mobility	17	5,7
Nursing Interventions		
Infection Control	78	26
Bleeding precaution	74	24,7
Cardiac care	54	18
Control pain	44	14,7
Injury care	44	14,7
Precaution against falls	12	4,0
Acute phase cardiac care	11	3,7
Pressure injury prevention	11	3,7
Care of tubes and drains	9	3,0

Source: Prepared by the researcher, 2021.

According to the literature, in the case of patients undergoing CABG, with the use of ECC, there is an increase in morbidity and mortality and postoperative complications,

mainly in patients over 60 years of age and prolonged ECC time, being preva-

artigo

Bezerra, F. M. C., Brunori, E. H. F. R., Simonetti, S. H.
Clinical predictors of complications in heart surgery and the main nursing patterns in carepredictores clínicos de complicaciones en

lent in the male population, smokers and the elderly. The relationship between the increase in mortality and the presence of comorbidities, such as Arterial Hypertension, Diabetes Mellitus, Dyslipidemia and Alcoholism, is also highlighted, data that corroborate the data obtained in this study. [20]

The first hours are the most important and difficult, as they demand complex care activities, associated with specific technical and scientific knowledge, due to the potential risk of immediate complications. The importance of the nursing process in patient care allows formulating a care plan according to the individual needs of each one. After the patient's evaluation, the formulation and execution of a care plan of care necessary for the maintenance of the care of the same occurs. [21]

Pain control was the intervention most performed by nurses. Acute pain is caused by intense manipulation of the patient during surgery, the presence of endotracheal tubes and drains, probes and catheters, in addition to prolonged bed position, also justify the difficulty of the patient in the postoperative period to perform simple activities that require fine motor coordination. Studies show that patients in the IPO of CABG complain mainly of pain in the surgical wound, leading to increased heart rate and blood pressure, changes in sleep pattern, rest and maintenance of comfort. Therefore, the diagnosis of acute pain is essential to guide patient care. [22]

Among the risk diagnoses, the risk of infection, which comes from increased susceptibility to pathogenic invasion, was identified in 99% of the analyzed nursing processes. [23] It is commonly identified in patients in the postoperative period of cardiac surgery, due to the causal relationship with the surgical trauma and invasive procedures inherent to such an intervention. According to studies, the environment in which the patient is after an invasive procedure increases the development of infections by 34.7%, and of these, 11% progress to death. 24,25 In this study, it can be observed that 1% of the patients evaluated died within 72 hours after the CABG, in-

Tabela 2: Relação das complicações e o processo de enfermagem no pós-operatório na UTI. São Paulo, SP, Brasil, 2019.			
VARIABLES (N)	**N**	**%**	**p***
BLEEDING			
Excessive Liquid Volume (n: 272)	35	12,9	0,043
Impaired Spontaneous Ventilation (n: 225)	21	9,3	0,029
Deficit in Self-Care for Bathing (n: 246)	11	7,7	0,045
ARRHYTHMIA			
Nursing Diagnoses			
Impaired Physical Mobility (n: 294)	39	19,3	≥0,001
Anxiety (n: 299)	34	14	0,014
Risk of Bleeding (n: 73)	17	23,3	0,012
Nursing Interventions			
Anxiety Reduction (n: 299)	42	14	≥0,001
Injury Care (n: 256)	41	16	0,045
Bath/Hygiene Self-Care Assistance (n:296)	39	13,2	≥0,001
Bleeding Precaution (n: 226)	38	16,8	0,032
DEATH			
Nursing Diagnoses			
Decreased Cardiac Debt (n: 223)	11	4,9	0,047
Risk of decreased cardiac output (n: 164)	11	8,1	≥0,001
Acute pain (n: 122)	9	7,4	0,005
Impaired Spontaneous Ventilation (n: 225)	11	4,9	0,051
Nursing Interventions			
Controle de Infecção (n: 222)	6	7,7	0,028
Injury Care (n:272)	7	2,3	0,002

Fonte: Elaborado pelo pesquisador, 2021.

creasing to 3.7% the occurrence of deaths after 72 hours of the procedure.

The risk of decreased cardiac output or decreased cardiac output is a prevalent complication in the IPO. Nursing care aimed at monitoring the patient to maintain adequate cardiac output, as well as early identification of changes that lead to this complication, include: assessing auscultation, heart rate and rhythm and paying attention to the decrease in systolic blood pressure values. [26,27]

Another prevalent diagnosis is the risk of bleeding (75.7%) in nursing processes, as this is another common complication in IPO. Studies that analyzed the diag-

nosis of risk of bleeding in cardiac surgery showed variables that were associated with excessive bleeding after cardiac surgery with CPB in the intraoperative and in the first minutes of the postoperative period, again supporting the importance of this diagnosis. [28, 29, 30, 31,32]

This study clearly demonstrates the impact of qualified nursing care, when it is based on a well-defined care plan, because, for example, we were able to observe the prevalence of arrhythmias in patients where the main nursing diagnoses shown here were not addressed. The literature identified that arrhythmias are important factors associated with the nursing process

artigo

Bezerra, F. M. C., Brunori, E. H. F. R., Simonetti, S. H.
Clinical predictors of complications in heart surgery and the main nursing patterns in carepredictores clínicos de complicaciones en

in the pre- and postoperative phases of cardiac surgery, and shows a considerable rate of hospital readmission during the first 30 postoperative days. [33]

It can be identified that there was an important correlation between the diagnosis of impaired physical mobility and the increase in arrhythmias, which is justified by the literature, since studies conclude that mobility restriction in the postoperative phase,

results in loss of muscle mass and an increase in late complications, such as the one mentioned above. In this way, the importance of a care plan also aimed at early mobilization and the promotion of recovery and return to the patient's functional independence is noted. [34]

It is known that the present study supports the relevance of measurement and monitoring actions that can be performed by nurses, to increase diagnostic accuracy, allowing early detection of the risk of bleeding that contributes to useful information for the practice of physicians and other members of the health team. [35,36]

The presence of the nursing diagnosis deficit in self-care for bathing/hygiene in this study had a prevalence of 52.7%, characterized as the patient's inability to perform their own self-care, making them dependent on the nursing team for its execution. Therefore, it is necessary to approach this diagnosis in order to promote the well-being and comfort of the patient, which also supports an early recovery. [37, 38,39]

According to the literature, anxiety is considered a predictor of a series of post-surgical changes including increased pain, nausea and vomiting. The diagnosis of anxiety as well as the intervention to reduce anxiety had a notorious significance since the psychological factor directly affects the patient's prognosis, which may have negative impacts on disease stability, quality of life and adherence to treatment. In a study with this population, it was observed that the higher the patient's anxiety level, the higher the pain levels, which lead to a prolonged hospital stay. [40,41]

One of the results obtained in this rese-

The literature identified that arrhythmias are important factors associated with the nursing process in the pre- and postoperative phases of cardiac surgery, and shows a considerable rate of hospital readmission during the first 30 postoperative days.

arch brings the survey of the main nursing interventions, for the care of the patient in the IPO of CABG, that can avoid the aforementioned complications, in addition to meeting the basic needs and guaranteeing the possibility of self-care for the patient. These interventions are: maintenance of cardiac output, decrease/absence of pain, adequate tissue perfusion, tissue integrity, fluid and electrolyte balance, maintenance of adequate ventilation and oxygenation, precautions and measures to reduce the risk of infection, communication and anxiety reduction. [42,43]

According to the literature, in relation to nursing interventions in the postoperative period, they are aimed at restoring homeostatic balance in order to prevent complications. [44]

It was observed that the nursing diagnoses commonly used in the ICU are related to the interventions recommended by the NIC, highlighting that most interventions are located in the complex and basic physiological domain of the NIC, which allows us to conclude that the nursing practice, in this unit, it is closely linked to the resolution of problems that require interventions that can guarantee the physical and homeostatic functioning of the organism. It is noteworthy that the use of the triad NANDA, NIC and NOC, in addition to guiding and supporting care, encourages scientific and practical knowledge in patient care, in addition to improving and effective care provided. [45, 46,47]

CONCLUSION

The accomplishment of this study demonstrates the importance of nursing care focused on the care of patients undergoing cardiac surgery, as a relevant measure for the prevention and control of the emergence of complications, contributing to safe practices. Knowing the complications in the postoperative period of cardiac surgeries and the nursing process, diagnosis, goals and interventions supported by the standardization of language allow nurses to plan in the singularity of individualized care and intervene safely.

artigo

Bezerra, F. M. C., Brunori, E. H. F. R., Simonetti, S. H.
Clinical predictors of complications in heart surgery and the main nursing patterns in carepredictores clínicos de complicaciones en

REFERENCES

[1]Mussi FC, Teixeira JB. Fatores de risco cardiovascular, doenças isquêmicas do coração e masculinidade. Rev Cubana Enferm. 2018;34(2). Disponível em: http://revenfermeria.sld.cu/index.php/enf/article/view/1613

[2]Santos MB. Comparação dos Resultados Iniciais entre Cirurgias de Revascularização do Miocárdio com e sem Circulação Extracorpórea. Arq. Catarin Med. 2018;47(2):170-81. Disponível em: http://www.acm.org.br/acm/seer/index.php/arquivos/article/view/334

[3]Branco CSPC, Pereira HO. Cuidados de enfermagem ao paciente em pós operatório imediato de cirurgia de revascularização do miocárdio. Enfermagem Revista. 2016;19(1):72-84. Disponível em: http://periodicos.pucminas.br/index.php/enfermagemrevista/article/view/11639

[4]Oliveira PLR, Castro J, Nogueira CS, Carius BDV, Ramos GJ, Silva RC, et al. Complicações do pós-operatório imediato de cirurgia cardíaca eletiva: estudo transverds. Revista de Enfermagem Referência. 2019;IV(22):23-32. Disponível em: https://doi.org/10.12707/RIV19042

[5]Kapadohos, Theodore. Determinants of prolonged intensive care unit stay in patients after cardiac surgery: a prospective observational study. Journal of thoracic disease.2017;9(1):70-9. Disponível em: https://doi:10.21037/jtd.2017.01.18

[6]Fadime Gök, Fatma Demir Korkmaz, Bilgin Emrecan, Os efeitos do banho em 48–72 h após a cirurgia de revascularização do miocárdio por meio de esternotomia mediana na infecção da ferida, dor, conforto e satisfação: ensaio controlado randomizado. European Journal of Cardiovascular Nursing. 2021;21(1): 56-66. Disponível em: https://doi.org/10.1093/eurjcn/zvab010

[7]AbuRuz ME. A depressão pré-operatória previu maior tempo de internação em pacientes submetidos à cirurgia de revascularização do miocárdio. Política de gerenciamento de risco Healthc. 2019;12:75-83. Disponível em: https://doi.org/10.2147/RMHP.S190511

[8]Neglia D, Liga R. Revascularization of ischaemic myocardium: still valuable in patients with stable CAD? Eur Heart J Cardiovasc Imaging. 2020;21(9):971-2. Disponível em: https://doi.org/10.1093/ehjci/jeaa130

[9] Sociedade Brasileira de Cardiologia. Ponte de Safena [homepage na internet], 2019. Disponível em: http://sociedades.cardiol.br/socerj/publico/dica-safena.asp

[10]Cavalcante AMRZ; Brunori EHFR; Lopes CT; Silva ABV; Herdman TH. Nursing diagnoses and interventions for a child after cardiac surgery in an intensive care unit. Rev. Bras. Enferm. 2015;68(1):155-60. Disponível em: http://dx.doi.org/10.1590/0034-7167.2015680121i

[11]Ferreira AM, Rocha EN, Lopes CT; Bachion MM; Lopes JL, Barros ALBL. Diagnósticos de enfermagem em terapia intensiva: mapeamento cruzado e Taxonomia da NANDA-I. Rev. Bras. Enferm. 2016;69(2):307-15. Disponível em: https://doi.org/10.1590/0034-7167.2016690214i.

[12]Pedrão TGG, Brunori EHFR, Santos ES, Bezerra A, Simonetti SH. Diagnósticos e Intervenções de Enfermagem para pacientes cardiológicos em cuidados paliativos. Rev enferm UFPE on line.2018.12(11):3038-45. Disponível em: https://doi.org/10.5205/1981-8963-v12i11a234933p3038-3045-2018

[13]Ribeiro KRA. Pós-operatório de revascularização do miocárdio: complicações e implicações para enfermagem. Rev Fund Care Online. 2018;10(1):254-9. Disponível em: https://doi.org/10.9789/2175-5361.2018.v10i1.254-259

[14]Silva MR; Silva DO; Santos EC; Oliveira PP; Sales AS; Rodrigues AB. Diagnósticos, resultados e intervenções de enfermagem para pessoas submetidas a cirurgias ortopédicas e traumatológicas. Rev. Enferm. UFPE online.2017; 11(5):2033-45. Disponível em: https://doi.org/10.1590/2177-9465-EAN-2019-0292

[15]Andrade A, Tanaka P, Poveda V, Turrini R. Complicações no pós-operatório imediato de revascularização do miocárdio. Revista SOBECC. 2019;224-30. Disponível em: https://revista.sobecc.org.br/sobecc/article/view/482

[16]Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap) – A metadata-driven methodology and workflow process for providing translational research informatics support, J Biomed Inform. 2009;42(2):377-81. Disponível em: https://doi.org/10.1016/j.jbi.2008.08.010

[17]Harris PA, Taylor R, Minor BL, Elliott V, Fernandez M, O'Neal L, et al. REDCap Consortium, The REDCap consortium: Building an international community of software partners, J Biomed Inform. 2019;95:103208. Disponível em: https://doi.org/10.1016/j.jbi.2019.103208

[18]Esperon JMT. Pesquisa Quantitativa na Ciência da Enfermagem. Esc. Anna Nery. 2017;21(1):-0027. Disponível em: https://doi.org/10.5935/1414-8145.20170027

[19]Koerich C, Lanzoni GMM, Erdmann AL. Fatores associados à mortalidade de pacientes submetidos à cirurgia de revascularização do miocárdio. Rev. Latino-Am. Enfermagem. 2016; 24(8): e2748. Disponível em: http://dx.doi.org/10.1590/1518-8345.0708.2748

[20]Bober RM, Milani RV, Oktay AA, Javed F, Polin NM, Morin DP. The impact of revascularization on myocardial blood flow as assessed by positron emission tomography. Eur J Nucl Med Mol Imaging. 2019;46(6):1226-39. Disponível em: https://dx.doi.org/10.1007%2Fs00259-019-04278-8

[21]Taurino IJM, Cirurgia cardíaca: refletindo sobre o cuidado de enfermagem no período pós-operatório PubSaúde, 2019. Disponível em: https://dx.doi.org/10.31533/pubsaude2.a014

[22]Barretta JC; Auda JM; Barancelli MDC. Pós-operatório em cirurgia cardíaca: refletindo sobre o cuidado de enfermagem. Rev Fund Care Online. 2017;9(1):259-64. Disponível em: https://doi.org/10.9789/2175-5361.2017.v9i1.259-264

[23]Bastos AR, Alves SRP, Sousa da Silva GN, Araújo HVS, Oliveira RC, Morais CAC. Segurança do paciente submetido a cirurgia cardíaca: implicações para a prática de enfermagem. Saúde Coletiva.2021;11(64):5582-87. Disponível em: https://doi.org/10.36489/saudecoletiva.2021v11i64p5582-5593

[24]Vilarinho LM, Vilarinho MLCM, Silva FL, Guimaraes MSO, Leal ACAM. Isolamento de staphylococcus aureus em mãos de profissionais de Unidades de terapia Intensiva. Rev. Pre. Infec e Saúde. 2015;(1):1:10-8. Disponível em: http://dx.doi.org/10.26694/repis.v1i1.3421

[25]Sousa MAS, Nascimeto GC, Bim FL, Oliveira LB, Oliveira ADS. Infecções hospitalares relacionadas aprocedimentos invasivos em unidades de terapia intensiva: revisão integrativa. Rev Pre Infec e Saúde.2017;3(3):49-58. Disponível em : https://doi.org/10.26694/repis.v3i3.4251

[26]Dos Santos ER, Lopes CT, Maria VL, de Barros AL. Risk factors for decreased cardiac output after coronary artery bypass grafting: a prospective cohort study. Eur J Cardiovasc Nurs.2017;16(4):352-9. Disponível em: https://doi.org/10.1177/1474515116681373

[27]Souza, AMM, Zeitoun SSB, Alba LBL. Débito cardíaco diminuído: mapeamento cruzado das intervenções de enfermagem e sua contribuição na prática clínica. Enferm. glob. 2019;18(56): 324-37. Dis-

ponível em: https://doi.org/10.1590/S0103-21002011000100017

[28]Lopes CT, dos Santos TR, Brunori EHFR, Moorhead SA, Lopes J de L, Barros ALBL de. Excessive bleeding predictors after cardiac surgery in adults: integrative review. J Clin Nurs. 2015;24:3046–62. Disponível em: https://doi.org/10.1590/1518-8345.2523.3092

[29]Lopes CT, Brunori EFR, Cavalcante AMRZ, Moorhead SA, Swanson E, Lopes J de L, et al. Factors associated with excessive bleeding after cardiac surgery. Disponível em: https://doi.org/10.1590/1518-8345.0000.3147

[30]El Ghanam M, Mourad F, Ahmed A, Abdel Aziz MM. Effect of extra protamine infusion in underweight patients undergoing cardiac surgery. J Egypt Soc CardioThoracic Surg. 2016;24:259–64. Disponível em: https://doi.org/10.1016/J.JESCTS.2016.11.003

[31]Braga, DVB, Marcos AG, Fatores de risco de sangramento para pacientes submetidos à cirurgia cardíaca com circulação extracorpórea. Revista Latino-Americana de Enfermagem. 2018;26:e3092. Disponível em: https://doi.org/10.1590/1518-8345.2523.3092

[32]Ferreira CA, Vicente WVA, Barbosa PRE, Rodrigues AJ, Klamt JG, Carlotti APCP et al. Avaliação da aprotinina na redução da resposta inflamatória sistêmica em crianças operadas com circulação extracorpórea. Brazilian Journal of Cardiovascular Surgery. 2010;25(1) Disponível em: https://doi.org/10.1590/S0102-76382010000100018

[33]Szpalher AS, BatalhaM. Arritmias cardíacas: Diagnósticos de Enfermagem baseados na Taxonomia da NANDA-I (2018-2020). Revista Eletrônica Acervo Saúde, 2019;11(17), 1447. Disponível em: https://acervomais.com.br/index.php/saude/article/view/1447

[34]Santos PMR, Aquaroni Ricci N, Aparecida BSE, Moraes PD, Chiavegato L. Effects of early mobilisation in patients after cardiac surgery: a systematic review. Physiotherapy. 2017:103(1):1-12. Disponível em: https://doi.org/10.1016/j.physio.2016.08.003

[35]AbuRuz ME. A depressão pré-operatória previu maior tempo de internação em pacientes submetidos à cirurgia de revascularização do miocárdio. Política de gerenciamento de risco Healthc. 2019;12:75-83 Disponível em: https://doi.org/10.2147/RMHP.S190511

[36]Silva LD, Pereira de Melo MV, Palmeira Rolim ILT, Dias RS. Intervenções de Enfermagem em pacientes submetidos à cirurgia cardíaca. J Manag Prim Health Care.2021;9. Disponível em: https://www.jmphc.com.br/jmphc/article/view/510

[37]Martins CP, Brandão MGSA, Freire MTJ, Marques KMAP. Diagnósticos de enfermagem em UTI: uma revisão integrativa. Rev. Aten. Saúde. 2018;16(57): 74-86. Disponível em: https://doi.org/10.13037/ras.vol16n57.5124

[38]Okuma, SM, Marostegan de Paula AF, Carmo GP, Pandolfi MM. Caracterização dos pacientes atendidos pela terapia ocupacional em uma unidade de terapia intensiva adulto. Rev. Interinst. Bras. Ter. Ocup.. 2017:1(5) 574-588. Disponível em: https://doi.org/10.47222/2526-3544.rbto8311

[39]Pedrão TGG, Brunori EHFR, Santos ES, Bezerra A, Simonetti SH. et al. Diagnósticos e intervenções de enfermagem para pacientes cardiológicos em cuidados paliativos. Rev enferm UFPE. 2018; 12(11): 3038-45. Disponível em: https://doi.org/10.5205/1981-8963-v12i11a234933p3038-3045-2018

[40]Kazitani BS, Furuya RK, Dantas RAS, Dessotte CAM. Ansiedade e depressão pré-operatória: diferenças entre pacientes selecionados à primeira cirurgia cardíaca. Rev René. 2018;19(3079). Disponível em: https://doi.org/10.14295/jmphc.v9i0.510

[41]Coiro CL, Ruschel PP. Ansiedade e dor no pós-operatório de cirurgia cardíaca: existe diferença entre os gêneros? Psicol. hosp. 2019;17(1):02-16. Disponível em: http://pepsic.bvsalud.org/scielo.php?script=sci_abstract&pid=S1677-74092019000100002

[42]Efird JT, Jindal C, Kiser AC, Akhter SA et al. Increased risk of atrial fibrillation among patients undergoing coronary artery bypass graft surgery while receiving nitrates and antiplatelet agents. J Int Med Res. 2018;46(8):3183–94. Disponível em: https://dx.doi.org/10.1177%2F0300060518773934

[43]Silva LLT, Mata LRF, Silva AF, et al. Cuidados de enfermagem nas complicações no pós-operatório de cirurgia de revascularização do miocárdio. Rev baiana enferm. 2017; 31(3):e20181 Disponível em: https://doi.org/10.18471/rbe.v31i3.20181

[44]Li J, Yang X, Tian Y, Wei H, Hacker M, Li X, Zhang X. Complete revascularization determined by myocardial perfusion imaging could improve the outcomes of patients with stable coronary artery disease, compared with incomplete revascularization and no revascularization. J Nucl Cardiol. 2019;26(3):944-53. Disponível em: https://dx.doi.org/10.1056/nejmoa1205361

[45]Jonhson M, Moorhead S, Bulechek G, Butcher H, Maas M, Swanson E. Ligações NANDA-NOC-NIC: condições clínicas: suporte ao raciocínio e assistência de qualidade. Rio de Janeiro: Elsevier, 2012. Disponível em: https://doi.org/10.1590/0034-7167-2018-0896

[46]Herdman TH, Shiguemi K. Diagnósticos de Enfermagem da NANDA: definições e classificações 2015-2017. Porto Alegre: Artmed, 2015. Disponível em: https://pesquisa.bvsalud.org/portal/resource/pt/biblio-870647

[47]Bulechek GM, Butcher HK, Dochterman J, Wagner CM. Classificação das Intervenções de Enfermagem - NIC. 6. ed. São Paulo: Elsevier, 2016. Disponível em: https://www.biosanas.com.br/uploads/outros/artigos_cientificos/14/0ac4055be9a07e3df54c72e9651c589e.pdf