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Use of checklist for safe care of hospitalized children

Uso de checklist para assistência segura à criança hospitalizada

Utilización de lista de verificación para atención segura de niños hospitalizados

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ABSTRACT

Objective: to identify the themes of patient safety checklists used in the care of hospitalized children. **Method:** integrative literature review, conducted in August 2019 in the LILACS, BDENF, MEDLINE/PubMed, Web of Science, CINAHL and SciELO databases. **Results:** a total of 396 articles were identified, and 24 studies were selected after applying the eligibility criteria. The thematic areas of the checklists were: surgery, medication, effective communication, intensive care, tracheal intubation, blood transfusion and digital radiology, with most studies addressing safe surgery (45.8%). **Conclusion:** the use of checklist in the care of hospitalized children contributes to the identification of failures in patient safety processes; standardization of techniques and processes; reduction of errors related to health care; improvement of teamwork; accurate and consistent communication; adherence to process measures; and, consequently, improvement in the quality of care provided.

Descriptors: Pediatrics; Pediatric Nursing; Child, Hospitalized; Patient Safety; Checklist.

RESUMO

Objetivo: identificar as temáticas dos *checklists* de segurança do paciente utilizados na assistência à criança hospitalizada. **Método:** revisão integrativa de literatura, realizada em agosto de 2019 nas bases de dados LILACS, BDENF, MEDLINE/PubMed, Web of Science, CINAHL e SciELO. **Resultados:** foram identificados 396 artigos, sendo selecionados 24 estudos após a aplicação dos critérios de elegibilidade. As áreas temáticas dos *checklists* foram: cirurgia, medicação, comunicação efetiva, terapia intensiva, intubação traqueal, transfusão sanguínea e radiologia digital, sendo que a maioria dos estudos aborda a cirurgia segura (45,8%). **Conclusão:** o uso de *checklist* na assistência à criança hospitalizada contribui para a identificação de falhas em processos de segurança do paciente; padronização de técnicas e processos; redução de erros relacionados aos cuidados em saúde; melhoria do trabalho em equipe; comunicação precisa e consistente; adesão às medidas de processo; e, consequentemente, melhoria da qualidade da assistência prestada.

Descritores: Pediatria; Enfermagem Pediátrica; Criança Hospitalizada; Segurança do Paciente; Lista de Checagem.

RESUMEN

Objetivo: identificar los temas de las listas de verificación de seguridad del paciente utilizadas en la atención de niños hospitalizados. **Método:** revisión bibliográfica integradora, conducida en agosto de 2019 en las bases de datos LILACS, BDENF, MEDLINE/PubMed, Web of Science, CINAHL y SciELO. **Resultados:** se identificaron un total de 396 artículos y se seleccionaron 24 estudios después de aplicar los criterios de elegibilidad. Las áreas temáticas de las listas de verificación fueron: cirugía, medicación, comunicación efectiva, cuidados intensivos, intubación traqueal, transfusión de sangre y radiología digital, siendo la mayoría de los estudios sobre cirugía segura (45,8%). **Conclusión:** la mayoría demostró que la utilización de listas de verificación contribuye a la identificación de fallas en los procesos de seguridad del paciente; estandarización de técnicas y procesos; reducción de errores relacionados con la atención médica; mejora del trabajo en equipo; comunicación precisa y coherente; adhesión a las medidas procesales; y, como consecuencia, mejora de la calidad de la atención ofrecida.

Descriptores: Pediatría; Enfermería Pediátrica; Niño Hospitalizado; Seguridad del Paciente; Lista de Verificación.

INTRODUCTION

Patient safety has gained national and international prominence, being an increasingly discussed topic within institutions and among health professionals, with the objective of reducing to an acceptable minimum the occurrence of avoidable incidents and improving the quality of the care provided[1].

In October 2004, the World Health Organization (WHO) launched the World Alliance for Patient Safety in order to facilitate the development of practices and policies, as well as to promote global efforts to improve safety in the care provided to patients from all WHO Member States. Patient Safety is understood as reducing to an acceptable minimum the risk of unnecessary healthcare-associated harms[2]. In this context, the WHO proposes global actions and encourages the use of checklists to guide safe care, in order to prevent incidents with or without harms to the patient[3].

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In the Brazilian context, Ordinance No. 529/2013 was enacted, which created the National Patient Safety Program, defining strategies for the elaboration and implementation of basic protocols, which involved the following: identification of the patient; safe surgery; pressure ulcer prevention; hand hygiene practice in health services; safety in medication prescription, use and administration; and fall prevention[4,5].

Improving care quality is a concern for the health services, and the global mobilization in favor of patient safety can provide subsidies for the specialties, especially in the pediatric area, as hospitalized children are in a situation of significant vulnerability for the occurrence of healthcare-related adverse events[6].

In the Pediatric Nursing practice, concern is noticed to develop the patient safety culture in the care of hospitalized children and to implement strategies to promote safe care for this clientele[6], among which checklists stand out to promote patient safety.

Checklists are tools for rapid verification of safety items and have been applied in the health area with the objective of improving care quality, based on the reduction of omission errors, correct application of procedures and protocols, and the possibility of devising reliable and replicable evaluations[7].

In this sense, synthesizing the scientific evidence on hospitalized children's safety, with the use of checklists as a focus, may enable improvements in the care practice and encourage the conduction of research studies on the elaboration and validation of pediatric patient safety checklists.

Therefore, the objective of this study consisted in identifying the themes of the patient safety checklists used in the assistance provided to hospitalized children.

METHOD

This is an integrative literature review study aimed at outlining an analysis of the knowledge already built in previous surveys on a given topic, in order to enable knowledge synthesis[8].

The following six stages were adopted to develop this research: 1) Identification of the topic and selection of the research question; 2) Definition of inclusion and exclusion criteria; 3) Identification of the pre-selected and selected studies; 4) Categorization of the selected studies; 5) Analysis and interpretation of the results; and 6) Presentation of the review/knowledge synthesis[8].

The PICo (acronym standing for Population, Interest and Context) strategy[9] was used to formulate the following research question: Which are the themes of the patient safety checklists used in the assistance provided to hospitalized children?

The search for studies was carried out in August 2019 by remote access via the Federated Academic Community (*Comunidade Acadêmica Federada*, CAFe), in the Journals Portal of the National Coordination for the Improvement of Higher Education Personnel (*Coordenação Nacional de Aperfeiçoamento de Pessoal de Nível Superior*, CAPES), using the *Universidade Federal do Estado do Rio de Janeiro* identification in the following databases: *Literatura Latino-Americana e do Caribe em Ciências da Saúde* (LILACS) and *Base de Dados em Enfermagem* (BDENF) via the *Biblioteca Virtual de Saúde* (BVS) portal; as well as Medical Literature Analysis and Retrieval System Online (MEDLINE) via PubMed; Web of Science; Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Scientific Electronic Library Online (SCIELO).

The following MeSH (Medical Subject Headings) and DeCS (*Descritores em Ciências da Saúde*) descriptors were used to search for the articles, namely: *Patient Safety*; *Checklist*; *Child, Hospitalized*; *Child*; *Pediatrics*; and *Pediatric Nursing*. An individual search strategy was used for each database employing *AND* and *OR* Boolean operators to combine the descriptors in the databases. The following strategy was implemented in LILACS and BDENF: *(tw:(Segurança do Paciente)) AND (tw:(Lista de Verificação)) AND (tw:((criança hospitalizada) OR (pediatria) OR (enfermagem pediátrica) OR (criança)))*; the strategy used in MEDLINE/PubMed was as follows: *((Patient Safety[Title/Abstract]) AND Checklist[Title/Abstract]) AND ((((Child, Hospitalized[Title/Abstract]) OR Child[Title/Abstract]) OR Pediatrics[Title/Abstract]) OR Pediatric Nursing[Title/Abstract])*; the strategy employed in CINAHL was *(MH "Patient Safety") AND (MH "Checklists") AND ((MH "Child, Hospitalized") OR (MH "Pediatric Nursing") OR (MH "Pediatrics")) OR (MH "Child")*; in Web of Science it was TOPIC: *(Patient Safety) AND* TOPIC: *(Checklist) AND* TOPIC: *(Child, Hospitalized or Child or Pediatric or Pediatric Nursing)*; and the strategy for SciELO corresponded to *(Segurança do paciente) AND (Lista de Checagem)*.

The materials included were original articles in full, available online in the databases selected; in English, Spanish or Portuguese; that specifically addressed the use of patient safety checklists in the context of hospitalized children; and that were published from 2005 onwards. The period proposed for the search was from 2005 to 2019, with institution of the World Alliance for Patient Safety as historical milestone, dating from 2004.

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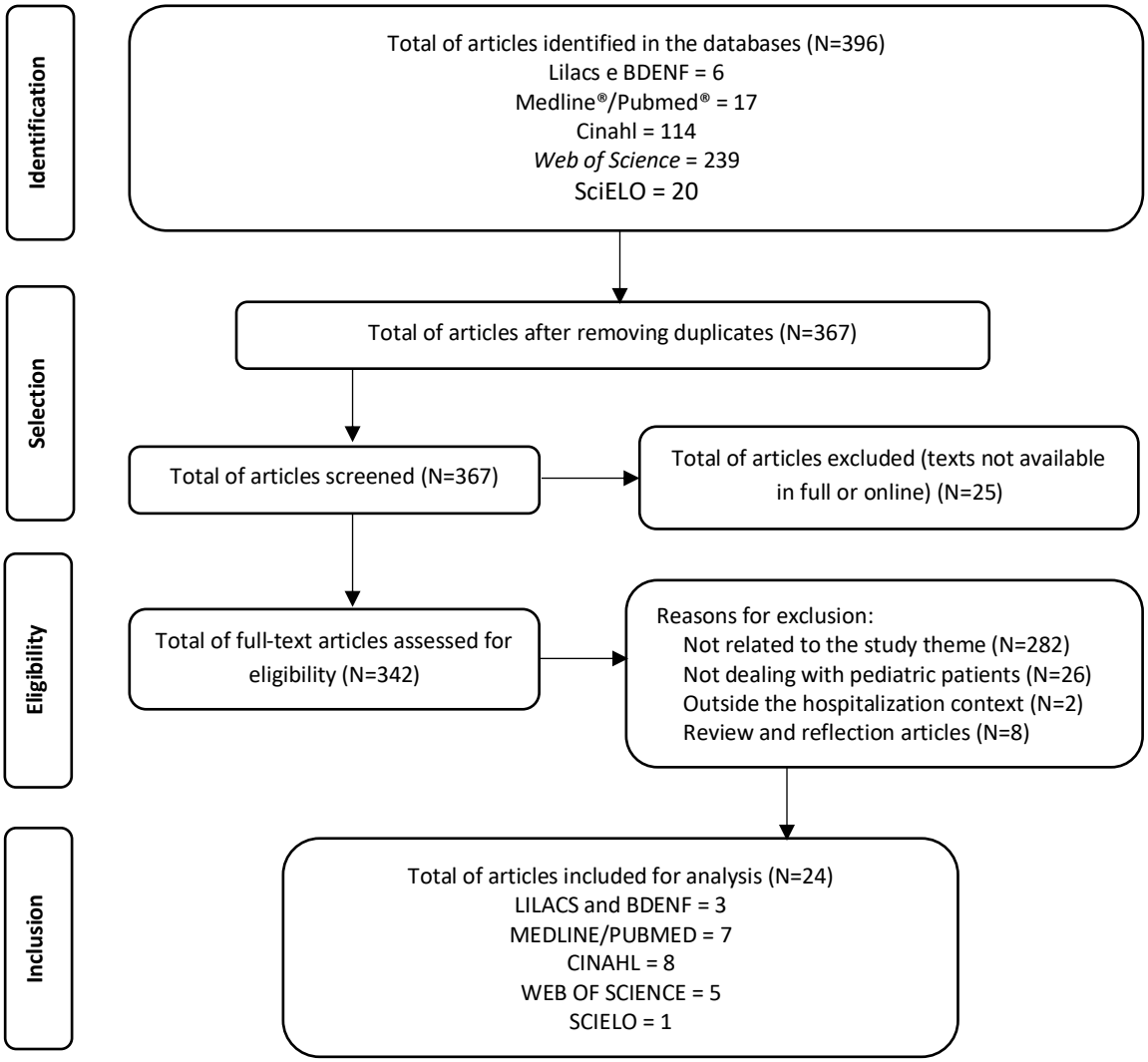
The articles indexed in more than one database were excluded, as well as those related to the health of neonates, adolescents and adults or to children outside the hospitalization context; those not related to patient safety; and publications in the form of theses, dissertations, monographs, books, reviews (narrative, systematic or integrative), response letters, congress proceedings, editorials and non-scientific materials.

In order to select the studies by means of the inclusion and exclusion criteria, two reviewers initially read the titles and abstracts. After selection, the studies that raised disagreements between the researchers were analyzed by a third party, who was responsible for making the decision regarding their inclusion or exclusion and, subsequently, full reading was performed to define the final sample.

The flowchart corresponding to the crossings with the result is shown in Figure 1 and followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) recommendation, which includes four stages: identification, selection, eligibility and inclusion[10].



Lilacs: *Literatura Latino-Americana e do Caribe em Ciências da Saúde*; BDENF: *Base de Dados em Enfermagem*; Medline: *Medical* Literature Analysis and Retrieval System Online; Cinahl: Cumulative Index to Nursing and Allied Health Literature; SciELO: Scientific Electronic Library Online.
Figure 1: Flowchart corresponding to the process of identification, selection, eligibility and inclusion of the articles. Rio de Janeiro, RJ, Brazil, 2019.

A total of 24 articles were selected for analysis after applying the inclusion and exclusion criteria, reading the titles and abstracts, and reading the full texts. For data analysis and interpretation, a synthesis of the diverse information extracted from the articles selected for eligibility was carried out, seeking to answer the research question. For this stage, the instrument used consisted of the following items: title, year of publication, database, journal, type of study, level of evidence, and thematic area of the patient safety checklist.

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In line with the ethical and legal aspects set forth in Resolution No. 466/2012, the research was not submitted to any Research Ethics Committee, for being a literature review and not involving human beings.

RESULTS

The characteristics of the studies included in the sample are presented in Figure 2.

Title	Year of publication/ Database/Journal	Type of study/Level of evidence[11]	Thematic area of the patient safety checklist
Increasing compliance of safe medication administration in pediatric anesthesia by use of a standardized checklist[12]	2019/ *Web of Science*/ Paediatr Anaesth	Estudo descritivo/ nível VI	Medicação Segura
Implementation of the surgical safety checklist for pediatric operations: compliance assessment	2019/ Portal Scielo/ Rev Gaúcha Enferm	Estudo descritivo/ nível VI	Cirurgia Segura
The impact of a pediatric shunt surgery checklist on infection rate at a single institution[14]	2018/ *Web of Science*/ Neurosurgery	Estudo de intervenção/ nível III	Cirurgia Segura
Patient safety in the administration of intramuscular medication in pediatrics: assessment of the nursing practice	2018/ Medline/Pubmed/ Rev Gaúcha Enferm	Estudo descritivo/ nível VI	Medicação Segura
Effect of surgical safety checklists on pediatric surgical complications in Ontario[16]	2016/ Cinahl/ CMAJ	Estudo de intervenção/ nível III	Cirurgia Segura
Recommendations for surgical safety checklist use in Canadian children's hospitals[17]	2016/ *Web of Science*/ Can J Surg	Estudo descritivo/ nível VI	Cirurgia Segura
Surgical checklist application and its impact on patient safety in pediatric surgery[18]	2015/ *Web of Science*/ J Postgrad Med	Estudo descritivo/ nível VI	Cirurgia Segura
Surgical safety in pediatrics: practical application of the Pediatric Surgical Safety Checklist[19]	2015/ Lilacs/ Rev Latino-Am Enfermagem	Estudo descritivo/nível VI	Cirurgia Segura
Parental involvement in the preoperative surgical safety checklist is welcomed by both parents and staff[20]	2014/ Medline/Pubmed/ Int J Pediatr	Estudo descritivo/ nível VI	Cirurgia Segura
Introduction of surgical safety checklists in Ontario, Canada[21]	2014/ Cinahl/ N Engl J Med	Estudo de intervenção/ nível III	Cirurgia Segura
Safe pediatric surgery: development and validation of preoperative interventions checklist[22]	2013/ Lilacs/ Rev Latinoam Enferm	Estudo metodológico/ nível VI	Cirurgia Segura
Lista de verificación de seguridad de la cirugía: logros y dificultades de su implementación en un hospital pediátrico[23]	2012/ Lilacs/ Arch Argent Pediatr	Estudo descritivo/ nível VI	Cirurgia Segura
The use of consultant-led ward round checklist to improve paediatric prescribing: an interrupted time series study[24]	2012/ Cinahl/ Eur J Pediatr	Estudo de intervenção/ nível III	Medicação Segura
Implementing a pediatric surgical safety checklist in the OR and beyond[25]	2010/ Cinahl/ AORN J	Estudo descritivo/ nível VI	Cirurgia Segura
Creation and validation of a checklist for blood transfusion in children[26]	2018/ Cinahl/ Rev Bras Enferm	Estudo metodológico/ nível VI	Transfusão sanguínea
Implementation of a checklist to increase adherence to evidence-based practices in a single pediatric intensive care unit[27]	2017/ *Web of Science*/ Arch Argent Pediatr	Estudo de intervenção/ nível III	Terapia Intensiva
Implementation of NAP4 emergency airway management recommendations in a quaterbary-level pediatric hospital[28]	2017/ Medline/Pubmed/ Paediatr Anaesth	Estudo descritivo/ nível VI	Intubação traqueal
A family-centered rounds checklist, family engagement, and patient safety: a randomized trial[29]	2017/ Cinahl/ Pediatrics	Ensaio randomizado de *cluster*/ nível II	Comunicação efetiva
Design and α-testing of an electronic rounding tool (CERTAINp) to improve process of care in pediatric intensive care unit[30]	2017/ Medline/Pubmed/ J Clin Monit Comput	Estudo de intervenção/ nível III	Terapia Intensiva
Development of a quality improvement bundle to reduce tracheal intubation-associated events in pediatric ICUs[31]	2016/ Medline/Pubmed/ Am J Med Qual	Estudo de coorte/ nível IV	Intubação traqueal
A PICU patient safety checklist: rate of utilization and impact on patient care[32]	2016/ Medline/Pubmed/ Int J Qual Health Care	Estudo de coorte/ nível IV	Terapia Intensiva
Safety by DEFAULT: introduction and impact of a paediatric ward round checklist[33]	2013/ Cinahl/ Crit Care	Estudo de intervenção/ nível III	Comunicação efetiva
The image gently pediatric digital radiography safety for improving pediatric radiography[34]	*checklist: tools* 2013/ Cinahl/ J Am Coll Radiol	Estudo metodológico/ nível VI	Radiologia digital
30-second head-to-toe tool in pediatric nursing: cultivating safety in handoff communication[35]	2011/ Medline/Pubmed/ Pediatric Nurs	Estudo metodológico/ nível VI	Comunicação efetiva

Cinahl: *Cumulative Index to Nursing and Allied*; Lilacs: Literatura Latino-Americana e do Caribe em Ciências da Saúde.

Figure 2: Synthesis of the studies included in the integrative review, according to title, year of publication, database, journal, type of study, level of evidence and thematic area of the checklist. Rio de Janeiro, RJ, Brazil, 2019.

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A total of 396 publications on the use of patient safety checklists in the care of hospitalized children were identified, of which 342 full-text and online articles met the eligibility criteria. Of these, 24 were selected for analysis, as follows: eight from CINAHL (33.3%), seven from Medline/PubMed (29.2%), five from Web of Science (20.8%), three from LILACS and BDEnf each (12.5%) and one from SciELO (4.2%).

The studies analyzed address the use of safety-related checklists in procedures for the assistance provided to hospitalized children, namely: surgery, tracheal intubation, blood transfusion, digital radiology, and medication prescription, use and administration. On the other hand, three research studies acknowledge effective communication as an essential element for safety in this population group.

Although the publication period started in 2005, it was only from 2010 onwards that articles on the topic were found. There was an increase in the number of articles published from 2015 to 2019 (N=15) when compared to the 2010-2014 period (N=9). Among the studies included, 18 (75%) were written in English, 5 (21%) in Portuguese and one (4%) in Spanish. The articles were published in 20 different journals, among which only three are from Brazil.

In relation to the level of evidence[36], most of the studies (58%) were classified as level VI, as review studies were excluded from the research. Regarding the thematic area of the checklists, eleven (45.8%) refer to safe surgery, three (12.5%) to safety in medication prescription, use and administration, three (12.5%) to effective communication, three (12.5%) to intensive care, two (8.3%) to tracheal intubation, one (4.2%) to blood transfusion and one (4.2%) to digital radiology.

DISCUSSION

The theme of the checklists with the highest number of publications was safe surgery, a priority area according to the Global Challenge for Patient Safety, which aims at improving surgical safety and reducing the number of complications and related deaths, through the “Safe Surgery Saves Lives” program. This document systematizes evidence-based practices and proposes the use of a checklist to reduce distractions, elucidate minimum stages expected when facing a complex situation, increase interaction between the team members, and improve performance[37].

However, a number of studies that investigated the use of safe surgery checklists observed some non-conformities, such as the following: absence of pulse oximetry recording in the induction phase; absence of surgical site demarcation; non-administration of prophylactic antibiotics; children with the same name and identical surgical procedures recorded in the same surgery list; absence of the patient's identification bracelet; incomplete identification of the patient; consent form not signed by the parents/guardians; inadequate immobilization of patients with displacement of the diathermy grounding electrode; lack of planning for major blood loss; unavailability of material for safety in anesthesia and in imaging tests; non-verification of the number of gauzes and compresses; and incorrect identification of surgical specimens[13,18,23].

Acknowledging the importance of adequate preparation of the child for the surgical procedure and in view of the nonexistence of an instrument for the pediatric preoperative period, a research study for the elaboration, validation and use of a checklist of preoperative interventions, called “Pediatric Checklist for Safe Surgery”, identified that 30% of the items were not filled out by the team[19,22]. On the other hand, studies on the application of safe surgery checklists found an increase in health professionals' adherence to the recommended practices and in the identification of failures in the processes; reduction of complications related to the surgical procedure, improvements in teamwork and communication, and development of the safety culture[13,17,19,23,25].

On the other hand, surveys carried out in Ontario, Canada, did not find significant associations between the use of safe surgery checklists and the reduction of perioperative complications and mortality[16,21] when comparing the periods before and after implementing the checklist. It is noted that such results can be related to the low occurrence rates of complications and adverse events in certain populations, such as the pediatric one[16], as well as to the professionals' low adherence to the checklists or to their non-standardized use[21].

In addition, it is important to emphasize that application of a checklist should not be focused solely on the team; it is fundamental to involve children and/or family members in its implementation before the surgical procedures, in order to reduce anxiety and promote patient safety[19,20].

The theme of safety in medication prescription, use and administration was addressed by three studies included in this review, which highlighted that the use of checklists favored early identification of errors for timely interventions, contributed to quality of the medical prescriptions, and reduced possible errors in administration, especially those that pose high risks[12,15,24].

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An observational study developed in a pediatric hospital evidenced the existence of failures in the process of drug administration via the intramuscular route, with emphasis on the actions performed before the procedure, which did not attain any satisfactory results (>70%). In this context, using the checklist contributed to making a situational diagnosis, which allowed identifying the most common errors and consubstantiated effective and interventions directed to solving the problems[15].

Such a strategy was also adopted in a Children's Hospital from Cincinnati (USA) in view of the increase in the number of acetaminophen dosage errors in the perioperative period, noticing that the implementation of a safe administration checklist resulted in increased process compliance (97%) and, consequently, in a reduction of the administration errors. From this experience, in this study the authors concluded that checklists can be used to develop safety behaviors and promote a safety culture[12].

In order to evaluate the impact of implementing medical prescription checklists on care quality and patient safety, a research study carried out in two pediatric wards of a teaching hospital in London verified a significant 5% reduction in the rate of technical errors (related to writing). However, the intervention exerted no significant impact in relation to the clinical errors (associated with clinical decision-making)[24].

Addressed in three studies included in this review, the theme of effective communication is extremely relevant in health care, as failures in this process generate errors and adverse events. Thus, improving communication is the second international patient safety goal, which aims at reducing the occurrence of errors, resulting in improved patient safety[38].

The studies that implemented a patient safety checklist to improve communication showed the importance of adopting a standardized system for shift changes and rounds performed by the multiprofessional team, in order to make these practices more dynamic, safe and efficient, with direct impacts on the quality of the care provided to pediatric patients[29,33,35].

In addition to focusing on the team, the strategy of including the family/companions in the patient care process confers safety in the assistance provided to hospitalized children, by means of guidelines related to health conditions and hospitalization, constituting an important measure to prevent harms and adverse events. Therefore, it is recommended to implement a checklist in family-centered rounds to improve quality and safety of pediatric care, as parents witness medication errors, professional engagement with safe procedures, and transmission of diverse information both during shift changes and in intra- and extra-hospital transfers[29].

The studies on the implementation of checklists in pediatric intensive care units evidenced an increase in the adherence rates regarding evidence-based practices. These instruments contain items related to the use of antibiotics, invasive devices, imaging and laboratory tests, identification of the patient, mobility, sedation, headboard elevation between 30 and 45 degrees, endotracheal intubation, ventilatory parameters and circuits, use of oral chlorhexidine, exchange of hospital supplies, nutrition, blood transfusions, ulcer prophylaxis, bowel protocol, deep vein thrombosis prophylaxis, skin care and glucose[27,30,32].

Another thematic area identified in two studies included in the current review was tracheal intubation, whose importance is proven by the association of emergency airway management with the high incidence of serious adverse events, with risk of death. Applied to pediatric patients, one of the checklists was prepared based on the NAP4 (4th National Audit Project of The Royal College of Anaesthetists and The Difficult Airway Society) recommendations for the verification of items referring to preparedness of the team, to the patient, to the intravenous medications, to the equipment and to the monitors[28]. The other was elaborated with a focus on evaluating the following items: risk factor; planning; pre-procedure time limit, to ensure that the team and equipment are prepared; and post-procedure grouping to identify improvement opportunities[31].

Less expressively, the use of checklists aimed at blood transfusion and digital radiology in Pediatrics emerged in two studies for the elaboration and validation of an instrument, respectively: to guide the professionals in relation to the items that must be followed and verified to ensure safe transfusions in children[26]; and for technologists to use during the test, which proved to be efficient in optimizing the work process and in reducing dependence on memory and, consequently, the risk of errors that can result in the children being exposed to radiation[34].

In view of the above, it is noted that checklists are tools to achieve quality and safety in the care of hospitalized children, which, at the same time, offers subsidies for the implementation of actions that improve the clinical practice and reduce healthcare-related risks and harms.

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Study limitations

The fact that the search and selection strategies employed resulted in the identification of few studies with higher levels of evidence (I and II) stands out as a limitation of this review.

CONCLUSION

This review identified that, among the patient safety checklists used in the assistance provided to hospitalized children, there is predominance of the themes referring to safe surgery; safety in medication prescription, use and administration; effective communication; intensive care; tracheal intubation; blood transfusion; and digital radiology.

It was verified that using these checklists contributes to qualification and safety, as they allow for identification of failures, standardization of techniques and procedures, improvements in communication, strengthening of teamwork, and reduction of errors and negative outcomes. Therefore, the process to implement these checklists in hospital institutions must mobilize the professionals and encourage the participation of children and their families, as strategies that increase adherence to the use of these instruments and prevent the occurrence of harms and adverse events.

Given the relevance of the use of checklists in Pediatrics, even to generate quality and safety indicators that consubstantiate interventions in the health work environment, the need for more Brazilian studies is pointed out, especially on the themes of basic national protocols, as this review identified a gap in the production of knowledge about the use of these instruments aimed at identification of the patient, fall prevention, pressure injury prevention and hand hygiene practice.

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