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Prevention and management of falls in hospitalized newborns: perspectives of mothers and nursing professionals

Prevenção e manejo de quedas de recém-nascidos hospitalizados: perspectivas de mães e dos profissionais de enfermagem
Prevención y manejo de caídas en recién nacidos hospitalizados: perspectivas de madres y profesionales de enfermería

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Abstract

Objective: to understand the perceptions of mothers and nursing professionals about the prevention and management of falls in hospitalized newborns. **Methods**: exploratory and qualitative study, resulting from experimental development research based on Design Thinking. This article addresses the stages of Empathy and Definition carried out with 20 nursing professionals and 34 mothers hospitalized in the Rooming-In Care of the Public Maternity Hospital of Fortaleza in 2023. For data collection, interviews, observation, photographic records and document analysis were used. The findings were submitted to Content Analysis using the MAXQDA software. Approval was obtained from the Ethics Committee (nº 5,974,647/2023). **Results**: a total of 485 context units were evidenced, distributed in six thematic categories. The participants revealed incidents of witnessed/known falls, contributing factors (maternal exhaustion, sleeping with the NB in bed or breastfeeding, carrying NB in the lap, bed rails lowered); consequences (trauma, fractures, fear, sense of guilt); and behaviors for prevention and intervention (staying alert when breastfeeding, raising bed rails, keeping baby in the crib, safe transportation, providing educational material for mothers). **Conclusion**: mothers and professionals know the contributing factors and consequences of neonatal falls, and there is an urgent need for their integration as protagonists in actions to promote patient safety.

Descriptors: Infant; Newborn; Hospitals; Maternity; Rooming-in Care; Accidental Falls; Patient Safety.

Whats is already known on this?
Every year, fall accidents kill children and newborns around the world. Experts warn that many of these incidents occur in hospital units, and this indicator should be seriously assessed.

What this study adds?
Although neonatal falls are common in hospitals, there is no consensus on how to prevent them. This study investigated the phenomenon from the perspectives of mothers and nursing professionals in an innovative theoretical-methodological approach.

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Resumo

Objetivo: *compreender as percepções de mães e dos profissionais de enfermagem sobre prevenção e manejo de quedas de recém-nascidos hospitalizados.* ***Métodos:*** *estudo exploratório, qualitativo, fruto de pesquisa de desenvolvimento experimental fundamentada no Design Thinking. Este artigo aborda as etapas de Empatia e Definição realizadas com 20 profissionais de enfermagem e 34 mães internadas no Alojamento Conjunto da Maternidade Pública de Fortaleza em 2023. Para coleta de dados, utilizaram-se entrevista, observação, registros fotográficos e análise documental. Os achados foram submetidos à Análise de Conteúdo no software MAXQDA. Obteve-se aprovação do Comitê de Ética (nº 5.974.647/2023).* ***Resultados:*** *evidenciaram-se 485 unidades de contexto, distribuídas em seis categorias temáticas. Os participantes revelaram incidentes de quedas presenciados/conhecidos, fatores contribuintes (exaustão materna, dormir com o RN na cama ou amamentando, transportar RN no colo, grades dos leitos abaixadas); consequências (traumatismos, fraturas, medo, sensação de culpa); e condutas para prevenção e intervenção (manter-se alerta ao amamentar, elevar grades das camas, manter bebê no berço, transporte seguro, fornecer material educativo para mães).* ***Conclusão:*** *mães e profissionais conhecem os fatores contribuintes e consequências das quedas neonatais, sendo urgente a necessidade de sua integração como protagonistas nas ações de promoção da segurança do paciente.*

Descritores: *Recém-nascido; Maternidades; Alojamento Conjunto; Acidentes por queda; Segurança do Paciente.*

Resumén

Objetivo: *conocer las percepciones de madres y profesionales de enfermería sobre la prevención y manejo de las caídas en recién nacidos hospitalizados.* ***Métodos:*** *estudio exploratorio, cualitativo, resultado de una investigación experimental para el desarrollo basada en el Design Thinking. Este artículo abarca las etapas de Empatía y Definición realizadas con 20 profesionales de enfermería y 34 madres internadas en la Unidad de Alojamiento Conjunto de la Maternidad Pública de Fortaleza en 2023. Para la recolección de datos se utilizaron entrevistas, observación, registros fotográficos y análisis documental. Los hallazgos se sometieron a análisis de contenido utilizando el programa MAXQDA. Se obtuvo la aprobación del Comité de Ética (nº 5.974.647/2023).* ***Resultados:*** *Se evidenciaron 485 unidades de contexto, distribuidas en seis categorías temáticas. Los participantes revelaron incidentes de caídas presenciadas/conocidas, factores contribuyentes (agotamiento materno, dormir con el RN en la cama o amamantando, llevar el RN en el regazo, barandillas de la cama bajas); consecuencias (trauma, fracturas, miedo, sentimiento de culpa); y conductas para la prevención e intervención (mantenerse alerta durante la lactancia, subir las barandillas de la cama, mantener al bebé en la cuna, transporte seguro, proporcionar material educativo para las madres).* ***Conclusión:*** *las madres y los profesionales conocen los factores contribuyentes y las consecuencias de las caídas neonatales, y existe una necesidad urgente de su integración como protagonistas en las acciones para promover la seguridad del paciente.*

Descriptores*: Recién Nacido; Maternidades; Alojamiento Conjunto; Accidentes por Caídas; Seguridad del Paciente.*

INTRODUCTION

In 2021, the World Health Organization's Global Challenge for Patient Safety introduced the theme "Safe motherhood and neonatal care", with the objectives of raising awareness on maternal and newborn (NB) safety issues, engaging multiple stakeholders and adopting effective and innovative strategies to improve maternal and newborn safety, and advocating for the adoption of best practices in health services to prevent preventable risks and harms for all women and NB.[1]

Accordingly, one of the greatest risks to the safety of hospitalized newborns is falls, defined as an involuntary displacement to a level lower than the position, caused by multifactorial events, which may or may not result in damage.[2]

In the context of maternity hospitals, specifically in Rooming-in Care (RC) units, mothers and newborns at risk of falls should be subjected to adequate surveillance, which requires collaboration from the interdisciplinary team, minimizing maternal sleep interruptions and providing guidance to reduce situations at risk of falls.[3-4]

Worldwide, accidents caused by falls are ranked as the second leading cause of death.[5] According to data from the Mortality Information System, in 2017, 15,667 deaths due to falls were recorded in all age groups. Considering children under 1 year of age, 42 deaths were recorded, of which 18 fell from furniture/bed.[6]

In a study carried out in New Zealand, from 2015 to 2018, the occurrence of 32 cases of newborn falls was found (rate 12.1/10 thousand live births). Of these, most occurred when the mother fell asleep during breastfeeding, especially at night and on weekends.[7]

Conversely, although falls in newborns in health units are evidenced worldwide, scholars warn about the need for a more accurate look at this population, and the incidence rate is still unknown. Due to this, there is no consensus on an adequate policy to prevent falls in hospitalized newborns, as well as there is a lack of validated risk assessment tools aimed at newborns.[8]

Although there is a growing recognition by health professionals about the risks associated with NB falls, the parents of these babies are often unaware of the possibility of this incident, especially in the hospital. Although most falls do not result in damage, they may require additional health services and cause stress to those involved.[9]

By understanding the circumstances associated with NB falls, it becomes possible to guide strategies to prevent these incidents. RC provides opportunities for healthcare staff to not only provide guidance and support on safe sleep practices, but also to prevent falls in neonates.[10] In view of the above, the following questions are asked: what are the circumstances and factors related to incidents of newborn falls in a RC unit of a public maternity hospital? And what are the perceptions of mothers and health professionals in RC about these incidents, as well as their prevention strategies and consequences?

The study is justified in view of the evidence that an event such as the fall of hospitalized newborns involves numerous consequences, such as increased hospitalization time and adverse events, with an impact on the institution's image and increased costs.

In view of the above, the objective of this study was to understand the perceptions of mothers and nursing professionals about the prevention and management of falls in hospitalized newborns.

METHODS

In order to describe the process of collecting and analyzing qualitative data, the Consolidated Criteria For Reporting Qualitative Research (COREQ) script was used.

Type of research

This is an exploratory study, with a qualitative approach, resulting from experimental development research based on the Design Thinking (DT) methodology. The study proposed the development of an intervention for the prevention and management of falls of newborns in CA. To this end, the five stages of DT were adopted: empathy, definition, ideation, prototyping and testing.[11] This manuscript covers the results of the first two stages, in which the team responsible for trying to solve the problem sought, through empathy and immersion, to identify the participants' wishes, desires and needs.

Place and period in which the research was carried out.

The study was carried out in a public maternity hospital, considered a care, teaching and research unit, of a University Hospital Complex located in Fortaleza, Ceará. Data collection took place from May to August 2023 in the Rooming-In Care unit, which has 30 physiological puerperium beds.

Population/sample studied, inclusion and/or exclusion criteria

In order to meet the objectives of the study, two groups were formed: Group 1 (professionals involved in the direct care of the NB in the RC, including nurses, nursing technicians and auxiliaries) and Group 2 (mothers of the NB hospitalized in the RC unit).

Intentional sampling was adopted. All participants were approached at the unit and those who were available to participate were invited. At the end of four months, the study had a total of 54 participants, including 20 nursing professionals and 34 mothers of NB, a number reached by theoretical data saturation.

For nursing professionals, the inclusion criterion was to work in the RC for at least 1 year. For the mothers, the following criteria were adopted: being over 18 years old and having the baby hospitalized in the unit for at least 1 day. Exclusion criteria were cognitive deficit or difficulty in understanding the interview script.

Data collection instruments and techniques

In the stage of Empathy, the following data collection techniques were used: interviews, participant observation, photographic records and analysis of incident notifications in an electronic system.

For the observations, a checklist was prepared that served as a script for the field diary. Aspects of the unit's structure, the team's work process, care provided to the NB by mothers and professionals, as well as environmental risks were observed. Thus, it was possible to survey the risks, behaviors and reactions of people in the face of the circumstances that involved the risk of falls of neonates. In this field diary, among other relevant aspects, the day, time and professional categories present were also recorded.

For the interviews, the semi-structured modality was adopted. The mothers of the babies and the nursing professionals were interviewed. These interviews were recorded with the prior consent of the participants, favoring data analysis.

The questions asked to the mothers were: has your baby ever slept in bed with you? Have you ever left your baby alone in bed without having someone watch? Have you ever breastfed feeling sleepy or

fallen asleep when you were holding your child? What do you think might happen if you sleep when you are holding or breastfeeding? Do you take any medications? How is your baby transported when he/she is called to do an examination? Have you ever witnessed your baby or another in the unit fall? Have you ever received guidance on the prevention of newborn falls? Do you know what the main risks and consequences of a newborn fall are? What can you do to keep the baby from falling?

For the nursing professionals, the questions were: have you received any training on NB fall prevention? Do you advise mothers and companions on the prevention of NB falls? Have you ever witnessed a baby exposed to the risk of falling? What are the main causes of NB falls? Have you ever witnessed NB falls on your shift? What would you do if any NB fell on your shift? Is there any instrument in the institution to prevent manage NB falls? What strategies does the team adopt to prevent falls? What measures can be implemented to prevent the risk of NB falls? Would you have suggestions for an intervention on the prevention and management of NB falls in the RC? What kind of intervention would be, in your opinion, effective?

Images of the unit, bed arrangements, furniture, materials, care provided to the babies and patient transport were included, duly protected in relation to the image. Regarding incident notification, the reports issued by the institution's Patient Safety Center from 2017 to the time of data collection were analyzed.

It should be noted that this data collection was carried out by the main author, who is a clinical nurse at the unit and a master's student in Child and Adolescent Health, together with two nursing students who are members of a Teaching, Research and Extension Center, duly trained to carry out the interviews.

In the stage of Definition, the second phase of DT, it is necessary to define the problem to be solved, identified in the stage of Empathy. Thus, the problem corresponds to the challenge to be solved. To this end, the following tools were used: empathy map, with a synthesis of the information collected in the stage of Empathy, which allows the organization of data by concepts (behaviors, concerns, aspirations, etc.) and conceptual map, bringing the graphic visualization of the collected data, with the objective of simplifying its visual organization.

Techniques for data analysis

The data were analyzed based on the Content Analysis technique in the pre-analysis phases, exploration of the material and treatment of the results, inference and interpretation.[12] The MAXQDA Analytics Pro software, version 2024, was used.

To ensure anonymity, the professionals were coded with the initials referring to the category (N: nurse and NT: nursing technician), followed by the numbers corresponding to the order of participation. As for the mothers of the babies, they were coded with the initial "M". It is noteworthy that, in the transcriptions of the testimonies, phrases in brackets prepared by the researchers were used to give greater understanding to the answers, especially for those who answered the questions objectively and punctually. In the presentation of the results, tables and figures were used, as conceptual maps.

Ethical aspects

The project was approved by the Research Ethics Committee (REC) of the institution (Opinion nº 5,974,647/2023). The subjects had access to the Free and Informed Consent Form, in compliance with ethical principles, according to Resolution 466/12 of the National Health Council.[13] The term was signed in two copies by the participants.

RESULTS

Regarding the profile of the 20 nursing professionals, it was observed that the vast majority were female (95.0%) and had a Consolidation of Labor Laws (CLT, as per its Portuguese acronym) work contract (85.0%), and all nurses had postgraduate degrees and specialization (9). A little more than half were nursing technicians (55.0%), with a mean age of 41 years and a work regime of 36 hours per week. The average time since graduation was considered relatively high (17.3 years), demonstrating that the professionals have experience in the area, while the average time working in the unit was less than ten years (6.8 years).

Regarding the profile of the 34 mothers of the NB, it is observed that most live in the capital of Ceará (73.5%); a little less than half have completed high school (41.1%); monthly income of 1 to 2 minimum wages (44.1%) and half have a stable union (50.0%). The mothers had averages of 28 years of age, 5 days of hospitalization, 2 children and 1 previous hospitalization.

From the content analysis of the interviews conducted with the mothers and nursing professionals, 485 units of context and record analysis (CU/RU) were extracted, which were distributed into thematic categories and subcategories (Table 1).

Table 1. Distribution of total content analysis record and context units by category and subcategory. Fortaleza, CE, Brazil, 2023. (n=485 RU/CU)

Category	Subcategory	Mothers RU/CU (%)	Professionals RU/CU (%)	Total RU/CU (%)
1. Contributing factors to NB falls in the Rooming-in Care	• Maternal exhaustion / companion (sleeping while breastfeeding or with NB on your lap)	41 (30.3)	27 (20.0)	135 (27.8)
	• Carry the NB on your lap	23 (17.0)	2 (1.4)	
	• Leave the newborn in the mother's bed without supervision	4 (2.96)	10 (7.4)	
	• Leave the bed rails down	-	9 (6.6)	
	• Mothers' resistance to the guidelines	-	6 (4.4)	
	• Keep the NB sleeping in the mother's bed.	-	5 (3.7)	
	• Peculiarities of the night period	-	4 (2.9)	
	• Use of psychotropic drugs/antihypertensives	4 (2.96)	-	
2. Fall events witnessed/ notified and implemented conducts	• Characteristics of the witnessed/known incidents	4 (9.1)	14 (31.8)	44 (9.1)
	• Conducts performed after the fall	-	26 (59.1)	
3. Improvement actions to be carried out in case of a NB fall[b]	• Communicate to the doctor on duty/arrange examinations	-	19 (37.3)	51 (10.5)
	• Take the NB to the nursing station	-	8 (15.7)	
	• Stabilize the baby	-	8 (15.7)	
	• Transfer the NB to an intermediate care unit / ICU	-	6 (11.8)	
	• Notify in the information system about adverse events	-	5 (9.8)	
	• Communicate the conducts to be performed to the mother of the NB	-	3 (5.9)	
	• Communicate the incident to the entire team	-	1 (1.9)	
	• Keep the NB on a zero diet immediately	-	1 (1.9)	
4. Consequences of NB falls[a]	-	57 (11.8)	-	57 (11.8)

5. Strategies for preventing NB falls in the Rooming-in Care	• Advise mothers and companions about the factors that contribute to falls	15 (8.6)	86 (49.1)	175 (36.1)
	• Be aware / be careful	18 (10.2)	-	
	• Keep the NB always in the crib	10 (5.7)	-	
	• Do not sleep / leave the NB in bed	9 (5.1)	-	
	• Carry out periodic rounds in the wards / watch	1 (0.6)	8 (4.6)	
	• Provide educational material for mothers and companions	-	8 (4.6)	
	• Wake up mothers by napping with the NB on their lap	-	4 (2.3)	
	• Promote continuing education of professionals	-	3 (1.7)	
	• Stay close to the NB	3 (1.7)	-	
	• Follow the guidelines provided by the professionals	3 (1.7)	-	
	• Avoid holding the NB on your lap when you feel sleepy	3 (1.7)	1 (0.6)	
	• Assess the mothers' fatigue during the shift	-	-	
	• Leave the bed rails elevated	1 (0.6)	-	
	• Companion must be attentive	1 (0.6)	-	
	• Mothers must avoid sleeping while breastfeeding	1 (0.6)	-	
6. Suggestions for intervention or technology for the management of fall incidents[b]	• Prepare and distribute educational material for mothers/companions (folder, booklet, illustrations)	-	20 (86.6)	23 (4.7)
	• Carry out continuous training of professionals	-	3 (13.04)	
Total				485 (100.0)

Caption: Record Unit (RU); Context Unit (CU); a. category emerged only from the analysis of the interviews with the mothers; b. category emerged only from the analysis of the interviews with the professionals.
Source: prepared by the authors.

Most of the RU/CU addressed prevention strategies and contributing factors to NB falls in the RC (Categories 5 and 1, respectively). It was also possible to identify details of the falls and conducts implemented (Category 2), the improvement actions carried out (Category 3), the consequences of the falls for the NB (Category 4) and suggestions for intervention or technology related to the management of falls incidents (Category 6).

Chart 1 below shows examples of participants' testimonies related to the categories introduced in Table 1.

Chart 1. Examples of participants' testimonies according to the analytical categories. Fortaleza, CE, Brazil, 2023.

Category	**Testimonies of mothers and nursing professionals**
1. Contributing factors to NB falls in the Rooming-in Care	I've [fallen asleep breastfeeding], because sometimes the fatigue is great, regardless of whether or not I want to [fall asleep] [...] (M4). Yes, [my baby has already slept in bed with me]. He keeps crying, wanting to breastfeed, and I'm operated, to get up is very bad, so we put him here in bed because it's easier to be breastfeeding, to be handling him. Yesterday he stayed in the crib in the afternoon, but at night it seemed that there were thorns, so he stayed with me. As I'm still very sore from the cesarean section, I'm leaving him here [in bed] (M28). [...] I've seen a mother sleeping with the NB in bed with the bars down, I've seen a companion in the chair dozing and holding the baby, the mother herself sometimes in pain, walking with the NB, which is also a risk of falls, walking without putting her in the crib [...] (N5). I've witnessed the movement of the child rolling in bed, you're waiting for the mother to dry the baby, then she leaves the child crying, crying, in that desperation, then I even said loudly "come back mom, the baby is turning around!", [...] They [the mothers] see him [the baby] crying and want to [bathe him], but they don't organize themselves beforehand, they don't put the ointment, the diaper, the brush, socks, whatever she will need, then she keeps grabbing a diaper, something else, she turns around, takes something else and leaves the boy there (NT3).
2. Fall events witnessed/ notified and implemented conducts	It has already occurred [fall] in my shift, but I did not witness it. I only found out, then we called the doctor on duty and notified the system. The person was breastfeeding and fell asleep, when she fell asleep, she loosened her arm. I called the doctor on duty because the baby was apparently fine, he examined it, he transferred it to the medium-risk unit to better monitor the baby and tests were done, then I even asked and the baby was discharged and had no sequelae, but he was transferred to the unit to be monitored and undergo CT (N7). I've already witnessed two [newborn falls]. [...] I was a night nurse, and falls occur at night. One was a grandmother, who was sitting in a lounge chair, put the baby on top of her and slept, and the baby fell from the lounger to the floor [...]. The second fall was from the bed, this one was more serious because this baby had trauma, he started to regurgitate, he went to unit 2, he even had a procedure, he hemorrhaged. He did an imaging test, the neuro [neurosurgeon] came and found that he had periventricular hemorrhage, hemorrhage due to the fall, then a drainage procedure was performed. [The fall] was from the side of the bed, the mother was sleeping, the baby was sleeping and the railing was low. It was from this that the fall protocol was made (N3). I didn't witness [my baby or someone else fall], but I've heard about it. My roommate's baby fell. I didn't [was here when he fell], it was the day I had my baby, the night he was born was the night her baby fell. She slept breastfeeding, he turned over and fell out of bed (M28).
3. Improvement actions to be carried out in case of a NB fall[b]	I would bring the baby to the sector and communicate the on-call doctor, [to] stabilize the baby (NT1). The first thing [after a fall] is to pick up the baby from the floor immediately, take it to the nursing station and call the pediatrician on duty to perform the physical assessment and imaging tests (NT2). [After a fall, it is necessary] to follow the flow: which is to put the baby in a crib of radiant heat, put it in oximetry, see the general condition, communicate to the neonatologist, and perform the pertinent examinations, which is the CT scan, and, depending on whether there is an injury to the bone part, take an x-ray of the limbs, if necessary, and transfer [NB] to a medium-risk unit. [the baby] does not stay in the rooming-in. We only speed up what we can speed up until the transfer comes out, and notify in the system, which is to make an action plan (N3).

	[In case of a fall, I] would provide the first care, such as physical examination and verification of vital signs, request medical assessment and advise the mother and companion on care to prevent a new fall in the newborn (N6).
4. Consequences of NB falls[a]	He [the baby] can fall, choke [...] (M1). I think it's dangerous [if I sleep when I'm holding my baby or breastfeeding]. Because if you are sleeping with him on your lap, you run the risk of knocking him over, or if he is in bed and you sleep, you can, in your sleep, roll over and fall on top of the baby and a fatality occurs. This is very dangerous, there are no conditions for a baby, newborn, to sleep with a mother (M7). I believe that [the baby] can even die, because of the fall, [because] they are too fragile to suffer a [strong] blow like this (M17). I believe it can even lead to death, not only in the newborn, it is already dangerous for us who are adults, imagine a newborn who is still discovering himself outside the [mother's] belly. I think he can also be paralyzed, depending on the situation [severity] of the blow, he can break some bone [these are the main consequences of a fall of a newborn]. It is very dangerous because he still has a soft body, his bones are fragile, so thousands of things can happen, perhaps affect his vision, only God himself, to deliver in the event of a fall (M28).
5. Strategies for preventing NB falls in the Rooming-in Care	Always [I advise mothers and companions on the prevention of falls in the newborn], in every visit, in the rounds as well. [I advise] the issue of them always keeping the rails high when they are with the baby in bed, I talk about the issue of risk, the consequences of falls, I also advise them to always keep the bed lower [...], not to sleep with the baby in bed trying to stay awake when they are breastfeeding, I always ask for the issue of companions, I say that they are also responsible for this surveillance, that they try to stay by the side of the puerperal woman when they have a baby in bed in bed in bed breastfeeding (N8). [Falls can be prevented] by providing guidance on the risks already mentioned, assessing the mother's physical condition in terms of fatigue and availability to breastfeed, giving lectures, educational booklets, folders or pamphlets on the topic, and also illustrating the wards with informative posters (NT2). [The strategies adopted by the team to prevent falls are] In addition to guidance, always carry the baby in his crib, when we go to handle it there in the RC room, always keep the crib rails elevated (NT6). [So that the baby doesn't fall,] I think that [mothers should] wake up at the time of breastfeeding and not let [the baby] sleep in bed, because, due to fatigue, you [mother] forget and end up letting [the baby] fall unintentionally [...] (M17).
6. Suggestions for intervention or technology for the management of fall incidents[b]	I really like to illustrate [the care procedures] with a folder, I think it's easy to access and it's there [available] for several patients. As it has a high turnover, the folder will always be there on the walls of the wards. Then a well-illustrated, large folder that can be seen by her [mother] from afar. And it's a permanent source of information (NT2). My suggestion would be for mothers, more posters warning, more attention signs to nail to the wall and be clearly visible (NT5). I think I could create a folder, focus more on the image, less text, with pictures and small explanations such as: don't sleep with your baby in bed, be careful when breastfeeding not to sleep and images that impact, in this aspect. Putting a photo of a mother sleeping with the baby on her lap, something like that, more visual than text, because, if it's text, they don't read it. I think the look draws more attention and makes the person see what is written [...] (N7). [My suggestion would be] aimed at professionals. There could be courses to raise awareness, training, guiding what to do at this moment (NT1).

Source: prepared by the authors.

It was evidenced that the main circumstances of falls of hospitalized NB include maternal exhaustion, sharing of beds between mother and NB, lowered bed rails, presence of the newborn in the mother's bed without supervision, transport of the NB in the lap and night shift. The consequences of the fall of the NB in the RC include physical injuries, such as bruises and fractures, and emotional issues for mothers, companions and professionals, such as guilt, shame, depression and anxiety.

Regarding the conducts for prevention and intervention in fall episodes, the following stood out: remain alert when breastfeeding, support the arm on which the NB supports at the time of breastfeeding; keep the bed rails elevated, avoid leaving the NB alone in an unprotected space; avoid handling naked NB, keep the NB always in the crib, make periodic rounds in the wards and provide educational material for mothers and companions.

Regarding the photographic records made in the RC unit, images were obtained of mothers with NB on their laps and the bed rails lowered, keeping the baby very close to the edge of the bed, which confirms the frequent situation reported in the interviews. The patients' beds were also photographed with a large space between the large ones, which generates a greater risk of falls, even though the four rails are elevated.

Another recurring situation is babies left unsupervised in beds with the rails down. Many mothers justify this practice by claiming that the babies are asleep and believing that they are not at risk of falling. Nevertheless, the photographs showed that, even with the bed rails raised, there is a possibility that the NB will fall when passing through the space between them, emphasizing the importance of keeping the baby in the crib as a preventive measure.

With regard to participant observation, a total of 75 hours were spent in the three shifts (morning, afternoon and night), making it possible to visualize the peculiarities of each one. The people observed (mothers and companions) were alerted when situations of risk of falls were evidenced and instructed about prevention measures.

In the consolidated observations, interviews, and analysis of incidents of falls reported at the institution, 37 notifications related to falls of newborns were identified between the years 2017 and 2023; of these, 15 were notified in the Rooming-in Care and 11 in the Neonatal Unit (Medium Risk and ICU). The vast majority of notifications were made by nurses (32). Of the fall incidents, 15 were reported as no damage, 4 with light damage, 1 as moderate damage, and 1 as severe damage.

Of the 14 incidents of falls reported/witnessed by professionals, it can be seen that most (11) were related to the contributing factor: mother or companion sleeping with a newborn on their lap. Only three did not mention this cause.

Based on the data presented, it was possible to create the conceptual map, in order to facilitate the graphic visualization of the data collected. Figure 1 shows the conceptual map with the synthesis of the results.

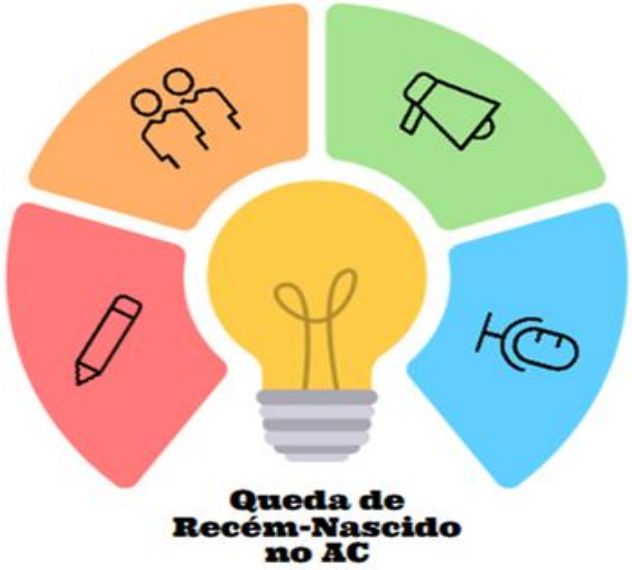
Figure 1. Conceptual map with the synthesis of the results. Fortaleza, CE, Brazil, 2023.

02 - Fall events witnessed/notified and implemented conducts

- Professionals: 14 reported/ witnessed
- Mothers: 4 reported / witnessed
- Notified 2017-2023: 37 notifications
  - **No damage:** 15
  - **Light damage:** 4
  - **Moderate damage:** 1
  - **Severe damage:** 1
  - **Near miss:** 1
  - **Risk:** 15

01- Contributing factors

- Maternal exhaustion / companion (sleeping while breastfeeding or with NB on your lap)
- Leave the newborn in the mother's bed without supervision
- Leave the bed rails down
- Mothers' resistance to the guidelines
- Keeping the NB sleeping in the mother's bed.
- Peculiarities of the night period
- Carry the NB on your lap
- Use of psychotropic drugs/antihypertensives



03 - Prevention strategies

- Provide information about the risk of falls during prenatal care
- Adopt a system for the prevention,assessment and management of NB falls
- Advise mothers and companions about the factors that contribute to falls
- Provide educational material for mothers and companions
- Carry out periodic rounds in the wards / watch
- Wake up mothers by napping with the NB on their lap
- Assess the mothers' fatigue during the shift
- Promote continuing education of professionals
- Follow the guidelines provided by the professionals

04- Improvement actions after the incident

- Communicate to the doctor on duty/arrange examinations
- Take the NB to the nursing station
- Stabilize the baby
- Transfer the NB to an intermediate care unit / ICU
- Notify in the information system about adverse events
- Communicate the conducts to be performed to the mother of the NB
- Communicate the incident to the entire team

Source: prepared by the authors.

DISCUSSION

Maternal exhaustion was the factor most associated with the occurrence of NB falls in the RC, which is due to the fact that the puerperium is a period marked by sleep deprivation, constant demands for care for the NB, hormonal and emotional changes. The literature confirms this data and adds factors such as sleep deprivation, low ability to absorb the information transmitted by professionals, deficiency of prevention strategies, inadequate equipment (such as high beds, with spaces between the side rails), lack of protocol for fall management, among others.[14-15]

A study carried out in postpartum units of a large North American medical center identified 19 falls in four years; of these, five occurred while the baby was under the immediate supervision of a caregiver who was not the mother. In all these cases, the father was responsible, and in three falls, the father fell asleep while holding the baby. In addition, a recurrent narrative was identified in the written descriptions of falls, involving mothers who fell asleep during the breastfeeding process.[10]

Therefore, it is essential that health professionals and family members are aware of this factor, incessantly advising on the risk of falls, offering support to mothers, providing adequate rest, to minimize this risk and promote a safe environment.

Witnessing the fall of a NB in the hospital is a devastating experience for the family and for professionals who provide care to the baby, as evidenced in the testimonies. Falls in the hospital environment can occur at any time during the hospitalization of the NB. As an example, a study carried out in two postpartum units in the USA showed that the period with the highest frequency of falls was between 10 PM and 7 AM [10], corroborating the report of E3, similar to that of another study that identified the highest occurrence of falls in the period between 10 PM and 4 AM.[16]

It can be perceived, then, that most falls follow a predictable pattern. In this sense, acting early and implementing safety measures can reduce its occurrence. Thus, it is incumbent on every health institution to implement a comprehensive system for the prevention, assessment, and management of falls in newborns in hospital environments.

In the event of a NB fall, early intervention is imperative, including a thorough physical examination, investigation of possible injuries, as well as measurement of head circumference at regular intervals (8). Such conducts allow the surveillance of any edema that may develop. All hospitals should have standard operating procedures and a risk assessment system, as well as scales for postnatal fall prevention, as well as rapid response staff to care for these babies immediately after the fall. The authors highlight that all initiatives for the safety and support of newborns must be documented and communicated to parents, caregivers and hospital authorities.[17]

Our study also showed that mothers are aware of the consequences of NB falls, agreeing with the results of studies that also mention the same damage reported by mothers, such as traumatic brain injury (TBI), which can cause severe neurological morbidity, changes in cognitive development and death.[18-19]

NB are considered a risk group; therefore, in order to reduce the risk of falling, it is necessary that some measures be implemented: carrying out intentional rounds to ensure a safe environment for sleeping, transporting the NB only in cribs, keeping the bed rails elevated (unless care is being provided), parents should not sleep while holding the NB, educate parents/families on the importance of remaining aware of their surroundings when walking with their babies, as well as keeping the environment free of hazards by removing unnecessary artifacts and providing adequate lighting.[20]

In addition to these measures, it is emphasized that the prevention of incidents requires a set of improvements in the process and structure of care, such as training of professionals, implementation of communication protocols, improvement of work processes, patient-centered care, incident surveillance, management involvement in patient safety, effective functioning of the Patient Safety Center (PSC), availability of appropriate resources, adequate maintenance of equipment and guarantee of sufficient personnel to meet the demand for care.[21]

In one study, the development of intervention programs aimed at the prevention and management of NB falls proved to be effective, with a reduction in risk situations and absence of records of falls for a period of approximately 12 months after the implementation of the initiatives.[19]

It is important for managers and health professionals to have knowledge about the factors associated with falls in their institutions. This understanding allows the development of protocols consistent with their reality, aiming at preventing falls in newborns. This approach represents an advance in the consolidation of a culture of safety and in the promotion of the quality of care to be provided.[8]

Consequently, the relevance of developing interventions related to the management of fall incidents is perceived, such as the elaboration of protocols, educational materials, training, in order to mitigate the occurrence of falls in newborns, contributing significantly to the promotion of newborn safety in hospital environments.

The limitations found in this study included the difficulties in accessing the incidence of falls in the study population (hospitalized newborns) and conducting interviews with mothers in their own beds, with the presence of noise and interruptions.

As contributions, the study may favor the development of technologies to prevent incidents of falls in hospitalized newborns. Thus, it will be possible to transmit information about the factors contributing to neonatal falls, in addition to the consequences and prevention measures.

CONCLUSION

The study made it possible to understand the perceptions of mothers and nursing professionals about the prevention and management of falls in hospitalized newborns from a theoretical-methodological perspective that allowed for an in-depth analysis of the phenomenon. It was observed that the mothers are aware of the contributing factors and the consequences of NB falls, but still adopt unsafe practices, neglecting the recommendations of the professionals. Conversely, they demonstrated relevant knowledge and practices to ensure the safety of the newborn, which should be used as a basis for the development of educational technologies aimed at the prevention of neonatal falls.

CONTRIBUITIONS

Contributed to the conception or design of the study/research: Nascimento BLV, Oliveira RM. Contributed to data collection: Nascimento BLV, Grangense VLC, Mota LRS, Oliveira RM. Contributed to the analysis and/or interpretation of data: Nascimento BLV, Oliveira RM, Grangense VLC. Contributed to article writing or critical review: Nascimento BLV, Grangense VLC, Soares AF, Matos JC, Oliveira RM. Final approval of the version to be published: Nascimento BLV, Oliveira RM,Grangense VLC, Mota LRS, Oliveira SM, Soares AF, Matos JC.

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