ORIGINAL ARTICLE

PARENTAL STRESS CONTEXTS IN A NEONATAL INTENSIVE CARE UNIT

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Highlights: (1) Mixed methods enhanced perceptions and outcomes regarding stressors in the NICU using PSS:NICU. (2) Changes in parental roles were identified as the greatest source of stress in the NICU. (3) Proposals include family-centered care and health education to reduce parental stress.

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(as accepted)

This is a preliminary, unedited version of a manuscript that was accepted for publication in Revista Contexto & Saúde. As a service to our readers, we are making this initial version of the manuscript available, as accepted. The article will still be reviewed, formatted and approved by the authors before being published in its final form.

http://dx.doi.org/10.21527/2176-7114.2025.50.14950

How to cite:

Alves TF, Limberger DC, Hausen CF, da Silva JC, de Souza NS, Jantsch LB. Parental stress contexts in a neonatal intensive care unit. Rev. Contexto & Saúde, 2025;25(50): e14950

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ABSTRACT

This study aimed to (re)discover the stressful situations experienced by parents in the context of a Neonatal Intensive Care Unit. This is a mixed method study conducted in two Neonatal Intensive Care Units. Thirteen fathers and/or mothers of newborns participated in the interview, and quantitative data were collected using the Parental Stress Scale: Neonatal Intensive Care Unit. Bardin was used for thematic analysis. The data resulted in four thematic categories and a "talking table" that integrates the data from the quantitative and qualitative approaches. Stress is present in both methodological facets of analysis, with emphasis on the parental role domain, with the highest mean score. The findings reinforce the need to promote unique care for newborns, taking the family into consideration. In addition to efficient communication, promoting and strengthening parental co-responsibility for care, and respecting family principles are essential for the recovery and rehabilitation of newborns.

Keywords: Neonatal Intensive Care Units; Newborn; Psychological Stress; Neonatal Nursing.

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INTRODUCTION

During pregnancy, the most varied family arrangements project images, dreams and expectations regarding a child that will be born. These moments are driven by behaviors and feelings that aim to welcome the newborn (NB) and family adaptation. When the moment of birth is not as expected, and there is a childbirth with complications and the birth of a high-risk NB, the idealized figure of a "perfect" NB is quickly abandoned, and parents have to face a new reality[1].

NBs at risk commonly require hospitalization in a Neonatal Intensive Care Unit (NICU), which aims to provide specialized and comprehensive care to NBs in serious condition or at potential risk of death, which requires a set of technical adaptations that include physical facilities, equipment and specialized human resources[2]. The following factors are considered for admission to a NICU: gestational age less than 30 weeks; weight less than 1,000 grams; acute respiratory failure; demand for mechanical ventilation; need for major surgical procedures and/or immediate postoperative period; need for parenteral nutrition; and health technologies to maintain life. In Brazilian studies, the main causes indicated for admission to a NICU are varied, but it is clear that prematurity is still the cause that most affects NBs admitted to a NICU[3-4].

According to the World Health Organization (WHO), in 2015, Brazil was considered the 10th country with the highest number of premature births in the world, with around 279,300 cases per year[5]. In the state of Rio Grande do Sul alone, in 2019, there were approximately 15,753 premature births between the 28th and 36th week of gestation[6]. Prematurity is one of the determining factors for adverse outcomes and infant mortality in Brazilian capitals[7]. Premature NBs' vulnerability increases the possibility of risks, injuries and multifactorial sequels that lead to several consequences and failures in child development and healthy growth[8].

Ongoing care for NBs admitted to a NICU is considered highly complex due to the immaturity of NBs' biological and physiological mechanisms and the technologies involved in the care process. For parents who participate in the routine care within a NICU, there is a constant concern for their children, since NICU environments are often associated with the risk of death. When a NB is admitted to a NICU, regardless of their clinical condition, parents also become part of the environment and participate in the care routine, and it is recommended that NBs' father or mother remain freely accessible throughout the hospitalization period[9-10].

The birth phase and hospitalization of a NB after birth in a NICU is considered extremely distressing and stressful for families, especially mothers, since the arrival of a baby and the care that the family would provide, such as feeding, hygiene, protection, among others, after birth, differ from what was idealized. These processes, when postponed, generate consequences in parents' and NBs' adaptation, as they weaken the bond between family and NB and generate changes in the family nucleus, since the first life experiences of NBs are related to hospitalization[10].

Routine care in a NICU subjects NBs to invasive procedures, excessive light, various noises, constant handling, maternal/paternal absence and loneliness inside the incubator. All of these aspects become stressors for the babies and the parents who accompany them. Moreover, the real image of a child in the incubator with tubes generates feelings of guilt, anxiety and fear in parents[11].

When observing a real baby that is far from the image of the imaginary baby they projected, many parents feel frustrated and limited in exercising their parental role. The vulnerability of not being able to feed, hold and protect their children from potentially painful interventions that cause NBs' agitation feeds the feeling of inability to care for the baby and characterizes this moment as extremely stressful for parents[12].

Psychological stress in parents of NBs admitted to a NICU is related to emotional health compromised by the parental role readjustment, the change in family routine with the need for

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hospitalization and the requirement of new knowledge and skills to deal with NBs. Furthermore, parents feel like they are supporting the caregiver role because, for the most part, they do not understand the complex language of a NICU and do not participate in some care activities because they consider themselves unfit to perform the activity[13].

In this context, the multidisciplinary team has the fundamental role of welcoming parents and promoting interaction between NBs and families. In this scenario, the nurse role stands out as a person responsible for managing and providing direct care to NBs and their family members in NICU environments. The bond with the family and the inclusion of parents in care routine benefits babies in several aspects and provides confidence to the family, with health team support, especially nursing professionals, being a facilitator during the stay in a NICU[14].

Nurses can redirect parents to their leading role in the care scenario for their children admitted to a NICU and generate feelings of belonging and identification with their parental role. In addition, strengthening the bond between parents and NBs favors their safe and healthy development. It is known that family-centered care (FCC) is one of the pillars for the best ND development; therefore, actions that allow parents to feel safe and have autonomy regarding their parental role favor the reduction of parental stress[13].

Considering the considerations presented above, in addition to the global context experienced by restrictions associated with the COVID-19 pandemic, the following research question was formulated: what are the contexts of parental stress in NICU environments? This study, therefore, aims to (re)discover the stressful situations experienced by parents of NBs admitted to a NICU.

MATERIALS AND METHOD

This is a concomitant mixed approach study (quanQUAL) carried out with parents of NBs admitted to two NICUs in municipalities in the north and northwest of Rio Grande do Sul.

The study participants were parents (father and/or mother) of NBs admitted to NICUs between May and October 2021. Fathers/mothers who had attended the NICU at least three times before data collection and whose child had been hospitalized for between five and 15 days in the NICU were included. Parents of NBs admitted directly to a conventional intermediate care unit and kangaroo care were excluded, as it is considered that, within the scope of intermediate care units, i.e., of less complexity, they may present differences related to stress levels and stressful situations.

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Quantitative data were collected using a proprietary characterization instrument and the Parental Stress Scale: Neonatal Intensive Care Unit (PSS:NICU)[15]. This scale aims to analyze the stress experienced by parents of NBs admitted to a NICU. The scenarios were defined by geographic proximity of the study researchers.

In the quantitative stage, all eligible participants were contacted by telephone, through contacts registered in the institutions' registration system, and all agreed to participate in the research voluntarily. Participants were contacted by the research team (nursing students, residents and master's students). Collection instruments were sent in a digital version, via messaging application, which were answered by parents who agreed to the Informed Consent Form (ICF), contained in the first section of the electronic form. Additional information characterizing parents and NBs was obtained through their registration systems and/or medical records.

The PSS:NICU contains 26 items, divided into three categories, such as "sights and sounds of the unit", "infant behavior and appearance" and "parental role alteration". The scale is in the Likert style, which uses statistics combined with psychology to obtain results, with scores from 1 to 5, with 1 being "not stressful", 2 "slightly stressful", 3 "moderately stressful", 4 "very stressful" and 5 "extremely stressful". There is also the NA option for "not applicable"[15]. Quantitative data were analyzed using descriptive statistics and means. For this analysis, we used the Statistical Package for the Social Sciences version 17.0.

For data analysis and integration in this study, only the data from participants in the qualitative stage were selected from the 129 parents participating in the quantitative stage, considering the possibility of integrating the quantitative and qualitative findings. In the qualitative stage, 13 parents (10 mothers and three fathers) were selected to conduct a semi-structured interview, through convenience selection, who had the lowest and highest stress scores in the quantitative stage, until data theoretical saturation was achieved. The interview script addressed parents' perception of the period of stay and participation in the NICU as well as the constitution of family social support. The interviews with the 13 participants took place online, through digital platforms (Google Meet: digital video call communication service), considering that the parents participating in the study had access to the internet. The interviews were recorded by the researchers, upon interviewees' acceptance, through a recording on the digital platform used. Afterwards, the interviews were transcribed, thus enabling data analysis.

The study qualitative stage was carried out simultaneously with the quantitative stage. Participant selection in the qualitative stage was delimited according to data saturation, in which

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the sample was closed by theoretical saturation. This occurred when the data obtained through collection presented redundancy or repetition in the researchers' view, no longer providing clarification about the object studied[16].

Qualitative data were analyzed using Bardin's thematic content analysis[17]. First, a text skimming was carried out, where it was possible for the researcher to know and organize the analysis *corpus*. Then, in the second stage, after defining the analytical *corpus*, the statements that could be classified within pre-defined axes/categories (domains of the quantitative instrument) were listed by thematic recurrence and significance. In addition to pre-established categories, another empirical category was instituted, considering thematic recurrence and contribution to the proposed object.

Analytical integration occurred in a complementary manner, in the approximation of qualitative data with quantitative responses, through the instrument used. A graphical strategy was used for approximation and interpretation of analytical syntheses, called "talking table"[18].

Data collection was approved by the *Universidade Federal de Santa Maria* (UFSM) Research Ethics Committee (REC), under Opinion 4.652.896 and CAAE 43938621.8.0000.5346. In order to preserve the identity of study participants, they were coded with the letter "M" (mothers) and "F" (fathers).

RESULTS

The results of this study are presented in four thematic categories: "Stressful parental experiences during intensive care immersion"; "Sights and sounds of the unit"; "Infant behavior and appearance"; and "Parental role alterations". This study used a "talking table" with integration of data from quantitative and qualitative approaches. In Figure 1, "talking table", it is possible to highlight that there is convergence between the scores found in the parental stress assessment instrument and statements. It is worth noting that the phenomenon of stress is present in both methodological facets of analysis. For three of the 13 participants, the situation of their child's neonatal hospitalization was not stressful, given that the score was less than two. For the other participants, the situation was stressful, with emphasis on the parental role domain, with a higher average score. After the talking table, the three theoretical analytical categories established and the only empirical analytical category (1st category) are highlighted, established by the thematic recurrence of statements.

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Figure 1. Talking table as an analytical strategy for parental stressors in Neonatal Intensive Care Units. Palmeira das Missões, RS, Brazil, 2022

	Stress				
Participant (Age)	**Sights and sounds of the unit**	**Infant behavior and appearance**	**Parental role**	**Mean**	**Classification**
M1	2.7	3.7	5.0	3.8	Stress present
M2	3.0	4.5	4.6	4.3	Stress present
M3	1.3	2.0	2.6	1.9	**Stress absent**
M4	1.8	3.4	5.0	3.4	Stress present
M5	2.2	3.1	3.0	2.7	Stress present
M6	1.7	2.9	3.6	2.7	Stress present
M7	2.0	3.2	4.7	3.3	Stress present
M8	1.7	3.4	4.4	3.1	Stress present
M9	3.0	4.1	4.1	3.7	Stress present
M10	3.0	4.0	4.3	3.8	Stress present
F1	2.0	2.7	2.3	2.3	Stress present
F2	1.0	1.2	2.8	1.6	**Stress absent**
F3	1.4	1.9	2.6	1.9	**Stress absent**
Total (∑)	**26.8**	**40.1**	**49**	**38.5**	

Source: the authors

“[...] *we can’t take care of them, just hold them caress them a little bit.* (M1)

And getting there, seeing him, lying there, kind of unconscious [...]*, it was a shock for me.* [...]” – M5

“[...] *because he was with all those devices, seeing him suffering, with holes, with a probe, with oxygen* [...]” – M10

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1st category - Stressful parental experiences during intensive care immersion

From the moment they hear the word NICU until the moment they actually start living inside a NICU, several feelings are brought to the surface and intensified, making the situation even more stressful. In parents' statements, it is possible to see that fear of the unknown was a trigger for situations of extreme stress. These situations are present in the statements below:

> But I think the amount of time we can spend there is cruel, it's one hour in the morning, one hour in the afternoon. We come home distressed [...] but the first few days were torment. I couldn't sleep, I couldn't eat (crying), I was like... exploding. (M1)

> At first it was terrifying and stuff. Coming from a smaller city like ours, arriving in a big city, not knowing anything, without... it was really terrifying. (F2)

> Ah, it's a very, very painful feeling, it really hurts to go through this, right, even more so hearing that our daughter is going to be in the ICU [...] the hardest part is the schedule, because until then I knew that I could stay up to two hours a day, in this case one hour in the morning and one hour in the afternoon. (M4)

> When I first heard the word ICU, [...], it was very frightening, because we think that ICU is when things are serious [...] it was very traumatic, let's say the experience of being there, of what it was like, [...] he was in despair, [...] because he saw everyone with oxygen, talking about surgery, talking about ICU. (M10)

> It's scary, just hearing it makes me scared, the anguish of remembering everything we went through there, it's fear that comes to my mind. (F3)

The way of managing these stressful situations is unique to each parent. However, it is possible to identify in statements that the way they are welcomed, the time spent with their children and their inclusion in care, changes the way they see the NICU.

2nd category - Sights and sounds of the unit

Entering a NICU for the first time and seeing a NB baby with tubes and mechanical ventilators is perhaps the scariest moment for parents. When they are faced with the

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environment and for the first time, seeing the image of their baby with different equipment, it generates a great feeling of frustration and helplessness regarding the future.

Since they are partially involved in care, parents are surprised when they arrive at a NICU and see equipment being removed or inserted. The noises and images of the first contact with the NICU bring back memories that many parents want to forget. These perceptions are expressed in the statements below.

> We just get there and are surprised, a day without the serum, a day without the phototherapy eye patch… (M1)

> We had never seen an ICU before, seeing babies with breathing machines and stuff. We didn't know how... we had no idea what it would feel like... (F2)

> Because we don't imagine that this will happen, but it's very difficult. Even when I saw her for the first time, she was on ventilation and everything. (M4)

> I don't even like to remember that little room. (M5)

> It was a feeling of inability to hold my son in my arms because he was wearing all those devices, seeing him suffering, with holes in his body, with a tube, with oxygen, it was really bad for me. (M10)

In the sights and sounds of the unit category, six of the 13 participants in the quantitative research were stressed when asked about the impression produced by contact with NICU equipment. However, it was noted that when questioned in the qualitative stage, stress was present in the statements of most parents. This shows that there may be a tendency for parents to sometimes not have understood the instrument or that the quantitative instrument alone cannot go deeper and allow for nuances and subjectivities that carry an emotional and cultural burden, which can be better interpreted in qualitative research. For parents, sights and sounds of the unit was the category that caused the least stress in NICUs. However, in the statements, it was recurrent that affective memory is closely linked to some procedure or equipment present in this space. It is clear that the first contact with NICU environments is the most stressful moment, related to the sights and sounds of the unit category.

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3rd category – Infant behavior and appearance

The moment of meeting a NB is the most anticipated moment for parents. When this baby requires intensive care due to their clinical condition, the first visual contact for most of them will be in a NICU. The expectations they had projected are frustrated the moment they see the NB. The real image of a NB can be extremely stressful for parents. This happens because many associate infant appearance, fragility and behavior with an outcome of neonatal death.

Of the 13 participants, 11 presented stress in the quantitative research instrument, specifically in the infant behavior and appearance domain, in which the highest score, 4.5, is considered a very stressful situation. This result converges with statements present in the qualitative stage. Only one father and one mother considered infant behavior and appearance as a non-stressful domain. Below are some speech strata that represent stress in this domain.

> She's so tiny, you can't imagine how big she is. (M1)

> One day with a bow, one day without a bow. We don't see what they do. (M1)

> And getting there, seeing him, lying there, kind of unconscious, he was sedated for two days, it was a shock for me, I didn't know what feeling I had. (M5)

> When he was very small, I only held him once, for a very short time, because he was very fragile, right? (M6)

Therefore, it is clear that the vast majority of parents are not prepared during prenatal care for the possibility of their child needing a NICU, being born "small" and "fragile". Thus, stress arises from the moment that what could be just a distant projection becomes real, the fear of loss becomes frequent, every time they contemplate a fragile, small baby who needs special care.

4th category – Parental role alterations

Being able to freely exercise parental role is the desire of most parents with children admitted to a NICU. In a way, the celebration and creation of bonds in the first days of NBs' lives are replaced by a mixture of feelings, crying, distancing and laments. Guilt is the feeling

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that appears most in parents' speech when asked about their parental role. This feeling is mainly found in mothers' speech. These speeches can be perceived in the statements below.

> It's good because, like, we start to have more of a connection with our son again, because whether we like it or not, he was practically taken from us for a while. (M5)

> I'm afraid to leave her there, that something will happen. (M1)

> So, instead of taking the baby home, you have to take him to a room and leave him there until he gets better, and then go home. So, you get a little worried, a little scared. (F1)

> Like, I went to pick up the baby about five days later when... I was able to pick him up; while I was doing that, I could only look at him, I couldn't really touch him. (M5)

> I was counting the days and hours until he reached the right weight to be able to breastfeed, to be able to latch on like this... to be with him. (M1)

> It's a feeling of [...], you miss holding your baby, of wanting to be with him but not being able to, it's a confusing feeling [...], we know it's for their own good, but our hearts are heavy. (M5)

All participants in the study presented stress in the domain of changes in parental role. Of these, two participants considered the situation to be extremely stressful. In the statements of these participants, it is clear that when leaving the baby in the NICU, they feel as if they are abandoning them. This feeling becomes even more intense, called guilt, a confusing/conflicting feeling, when the couple has other children. Below are some statements that highlight this circumstance.

> I feel guilty, like, I feel guilty about leaving. When I'm with one, I feel guilty about not being able to be with the other [...]. You know, it's the hardest part of, let's say, having to sacrifice one to be able to see the other. (M1)

> It's a very confusing feeling, because you know you're there for your child's sake, but you also feel that tightness of leaving the other one at home, you don't actually have one in your lap. (M5)

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Furthermore, because they cannot hold the baby in their arms, bathe them or even change their diapers, they feel incapable of playing the role of parents to their own children. These feelings are observed in parents' speeches below.

> Look, we are very limited, because we can barely hold anyone [...]. (M1)
>
> [...] we can't take care of her, because if she cries, she's hungry; they pick her up and go give her a breast; if she poops, they pick her up and go change her, we don't have that kind of contact with her. (M1)
>
> She took her first bath on Saturday and we didn't see it. (M1)
>
> At least until now we haven't been able to see them bathe or change their clothes, we haven't even seen them, but just look, they change their clothes. (F2)
>
> You know, there are only a few little things we can do each day when we are there with her, because until then, we can't even change her diaper, they change everything. (F2)

The aforementioned speech strata reinforce that, even if for a short time, parents have the impression that their children have been torn away from the family, leaving them only to play the role of spectators in care routine.

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DISCUSSION

The statements show parents' discomfort regarding the limited time they have to spend with their children during their stay in NICUs as well as how their short stay in NICUs can change the way they view their hospitalization. These reports differ from those recommended by the kangaroo method, which, since its implementation in 2000, has encouraged parents to have free access to NICUs[19]. The guarantee of free access to parents, as well as their permanence, in the NICU is provided for by law through the ordinance that establishes the guidelines and objectives for the organization of comprehensive and humanized care for critically or potentially critically ill NBs[20] and defended by the Child and Adolescent Statute (In Portuguese, *Estatuto da Criança e Adolescente* - ECA), which also establishes that health institutions must provide conditions for the full-time presence of one of the parents or guardians during the hospitalization of children.

Furthermore, it is worth noting that this study took place during the SARS-CoV-2 pandemic, which may be related to parents' limited access time, as their own statements refer to the pandemic. As a result, parents began to have limited access time to accompany their children in some institutions. Results of the impacts of the pandemic on the daily lives of mothers of babies admitted to NICUs have also been highlighted in another qualitative study, from Belo Horizonte, Minas Gerais, which states that the pandemic scenario has had repercussions on the daily lives of mothers who accompany the hospitalization of high-risk NBs, impacting family dynamics, their own care and baby care. Furthermore, this confrontation was linked to greater stress conditions due to the need to restrict the movement of people between cities and institutions, as well as the distancing from other family members, restricting the social support network of these mothers[21].

By depriving parents of this access, in addition to denying a right, this separation from the baby can be one of the factors that contribute to parental stress, as demonstrated in statements. It is known that the use of best practices such as ensuring free access for parents to NICUs, open dialogue with the family, flexible access to information about NBs, and the development of FCC can cooperate to develop autonomy in parental role performance and reduce stress[13].

The word NICU, in the accounts of most parents, is related to feelings of fear and insecurity, even more so when it is heard right after the birth of a NB. There is a predominance of people who associate the NICU with a fatal outcome, which makes this environment feared by most parents. Moreover, because they are not familiar with NICU environments, many may reproduce negative scenes generated by their own anxieties. This negative perception of NICUs can be enhanced when there is no efficient communication or there is a failure in the process of welcoming parents[22].

In order to help demystify and deconstruct negative associations with the NICU, strategies for welcoming and providing guidance to parents can be used, such as on the unit's routines. Furthermore, in addition to providing guidance, it is necessary to actively listen to parents' concerns regarding this environment. This strategy facilitates the team's approach and the creation of a bond with the parents, enabling FCC. Parents' perception should be the guiding element for family welcoming. It is worth highlighting the importance of making parents jointly responsible for NB care, so parents can stop being supporting actors and become leading figures in the care of their children during NICU stay[23].

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When first meeting their NBs, many parents tend to find it difficult to approach and offer comfort, due to the large number of devices and wires surrounding them. In addition to this, there is anxiety generated by the process of being used to the NICU, which is a trigger for the first signs of stress for parents[24]. In statements, it was possible to perceive the stress generated in parents by the equipment used by NBs, marking this first contact and experience with NICUs.

In the sights and sounds of the unit domain, stress was absent or at low levels in parents who considered the visualization of devices, tubes and emission of sounds as a source of stress. These results support a descriptive study carried out in the state of Rio Grande do Sul, which indicated the lowest level of stress in the sights and sounds of the unit category[25]. However, when analyzing the data in the qualitative stage, stress was identified. This result differs from the study cited above, demonstrating that the adaptation to the technologies used in NB care generated stress, marking parents' first contact with a NICU. Above all, the importance of new studies with mixed methods is highlighted, which bring the quantitative and qualitative stages closer together.

Parents' assumptions regarding infant behavior and appearance are projected and idealized, even if unconsciously, from the moment they discover the pregnancy. The conception of this imaginary baby allows parents to understand the real baby's needs and favors the creation of an emotional bond between the father/mother/baby trinomial. However, when the image of the real baby is very distant from the imaginary baby, a gap is created, in which projected desires turn into insecurity and uncertainty[26].

Parents report that the image of a sedated, hypoactive, small and fragile baby triggers feelings in them that are difficult to express, and is therefore considered an extremely stressful situation. The mean response in this domain, infant behavior and appearance, was 3.1 points, data similar to that found in a study conducted in Chile, with a mean of 2.88, and in Mexico, with a mean of 2.29[27-28].

It is known that some parents are not prepared during prenatal care for a possible outcome of NB hospitalization. This factor can contribute to increased stress. It is important that these issues and outcomes that are different from those usually expected are also addressed during pregnancy follow-up consultations, especially for women with high gestational risk. Furthermore, it is the responsibility of the NICU team to provide health education to parents so that the damage caused by stress can be minimized[29].

The parental role alterations domain achieved the highest mean of 3.82 points in relation to the other variables. All fathers/mothers presented stress present in this category, converging with data from studies that used the same instrument, those carried out in Brazil, Chile and Mexico, which presented similar means, 3.49, 3.38 and 3.24, respectively[25,27-28]. Furthermore, during parents' speeches, brought by qualitative results, it is noticeable how the distance from the basic routine of caring for NBs interferes with how they recognize themselves in their parental role.

Furthermore, it was noted that guilt for their children's hospitalization was a feeling that was constantly present, especially in maternal discourse. Moreover, because they do not fulfill their role as primary caregiver, many mothers feel belittled and unqualified to perform such a role. Consequently, psychosomatic illnesses may arise, such as anxiety, insomnia and especially postpartum depression, elements that can harm the mother/baby bond[30-31].

These results point to the importance of including parents as NBs' primary caregivers, with FCC being a possibility for improvements in care in NICUs, a strategy to improve the feeling of being in parental role when faced with the adversities of a high-risk NB and perhaps an initiative to reduce stress associated with this domain. By including FCC as one of the pillars of neonatal care, it becomes possible to broaden NBs' perspectives and think about long-term care[32-33].

The results found in this study reinforce the need to promote unique care for NBs, taking the family into account. Measures such as efficient communication, promoting and strengthening parental co-responsibility for care, and respecting family principles are essential for NBs' recovery and rehabilitation. Moreover, FCC contributes to a significant reduction in parental stress[32-33].

The study had limitations due to the fact that it was developed during the COVID-19 pandemic, as it was impossible to collect data in person, which may have limited the selection bias to participants who had the technological conditions to participate in the study. It is important to highlight the lack of and need for new studies with interventions that also address practical measures to reduce stress on the parental duo in NICU environments.

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CONCLUSION

In relation to the methodological design of this study, it was noted that the application of the PSS:NICU integrated with semi-structured interviews was a differential, since the mixed method expanded the perception and results on stressful situations in NICU environments. The hospitalization of a child in a NICU is a stressful event in parents' lives, and parental role alterations are the most stressful domain in this context. Increased stress, according to parents' reports, is also highlighted when the first experience in NICU environments occurs.

Considering parental role as a condition of greatest stress in the NICU, it is important to adopt FCC measures, making parents active and co-responsible for care, thus improving their perceptions about their parental role. It is also important to highlight the importance of health education actions, both in prenatal care, with high-risk pregnant women and families, as well as with parents with NBs already hospitalized in the NICU, considering that information and guidance promote better acclimatization of parents to the NICU's highly technological environment and to conditions associated with the appearance and equipment used by babies during hospitalization, thus reducing the stress related to this category.

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Submitted: August 1, 2023

Accepted: June 24, 2024

Published: February 17, 2025

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Authors' contributions:

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Conflict of interest: There is no conflict of interest.

There is no funding.

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Editor-in-chief: Adriane Cristina Bernat Kolankiewicz. PhD

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