







Newborn patient identification: scoping review

Identificação do paciente recém-nascido: revisão de escopo

Gabrieli Patricio Rissi¹ , Bianca Machado Cruz Shibukawa¹ , Andressa Martins Dias Ferreira¹ ,
Roberta Tognollo Borotta Uema¹ , Maria de Fátima Garcia Lopes Merino¹ , Ieda Harumi Higarashi¹ 

ABSTRACT

Objective: To map the evidence available in the literature on ways to identify hospitalized newborns. **Methodology:** Scoping review based on the assumptions of the Joanna Briggs Institute review method. The bibliographic survey was carried out in 22 databases related to health. **Results:** 785 studies were initially identified, 11 of which comprised the final sample. The use of identification wristbands was mostly verified by the studies. One study raised the safety of performing Deoxyribonucleic Acid sampling. Variation was observed both in the physical structure of the wristbands and in the information contained therein. **Conclusion:** The importance of choosing the correct identification method in newborns is highlighted, especially when considering the peculiarities that this population presents.

Descriptors: Patient Identification Systems; Infant, Newborn; Patient Safety; Admitting Department, Hospital; Review.

RESUMO

Objetivo: Mapear quais as evidências disponíveis na literatura sobre as formas de identificação de recém-nascidos hospitalizados. **Método:** Revisão de escopo baseada nos pressupostos do método de revisão do Instituto Joanna Briggs. O levantamento bibliográfico foi realizado em 22 bases de dados relacionadas a área da saúde. **Resultados:** Identificou-se inicialmente 785 estudos, sendo que apenas 11 compuseram a amostra. Verificou-se majoritariamente a utilização de pulseiras de identificação, com exceção de um estudo que levantou a segurança em realizar amostragem de Ácido Desoxirribonucleico. Observou-se variação tanto da estrutura física das pulseiras como das informações nelas contidas. **Conclusão:** Destaca-se a importância da escolha correta do método de identificação em recém-nascidos, especialmente ao considerar as peculiaridades que essa população apresenta.

Descritores: Sistemas de Identificação de Pacientes; Recém-Nascido; Segurança do Paciente; Serviço Hospitalar de Admissão de Pacientes; Revisão.

¹Universidade Estadual de Maringá (UEM) – Maringá (PR), Brazil. E-mails: gabrielirissi@gmail.com, bih.cruuz@gmail.com, andressam_dias@yahoo.com.br, robertaborotta@hotmail.com, fatimamerino@gmail.com, ieda1618@gmail.com

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INTRODUCTION

The safe identification of patients is an increasing theme in the health context, especially in the field of nursing. This scenario is due to the effects and impacts generated in the care provided to patients, which can result in irreversible damage to the biopsychosocial health of patients and their families⁽¹⁾.

In 2005, the World Health Organization (WHO) defined the correct identification of patients as one of the international goals of patient safety, as a proposal to prevent adverse events related to health care. In this regard, Brazil, when it joined the World Alliance for Patient Safety, also adopted correct identification as a patient safety goal⁽²⁾.

Furthermore, through the National Patient Safety Program and the basic patient identification protocol^(2,3), the Ministry of Health defined the importance of implementing this practice in all health services, with the engagement of health professionals, patients, and families regarding the use of the identification wristband.

It is important to highlight the indispensability of safe identification, especially in the pediatric population, as this population presents morphological and cognitive, social and emotional development particularities⁽⁴⁾. Such characteristics increase both the occurrence and the severity of adverse events, such as the performance of procedures and medications in incorrect patients, inadequate supply of breast milk, and switching babies at birth^(5,6).

Safe patient care begins with the correct identification of the newborn, as well as the use of strategies such as the distinguished name system, professional knowledge, and bar code technology⁽⁷⁾.

According to the protocol structured by the Ministry of Health⁽³⁾, the identification of the pediatric patient must be carried out as soon as the patient is admitted to the service and must continue throughout their entire hospitalization, being necessary to pay attention to the specificities of the newborn. The newborn's identification wristband must contain, at least, the mother's name and medical record number, in addition to being placed on the ankle to prevent loss⁽³⁾.

Even after the adoption of preventive measures by health institutions, situations where newborns are switched in hospitals still occur due to the lack of or failures in the identification process^(6,8). Such failures may be due to identical first and/or last names, medical record numbers, similar birth dates. Furthermore, newborns have physical similarities and are unable to communicate verbally to participate in the identification process^(5,6,8).

A study in Pennsylvania estimated that there are approximately two daily adverse events related to the misidentification of newborns, resulting in one misidentification in every 217 births⁽⁵⁾. This data is worrisome, especially when considering that there is no standardization in the identification of newborns⁽⁹⁾.

Still on weaknesses in the identification process, a study carried out in 2018 in three university hospitals in southern Brazil, found that of the 96 patients observed during hospitalization in the pediatric ICU, 94 had bedside identification. However, none of them used an identification wristband, even though the use of this device was recommended by the Ministry of Health⁽⁴⁾.

Therefore, it is important to emphasize that the correct identification of newborns, in addition to benefiting the quality of health services, also contributes to the communication of information during the performance of procedures⁽¹⁰⁾.

It is noteworthy that there is an absence of consolidated and standardized strategies regarding the forms of identification of pediatric patients⁽¹⁾, added to the failure in the engagement of professionals and parents on the importance of safe identification⁽¹¹⁾. There is a need for a consensus among hospital institutions regarding the standardization of minimum criteria for proper identification of newborns and thus safety for patients⁽¹²⁾.

Therefore, due to the lack of standardization of identification of newborns and, considering the importance of correct identification for the prevention of adverse events in health care, the objective was to map what evidence is available in the literature on the forms of identification of hospitalized newborns.

METHODOLOGY

This is a scoping review study, based on the assumptions of the review method presented by the Joanna Briggs Institute (JBI), which can be used to explore, expand, structure, and clarify the main evidence that supports a particular field of research⁽¹³⁾.

The scoping review was chosen because it aims to elucidate the main concepts and definitions in the literature, in addition to identifying characteristics or related factors, aiming to analyze the gaps in existing knowledge within that theme⁽¹⁴⁾.

The review question was built based on the strategy Population, Concept, and Context (PCC)⁽¹³⁾, being established: P- newborns; C- patient identification, and C- hospitalization. Thus, the delimited review question was: What evidence is available about ways to identify hospitalized newborns?

The bibliographic survey was independently carried out from July to August 2020 by two researchers, following the three steps proposed in a scoping review. In case of disagreement between the two researchers, a third would be called. However, there was no divergence among researchers.

As inclusion criteria, the following were defined: being available in English, Spanish, or Portuguese; primary studies, editorials or books, and guidelines; published or available

until August 2020; and covering the theme of identification in hospitalized newborns.

For the first step, a limited search was performed in two databases, to identify the keywords and descriptors that were later used. The second step included a more comprehensive search, applying all the keywords identified in the previously selected articles to the other databases included in the study. The third and final step used the search in the references of selected articles through additional sources.

For data collection, an instrument was developed that included the following items: title and year of publication, type of study, database, author(s), study objective, methodological design, and main results.

Initially, the search took place with the Keywords: Patient Identification Systems, Infant, Newborn, and Patient Safety in the SCIELO virtual library and the PubMed database. Later, the search was expanded to Cumulative Index to Nursing and Allied Health Literature (CINAHL), SciVerse Scopus (SCOPUS), Medical Literature Analysis and Retrieval System Online (MEDLINE), Latin American and Caribbean Health Sciences Literature (LILACS), *Banco de Dados em Enfermagem* (BDENF), Excerpta Medica dataBASE (EMBASE), Applied Social Sciences Index & Abstracts (ASSIA), OTseeker, Open Gray, Google Scholar, Dart-e, Cyberthesis, Open Thesis, PeerJ Preprint, MedRxiv, BioRxiv, and PsycINFO databases.

At all stages, the title, abstract, and descriptors of each article were analyzed. For those that answered the review question, the researchers read the articles in full and had their references analyzed, completing the third step.

Descriptors in Health Sciences (DeCs) were used for databases in Portuguese and the Medical Subject Headings (MeSH) descriptors were used for the English language databases. In addition, the Boolean term AND was used to assist searches in information bases, forming the search terms used in all databases, "Patient Identification Systems" AND "Infant, Newborn" AND "Patient Safety".

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) tool was used as a basis for preparing the flowchart of the methodological approach⁽¹⁵⁾.

RESULTS

In the initial search in the selected databases, 785 scientific studies were identified. All articles analyzed were in English. After applying the selection criteria, verifying agreement with the review question, and excluding duplicate manuscripts, 11 studies remained to compose the final sample.

Subsequently, the references of the selected manuscripts were analyzed, but there was no inclusion in the sample, except for one reference, which was already included since selection in the databases.

After a critical reading of the findings, the analysis of the collected data took place using a descriptive method. To facilitate the visualization of the methodological path, ensuring the reliability of the search in the information bases, Figure 1 was elaborated based on the PRISMA ScR⁽¹⁵⁾.

Of the studies that comprised the scoping review, there was a variation in the years of publications, with manuscripts found from between 2008 and 2019. Regarding the databases, it was found that databases related to medical and nursing sciences were the most present in the studies of the sample⁽¹⁶⁾.

Regarding the methodological design, it was observed that case reports and editorials were the most frequent method, with 27.3%^(5,17-23), followed by studies of a prospective, comparative and reflective nature, and experience reports.

The use of identification wristbands was the most prevalent^(18,19,23-25), except for one study that raised the safety of sampling Deoxyribonucleic Acid (DNA) from the newborn's umbilical cord⁽²¹⁾.

To achieve the objective proposed by the study, the following information was extracted to answer the research question, such as: the forms of identification of the hospitalized newborn and the barriers to the implementation of patient identification, thus constructing Chart 1. It is known that the purpose of the review was not focused on barriers, but on the methods of identification, however, as this information is present in most of the articles found, it was decided to bring it to the discussion.

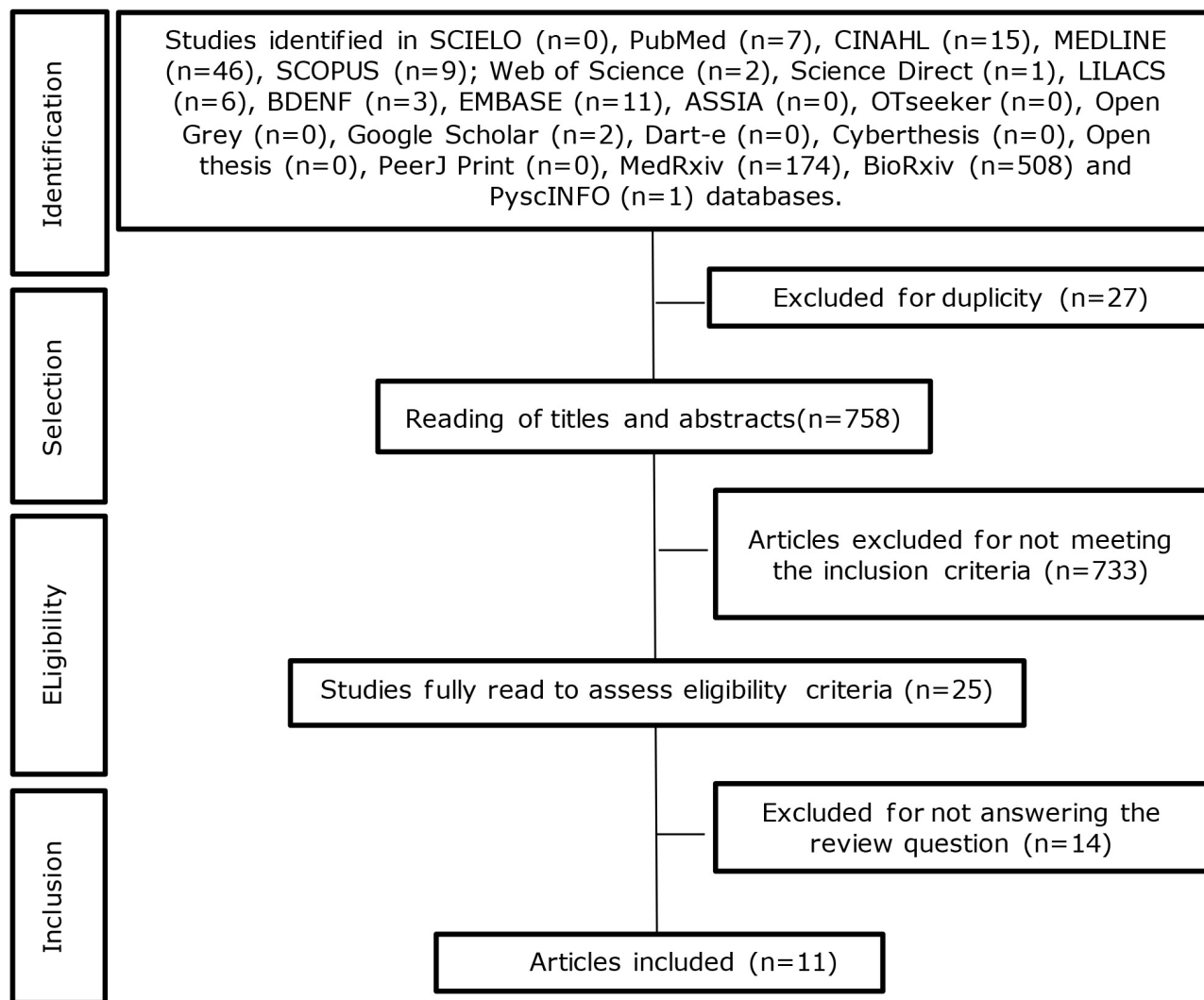
DISCUSSION

The results describe that the main method of identifying newborns is the identification wristband. The wristband is considered the best resource for patient identification, as it is an easy-to-apply and low-cost measure, which can contribute to adherence to its use⁽²⁶⁾. Given that the secure identification process consists of ensuring that care and procedures are directed to the correct patient⁽²⁾, the methods used to check information must be effective and health professionals must be engaged.

The use of a wristband contributes to the improvement of patient identification, especially for newborns, considering that, due to age, it is impossible for them to report and understand information and questions⁽²⁷⁾.

Even in the case of pediatric patients, the identification wristband is also an important barrier for situations such as switching newborns⁽²⁸⁾. However, the size of the patient must be taken into account⁽²⁹⁾.

Due to the patient's characteristics, it is important to prioritize comfort when using wristbands, considering the appropriate size and which limb it should be placed on^(29,30). It is necessary to observe these characteristics so that use of



CINAHL: Cumulative Index to Nursing and Allied Health Literature; MEDLINE: Medical Literature Analysis and Retrieval System Online; LILACS: Latin American and Caribbean Health Sciences Literature; BDENF: *Banco de Dados em Enfermagem*; EMBASE: Excerpta Medica dataBASE; PUBMED: US National Library of Medicine; SCOPUS: SciVerse Scopus Source: Survey data, 2021.

Figure 1. Scoping review search flowchart.

wristbands is safe and risk free for patients, especially in regard to the risk of skin lesions and loss of wristbands.

Regarding the information present on the wristbands, the selected articles differ from each other and also to the Brazilian basic protocol for patient identification. This protocol recommends the use of at least two identifiers with information related to the patient and that cannot be changed, such as full name, mother's full name, or date of birth⁽³¹⁾. The protocol itself indicates that the use of information that is likely to generate misunderstandings or that is not properly recorded on the wristband should be avoided, considering that these data must be checked with the patient whenever care and procedures are performed⁽³⁾.

It is noteworthy that it is important to delimit the amount of information, considering that it must be entered in a legible and easy-to-check form⁽³¹⁾. One of the alternatives available to meet the recommendations is the use of bar code wristbands, a feature cited in six articles selected in the sample. This feature allows locating information regarding the patient when reading their bar codes with specific equipment⁽²⁹⁾.

In addition to the amount and type of information recorded on the wristbands, the use of multiple and colored wristbands also differs from the basic Brazilian protocol. The document entitled "*Protocolo de Identificação do Paciente*" (Patient Identification Protocol), prepared by Anvisa together with the Ministry of Health and the Oswaldo

Chart 1. Description of methods of identifying hospitalized newborns and implementation barriers. Maringá, PR, Brazil, 2021.

| Authors Year Database | Location | Publication type | Objective | Methods of identi- fication found | Implementation barriers |
|------------------------------------------------------------|----------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mccartney ⁽¹⁸⁾ , 2008 CINAHL | USA | Editorial | Describe how barcode technology can reduce patient identification errors in various aspects of care, including medication administration. | One-dimensional barcode printing on the wristband. | Often, the incompatibility between the size code and the size of the newborn's arm, makes the use of this form of identification unfeasible. |
| Gross ⁽¹⁹⁾ , 2009 CINAHL | USA | Editorial | Describe the technology initially used to prepare and administer medications to match newborns with their mothers. | Bar code wristband, also including the father's name, both on the baby's wristband and on the breast milk containers. | No barriers were identified. It highlights the need to use computers to contemplate the visual and auditory resources of the link in the newborn's bond with parents. |
| Salera-Vieira and Tanner ⁽²⁰⁾ , 2009 MEDLINE | USA | Case Reports | Improve safety in drug administration for infants admitted to intensive care units and nurseries. | Wristband with specific colors to identify twin babies. | Use colors different from any other code system in the institution. |
| Fiocchi et al. ⁽²⁴⁾ , 2011 MEDLINE | Italy | Comparative Study | Estimate, through computational techniques, the electromagnetic fields generated by passive radiofrequency systems to reconfirm the mother-newborn identity. | Radiofrequency activated wristband. | To ensure optimal performance of the wristband, it is necessary to reduce the baby's exposure time to radiofrequency. |

Continue...

Quadro 1. Continuation.

| Authors Year Database | Location | Publication type | Objective | Methods of identi- fication found | Implementation barriers |
|-----------------------------------------------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Quadrado and Tronchin ⁽¹⁶⁾ , 2012 CINAHL/ MEDLINE/ SCOPUS/ LILACS/ BDENF/ EMBASE/ PysicINFO | Brazil | Exploratory, descriptive, prospective, with a quantitative approach | Evaluate a protocol for identifying babies hospitalized in a semi-intensive and neonatal intensive care unit of a private hospital. | Identification wristbands with the mother's full name, hospitalization number in the bar code, and type of hospitalization, in an appropriate size for the baby and with three wristbands (two on the upper limbs and one a lower limb). | The appropriate size of the wristband for the baby, checking the number of wristbands, and collaboration with family members and caregivers. |
| Vicki et al. ⁽²¹⁾ , 2012 CINAHL | USA | Case Report | Testing the DNA Blood Spot program at Harbor Hospital as a current method of infant and parent-child safety. | Collecting umbilical cord blood immediately after birth. | No barriers were identified. There was 100% adherence by parents and employees regarding DNA sampling. There was also an increase in the satisfaction index and referral to the hospital. |
| Tase et al. ⁽¹⁷⁾ , 2013 PUBMED/ MEDLINE/ SCOPUS/ LILACS/ BDENF/ EMBASE | Brazil | Reflective Theoretical | Highlight the constituent elements of the patient identification process through wristbands and discuss issues related to the implementation of this process in hospitals. | Identification wristband. The wristband must be of an adequate size, be comfortable and durable, have a printing technique for applicability to avoid misunderstandings, be white, with black lettering and have full name, date of birth, and registration number with the national health system. | It is necessary to improve the formulation, execution, and evaluation of protocols regarding patient identification so that the use of wristbands can be demanded within institutions. |

Continue...

Quadro 1. Continuation.

| Authors Year Database | Location | Publication type | Objective | Methods of identi- fication found | Implementation barriers |
|--------------------------------------------------------------------------------------------|-------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Probst et al. ⁽²²⁾ , 2016 PUBMED/ MEDLINE/ SCOPUS | USA | Case Report | Report the effort in two large integrated healthcare systems that employed human factor engineering approaches to design the information layout of new patient identification clamps. | Identification wristband. The wristband contained the full name and date of birth. | It is still necessary to change the wristband regarding the font, space between the numbers, inclusion of age and gender. |
| Covas et al. ⁽²⁵⁾ , 2018 PUBMED/ MEDLINE/ SCOPUS/ LILACS/ EMBASE | Argentina | Observational, prospective, randomized cohort | Evaluate the permanence of the wristband during the hospitalization period and the location where it was placed. | Identification wristbands with the mother's full name and the specific number of the institution (a medical record number). | Wristbands are not kept in the same location on babies during hospitalization. |
| Villalonga et al. ⁽²³⁾ , 2019 LILACS/ GOOGLE SCHOLAR | Puerto Rico | Editorial | Describe possible solutions to achieve established patient safety goals. | Identification wristbands with the child's full name, date of birth, date of admission, service number, and medical record. | A specific group of professionals must carry out the control and systematic survey of the presence or absence of the identification wristbands. |
| Scalise e Piech ⁽⁵⁾ , 2019 CINAHL | USA | Case Report | Explore newborn misidentification and describe the maximization of the information system used to design an innovative and low-cost solution that would provide the desired additional layer of security and double verification. | Wristbands with the date of birth plus manufacturer's pre-printed number. | The use of wristbands was initiated due to an incident related to switching babies. Barriers to its implementation were not described. |

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Cruz Foundation (Fiocruz), recommends not using several wristbands with significant color variations, to avoid possible misunderstandings of information, especially in the use of colors that could impair data legibility⁽³¹⁾. Since multiple wristbands can present different and varied information, it is important to pay attention to two other points that the Anvisa protocol highlights: the maintenance of patient identification (exchange of wristbands when it becomes illegible and/or information changes) and standardization of identification techniques and methods⁽³⁾.

To ensure the safe use of identification wristbands, this practice must be validated and institutionalized in health services, so that all professionals are trained and guided on their use⁽¹¹⁾. Furthermore, educating patients and families about the importance and meaning of such wristbands is an effective and resolving method for the problem addressed⁽¹¹⁾. These innovative methods allow indicating the emergence of technologies that can be implemented together with the identification wristband. Thus, it becomes possible to address the weaknesses of the common identification wristband, such as errors related to human factors (registration of incorrect information on the wristband and lack of verification of information when performing assistance).

Although the main practice of patient identification found in this review is the use of wristbands for checking, other technologies can be adopted, such as the use of DNA from blood drops and a radiofrequency wristband^(21,24).

Still on the use of technological resources, an article published by representatives of the Standards Committee of the Spanish Society of Neonatology⁽³²⁾, highlights that there are currently several methods available for identifying newborns, the most common being fingerprint identification, the use of wristbands, biometrics, and analysis of genetic material (DNA). The same document emphasizes that the use of biometrics through bar codes and fingerprints is limited by the need for high resolution of the fingerprint to avoid mistakes, requiring adequate equipment and professional training to obtain the image. In addition, fingerprint collection depends on the patient's clinical condition⁽³²⁾.

Another possibility that this study presents is the identification of the clamp used in the newborn's umbilical stump, and it is important to verify it concomitantly with the identification wristband. However, the same document emphasizes that, just as the wristband can detach from the patient, this situation can also occur with the umbilical cord clamp⁽³²⁾.

The use of a radiofrequency wristband allows for greater tracking of geographic location, being an important resource for the care of pediatric patients, especially newborns⁽²¹⁾. In this regard, the Spanish committee highlights the relevance of this device to determine the distance between mother and baby, when both use this wristband, thus allowing an alarm

system to be activated when the distance exceeds the limit defined by the institution⁽³²⁾.

Regarding the use of DNA for identification, the Spanish committee highlights the method as the gold standard for discerning any individual, with the advantage of using different types of samples such as blood, saliva, and tissue. The collection of the small blood sample must occur through venipuncture or from the umbilical cord, as soon as it is clamped, with the consent and presence of the mother and/or companion during the procedure⁽³²⁾. However, according to the committee, this sample is used exclusively as a mechanism for identifying the newborn and the mother, although there are locations that use the DNA sample as a protocolized identification system⁽³²⁾.

However, despite this advantage, considering that the use of radiofrequency and DNA samples for identification are in the insertion phase, the health team must be qualified for its use. Furthermore, further studies are needed on what risks the patient may be exposed to when using these innovative methods, considering that this technology also has weaknesses, such as having their genetic material collected and stored for this purpose, which may not always be something well accepted by the patient, in addition to the fact that such methods have a high cost⁽³⁰⁾. It is worth remembering that the identification wristband should be a barrier against adverse events and not a danger to patient safety or even an unfeasible method to be applied.

For greater depth on the subject, it is suggested that exploratory studies and reviews be carried out with nursing professionals working in Brazilian health services, to investigate other possible ways of identifying newborns that are adopted in their daily practice, and the respective strengths and weaknesses of each method.

CONCLUSION

This scoping review provided the mapping of the following ways of identifying hospitalized newborns: use of identification wristbands with one-dimensional bar code, linking the father's name to the newborn's identification wristband, color coded wristbands, radiofrequency activated identification wristbands, in addition to identification through the use of genetic material.

It is noteworthy that this study contributed to demonstrate that there are several types of strategies that can be used to identify the patient and consequently maintain their safety within the hospital environment. It is worth noting that each institution must reach a consensus on what can be applied to its reality and thus ensure that this security goal is met. Especially in the pediatric population, it is suggested that this process be constantly stimulated, to avoid adverse events and irreversible damage.

Investigating strengths and weaknesses in the identification process can contribute to health managers and leaders in the (re)formulation of institutional protocols, in the training of professionals, and in the face of the engagement of family members and caregivers.

It is known that the scoping review is not intended to produce evidence and although this may constitute a limitation of the results, it is believed that the study can contribute to the encouragement of other studies that address the issue, especially with health professionals who work directly in care.

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