



THE PATIENT SAFETY IN NEONATAL INTENSIVE CARE UNIT: A LITERATURE REVIEW

A SEGURANÇA DO PACIENTE EM UNIDADE DE TERAPIA INTENSIVA NEONATAL: UMA REVISÃO DE LITERATURA

SEGURIDAD DEL PACIENTE EN LA UNIDAD DE CUIDADOS INTENSIVOS NEONATALES: UNA REVISIÓN DE LA LITERATURA

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ABSTRACT

Objective: to raise the scientific literature on the issue of patient safety in Neonatal Intensive Care Unit and its relationship to the Nursing. **Method:** this is an integrative literature review, performed from 2000 to 2010, from the Medline, CINAHL and SciELO databases, by using descriptors “Neonatal Intensive Care Unit”, “Newborn” and “Nursing Care”, crossing them with the descriptor “Safety”. **Results:** 12 articles were selected, later, they were organized into three categories for analysis: 1) Patient safety: conceptual aspects; 2) The nursing professional before the patient safety; 3) Patient safety in NICU and drug therapy. **Conclusion:** we have realized the complexity of the issue and the need for a greater discussion among the health care staff, especially the nursing staff, which is comprised of professionals able to detect errors and, thus, to improve the care quality. **Descriptors:** Patient Safety, Nursing Care; Newborn.

RESUMO

Objetivo: levantar a produção científica sobre o tema segurança do paciente em Unidade de Terapia Intensiva Neonatal e sua relação com a Enfermagem. **Método:** revisão integrativa de literatura, no período de 2000 a 2010, a partir das bases de dados MEDLINE e CINAHL e SciELO, utilizando os descritores “Unidade de Terapia Intensiva Neonatal”, “Recém-Nascido” e “Cuidados de Enfermagem”, cruzando-os com o descritor “Segurança”. **Resultados:** foram selecionados 12 artigos, em seguida, organizados em três categorias para análise: 1) A segurança do paciente: aspectos conceituais; 2) o profissional de enfermagem frente à segurança do paciente; 3) a segurança do paciente em UTIN e a terapia medicamentosa. **Conclusão:** percebeu-se a complexidade do tema e a necessidade de maior discussão entre a equipe de saúde, principalmente a equipe de enfermagem, a qual é composta profissionais capazes de detectar erros e, assim, melhorar a qualidade da assistência. **Descritores:** Segurança do Paciente; Cuidados de Enfermagem; Recém-Nascido.

RESUMEN

Objetivo: aumentar la producción científica sobre el tema seguridad del paciente en la unidad de cuidados intensivos neonatales y su relación con la enfermería. **Método:** revisión integradora de la literatura desde 2000 a 2010, a partir de las Bases de datos Medline y CINAHL y biblioteca virtual Scielo, utilizando las palabras clave “Unidad de Cuidados Intensivos Neonatales”, “Recién Nacido” y “Cuidados de Enfermería”, cruzándolos con el descriptor “Seguridad”. **Resultados:** 12 artículos fueron seleccionados y en seguida, organizados en tres categorías para análisis: 1) la seguridad del paciente: aspectos conceptuales, 2) el profesional de enfermería frente a la seguridad del paciente, 3) la seguridad del paciente en UCI Neonatal y por tratamiento farmacológico. **Conclusión:** se realizó la complejidad del tema y la necesidad para la mayor discusión entre el equipo de salud, especialmente el personal de enfermería, profesionales capaces de detectar errores y así mejorar la calidad de la atención. **Descriptores:** Seguridad del Paciente; Cuidados de Enfermería; Recién Nacido.

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INTRODUCTION

The term “patient safety” has won great visibility after report published at the end of the 1990's by the Institute of Medicine, entitled *To Err is Human: Building a Safer Health Care System*. This report shows surprising data with regard to the number of Americans who die annually due to errors related to health services.¹ After this publication, the issue of error in the health sector has gained importance, becoming the target of several researches.

Improving the care quality and assure patient safety has become a priority in the health field today, especially when we refer to extremely complex environments within institutions, such as the intensive care units, who daily deal with critically ill patients; in this context, the neonatal intensive care units (NICU) should be included.

The NICU environment has a large scientific and technological apparatus, besides of skilled professionals, which ensures a greater survival chance for life-threatening newborns (NB) who are interned there. Nonetheless, for that to occur, it is necessary to mobilize efforts to assure the patient safety.

Assuring that the NB admitted to the NICU are free from damage caused by errors made in the health services, increases their survival chance and improves the quality of health care. The errors increase the child's stay in the NICU, by raising the hospitalization costs and reducing the amount of available vacancies, besides causing, usually, irreversible sequelae.

When it comes to NICU, one of the professional categories present 24 hours a day in such an environment is the nursing staff. It is a task of the nursing to keep a largest contact with NB, by being aware at all times in relation to the provided care. The nursing professional has other responsibilities that go beyond the direct care, such as oversee its staff, contributing to hold a harmless care and conducted in the safest possible way. For this reason, the issue of patient safety should be widely discussed in the Nursing work environment, as a way to assure safe care, since the nursing staff members remain daily next to the patient, consequently, they can act to combat or even to eradicate errors.

OBJECTIVE

- To raise the scientific literature on the issue of patient safety in Neonatal Intensive Care Unit and its relationship to the Nursing.

METHOD

This is an integrative literature review performed by fulfilling the following steps: establishment of the research question; formulation of inclusion and exclusion criteria; definition of information to be collected from selected texts; assessment of studies included in the integrative review; presentation and synthesis of knowledge.²

A search was motivated and performed by means of the following question: what is being produced on the Nursing's role at the NICU regarding the patient safety?

As for inclusion criteria, we have defined: scientific papers, published in the period from 2000 to 2010, in Portuguese, English and Spanish, which were available in their full version, so that we could read the integral content on the web. We have excluded dissertations, theses and publishing.

The search for texts was performed in the following databases: Scientific Electronic Library Online (SciELO), International Literature on Health Sciences (MEDLINE) and the Cumulative Index to Nursing and Allied Health Literature (CINAHL), from the descriptors “Neonatal Intensive Care Unit”, “Newborn” and “Nursing Care”, being that all three expressions were crossed with the descriptor “Safety”. The literature survey was conducted in April 2011. The search through the aforementioned descriptors resulted in a total of 823 texts, of which, after selecting following the above mentioned criteria and reading the titles and abstracts, 76 were selected. After this pre-selection, papers were read in full, which has resulted in a final sample of 12 papers that met the study objectives for designing this current paper.

For defining the information to be collected from the selected texts that would be included in the integrative review, we have designed a tool to gather and synthesize key information for our review. This tool contained items, such as: paper number, author, title, journal in which it was published, publication year, study type and purpose, methodology, results related to the patient safety and its relationship to the Nursing at the NICU environment.

The assessment stage the studies included in the integrative review occurred through initial reading of all titles, and if there was the possibility of answering the objective of the present study, we should proceed to read the summary or abstract and, later, the article in its full version.

The last stage of the integrative literature review corresponded to the analysis and

synthesis of knowledge of the selected articles, which has occurred through the characterization of the papers in a frame, followed by the presentation of the three categories that synthetize the main results. Finally, we conducted a discussion based on the results and critical assessment of the included studies and in the relevant literature.

RESULTS

Country	Author/year	Journal	Authors' expertise area	Study type
USA	Boss et al (2010)	Advances in Neonatal Care	Medicine	Case Study
USA	Heiss-Harris;Verklan (2005).	J Perinat Neonat Nurs	Medicine	Literature Review
USA	Hicks et al (2007)	Advances in Neonatal Care	Pharmacy/ Medicine	Descriptive
Thailand	Jirapaet et al (2006)	JOGNN	Nursing/ Medicine	Descriptive
USA	Johnson (2005)	J Perinat Neonat Nurs	Medicine	Descriptive
USA	Lin;Liang (2007)	Nursing Forum	Medicine	Argumentative Paper
USA	Lucas (2004)	Am J Health-Syst Pharm	Pharmacy	Descriptive
Holland	Mesman (2009)	Social Science & Medicine	Medicine	Argumentative Paper
Holland	Snijders et al (2009)	Crit Care Med	Medicine	Survey
Canada	Stokowski (2001)	Advances in Neonatal Care	Medicine	Argumentative Paper
USA	Thomas (2005)	J Perinat Neonat Nurs	Nursing	Argumentative Paper
USA	Woods et al (2005)	Pediatrics	Medicine	Epidemiological

Figure 1. Distribution of the references included in the integrative literature review, according to the country of the study, authors, year, journal, authors' expertise area and study type. Cuiabá- MT, 2012.

The 12 papers selected for the integrative review were inserted in the CINAHL database, being that all of them were published in international journals in the English language; the oldest was published in 2001 and the most recent was launched in 2010, and 83.3% (10) were published in the last five years. Regarding the authors, the majority belonged to the medical field (8), while 16.6% (02) were from the nursing field and 16.6% (02) were from the pharmacy area. Concerning the methodological issues, it was found a predominance of descriptive studies. All researched papers brought in their content the issues related to the patient safety and its relationship to nursing care and the population of newborns, in line with the proposed objective.

Below, we will present the results obtained after analysis of papers on the patient safety in NICU, through three categories of analysis: **1) Patient safety: conceptual aspects; 2) The nursing professional before the patient safety; 3) Patient safety in NICU and drug therapy.**

• **Patient safety: conceptual aspects**

There are several ways to address the issue of patient safety in health institutions. The most frequently one found in scientific papers is related to the drug therapy. For authors, medication errors are challenges even for the most advanced health care services in the world, being that the safety in medication management is a vital and valued aspect in the health care procedures. Due to being the

The presentation of results is divided into two stages: the first with the characterization of the papers that were analyzed and, the second, with the categorization and discussion of the main results.

Figure 01 shows the synthesis of the papers included in the review, according to the authorship, publication year, journal, study location, authors' expertise area and study type.

most cited approach, we propose to close the comments at this point so that we can drill its aspects in a specific category.

With regard to the patient safety, definitions and concepts are fundamental in knowledge production and in professional practice. The term “patient safety” is defined as the prevention of injuries to the patients and adverse events arising from health care provided by professionals.⁴ The same author also brings the definition of incident: “As any event that could reduce the patient safety margin”.⁴

In turn, the medical error is defined as the failure of a planned action, which was not properly performed, or the use of a wrong planning to achieve an aim.⁵⁻⁶ The error might lead to an adverse event, which is defined as injuries caused by the care provided to the patient, as opposed to their underlying medical condition.⁷

The definition of adverse event was deepened by other authors who define it as a non-intentional incident during the provided care, which results in an unfavorable outcome for the patient, requiring a greater effort for holding further care.⁵ It should be highlighted that all these definitions are necessary, since they are widely used terms by all authors when discussing about the patient safety.

Although most researches emphasize medication, we have verified that other aspects are also studied when it comes to the patient safety. For some authors, the patient safety is not only related to the detection and

elimination of causes of adverse events, since the issue is more complex than meets the eye. It is necessary to address the elements that are informal or implicit in the safety culture, as is the case of the geographical space.⁸ For this author, the space is not only to measure distance and location of the environment, but a cultural and symbolic phenomenon that is built through the relationship between people and their environments.⁸

Another less quoted aspect in the studies, but not least, is related to the issue of the patients' safety when they are research subjects.⁹ For this author, the professional should be concerned when patients and their family members are subjects of scientific surveys, because, many times, in spite of the scientific researches do not cause physical harm to the person, they might cause loss of trust, psychological distress and social embarrassment, becoming a part, therefore, of the concern for the patient safety.⁹

Despite the issue of patient safety is widely discussed in the last few years, we have found some obstacles that hinder its full implementation. In the case of Neonatal ICU, a study conducted in the Thailand showed five categories of barriers that hinder a safe practice in NICU, namely: human susceptibility to errors; fragility of the health system; the issue of medical devices (equipment failures); poor communication among the staff; and, finally, the particular characteristics of the NICU related to the patients' clinical pictures, and the multiple tasks that are required by the ICU.⁵ It is always necessary to keep in mind the wish to overcome these barriers to get a safe practice.

From this perspective, every step of the work process to provide care for the patient should and might be safely done. For this purpose, the primary focus of the health system should be trying to reduce human errors. Human errors can occur, but the system should be prepared to identify and correct it, by operating as a protective barrier.¹⁰ Although the human error is a factor, it should be remembered that the physical, occupational and social environment of institutions can also contribute to the errors occurrence, so the importance of the system being prepared to detect them.¹⁰

• The nursing professional before the patient safety

The patient safety is a critical concern for the health system, which should be improved in several levels, and one of them is represented by the work environment of the nursing staff.¹¹ Thus, an inadequate work

environment and the nursing staff dissatisfaction with regard to such a condition might raise negative implications for this goal.¹¹

The professional dissatisfaction on the part of nurses might be linked to the job stress, exhaustion for extra shifts, for lack of workers in the team, among other factors. Thus, negative outcomes in relation to the patient safety, such as the occurrence of some infections, occur when there is an inadequate amount of professionals in the nursing team.¹¹ It can be said that the nursing staff is able to intercept approximately 90% of the medication errors before they reach the patients, being that the nursing is the last barrier to avoid the errors, therefore, nurses' working conditions should be improved.¹¹ Accordingly, health institutions have an ethical obligation to have professionals in sufficient numbers to promote the patient care, as well as Nursing has an ethical obligation to safely promote care.

Besides the lack of staff, and the inadequacy of the nursing work environment, another issue that has been seen as a barrier in promoting patient safety is the failure in communication, not only among the nursing staff, but in the multidisciplinary team as a whole.

The poor communication among staffs has been identified as the main contributor to the occurrence of adverse events, thus compromising the patient care. Given the above, efforts to promote communication and teamwork can yield good outcomes through a safe and error-free health system.¹² The multidisciplinary work requires that this communication is free in every sense, starting from the mutual respect among health professionals and workmates, in order to guarantee the quality of care, as well as a more harmonious work environment.

When it comes to communication, one cannot fail to give emphasis for this matter when there are errors occurrences, since knowing when and how these errors occur is crucial to prevent thereof.¹³ For this reason, today people talk about a voluntary and non-punitive reporting of errors, as a way to learn from the experience itself, by creating a climate of safety, both for patients and for health staffs.⁴

• Patient safety in NICU and drug therapy

The care of sick and vulnerable newborns, admitted to a NICU, is complicated by human and environmental factors, which together constitute a challenge to the health care

team, often creating a stressful and emotionally charged environment.¹² The severity of the pathologies associated with the multiple interventions and the high technology inherent in the NICU require greater care and permanent monitoring of patients, far more than in other hospital care environments.⁴

One of the care technologies inherent in the NICU environment is the drug therapy; however, the newborns hospitalized in this environment type have a high risk of suffering from medication errors, being that the safety of this aspect becomes a priority in this environment.¹³ The newborns, because of their physiological immaturity and the phase of adaptation to the extra-uterine life in which they are, when victims of medication errors, suffer more damage than other populations, often becoming fatal victims of these mistakes.

For some authors, the causes of medication errors nowadays are the same occurred for decades, such as: dosage calculation, preparation and dilution, besides the management.¹³ Researches have been developed in view of improving the safety during the medication, as is the case that analyzed the contamination of glass particles - upon the ampoule breakage time - with the medicinal drug.¹⁴ For these authors, an issue that enhances the safety in this direction is the use of filter needles, with a view to preventing these particles to pass into the venous system of the patient.¹⁴

It is seen, therefore, that the issue of medication is wide-ranging and includes several aspects. Nevertheless, as noted by some authors, medication errors can be intercepted at any stage of the process and that, despite the nursing staff being on the tip of the process and be the most participant group in such a process, its members are not necessarily blamed for the biggest errors; it is up to any professional involved in the process to stay concerned about the safety.¹³

DISCUSSION

The patient safety is an initiative that has been growing within health organizations as a clinical and managerial concern to provide a better quality in the health care to the population, by reducing the medical errors.⁶ This concern, however, is not new; history shows us that there always had a careful thought to not to make mistakes, but, what can be seen, currently, is a general concern with this issue, and not in an isolated way, which enables us to say that we are living in the "Security Age".¹⁵

It should be realized how wide is this issue at stake and how many questions are covered by it. When the authors mention the issue of the geographical space, it is noteworthy that the space issue includes not only the physical space itself, but also the relationship that is established between the people and the culture in this environment, which brings us back to the teamwork and the full care to the patient. A multidisciplinary team that works together, that communicates in an effective way, is more likely to provide a safe patient care, by learning from the committed mistakes. On the other hand, the patient or its caregiver, in the case of newborns, can be an ally of the health care team, with a view to reducing the incidents, since by being well-informed about the care procedures and having a good relationship with the team, can detect the error even before its happening.

When it comes to the patient safety, numerous terms are used and, often, in a wrong, indiscriminate and even confusing way. So far, it is possible to perceive the use of terms such as "errors", "adverse events" and even "patient safety", among too many others that will be used, making it necessary to know what the authors bring like definitions for the same, i.e., how these concepts have been regarded and used. Hence, it should be obtained a greater clearness and insight, by contributing to the professional practices and to the improvement of the quality of care provided by health care services.

It is relevant to note that, despite the broad aspect of the issue of patient safety, there is something in common that you cannot fail to take into account when looking for quality of care: a systemic view of the error. Thus, it is understood that the error did not occur due to the failure of a single professional, but for the way the system, procedures, rules and routines are organized when allowing that it to happen; it becomes necessary to review the system so that we might prevent the error. Nonetheless, it is still easier to find the motive in a responsible subject than to review and to restructure the processes; but this viewpoint is changing.¹⁶

Work environments that value the patient safety are those which create a culture where the guilt has no place, they simplify and standardize the processes, learn from the stories of mistakes, and constantly check the processes, in order to intercept possible errors before their occurrences, by creating barriers for the prevention.¹⁷

The Swiss Cheese Model, designed by the British psychologist James Reason, for

addressing organizational accidents, has been comprehensively used to explain the current approach to errors. For him, in complex organizations, a single error at the top is rarely enough to cause harm. To cause a devastating result, such errors should pervade multiple and unfinished protection layers (Swiss cheese layers). Hence, there is the need to focus less on the target, by trying to shrink the cheese's holes.¹

Following this logic, there must be a critical and investigative viewpoint on the failures, in order to show what are the gaps that need to be addressed and, thus, to benefit not only the health care team, but especially the system.¹⁸

A cultural change in the way we see the error coupled with voluntary reporting helps to create barriers so that the error can be detected before it reaches the patient. Nevertheless, it is noteworthy that this has to be the institutional approach and not just from the professional who is working within the system. The institution that does not frighten their health care professionals when a mistake happens, but encourages them to describe it and to seek together the creation of protective barriers so that the same does not happen again, gives a further step in ensuring the quality of health care and safety of its patients.

Among the aspects discussed in the analyzed papers, the environment and the working conditions of nurses should be highlighted. According to the Code of Ethics for Nurses, Chapter I- Regarding the professional relationships, the Nurse has as responsibility and duty: Article 5º - To exercise the profession with justice, commitment, equity, resoluteness, dignity, competence, responsibility, honesty and loyalty; Article 6º - To substantiate its relations on the right, prudence, respect, solidarity and diversity of opinion and ideological position; Article 7º - To report to the COREN and competent agencies, facts which contravene legal provisions and that would impair the professional exercise.¹⁹

Therefore, it is concluded that the nurse has the right to have dignified work conditions so that it can provide safety for patients and for itself as a worker, as well as having the duty to communicate to its Class Council, when the institution does not offer minimum working conditions, by being supported by its Professional Ethics Code.

It is important to note that the nursing care has become increasingly complex and dynamic, being that the nurse should develop a leadership attitude within its team, by

linking scientific knowledge with new technologies, using the evidence-based practice, integrating the work of the nursing staff to the work of the multidisciplinary team, participating in decisions about the processes and seeking to promote the safety of its patients.¹⁶

The drug therapy is a challenge for professionals working in the NICU, because of particular characteristics of the newborns and the used pharmacological drugs. Newborns have characteristics that quickly change and that influence in the drug therapy, such as the body weight, the water distribution in the organism, liver immaturity, kidney function, among others.¹³ Moreover, many of the infants admitted to neonatal units are premature, underweight, or have any congenital anomaly, which makes them immature, with physiological instability and flimsy. As for the pharmacological drugs, the majority used in NICU environments has not been standardized or approved for being used in children, which does not prevent from doing so, but the risk increases with the use of these medications, which might decrease the safety margin.¹³ The medications used in the NICU environment, due to they are not tested before in children and newborns, are tested during the clinical practice, being that the doses are not always correctly calculated.

Besides the doses calculation, there is the issue of dilution and (re)dilution of the same, which makes the process of preparing to be differentiated of the rest of the clinical practices of the hospital, by demanding a greater complexity and adequate training from those who prepare them. All this eases the emergence of errors during the medication within the NICU, so it is necessary that the professionals who work in such a scope are constantly recycling their knowledge and stay awareness to ensure the newborns safety.

In a research conducted with nurses working in an ICU from city of Fortaleza/CE/Brazil, it was possible to find that these professionals did not feel prepared by the higher education institution in which they have been trained to deal with issues related to medications preparation and management.²⁰ This fact becomes worrisome when one considers the proportion of medication errors reached in the current days. Notwithstanding, the same study showed that most of the nurses, because they feel insecure, seeks some updating form in pharmacology.²⁰ The constant updating, as well as the support from health institutions for that these professionals get qualified,

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increase the quality of care and ensures a greater safety for patients.

It should be realized that some measures are being implemented through performed studies so that we can raise barriers to consolidate the patient safety, but so much more needs to be done to improve the care provision. Among these measures, we could quote: the use of electronic prescription instead of the manual; unit-dose drug distribution; dual conference in medication calculations; the use of an infusion pump of only one brand and the voluntary reporting of errors, among other measures.

CONCLUSION

We have tried to analyze what has been produced until now about the patient safety in NICU, as well as the implications of this factor for the nursing staff. It was noticed that the issue is large, with several dimensions that can be improved for the care practice.

A safe and harmless care for the patient requires commitment of the entire work staff, managers and the institution as a whole, as one realizes that the issue of safety not only takes into account the human factor for the error occurrence, but the entire service network, working conditions, environment, amount of professionals, and other related aspects.

We have observed that the majority of the surveyed papers emphasize the issue of patient safety from the standpoint of drug therapy in NICU, which is an aspect that should be widely discussed, due to the high errors rate, and the own fragility and vulnerability of newborns, which can bring irreparable damages to this population.

Bearing in mind the complexity of the issue of patient safety, as well as the studies reviewed here, one realizes the need for a greater discussion among health care teams on this matter, by treating it as the focus of the care provision, especially among the nursing staff, which besides daily assist the patient, participates in almost all care processes, being that the nurse may act as a professional able to ensure the patients' safety.

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