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Safety elements and understanding of guidelines at discharge from Neonatal Intensive Care Units

Elementos de segurança e compreensão de orientações na alta em Unidades de Terapia Intensiva Neonatal

Elementos de seguridad y comprensión de las guías al alta de las Unidades de Cuidados Intensivos Neonatales

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ABSTRACT

Objective: To compare safety elements and the understanding of guidelines at discharge from the Neonatal Intensive Care Unit between public and private hospitals.

Method: Cross-sectional study, developed in two Neonatal Intensive Care Units in the Midwest of Brazil. The Checklist for patient safety in preparing for discharge from the Neonatal Intensive Care Unit and the Assessment Scale of Patient Understanding about Discharge Guidelines were used for a sample (n=105) of caregivers of newborns. Descriptive and inferential statistical analysis was performed.

Results: The Checklist item "skin care and body hygiene" had greater conformity in the private sector (96.9%) than in the public sector (73.2%) (p-value<0.000) and the understanding of discharge guidelines had an overall mean of 62.9±8.3 points, with no significant difference between the locations.

Conclusion: Compliance with safety elements and understanding of guidelines at discharge were equal among hospitals.

Keywords: Patient discharge. Health communication. Infant, newborn. Patient safety. Intensive care units, neonatal.

RESUMO

Objetivo: Comparar elementos de segurança e a compreensão de orientações na alta da Unidade Terapia Intensiva Neonatal entre hospitais público e privado.

Método: Estudo transversal, desenvolvido em duas Unidades Terapia Intensiva Neonatal do Centro-Oeste do Brasil. Foram empregados o Checklist para segurança do paciente no preparo para alta da Unidade Terapia Intensiva Neonatal e a Escala de Avaliação da Compreensão do Paciente sobre Orientações de Alta a uma amostra (n=105) de cuidadores dos neonatos. Realizou-se análise estatística descritiva e inferencial.

Resultados: O item do Checklist "cuidados com a pele e higienização corporal" obteve maior conformidade no setor privado (96,9%) que no público (73,2%) (p-valor<0,000) e a compreensão de orientações de alta teve média geral de 62,9±8,3 pontos, sem diferença significativa entre os locais.

Conclusão: O atendimento a elementos de segurança e a compreensão de orientações na alta foram equânimes entre os hospitais.

Palavras-chave: Alta do paciente. Comunicação em saúde. Recém-nascido. Segurança do paciente. Unidade de terapia intensiva neonatal.

RESUMEN

Objetivo: Comparar elementos de seguridad y comprensión de las guías para el alta de la Unidad de Cuidados Intensivos Neonatales entre hospitales públicos y privados.

Método: Estudio transversal, desarrollado en dos Unidades de Cuidados Intensivos Neonatales del Medio Oeste de Brasil. La Lista de verificación para la seguridad del paciente en la preparación para el alta de la Unidad de Cuidados Intensivos Neonatales y la Escala de Evaluación de Comprensión del Paciente sobre Pautas de Alta se utilizaron para una muestra (n=105) de cuidadores de recién nacidos. Se realizó análisis estadístico descriptivo e inferencial.

Resultados: El ítem de la lista de verificación "cuidado de la piel e higiene corporal" tuvo un mayor cumplimiento en el sector privado (96,9%) que en el sector público (73,2%) (valor de p <0,000) y la comprensión de las pautas de alta tuvo una media general de 62,9 ± 8,3 puntos, sin diferencia significativa entre las ubicaciones.

Conclusión: La atención a los elementos de seguridad y la comprensión de las guías al alta fueron iguales entre los hospitales.

Palabras clave: Alta del paciente. Comunicación en salud. Recién nacido. Seguridad del paciente. Unidades de cuidado intensivo neonatal.

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INTRODUCTION

Despite the exponential advance of scientific knowledge that increases the survival of high-risk newborns (NBs), there are still many favorable conditions for the occurrence of adverse events in this population, both because of their high clinical complexity and because they are handled by several professionals, undergoing multiple diagnostic-therapeutic interventions and having a long hospital stay, including in critical sectors such as Neonatal Intensive Care Units (NICU) [1]. Furthermore, they are individuals with organic systems in development and greater fragility in the face of unsafe care, consequently, with more susceptibility to the occurrence of damage[2].

In the NICU scenario, the following adverse events of different severity and preventability are frequently described: intravenous catheter infiltrations, healthcare-associated infections, accidental extubation, intraventricular hemorrhages, skin lesions, misidentification among multiple-born babies, thermoregulation and blood glucose disorders, and nasal injuries from non-invasive ventilation. Such events were found in different geographic and economic contexts such as Brazil[2], Spain[3], France[4] e and the United States of America[5].

In addition to the adverse events that can affect NBs during their NICU stay, those who survive and are discharged from these services often have complex health problems and develop chronic morbidities such as periventricular leukomalacia, hearing loss, retinopathy of prematurity and bronchopulmonary dysplasia, which can lead to delay in growth and development[1]. For this and other reasons, among the safety processes that involve the neonates and their family, it is necessary to make the transition of care in an efficient and safe manner[6].

The transition of care refers to a set of actions aimed at the coordination and continuity of care in the transfer of patients between different locations in the health system or between different units within the same institution[7]. It is a multifactorial activity as it involves individuals with different skills, such as the patient and their caregivers, the health professionals/services who performed care and those who will continue the service[8]. When the care transition occurs ineffectively, it can favor the occurrence of serious adverse events, with an increase in morbidity and mortality rates, generate a feeling of dissatisfaction in all the actors involved in the process, also in increasing the costs of services and health systems[6,7].

Regarding neonatal care, it is noticed that there is still room for improvement in the strategies used to ensure that care continues after hospital discharge. In view of this, a recent study conducted at the NICU of the Vermont Oxford Network defined an ideal critical transition as one that occurs in a safe, timely, efficient, effective, equitable, patient-centered and family-centered and socially responsible manner. In the study, four contributors to "ideal" critical transitions were proposed: teamwork, family integration, direct and standardized health communication, and standardization of care, by the use of instruments such as checklists and clinical practice guidelines[8].

Discharge from NICU must be performed by the multiprofessional team and consider the NB's clinical conditions: oral feeding coordinated with breathing and in sufficient quantity for good weight gain or in cases where the child needs other feeding methods, that the caregiver is properly trained to provide it; maintenance of normothermia at home environment and stability of cardiorespiratory function. Attention should be paid to post-discharge needs: availability of medicines and equipment; preparing family members to perform routine care with the baby, such as feeding technique, medication administration and identification of risk signs; availability of discharge summary; and ensuring follow-up in the health network[9]. Therefore, the preparation of family members to continue the care for the NB after discharge from the NICU should occur throughout the hospitalization period, and not just on the day of discharge from the unit[10,11].

Despite the advance in knowledge about patient safety in neonatology, there is still the need for further studies that consider the discharge process in different models of organization and work management[12,13]. This is important because, for the planning and implementation of actions aimed at the quality and patient safety and, therefore, that have the potential to reduce physical, emotional and even financial damages to the patient and to organizations, robust management models and systematized actions are needed to rationalize care with this approach[12].

In view of the peculiarity of care provided in NICU, the importance of care transition in this context, and that disparities related to the performance of services provided by hospitals with different sectors and/or management models may occur, particularly in issues related to the quality and safety of care[12], it is understood that it is socially and scientifically relevant to know how the discharge process takes place between NICU from distinct segments. Thus, the study aimed to compare safety elements and the understanding of guidelines at discharge from the Neonatal Intensive Care Unit between public and private hospitals.

METHOD

Cross-sectional study. It was performed in two NICU, being one in a public hospital and the other in a private hospital. Both units were situated in the capital of one of the states in the Midwest region of Brazil. The public hospital is a medium-sized general university hospital with care 100% linked to the Unified Health System (*Sistema Único de Saúde* – SUS) and had a type II NICU, with 10 beds. The private hospital, on the other hand, is a medium-sized general hospital that does not serve the SUS and had a type II NICU, with 15 beds.

The study population consisted of caregivers of newborns who were discharged from the aforementioned fields of study, between September 2 and December 17, 2020, and who met the following eligibility criteria: being a caregiver (regardless of the degree of kinship/bond) who actively participated in the care of the newborn in the NICU – which, in the face of the COVID-19 pandemic, meant the caregiver being present at the unit at the scheduled times to receive the medical report while the NB was clinically unstable or to remain in the unit to provide daily care for the NB when he/she started to present clinical stability – and was present at the discharge from the NICU to his/her home; and being a caregiver of a NB who stayed at least 48 hours in the NICU. Exclusion criteria were: caregivers under 18 years of age; people with intellectual disabilities or who used illicit drugs with the power to modify the functioning of the central nervous system; caregivers of newborns under the intervention of the guardianship council; caregivers of twins in which one of the twins died; and those who did not respond to three telephone contact attempts.

In cases involving twinness, telephone contact was made with the caregiver only after the last twin was discharged, and it was used the newborn's characterization data related to it. When the twins were discharged at the same time, twin "1" was chosen as a reference for extracting data from this NB. In view of the above criteria, the sample was formed by convenience, consecutive, prospective.

At the public hospital, 48 caregivers left the NICU with their newborns within the period established for the research. From these, seven were not eligible, as one was under the intervention of the guardianship council, one evaded, one stayed less than 48 hours in the unit, three were under 18 years old and one did not respond to the three attempts to contact for data collection. From the private hospital NICU, 75 caregivers left the period, of which 11 were not eligible, since 10 remained in the unit for less than 48 hours and one did not participate in the care for the newborn during hospitalization. Therefore, 105 caregivers constituted the final sample of the study, 41 from the public hospital and 64 from the private hospital.

Data collection was performed in two moments, during the cited time frame. The first moment, which took place every day of the week, in both fields of study, was characterized by individualized contact in the researcher's hospital environment with the caregivers of the neonates to invite them to participate in the research, by the presentation of the project, clarifications about the investigation and delivery of the Free and Informed Consent Form for reading and signing of those who so desired. After consent, the researcher filled in the participants' characterization form, through an interview with the caregiver to collect the variables referring to the caregiver her/himself: sex, race, age, degree of kinship with the neonate, family income and education level, in addition to registering the telephone contact. Next, through research in medical records, the variables referring to the NB of the respective caregiver were collected: sex, gestational age, and birth weight.

The second moment of data collection took place after on-site confirmation of the neonate's discharge accompanied by his/her caregiver who was a preliminary member of the research. An interview was conducted with the caregiver by telephone, not recorded within 72 hours after the NB discharge, completing the data on the characterization form filled in the first stage, with the information on the total time of hospitalization of the neonate in the NICU, and applying two instruments previously validated in Brazil.

The first instrument applied was the "Checklist for patient safety in preparing for discharge from the Neonatal Intensive Care Unit", which aims to verify the safety elements at discharge from the NICU. This consists of seven questions that include international patient safety goals, with dichotomous answers of "yes" or "no" and is in the public domain for online access[13].

The checklist was validated in a recent study developed in Minas Gerais, Brazil, with an ideal Content Validity Index of 0.95. The seven checklist questions are related to the following safety elements: patient identification, communication, medication safety, prevention of infections associated with health care, falls prevention and skin lesions[13]. Therefore, the compliance of these elements was questioned by the researcher and referred by the caregiver based on their participation in the NICU discharge process. That is, the caregiver referred whether or not the security element was fulfilled in the discharge process.

The second instrument applied, called "Assessment Scale of Patient Understanding about Discharge Guidelines" was recently validated through a study conducted in the state of

São Paulo, Brazil. The overall Cronbach's Alpha value for Part I of the scale, used in this study, was considered excellent (α=0.918) and, regarding the assessment of the judges, the results showed that there was a positive assessment of the instrument[14]. This is a Likert-type scale of agreement, with a score from 1 to 5, according to the patient's perception on their understanding of discharge guidelines. In part I of the instrument, the score "1" refers to did not receive guidance, "2" disagree, "3" partially disagree, "4" partially agree, "5" agree.[14] The scale uses as indicator the process of communication centered on the patient's perception, therefore, measures the patient's understanding on the guidelines provided by health professionals about their post-discharge treatment.

The instrument consists of 14 items subdivided into four factors: 1) understanding about medications; 2) understanding about treatment and diagnosis; 3) understanding about restriction; and 4) understanding about return[14]. It is noteworthy that, in this study, the understanding of the patient refers to the understanding of the NB's caregiver. It is noticed that the complete instrument was not used, due to one of its parts evaluating the participant's non-verbal reactions, an impracticable condition for data collection by telephone. This option was made so as not to interfere with the routine dynamics of caregivers more incisively and, due to the context of the COVID-19 pandemic.

Both instruments used were enunciated in the act of data collection adapted only to be understandable in the context of the neonate's caregiver as a respondent, without changing the content of the instruments. For the scale to be understandable in the context of the neonate's caregiver as a respondent, adaptations were made to its statement. For example, instead of saying to the participant "I understood my medical diagnosis", it was said "I understood the baby's medical diagnosis", and so on in all 14 questions asked. It was considered that these adaptations did not change the essential content of the measurement scale.

The data collected were entered with double-checking in Microsoft Office Excel® software spreadsheets and, later, descriptive, and inferential statistical analysis was performed using the Statistical Package for the Social Sciences, version 21. Categorical variables were analyzed by absolute and relative frequency (%). Quantitative variables were described by measures of central tendency and dispersion. The quantitative variables of the participants' characterization form, as well as the items that compose the Assessment Scale of Patient Understanding about Discharge Guidelines, were submitted to the Komogorov-Smirnov normality test, with "birth weight" being the only variable with normal distribution.

It is noteworthy that, in the analysis of the Assessment Scale of Patient Understanding about Discharge Guidelines, the final score is obtained by the simple sum of each item and, therefore, considering part I of the instrument, it can range from 14 to 70, the higher the score, the greater the perception of understanding regarding their treatment and discharge, with no cut-off point for a good understanding[14].

In the inferential analysis, comparison tests were used. Chi-square was used for the categorical variables: sex, race and caregiver's education level, family income, caregiver's degree of kinship with the newborn, newborn's sex; and also, on the checklist items (first instrument). The t-student test was used for the quantitative variable with normal distribution and the Mann-Whitney test for the quantitative variables with asymmetrical distribution. In the entire process of inferential statistical analysis, significance was considered at 5%, expressed in p-value≤0.05. To assess the reliability of the Assessment Scale of Patient Understanding about Discharge Guidelines, Cronbach's Alpha coefficient was calculated, established as satisfactory if value ≥0.70.

All ethical and legal assumptions established in Resolution No. 466/2012 of the National Health Council were met and the research project was registered under CAEE: 36371420,8,0000,5541 and opinion 4,252,212/2020.

RESULTS

From the general sample (n=105), predominated female caregivers (98.1%), mothers (95.2%), with a mean age of 31±7.2 years, brown (55.2%), with family income less than four monthly minimum wages (62.8%). The family income and education level were higher among caregivers in the private service (Table 1).

In the general sample, the mean gestational age was 35±2.8 weeks and the mean birth weight was 2478.48±727.9 grams. As shown in Table 2, the length of stay of NBs was significantly longer for public service patients. There were no significant differences in the age of the caregiver, gestational age, and newborn's birth weight between public and private hospitals.

Table 1 – Sociodemographic characteristics of caregivers and newborns, by type of hospital, (n=105). Midwest, Brazil, 2020

Variables	Public Hospital		Private Hospital		p-value*
	n	%	n	%	
Caregiver's Sex					
Female	39	95.1	65	100	0.15
Male	2	4.9	-	-	
Caregiver's Race					
White	12	29.3	23	35.9	0.326
Brown	22	53.7	36	56.3	
Black	7	17.1	5	7.8	
Family Income†					
<= 2 Minimum Wages	25	61	8	12.5	<0.00
> 2 ≤ 4 Minimum Wages	13	31.7	20	31.3	
> 4 ≤ 10 Minimum Wages	3	7.3	23	35.9	
>10 ≤ 20 Minimum Wages	-	-	10	15.6	
> 20 Minimum Wages	-	-	3	4.7	
Education Level					
Illiterate	1	2.4	-	-	<0.00
Incomplete Elementary	2	4.9	-	-	
Complete elementary	2	4.9	1	1.6	
Incomplete high school	10	24.4	1	1.6	
Complete high school	11	26.8	12	18.8	
Incomplete higher education	5	12.2	13	20.3	
Completed higher education	10	24.4	37	57.8	

Table 1 – Cont.

Variables	Public Hospital		Private Hospital		p-value*
	n	%	n	%	
NB's Sex					
Male	26	63.4	37	57.8	0.327
Female	15	36.6	27	42.2	
Kinship with NB					
Mother	37	90.2	63	98.4	0.119
Father	2	4.9	-	-	
Grandparents	2	4.9	1	1.6	

Source: Research data.
*Pearson's Chi-square test.
†Minimum wage in data collection period = BRL$1,045.00.

Table 2 – Sociodemographic and clinical characteristics of the sample, by type of hospital. Midwest, Brazil, 2020

	Public Hospital					Private Hospital					p-value
	Mean	95%CI	Median	IQR*	SD	Mean	95%CI	Median	IQR*	SD	
Age of guardian (years)	32	[29 – 35]	32	15	9.1	30	[27 -31]	30	7	5.69	0.182†
Gestational age (weeks)	35	[34 – 35]	35	5	2.9	35	[34 – 35]	35	4	2.7	0.966†
Birth weight (grams)	2387	[2156 - 2618]	2280	1223	731	2536	[2355-2718]	2682	1050	725.3	0.308‡
Length of stay (days)	23.3	[18- 28]	18	28	16	16	[11 – 19.5]	11	10	15.6	0.003†

Source: Research data.
*IQR = Interquartile Range
†Mann-Whitney test
‡Independent t-student test

Compliance with elements for patient safety in the preparation for discharge from the NICU is shown in Table 3. It was evidenced that the item most attended in both hospitals was referring to the fulfillment of the notebook and discharge summary, while the items on risks of falling/transport of the NB and on training to medication administration had lower compliance. The item on skin care and body hygiene was significantly more frequent in the private hospital.

As for the results of the "Assessment Scale of Patient Understanding about Discharge Guidelines", it is noticed that there was good internal consistency in the investigated sample (Cronbach's alpha=0.83). The total score ranged from 37 to 70. The general mean score for the public hospital was 63.46±8.661 and for the private hospital it was 62.56±8.136, with no statistically significant difference (p=0.466), as shown in Table 4.

The distribution of scores for each item of the scale showed no statistical difference between locations, according to the results presented in Table 5.

Table 3 – Comparison of care for safety items/elements at discharge from the Neonatal Intensive Care Unit, by type of hospital. Midwest, Brazil, 2020

Check items	Public Hospital (n=41)		Private Hospital (n=64)		p-value†
	Yes n (%)	No n (%)	Yes n (%)	No n (%)	
Fulfillment of the notebook and discharge summary	40 (97.6)	1 (2.4)	63 (98.4)	1 (1.6)	0.749
Guidance on the need for consultation for monitoring the NB*	39 (95.1)	2 (4.9)	62 (96.9)	2 (3.1)	0.647
Guidance on prescribing and storing medications for home use	38 (92.7)	3 (7.3)	57 (89.1)	7 (10.7)	0.538
Training for medication administration for home use	23 (56.1)	18 (43.9)	31 (48.4)	33 (51.6)	0.444
Guidance on the risks of infection in the out-of-hospital environment	28 (68.3)	13 (31.7)	46 (71.9)	18 (28.1)	0.695
Guidance on the risks of falling and the proper way of transporting the NB*	18 (43.9)	23 (56.1)	18 (28.1)	46 (71.9)	0.097
Guidance on skin care and body hygiene	30 (73.2)	11 (26.8)	62 (96.9)	2 (3.1)	<0.000

Source: Research data.
*NB=Newborn
†Pearson's Chi-square test

Table 4 – Comparison of the overall score of Part I of the Assessment Scale of Patient Understanding about Discharge Guidelines, by hospital type. Midwest, Brazil, 2020

Hospital	Mean	95% CI	Standard Deviation	Median	Minimum	Maximum	p-value*
Overall (Both)	62.91	[61.3 – 64.5]	8.315	66	37	70	
Public Hospital	63.46	[60.7 – 66.2]	8.661	66	41	70	0.466
Private Hospital	62.56	[60.5 – 64.5]	8.136	64.5	37	70	

Source: Research data.
*Mann-Whitney test

Table 5 – Comparison of the items on the Assessment Scale of Patient Understanding about Discharge Guidelines, by type of hospital. Midwest, Brazil, 2020

Scale Item	Public Hospital				Private Hospital				p-value†
	Mean	SD	IQR*	Median	Mean	SD	IQR*	Median	
1. Understands medical diagnosis	4.76	0.624	0	5	4.7	0.79	0	5	0.918
2. Knows how to explain the problem	4.51	0.81	1	5	4.63	0.807	0	5	0.304
3. Understands how many medications will be used	4.71	0.962	0	5	4.80	0.78	0	5	0.715
4. Understands medication schedules	4.54	1.09	0	5	4.67	0.909	0	5	0.523
5. Understands how long to use medication	4.20	1.382	1	5	4.23	1.46	1	5	0.465
6. Understands the purpose of each medication	4.51	1.02	1	5	4.38	1.254	1	5	0.876
7. Understands information about return	4.76	0.624	0	5	4.70	0.790	0	5	0.264
8. Understands the need to look for emergency	4.12	1.45	1	5	3.72	1.62	3	5	0.225
9. Understands dietary care	4.8	0.587	0	5	4.83	0.606	0	5	0.954
10. Understands aspects of physical activity	3.90	1.65	2	5	3.27	1.84	4	4	0.087
11. Understands post-discharge care	4.78	0.725	0	5	4.72	0.845	0	5	0.922
12. Understands the total period of treatment	4.41	1.204	1	5	4.56	0.990	0	5	0.586
13. Understands treatment guidelines	4.59	0.894	1	5	4.66	0.840	0	5	0.607
14. Had doubts clarified	4.68	0.722	3	5	4.66	0.739	0	5	0.796

Source: Research data.
*IQR = Interquartile Range
†Mann-Whitney test

DISCUSSION

This study contributes to the identification of safety elements and understanding of guidelines for NICU discharge between public and private hospitals. The findings allow rationalizing the planning of improvements in the discharge process in these locations. In Brazil, no publications were found that address factors associated with the quality of NICU discharge and their comparison in relation to different management and/or funding sectors.

Among the caregivers, there were divergent socioeconomic aspects, as most of those coming from the public hospital had a lower education level and monthly family income, compared to caregivers from the private hospital. Socioeconomic differences are important to be considered when planning discharge and providing guidance to family members. In this direction, a previous study identified that health literacy, family income, unemployment and race/ethnicity are factors associated with the perception of preparation for discharge from NICU[15].

The observed NICU length of stay was significantly longer for public service patients. This difference could be explained by a higher clinical severity of patients coming from this location[16]. However, data of this order were not assembled. On the other hand, considering the market logic of the private sector, as a propellant for the adoption of strategies that lead to greater productivity and, consequently, to greater revenue[17], it is raised the hypothesis that the private hospital has structural and managerial means more increments to increase the turnover of their NICU beds, such as greater agility and availability for carrying out complementary exams, procedures and consultations with specialists; in addition to good accessibility for patients to medical consultation in the extra-hospital environment, thus reducing the length of stay and increasing the number of admissions.

The shorter length of stay can negatively contribute to the training of caregivers regarding daily care for the NB after hospital discharge at home. However, the longer the hospitalization, the greater the exposure of the NB to the occurrence of incidents with damage[7].

Thus, means are needed that provide assertiveness and safety in neonatal care, especially in critical moments, such as the transition of care. Every care contact of health professionals with the neonate and the family can be considered as an opportunity to exchange information relevant to post-discharge care.

It was found that in the two research scenarios there was a good attendance of the following items that make up the Checklist for Patient Safety in Preparing for Hospital Discharge: fulfillment of the child's notebook and discharge summary; guidance on the consultation for monitoring the NB and on medications for home use. However, there is still room for improvement in both hospitals, in terms of meeting the following items: training for medication administration; guidance on the risks of infection in the out-of-hospital environment, and guidance on the risks of falling and transporting the NB.

In line with the literature[18], it is observed that medication administration errors are among the main adverse events after hospital discharge. A recent study conducted in the United States with caregivers of pediatric patients after hospital discharge found medication safety as the main concern of the nursing team during home visits, with the main problems being those related to family administration of drugs and medication reconciliation[18].

The only checklist item in the study that showed a significant difference between the two hospitals was the one that includes the guidance on skin care and body hygiene of the NB. The private hospital presented more satisfactory results, compared to the reality verified in the public service. This is relevant because newborns have the immaturity of the stratum corneum as a particularity, and therefore, a lower functional barrier of the skin, which makes them more vulnerable to aggressions from the external environment, including infections[19].

The difference found between the services on the aforementioned item could be explained by the fact that, in the practice of professionals at the private hospital, there is the use of a prescription model for the discharge of the NB from the NICU, which includes guidelines on care with the baby, including topics on newborn skin care. In addition, due to the difference in education level between hospital participants, there is a possibility of a bias in understanding the question, so that participants with higher education level have a better understanding of the guidelines given by the health team. This aspect emerges as a possibility for future investigations.

In general, there were positive results in both hospital scenarios regarding the understanding of caregivers about newborn discharge guidelines. The fact that the data collection instrument on understanding the discharge guidelines[14] was publicized in the same year as the data collection for this research probably interfered with the inexistence of other publications that used this scale. This, despite being a limitation of the density of the debate/interpretation of the results, is also a contribution of this study since future research may obtain greater orientation in this interpretative analysis. Thus, the study can serve as a comparative basis for the scores obtained in other scenarios.

It was interpreted that the understanding on the signs of worsening of the NB's disease and, therefore, when an emergency service should be sought, was a field with room for improvement, both in the public and private hospitals. The concerns of the parents in the care for the NB discharged from the NICU are directed towards complications, because they associate with a fragile and defenseless being and with a greater probability of getting sick, thus, the concern with the baby's survival during hospitalization is replaced by the concern with the maintenance of their health[6]. Therefore, it is important that caregivers feel prepared to identify the possible warning signs that the NB may present, indicating that they need to look for an emergency service[10].

Clinical signs that indicate the need to seek emergency services for an NB are: hypoactivity, seizures or tremors, cyanosis, pallor, weak or uncontrollable crying, difficulty breathing, apnea, food refusal, abdominal distension, frequent regurgitation or vomiting, emergence or worsening of jaundice, inadequate diuresis, signs of dehydration and hypothermia or hyperthermia[10].

The relatively low score on the item in question may indicate the need for highly complex services, such as NICU, to be co-responsible for the organization and articulation with the care network, developing and improving referral and counter-referral mechanisms, as well as guiding care in this aspect during hospitalization, both to avoid unnecessary searches that cause overcrowding and turmoil in emergency services, and so that a newborn does not be attended, due to negligence and/or parental ignorance.

In the face of the scenario exposed, it can be seen that the study advances in the sense of pointing out with more specificity which elements or aspects of care can be improved during discharge from the NICU in both hospitals researched, namely: guidelines and training for medication administration; guidance on fall prevention/safe transport; skin care and body hygiene and the need to seek emergency services. Therefore, the findings of this study reinforce the need to improve the care transition at NICU discharge, especially regarding health education to better prepare caregivers for discharge.

The planning of care for discharge, assistance in social rehabilitation, health education, coordination with other services and post-discharge follow-up are activities developed by nurses and other members of the multiprofessional team to ensure safe and efficient discharges[7]. Perhaps, the implementation of checklists, such as the checklist used in this study, can serve as a contribution to improve the quality of services, while these instruments work as contributors to a qualified and safe transition[8].

It is known that despite any preparation by the team on the care of the NB in the transition to home, in practice, responsible caregivers often feel unprepared for discharge[9]. An Australian study showed that mothers of NBs hospitalized in NICU recognized that they needed to be informed several times about how to care for their babies, as they were sometimes very stressed and could not understand what was being said to them.

It is necessary the incorporation of systematic strategies in order to ensure that the patient or the caregiver receives the right content of care, in the right place, at the right time and from the right team.[8,13] It is recognized that health education activities are essential for a safe transition from the hospital to home, which must be performed during the patient's hospitalization, and it is not recommended to provide guidance only at the time of discharge[7]. Caregivers must be trained gradually, even during hospitalization, to perform post-discharge care, involving them in the learning process as active subjects[6].

It is agreed that, in addition to the clear definition of the guidelines to be carried out, it is necessary to assess their understanding, so that the transition of care is successful[6]. Some strategies can be carried out, including approaches that promote health literacy, such as a teach-back communication method, language aimed at the 8th grade reading level and repeated tutoring[15]. The use of informational materials and other recreational activities to reinforce care guidelines are also indicated[7].

It is understood that the follow-up of NBs after discharge from the NICU is essential for the continuity of care. It is recommended that the first nursing consultation be held one week after discharge to assess the NB's health status and adaptation to the family environment, as well as clarify doubts and reinforce care guidelines[6]. In addition to face-to-face consultations, follow-up can occur through home visits and by telephone contacts[6,7].

In this study, the moment of data collection was also an opportunity to monitor newborns and their respective caregivers by telephone. Participants had their doubts regarding breastfeeding, warning signs to seek emergency service, adequate way to transport the NB, risks of infection, medication administration and skin care of the NB, clarified by the researcher, favoring the improvement of the caregivers' skills and also better articulation of research with the clinical practice.

Finally, it is recognized the importance of qualification processes for professionals involved in the care transition of NBs and their caregivers. Thus, investment in continuing education is a requirement, favoring a teaching-learning

process in daily work, with a view to provide better care for safety elements at discharge and provide guidance on home care for these individuals.

CONCLUSION

It is concluded that, by comparison, the compliance with safety elements and the understanding of guidelines at discharge from the NICU was equitable among the hospitals. However, there are still spaces for improvement, regardless the public/private management model, especially regarding safety elements related to medication administration and the prevention of falls/safe transport.

The item "skin care and body hygiene" had a significant difference between the locations, with better results in the private hospital. Regarding the caregivers' understanding of the discharge guidelines, good results were observed generally in both hospital scenarios, however, it was interpreted that the understanding of the signs of worsening of the NB's disease was a space for improvement, both in public and private hospitals.

This research presents as a possible limitation a gratitude bias, because, knowing that the parents/caregivers certainly had some positive feeling for the neonate's discharge, they could perhaps overestimate the compliance with the safety items and the guidance provided at discharge. In this sense, future studies with on-site observation are recommended. The difficulty in comparing results with national studies, due to the scarcity of related research, is also a limitation. However, it is expected that this study can trigger further discussions on the transition of neonatal care, in addition to the rational use of means and instruments that qualify discharge from the NICU, regardless of the hospital management model.

REFERENCES

1. Yu M, Park CG. Factors associated with patient safety in neonatal intensive care units: A multicenter study using ordinal logistic regression. Jpn J Nurs Sci. 2021;18(1):e12374. doi: https://doi.org/10.1111/jjns.12374.
2. Lanzillotti LS, De Seta MH, de Andrade CLT, Mendes Junior WV. Adverse events and other incidents in neonatal intensive care units. Cien Saude Colet. 2015;20(3):937-46. doi: https://doi.org/10.1590/1413-81232015203.16912013
3. Redondo MA, López ES, Blanca ARS, Ros IM, Gómez LC, Redondo AD, et al. Mejorando la seguridad del paciente: utilidad de las listas de verificación de seguridad en una unidad neonatal. An Pediatr. 2017;87(4):191-200. doi: https://doi.org/10.1016/j.anpede.2017.08.004
4. Caeymaex L, Lebeaux C, Roze JC, Danan C, Reynaud A, Jung C, et al. Study on preventing adverse events in neonates (SEPREVEN): a stepped-wedge randomised controlled trial to reduce adverse event rates in the NICU. Medicine. 2020;99(31):e20912. doi: https://doi.org/10.1097/MD.0000000000020912
5. Hatch LD III, Scott TA, Slaughter JC, Xu M, Smith AH, Stark AR, et al. Outcomes, resource use, and financial costs of unplanned extubations in preterm infants. Pediatrics. 2020;145(6):e20192819. doi: https://doi.org/10.1542/peds.2019-2819
6. Engenheiro OB, Carvalho GMA. Strategies in the continuity of post-discharge care to premature or low-weight newborns. Rev Ibero-Am Saúde Envel. 2020 [cited 2021 Apr 20];6(1):2023-36. Available from: http://www.revistas.uevora.pt/index.php/saude_envelhecimento/article/view/398/679
7. Weber LAF, Lima MADS, Acosta AM, Maques GQ. Care transition from hospital to home: integrative review. Cogitare Enferm. 2017;22(3):e47615. doi: https://doi.org/10.5380/ce.v22i3.47615
8. Kaplan HC, Edwards EM, Soll RF, Morrow KA, Meyers J, Timpson W, et al. Variability in the systems of care supporting critical neonatal intensive care unit transitions. J Perinatol. 2020;40(10):1546-53. doi: https://doi.org/10.1038/s41372-020-0720-3
9. Green J, Fowler C, Petty J, Whiting L. The transition home of extremely premature babies: an integrative review. J Neonatal Nurs. 2021;27(1):26-32. doi: https://doi.org/10.1016/j.jnn.2020.09.011
10. Hannan KE, Hwang SS, Bourque SL. Readmissions among NICU graduates: who, when and why? Semin Perinatol. 2020;44(4):151245. doi: https://doi.org/10.1016/j.semperi.2020.151245
11. Sadeck LSR. Seguimento do recém-nascido prematuro. In: Segre CAM, Costa HPF, Lippi UG, editores. Perinatologia: fundamentos e prática. 3. ed. São Paulo: Sarvier; 2015. p. 243-50.
12. Andrade LEL, Lopes JM, Souza Filho MCM, Vieira Júnior RF, Farias LPC, Santos CCM, et al. Cultura de segurança do paciente em três hospitais brasileiros com diferentes tipos de gestão. Ciênc Saúde Colet. 2018;23(1):161-72. doi: https://doi.org/10.1590/1413-81232018231.24392015
13. Silva DCZ. Construção e validação de conteúdo dos checklists de segurança do paciente no cuidado de enfermagem em unidades de terapia intensiva neonatal. [dissertação]. Belo Horizonte: Universidade Federal de Minas Gerais; 2019 [cited 2021 Apr 20]. Available from: https://repositorio.ufmg.br/handle/1843/30260
14. Mota RJBS, Puggina ACG. Construção e validação da escala "Avaliação da compreensão do paciente sobre orientações de alta". Enferm Foco. 2020;11(1):118-25 . doi: https://doi.org/10.21675/2357-707x.2020.v11.n1.2748
15. Enlow E, Gray MM, Wallace-Keeshen S, D'Agostino JA, Abbasi S, Lorch SA. Health literacy of parents of very preterm infants at NICU admission and discharge: a prospective cohort study. J Perinatol. 2019;39(6):866-75. doi: https://doi.org/10.1038/s41372-019-0340-y
16. Mendonça JG, Guimarães MJB, Mendonça VG, Portugal JL, Mendonça CG. Profile of hospitalizations in pediatric intensive care units of the Brazilian unified health system in the state of pernambuco, Brazil. Ciênc Saúde Colet. 2019;24(3):907-16. doi: https://doi.org/10.1590/1413-81232018243.02152017
17. Oliveira JLC, Gabriel CS, Fertonani HP, Matsuda LM. Management changes resulting from hospital accreditation. Rev Latino-Am Enfermagem. 2017;25:e2851. doi: https://doi.org/10.1590/1518-8345.1394.2851
18. Tubbs-Cooley HL, Riddle SW, Gold JM, Wade-Murphy S, Auger KA, Statile AM, et al. Paediatric clinical and social concerns identified by home visit nurses in the immediate postdischarge period. J Adv Nurs. 2020;76(6):1394-403. doi: https://doi.org/10.1111/jan.14341
19. Albahrani Y, Hunt R. Newborn skin care. Pediatr Ann. 2019;48(1):e11-e55. doi: https://doi.org/10.3928/19382359-20181211-01

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