

Nursing care after pediatric cardiac surgery: integrative review

Cuidado de enfermagem no pós-operatório de cirurgia cardíaca pediátrica: revisão integrativa

João Victor Batista Cabral¹ 
Juliana Sousa de Castro Chaves² 

¹Corresponding author. Centro Universitário da Vitória de Santo Antão (Vitória de Santo Antão). Pernambuco, Brazil. jvbcabral@gmail.com

²Universidade de Pernambuco (Recife). Pernambuco, Brazil. jujusousac@msn.com

ABSTRACT | OBJECTIVE: To identify the role of nurses in the postoperative period of cardiac surgery in pediatric patients. **METHODOLOGY:** This is an integrative review through the execution of six steps, with sampling carried out through survey and bibliographic analysis, after searching the articles on the VHL site, in the LILACS, MEDLINE, BDNF databases between 2009 and 2018, with a combination of the selected descriptors. **RESULTS:** From the data emerged two thematic axes: the nurse and his own perception in the care of pediatric patients in the postoperative period, in which he becomes a being-with who assumes the responsibility of ensuring the child a complete care, providing inputs, constantly monitoring and providing comprehensive care; and the main nursing diagnoses and interventions, which range from risk to real diagnoses, guiding the nurse towards prevention, assessment and recovery or rehabilitation. **CONCLUSION:** The performance of nurses is translated through systematic, complex and thorough conduct, which assumes the responsibility of ensuring the child a complete care, providing inputs, constantly monitoring and providing comprehensive care guided by nursing diagnoses and interventions.

DESCRIPTORS: Nursing care. Cardiac surgery. Postoperative period. Postoperative care. Child.

RESUMO | OBJETIVO: Identificar a atuação do enfermeiro no pós-operatório de cirurgia cardíaca no paciente pediátrico. **METODOLOGIA:** Trata-se de uma revisão integrativa através da execução de seis etapas, com amostragem realizada por meio de levantamento e análise bibliográfica, após busca dos artigos no sítio da BVS, nas bases LILACS, MEDLINE, BDNF entre 2009 a 2018, com combinação dos descritores selecionados. **RESULTADOS:** A partir dos dados emergiram dois eixos temáticos: o enfermeiro e sua própria percepção no cuidado ao paciente pediátrico no pós-operatório, no qual ele se torna um ser-com que assume a responsabilidade de assegurar à criança um cuidado completo, providenciando insumos, monitorando-a constantemente e propiciando um cuidado integral; e os principais diagnósticos e intervenções de enfermagem, que variam de diagnósticos de risco a diagnósticos reais, orientando o enfermeiro para condutas de prevenção, de avaliação e de recuperação ou reabilitação. **CONCLUSÃO:** A atuação do enfermeiro se traduz por meio de uma condução sistemática, complexa e minuciosa, que assume a responsabilidade de assegurar à criança um cuidado completo, providenciando insumos, monitorando-a constantemente e propiciando um cuidado integral orientado pelos diagnósticos e intervenções de enfermagem.

DESCRITORES: Cuidados de enfermagem. Cirurgia cardíaca. Período pós-operatório. Cuidados pós-operatórios. Criança.

Introduction

Nursing focuses on the care of human in all stages of development and has been expanding their knowledge in the field of care. Nursing in a neonatal (NICU) and / or pediatric intensive care unit (PICU) is a constant challenge because it requires vigilance, skill, knowledge and sensitivity, since the patient is extremely vulnerable and totally dependent on the assistance team¹. NICUs and PICUs were created with the aim of attending newborns and infants through complex and invasive procedures combined with the use of specific technologies².

Currently, more and more high-risk neonates and children, especially premature or those with complex diseases such as congenital heart disease (CHD), are benefiting from technological advances and have a higher chance of survival^{3,4}. However, despite the reduction in mortality, technological advances can accentuate morbidity in this specific population, due to the long hospitalization time that is necessary to guarantee survival of these patients⁴.

Congenital heart malformations constitute a broad clinical spectrum, ranging from defects that evolve asymptotically to those that determine important symptoms and a high mortality rate⁵. They represent one of the most frequent malformations whose worldwide incidence varies from 6 to 12 per 1.000 live births, being a significant cause of morbidity and mortality in the first year of life⁶.

The indication for surgical correction has now become routine, soon after confirmation of the diagnosis of congenital heart disease, which is dependent on several factors such as age, weight, nutritional conditions, complexity and type of heart disease and surgical intervention itself⁷. However, the high degree of stress of the surgical intervention may compromise the patient's evolution, which may worsen when there is a previous nutritional problem caused by the disease that led to the surgery.

The operative period is crucial in the evolution of children with heart disease. Blood volume variations, body temperature, plasma composition and tissue blood flow are present and have important pathophysiological consequences. Additional aggressions, sometimes

inevitable, such as cardiopulmonary bypass (CPB), further aggravate the organic imbalance. The stress generated evokes defense mechanisms defined as neuroendocrine-immuno-metabolic response to trauma, to the initial injury event. The triggered endocrine and immunological responses lead to a set of metabolic alterations that aim to protect the main physiological functions. However, as with other adaptive mechanisms, the exacerbation of this response may contribute to the perpetuation of the disease state and the occurrence of clinical and surgical complications⁸.

The nursing's work in these scenarios, especially with the pre and especially postoperative patients with heart disease, is characterized by complex care activities that require high technical and scientific competence, since immediate decision and the adoption of conducts safe and secure are directly related to the life and death of patients. In this context, it is of fundamental importance to provide and maintain qualified and appropriately sized nursing staff to ensure quality and safe care².

The use of the nursing process (NP) as an instrumentation of the systematization of nursing care (SNC) applied in this patient's profile is of fundamental importance, as qualified care should not only be limited to guaranteeing the child's survival, but also planning actions and implement them according to the needs of care^{4,9}. The SNC is configured as a methodology to organize and systematize care, based on the principles of the scientific method. Its objectives are to identify health-disease situations and nursing care needs, as well as to subsidize the health promotion, prevention, recovery and rehabilitation interventions of the individual, family and community^{2,10}.

Given this context in which SNC and NP are configured as fundamental tools for the care of critically ill patients and because of the need for studies that identify specific care for pediatric patients undergoing cardiac surgery, it is necessary to compile and describe what care are required, according to the literature, that describe the nursing process to these patients in the postoperative period. This study aims to identify the role of nurses in the postoperative period of cardiac surgery in pediatric patients.

Methodology

This study is an integrative literature review and was carried out through six distinct stages: 1st stage: Identification of the theme and selection of the hypothesis or research question for the elaboration of the integrative review; 2nd stage: Establishment of inclusion and exclusion criteria for study / sampling or literature search; 3rd stage: Definition of information to be extracted from selected studies; 4th stage: Evaluation of the studies included in the integrative review; 5th stage: interpretation of results; Step 6: Presentation of the knowledge review / synthesis¹¹.

The theme of this study is: the nursing care in the postoperative period of pediatric cardiac surgery, being guided by the following guiding question: How is the role of nurses in the postoperative period of cardiac surgery in pediatric patients described in the Brazilian publications last 10 years?

Inclusion criteria were articles that discuss nursing care in the postoperative period of pediatric cardiac surgery published in Portuguese, full text, available free of charge electronically, indexed in the *Biblioteca Virtual de Saúde* (BVS), in Latin American and Caribbean Sciences in Health (LILACS), Medical Literature Analysis and Retrieval System Online (MEDLINE) and Nursing Database (ND), as these are

the bases on which most national nursing journals are indexed. It was considered the period from 2009 to 2018, aiming to be a historical cut of the content from the promulgation of Resolution 358/2009, of the Federal Nursing Council - FNC, which determines the obligation of the SNC in all care environments and that contain the descriptors used in the search in their title, abstract or subject. Articles dealing with the adult and / or elderly population in other languages were excluded due to a better understanding of the theme in the Brazilian reality and its contextualization with SNC, as well as other documents such as books, monographs, dissertations, theses and editorials, as it is a literature not yet published in journals and thus needs peer review.

The sampling was done through survey and bibliographical analysis of publications through the search of articles by the descriptors selected in the Descriptors in Health Sciences (DeCS / <http://desc.bvs.br>): Nursing Care; Cardiac surgery; Postoperative period; Postoperative care; and Child, with crossing performed by the Boolean operator "and" in three phases: the first phase comprises the crossing and the total of identified articles; The second phase concerns the application of filters and the inclusion of articles for full reading; and the third phase comprises the articles selected for the sample, as described in Chart 1.

Chart 1. Crossing of descriptors using the boolean operator and the BVS, using the LILACS, MEDLINE and BDNF bases

Data crossing	Phase 1: Articles Found	Phase 2: Applying the Filters		Phase 3: Sample Articles After Reading Titles and Abstracts
		Articles Full Text / Available Free / Language Portuguese / 2009-2018		
		Excluded	Included	
Nursing Care and Heart Surgery and Postoperative Period and Child	21	18	3	3
Nursing Care and Heart Surgery and Postoperative Care and Child	29	29	0	0
Nursing Care and Heart Surgery and Child	81	80	1	1
TOTAL	131	127	4	4

Source: Authors, 2019.

Out of the 131 studies selected, 127 were excluded because they were not available in full text, free of charge, in languages other than portuguese, outside the period from 2009 to 2018, and for not clearly answering the guiding question, thus not meeting the eligibility criteria (Chart 1), being the sample of this study composed of 04 articles.

The information extracted from the articles was descriptive and directly related to the objective of identifying nursing care for patients with congenital heart disease after cardiac surgery. The evaluation of studies regarding the Level of Evidence (LE) was guided by the determinations of Oxford Center Evidence Based Medicine¹³ according to Table 1.

Table 1. Levels of Evidence by Type of Study According to Oxford Center Evidence Based Medicine

LE	TYPE OF STUDY
1A	Systematic review of randomized controlled trials. Well-designed randomized controlled trials with relevant clinical outcome.
1B	Randomized controlled trial with narrow confidence interval.
1C	All-or-nothing therapeutic results. Study of series of controlled cases.
2A	Homogeneous systematic review of cohort studies (with comparison groups and variable control).
2B	Cohort study with poor quality randomization, control or no long follow-up, cross-sectional cohort study.
2C	Research results (observation of therapeutic results or clinical evolution).
3A	Homogeneous systematic review of case studies with control group.
3B	Case studies with control group.
4	Case and series reports without case-control definition.
5	Opinion of respected authorities or experts. Review of non-systematic literature.

Source: Adapted from Oxford Center Evidence-Based Medicine¹²

The interpretation of the results was based on the extraction of data related to the bibliometric characteristics of the studies and the descriptive evaluation of nursing care to children in the postoperative period of cardiac surgery using the absolute relative frequency. The presentation of the review was made through descriptive tables containing article number, authors, journal, database, place of study, year and objective (Chart 2); and article number, type of study, level of evidence and results (Chart 3).

Results and discussion

The sample of this review consisted of 04 studies identified with sequential numbering. Regarding the publication journal, the Journal of Research: Care is Fundamental (Online) obtained the largest number of publications with two studies (50%). The most indexed database was LILACS, with 75% of published studies. Concerning the place of publication, 50% of the publications come from the Southeast Region and 50% from the Northeast Region of Brazil. According to the year of publication, most were published in 2012 (75%) (Chart 2).

Chart 2. Characterization of studies according to article number, authors, journal, base, place of study, year and objective

Nº	Authors	Periodical	Base	Place	Year	Objective
1	Melo et al., ¹³	Anna Nery Journal School of Nursing	ND	Recife, PE/BR	2012	Understand child care during the immediate postoperative period of cardiac surgery from the perception of being a nurse.
2	Monteiro et al., ¹⁴	Electronic Journal of Nursing	LILACS	Fortaleza, CE/BR	2012	To analyze research that addresses the nursing behavior of children in the postoperative period of cardiac surgery.
3	Urakawa e Kobayashi ¹⁵	Research Journal: Care is Fundamental (Online)	LILACS	São Paulo, SP/BR	2012	To characterize the profile and identify the Nursing diagnoses of the neonate with CC.
4	Silva et al., ¹⁶	Research Journal: Care is Fundamental (Online)	LILACS	Rio de Janeiro, RJ/BR	2014	Correlate the standardization of nursing diagnoses, interventions and outcomes against the knowledge produced in the literature, as a way to express interrelated and systematized actions to children with heart disease.

Source: Authors, 2019.

Considering the objectives, all studies answer the question of this research, as they demonstrate to contribute to the nursing care of children with heart disease in the postoperative period of cardiac surgery.

Chart 3. Characterization of studies according to article number, type of study, level of evidence and results

Nº	Type of Study	LE	Results
1	Qualitative Phenomenological	5	The analysis allowed us to delineate the nurse's care as systematic, complex and thorough, which at the same time requires technical and scientific skills, requiring the being who cares for the ability to deal with their feelings in the eventualities of daily life.
2	Integrative Review	5	Nursing actions are: prevention conducts, evaluation conducts and recovery or rehabilitation conducts.
3	Retrospective Descriptive Exploration	2B	The prevalent nursing diagnoses were: risk for decreased cardiac output (91.3%) and peripheral arterial unsaturation (80.4%).
4	Integrative Review	5	The studies presented various proposals for nursing care for children with heart disease; In general, it was found that there is a concern to standardize and standardize nursing care for this clientele. Being through the adoption of a certain nursing classification, application of Nursing Theories in the development of care or, from a construction produced by the experience arising from the practice with technical-scientific basis.

Source: Authors, 2019. **Caption:** LE - Level of Evidence

According to Table 3, among the selected articles two adopted the type of integrative review study (50%), one study chose to use the retrospective exploratory descriptive method (25%) and one the qualitative phenomenological study (25%). Studies 1,2 and 4 reached level of evidence 5. Although study number 1 did not meet the criteria established by Oxford Center Evidence-Based Medicine¹², the authors agreed to classify it as level 5, as this was a discussion conducted by notorious experts know.

From the results emerged two thematic axes: the nurse and his perception of postoperative pediatric patient care and the main nursing diagnoses and interventions.

The nurse and his/her perception of postoperative pediatric patient care

The nurse specialized in cardiac surgery needs to develop methods for clinical and surgical care based on technical and scientific knowledge, which requires the sensorial perception of the problems associated with surgical procedures experienced by children in the postoperative, valuing the maintenance of their clinical balance¹³. Souza et al. (2008)¹⁷ state that the hospitalization process itself represents an important impact for the child, through their physical distance from family contact, the restriction of common activities of their daily lives, diet modified in taste and presentation and painful procedures, which may characterize as punishment or aggression.

The hospitalization of congenital heart disease, specifically for the performance of cardiac surgery, portrays an imbalance to the family system, but on the other hand also represents a hope of cure and improvement in quality of life¹⁸.

Cabral et al. (2018)¹⁹ emphasize that hospitalized children are exposed to unpleasant situations due to the worsening of their health, exacerbating negative feelings related to insecurity and carrying stress, anxiety and fear, due to the immediate analogy between PICU and death, associated with the temporary separation of the family-child.

An important point highlighted in the study carried by Melo et al. (2012)¹³ was the view of one of the components of their study in relation to the mother, treated as "being a mother", and from this study, she

realized the importance of the family to know the environment that the child will be after the surgery, which is one of the ways that nurses can work on the mother's emotional fragility, which begins in the immediate postoperative period.

The presence of a caregiver and especially the mother motivates and maintains an interpersonal relationship between the professionals and the child, reducing the negative impacts of family separation and thus helping the child to adapt to the environment, as well as providing better acceptance to treatment, attenuating the stressful reasons regarding the pathology, the procedures and the hospitalization process¹⁹.

In the admission of the child after surgery, the procedures and precise monitoring lead the nurse to perform his/her knowledge, valuing his/her technical ability and overlapping the subjectivity that involves the care that emerges with the clinical evolution, because a priori the context requires of the nurse a technical precision, making the feelings of this professional, at this moment, are relegated to a background. Humanizing care in this scenario does not mean denying the importance of technology that is essential in this situation, but implies valuing and attaching real importance to the relational aspects of care: the need for being cared for and the way nurses are seen and understood the co-presence of the other¹³.

Melo et al. (2012)¹³, verified the nurse as a being-with who assumes the responsibility of ensuring the child a complete care, providing inputs, constantly monitoring it and providing integral care. To improve the quality of care, it is necessary to define, through the EP, a framework of nursing diagnoses that are continuously based on clinical evolution and thus define actions and decision-making based on scientific reflections and practices¹⁷.

Major nursing diagnoses and interventions

ND is a process that includes the use of clinical and critical skills and as a result presents major challenges for its understanding and use. Commonly, in the daily routine of nurses, the ability to use them is fundamental, since, as they are standardized instruments that direct the procedures, strong allies in professional practice are obtained²⁰.

According to Silva et al. (2014)¹⁶, NDs are based on real, potential, and health-promoting problems through responses to physiological, behavioral, psychosocial, or spiritual dysfunction. In their study, the following NDs were listed in the immediate postoperative period: pain, impaired skin integrity, self-care deficit, sleep pattern disorder, family bond disruption, risk for temperature change, risk for fluid volume deficit, risk of decreased cardiac output, risk of infection, risk of inappetence, risk of impaired glucose metabolism, risk of impaired breathing pattern, risk of impaired skin integrity, and risk of constipation. The authors agree that these diagnoses presented a causal relationship between the primary problem and the surgical treatment.

In the study conducted by Urakawa and Kobayashi (2012)¹⁵, which identified the ND profile for newborns with CH, it was found that in the PICU, the prevalent diagnoses were high risk for infection; impaired skin integrity; risk of temperature change; risk for change in fluid volume; risk for change in heart rate, blood pressure and heart rate; risk for change in breathing pattern; ineffective upper airway cleaning; risk for damage to skin integrity, risk for inappetence, excess fluid volume; risk for aspiration; and risk for change in glucose metabolism.

Both studies¹⁵⁻¹⁶ listed ND present in clinical practice with structural changes that differ but that converge to direct goals in addressing the child. Due to the high complexity and clinical situation in the immediate postoperative period, it is important that diagnoses should be addressed in order of priority, thus providing a central focus for subsequent steps.

Urakawa and Kobayashi (2012)¹⁵ verified that it becomes necessary that nursing interventions guarantee the safety, quality and individualization of nursing care for newborns with CC. Through the NP, especially the ND, it is possible for the nurse to trace his plan of conduct. Monteiro et al. (2012)¹⁴ in a study that sought to list nursing conducts in the postoperative period of pediatric cardiac surgery, established that care can be guided by three axes: prevention conducts, evaluation conducts and recovery or rehabilitation conducts.

Preventive behaviors represent actions that precede the occurrence of possible changes in the child or provide a communication channel between nurse,

parents / guardians and the child itself. From the evaluation point of view, actions include: pain assessment through verbal, facial and body language expression, changes in the child's physiological conditions, skin, neurological status, affection, mood, activities of daily living; of parents entering the sector; the child's condition to start feeding; central venous catheter insertion site and venous perfusion¹⁴.

Recovery behaviors were interdependent with other professionals. In these, the nurse is concerned with the restoration of the child's health conditions, with emphasis on the continuity of treatment, especially in the healing process. The following were: administration of pain relief medications; vasoactive drug administration; and adoption of non-pharmacological measures for pain management¹⁴. Thus, the postoperative period of congenital heart disease involves a series of cares performed by the nurse and / or under his management, which change according to the type of heart disease and postoperative recovery²¹.

The task of caring for patients in the postoperative period of cardiac surgery is a common activity for the entire multidisciplinary team; however, the nursing team, under the coordination of the nurse, has a series of activities, ranging from collecting information about the intraoperative patient, the preparation of the unit for patient reception, until the assistance itself, besides being the link between the family and the team²².

Conclusion

It is concluded that the nurse's performance is translated by conducting a systematic, complex and thorough role, which assumes the responsibility of ensuring the child a complete care, providing inputs, constantly monitoring and providing comprehensive care. Technically, the nurse plans and executes prevention, evaluation and recovery conducts, seeking to standardize and standardize care based on nursing diagnoses and interventions.

As limitations, we highlight the choice of the pediatric population and therefore the scarcity of studies describing the nurse's role in the postoperative period of pediatric cardiac surgery, resulting in the small

sample size. However, the study brings contributions to nursing practice, since it allows the reflection and recognition of nurses as a fundamental agent of care and for presenting results that can direct care with regard to prevention, assessment and recovery in the postoperative period. operative.

Further studies are suggested in order to identify directly the specific nursing care for children in the postoperative period of cardiac surgery.

Author contributions

All authors participated in all stages of the study entitled "Nursing care in the postoperative period of pediatric cardiac surgery: integrative review" from conception of the theme to formatting, interpretation and discussion of results.

Conflicts of interest

No financial, legal or political conflict involving third parties (government, companies and private foundations, etc.) has been declared for any aspect of the work submitted (including, but not limited to grants and funding, advisory board membership, study design, preparation manuscript, statistical analysis, etc.).

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