Patient Safety on the Preparation of Intravenous Medication in Brazilian Pediatric Cardiology Units

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Purpose: The medication system in pediatric units is complex, once physiological alterations that occurs with the growth and normal development of childhood to adolescence results in dynamic transition of the medication disposal in the organism and the therapeutic response (Castilho, Nascimento & Grassi, 2016). According to Ferreira et al. (2014), the system of medication in pediatric units is frequently implemented in hospital institutions and includes multiprofessional team, above all, demands great attention, because the patients are subjected to adverse events patients caused by the professionals. Studies already developed regarding adverse events in the intravenous medication system of hospitalised children with cardiopathy, such as Azeka et al. (2014), Wilhelmsson et al. (2015). The medication system is one of the focal point that deserves attention, since it involves different processes including standardization, purchase of medication, prescription, transcription, distribution and administration. This study were considered three processes of the medication system described by Silva (2008), which can be mentioned: process of prescription, dispensation and distribution; preparation and administration of medication. As for the preparation and administration process of medication, the nursing team that is composed by nurses, nursing technicians and nursing auxiliaries is an important part of such work practices (Alomari et al., 2017). According to Feldman et al. (2017, p. 31) in Brazil is ensured in the legislation that the preparation process of medication, including the system of medication, is the Nursing team responsibility of safe use of medications. In accord with Sousa (2014, p. 15), Sousa (2014, p. 23) the performance scenario of such professionals is dynamic, with simple and complex work processes, which occur simultaneously and request continuous operations and decisions. Consequently, this study has the objective of identify the Nursing assistance quality in the process of intravenous medicine preparation in cardiology pediatric units of a public Brazilian hospital.

Methods: It is an analytical study, with a cross-sectional design and a quantitative approach, conducted in three cardiology pediatric units, called pediatric block, of a public hospital, specialized in cardiovascular and pulmonary disease, located in Fortaleza, Ceará, Brazil. The data collection occurred during the period of December 2017 to March 2018 through systematic observation of the Nursing professional realizing the preparation process of intravenous medication. The observation was mediated by a checklist type of itinerary with nine operations related to preparation of medication: “check the medication label with the prescription”, “verify the integrity the wrapping”, “inspect the medicine bottle to observe any possible particular, color alteration, crack and/or leak”, “observe the medicine expiration date”, “disinfect the ampoule bottle”, “medication reconstructed in distilled water or saline solution, respecting the principal of hospital infection prevention”, “prepared medication for administration of continuous infusion”, “identify the prepared medication” and “properly discard of used materials during the preparation”. In order to determine the amount of intravenous medication preparation to be observed a sample calculation was carried, eventually evaluating 237 preparations, which were conducted by 140 professionals of the Nursing team, among nurses and nursing technicians. The collected data were processed through the Statistical Package for the Social Sciences software version 20.0 and analyzed through descriptive statistics. The analysis of the Nursing quality was carried out, based on parameters used by Murassaki et
al. (2013), that were determined from Positivity Ratio results. The Positivity Ratio is defined as adequately conducted operations percentual. The Nursing assistance quality was classified according to the Positivity Ratio, which may assume the classifications: desirable (100%), proper (90 a 99%), safe (80 a 89%), borderline (71 a 79%) and low (lower or equal to 70%). The study was approved by the ethics committee.

**Results:** The quality of the Nursing assistance was considered, according to the sequence of observation: proper in operations “check the medication label with the prescription” (90,7%); “verify the integrity the wrapping” (92%); “identify the prepared medication” (94,9%); and “properly discard of used materials during the preparation” (99,3%). Borderline in operations “inspect the medicine bottle to observe any possible particular, color alteration, crack and/or leak” (76,6%); “observe the medicine expiration date” (76,6%); “medication reconstructed in distilled water or saline solution, respecting the principal of hospital infection prevention” (78,3%); and “prepared medication for administration of continuous infusion” (78,5%). Low in the operation “disinfect the ampoule bottle” (49,8%). No operation related to the preparation of intravenous medication achieved the Positivity Ratio desirable and safe percentage. However, there were borderline and poor results that need to be improved through training and awareness of the team on the importance of performing these actions, which may compromise the quality of care and patient safety. In a study, that analyzed the preparation and administration process errors of medication in pediatric patients, the preparation error rate was 67,44% and it was determined that this errors are common in the hospital and pediatrics environments, serving as indicator of quality in the service provided to the patient (Baptista, 2014). In another study, that evaluated the Nursing practice in terms of intramuscular medication administration in pediatrics, all the operations which had been carried out before the medication administration were unsatisfactory (< 70% frequency) (Souza et al., 2018). The preparation of the medication demands the interpretation of the prescription and involves a great amount of specific information on preparation and disposal of residues, considering the need of resources and workforce of the Nursing team to improve the quality and safety of the medication process, serving patients in what they effectively need, reaching higher levels of satisfaction (Costa et al., 2013).

**Conclusion:** This study was capable to identify the situational diagnosis of the Nursing team, when performing the preparation process of intravenous medication in pediatric patients, corresponding a unsatisfactory assistance, which reveals that recommended actions by literature of intravenous medication administration is still a challenge to lifelong education. Therefore, it is suggested to be offered constant training to the entire Nursing team.

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**Title:**
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**References:**


Abstract Summary:
The research evaluated the quality of nursing care in the actions related to the preparation of intravenous drugs of a pediatric unit in Brazil. No action was considered desirable, being developed in all preparations of intravenous drugs. The study suggests that nursing care has been unsatisfactory.

Content Outline:

1. Introduction
   1. The preparation of intravenous drugs in pediatric units and the patient safety.
   2. The nursing team in the preparation of intravenous drugs.
2. Methodology
   1. An analytical study, with a cross-sectional design and a quantitative approach.
   2. Pediatric unit of public hospital specialized in cardiovascular diseases.
3. Observation of nine actions related to the preparation of intravenous drugs.

3. Results
   1. 237 preparations of intravenous drugs were observed.
   2. No observed action was considered desirable (100%).
   3. An observed action was considered suffering (<70).

1. Conclusion
   1. Nursing care was considered unsatisfactory in the context.
   2. Importance of constant training of the nursing team about the preparation of medications.

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