




Transition time from gastric tube feeding to oral feeding in preterm infants at a neonatal unit of the Unified Health System

Tempo de Transição da alimentação por sonda gástrica para alimentação por via oral em recém-nascidos pré-termo de uma unidade neonatal do Sistema Único de Saúde

Tiempo de transición de la alimentación por sonda gástrica a la alimentación oral en recién nacidos prematuros en una unidad neonatal del Sistema Único de Salud

Flavia Aparecida Felipe de Lima Silva* 

Nathaly Aparecida da Costa Alves* 

Amélia Augusta de Lima Friche* 

Abstract

Introduction: The removal of the feeding tube in premature infants and the successful establishment of oral feeding are important for the baby's health, as they promote breastfeeding and hospital discharge. However, it is a challenge in neonatal units. **Objectives:** This article analyzes the factors associated with the time of transition from tube feeding to oral feeding in premature infants admitted to the Neonatal Unit of the Brazilian Unified Health System (SUS). **Method:** An analytical observational cohort study was conducted with 45 premature infants who used a feeding tube from December 2021 to January 2022 and were accompanied by the Speech Therapy team of the service. The following factors were evaluated: premature infant's readiness for oral feeding, oral feeding with finger feeding technique, breastfeeding, and levels of oral skill. **Results:** Factors associated with a longer transition time from tube feeding to oral

* Universidade Federal de Minas Gerais - UFMG, Belo Horizonte, MG, Brazil.

Authors' contributions:

FAFLS: study conceptualization, methodology, data collection, and article draft.

NACA: data collection and article draft.

AALF: study conceptualization, methodology, data collection, critical review, and supervision.

E-mail for correspondence: Flavia Aparecida Felipe de Lima Silva - flavialima.fono@gmail.com

Received: 04/06/2023

Accepted: 16/10/2023



feeding included gestational age at birth of fewer than 32 weeks, birth weight under 1500 grams, lack of readiness for oral feeding, and hospital discharge with artificial feeding. **Conclusion:** Characteristics of the premature infant and feeding at assessment and hospital discharge were associated with a shorter transition time from the tube to oral feeding. Therefore, interventions that stimulate oral feeding during hospitalization can help reduce the transition time and promote breastfeeding, benefiting the health of premature infants and the mother-baby bond. They can also contribute to early discharge, allowing for bed turnover and, consequently, increased availability for SUS users.

Keywords: Infant, premature; Feeding methods; Speech, language and hearing sciences; Feeding behavior; Unified health system.

Resumo

Introdução: A retirada da sonda no recém-nascido pré-termo (RNPT) e o adequado estabelecimento da via oral são importantes para a saúde do bebê, já que favorecem aleitamento materno e alta hospitalar, entretanto, é um desafio nas unidades neonatais. **Objetivos:** Analisar os fatores associados ao tempo de transição da sonda para via oral em RNPT internados em Unidade Neonatal do Sistema Único de Saúde (SUS). **Método:** Foi realizado um estudo observacional analítico de coorte, com 45 RNPT que usaram sonda para alimentação no período de dezembro de 2021 a janeiro de 2022 e foram acompanhados pela equipe de Fonoaudiologia do serviço. Foram avaliados: a prontidão do prematuro para alimentação oral; a via oral com a técnica do *finger feeding*; a mamada e os níveis de habilidade oral. **Resultados:** Estiveram relacionadas ao maior tempo para transição da sonda para a via oral a idade gestacional ao nascimento inferior a 32 semanas, o peso ao nascimento inferior a 1500 gramas, a ausência de prontidão para via oral e a alta hospitalar em aleitamento artificial. **Conclusão:** Características do RNPT e da alimentação na avaliação e na alta hospitalar foram associados ao menor tempo de transição da sonda para a via oral. Assim, intervenções que estimulem o alcance da via oral no período de internação podem contribuir para a redução do tempo de transição e para o estímulo do aleitamento materno, favorecendo a saúde do RN, o vínculo mãe-bebê, a alta precoce, propiciando a rotatividade de leitos e, conseqüentemente, maior oferta aos usuários do SUS.

Palavras-chave: Recém-nascido prematuro; Métodos de alimentação; Fonoaudiologia; Comportamento alimentar; Sistema Único de Saúde.

Resumen

Introducción: La retirada de la sonda en los prematuros y el establecimiento adecuado de la vía bucal son importantes para la salud del bebé, ya que favorecen la lactancia y el alta hospitalaria, sin embargo, es un desafío en las unidades neonatales. **Objetivos:** Este artículo analiza los factores asociados al tiempo de transición de la sonda a la vía oral en prematuros internados en la Unidad Neonatal del Sistema Único de Salud (SUS). **Método:** Se realizó un estudio observacional analítico de cohortes, con 45 prematuros que utilizaron sonda de alimentación desde diciembre de 2021 hasta enero de 2022 y fueron seguidos por el equipo de logopedia del servicio. Se evaluaron: la disposición del prematuro para la alimentación oral; la vía oral con la técnica de alimentación con los dedos; lactancia materna y niveles de habilidad oral. **Resultados:** La edad gestacional ao nacer de menos de 32 semanas, el peso de nacimiento de menos de 1500 gramos, la falta de preparación para la administración oral y el alta hospitalaria con alimentación artificial se relacionaron con el mayor tiempo de transición de la vía por sonda a la vía oral. **Conclusión:** Las características del recién nacido prematuro y la alimentación en el momento de la evaluación y el alta hospitalaria se asociaron con un menor tiempo de transición de la sonda a la vía oral. Así, las intervenciones que fomenten la vía oral durante el período de hospitalización pueden contribuir a reducir el tiempo de transición y fomentar la lactancia materna, favoreciendo la salud del prematuro y el vínculo madre-bebé, además de contribuir al alta precoz, promoviendo la rotación de enfermeras, camas y, en consecuencia, mayor oferta a los usuarios del SUS.

Palabras clave: Recien Nacido Prematuro; Métodos de Alimentación; Fonoaudiología; Conducta Alimentaria; Sistema Único de Salud.



Introduction

Preterm newborns (PTNB) are those born before completing 37 weeks of gestational age¹. Although PTNB survival has improved in recent years, prematurity is still considered the main cause of neonatal mortality and morbidity in Brazil. They have specific characteristics due to the immaturity of several systems, generally requiring specialized care and hospitalization in Neonatal Units².

Special attention should also be given to this population's feeding, due to their greater risk of complications and aspiration during oral feeding, as humans are expected to manage the coordination between sucking, swallowing, and breathing at around 34 weeks of gestational age³.

Thus, they may have difficulties because of clinical conditions and maturity that prevent oral feeding soon after birth. Thus, feeding generally begins through a gastric tube, which directs the food directly to the newborn's (NB) stomach⁴. Prolonged use of a feeding tube can change the tonicity, mobility, and sensitivity of oral cavity structures⁵. Therefore, as the NBs clinically stabilize, the transition process must begin, encompassing the period from the beginning of oral feeding until the tube is removed and the NB reaches the exclusive oral route⁶.

The transition from the tube to the oral route in PTNB is a challenge in Neonatal Units, since, in clinical practice, it is still difficult to initiate this transition. Generally, it occurs differently between services, due to the lack of parameters to define procedures and the lack of standardization between services⁶. They often use isolated criteria such as gestational age and/or weight, which may be insufficient to indicate readiness for oral feeding^{7,8}. The literature indicates that clinical stability, feeding proficiency and efficiency, behavioral status, and morbidities are related to oral feeding capacity in PTNB^{9,10}.

Validated protocols have been recommended to define the ideal moment to start the oral route in PTNB and strategies for a safe feeding transition to the oral route in those who are already able to receive it so that the tube is not used longer than necessary and immature NBs are not breastfed before the ideal moment¹¹.

The correct identification of the moment to start the oral route can provide the NB with positive feeding experiences and reduce the time needed to reach the exclusive oral route. This may decrease their length of hospital stay, which allows for greater bed turnover and ensures access to the service by other users of the Unified Health System (SUS, in Portuguese)¹². The assistance of a qualified and humanized multidisciplinary team favors these NBs' development. Hence, it is important to address the NBs' safe oral stimulation, aiding the transition from the tube to the oral route and the establishment of efficient breastfeeding, ensuring minimal risks to the NB in this process of transition to the oral route¹³.

Given the need to identify other factors that may interfere with the PTNBs' transition process from the tube to the oral route and better plan and qualify care, with an impact on the length of hospital stay and bed turnover, in addition to the mother's and NB's quality of life, this study aimed to analyze the factors associated with the transition time from the tube to the oral route in PTNBs admitted to a Neonatal Intensive Care Unit that serves exclusively through the SUS.

Material and Method

This analytical, longitudinal, observational study was carried out in the Neonatal Unit of a philanthropic maternity hospital in Belo Horizonte, Brazil, which serves exclusively through the SUS. The PTNB were monitored regarding their transition time from the tube to the oral route during the assessment period until hospital discharge.

The sample included PTNB without serious associated pathologies, who required a gastric feeding tube and underwent speech-language-hearing (SLH) assessment and intervention from December 2021 to January 2022. The pathologies considered for non-inclusion of NB were heart disease, bronchopulmonary dysplasia, neurological changes, necrotizing enterocolitis or changes in the gastrointestinal system, congenital malformations, syndromes, and TORSCH infections. The study also excluded NBs in social hospitalization due to maternal abandonment or social vulnerability, with absolute contraindication to breastfeeding, or who died during the research period.

Data were collected between December 2021 and January 2022, identifying PTNBs that met the research criteria, based on the medical request for SLH assessment. The collection encompassed the moment the NB was admitted for SLH assessment until hospital discharge.

The data were collected by three SLH pathologists with more than 7 years of experience in the service. A pilot study evaluated these pathologists' agreement regarding the results of the instruments used in the collection – LATCH and Preterm Oral Feeding Readiness Scale (POFRAS). The weighted kappa index was 86.8% for LATCH, indicating excellent agreement, and 61.5% for POFRAS, indicating satisfactory agreement¹⁴. Next, the necessary adjustments and alignments were made to begin data collection. Data from the pilot study were not used in the final version of the study.

Sociodemographic and clinical data were collected from the NB medical records. Initially, POFRAS was used to assess the NB's readiness for oral feeding⁷. This instrument's scores determine whether the PTNB is suitable or unsuitable for oral administration. It assesses the state of behavioral organization, oral posture, oral reflexes, and non-nutritive sucking. Each item is scored from 0 to 2, totaling 36 points. The cutoff point for PTNB to be considered suitable for oral use was 30, as suggested by the instrument. This assessment was carried out 10 minutes before administration of the diet through the gastric tube, with NB half-sitting, head aligned, and legs and arms flexed, assigning the score at the end. Those with scores equal to or greater than 30 (suitable for the oral route) underwent oral route assessment, as described in the following paragraph. Those with a score lower than 30 (unsuitable for the oral route) underwent SLH intervention with daily oral stimulation, according to the institutional protocol and routine of the institution's SLH service, until the NB was ready for oral route assessment (POFRAS was applied at the end of each session). The intervention was not part of the study because the institution's standardized intervention was already part of the routine, and it was not the study's objective.

The oral route was assessed with LATCH¹⁵ when the mother was present, with NB positioned at the mother's breast, with body and head aligned. The scores in this scale consider the following characteristics: quality of the child's latch (L); au-

dible swallowing while breastfeeding (A); type of nipple (T); mother's comfort level concerning the breast and nipple (C); and mother's need for help holding the child (H). Each item is scored from 0 to 2, totaling 10 points. The higher the score, the better the feeding. Ten minutes before the next diet administration time, the finger feeding technique was used, attaching a number four gastric tube to a syringe without the plunger and to the professional's gloved finger, offering at the most the diet volume prescribed to the NB. The following oral feeding skills were considered: proficiency, percentage of milk ingested in the first 5 minutes of sucking in relation to the total prescribed diet volume, and the milk transfer rate (i.e., the volume of milk transferred during feeding time, in ml/min¹⁶. The NB's level of oral skill was defined as follows, according to the assessment: LEVEL 1, the most immature, proficiency < 30% and transfer rate < 1.5 ml/min; LEVEL 2, proficiency < 30% and transfer rate \geq 1.5 ml/min; LEVEL 3, proficiency \geq 30% and transfer rate < 1.5ml/min; and LEVEL 4, the most mature, proficiency \geq 30% and transfer rate \geq 1.5ml/min. Skill levels were originally defined using baby bottles¹⁶. However, this study used the finger-feeding technique because the institution where the study was carried out is a participant in the Baby-Friendly Hospital Initiative; therefore, this utensil is cautiously used. Like another study that evaluated oral skill levels and also used finger-feeding¹⁷, considering the harm caused by artificial nipples, we chose not to expose the PTNB to a baby bottle, using instead the tube-breast transition technique, which in the service's routine procedure.

The transition progress was monitored until the tube was removed when data was collected regarding the form of feeding, transition time (in days), gestational age, and weight. The form of feeding was also identified upon hospital discharge.

The descriptive analysis presented the data of continuous variables in means and standard deviations (SD) and those of categorical variables in absolute and relative frequencies. Survival analysis was used to evaluate the time in days until tube removal and its relationship with other variables. This analysis is used when time is the object of interest, whether interpreted as the time until an event occurs or the risk of an event occurring per unit of time. Survival was assessed using Kaplan-Meier graphs, and the curves were compared with the Log-Rank

test. The Cox regression model was used to evaluate the variables that were jointly significant. The analyses were carried out in the Stata software, version 14, considering 20% significance in the univariate analysis, 5% significance in the multivariate analysis, and 95% confidence intervals.

The study was approved by the Research Ethics Committee of the institution, under number 5.077.779, and of the Federal University of Minas Gerais, under number 5.040.543. All participants' parents/guardians signed an informed consent form, and the human research ethical principles were met.

Results

During the data collection period, 62 PTNB underwent SLH assessment and intervention – of which 17 had serious associated pathologies. Therefore, 45 PTNB were included in this study.

The mean age of the mothers of NBs participating in the study was 28.1 years (SD = 7.4), and 28 of them were multiparous (62.2%). Other variables related to the maternal profile, such as education level, type of birth, previous children, and hospital stay are shown in Table 1.

Table 1. Characteristics of the mothers of premature newborns

Variables	n	%
Education level		
Incomplete middle school	3	6.7
Complete middle school	5	11.1
Incomplete high school	11	24.4
Complete high school	22	48.9
Higher education	4	8.9
Delivery		
Normal birth	23	51.1
Cesarean section	22	48.9
Previous children		
Primiparous	17	37.8
Multiparous	28	62.2
Accompanied at the hospital		
No	3	6.7
Yes	35	77.8
Partly	2	4.4
Isolation (COVID-19)	5	11.1

The NBs' mean gestational age at birth was 32.2 weeks (SD = 2.3 weeks) and their mean birth weight was 1,787 g (SD = 493.7 g). Among them, 38 (84.4%) required oxygen therapy for a mean of 7.8 days (SD = 8.8 days), and the main suspected

diagnosis was respiratory distress syndrome in 38 NBs (84.4%).

Data on weight, gestational age, and days of life at the time of oral readiness assessment, nutritive sucking assessment, and tube removal are found in Table 2.

Table 2. Characteristics of the delivery and speech-language-hearing assessment of premature newborns

Variables	Mean	Standard deviation
NB's weight at NNS ¹	1824.4	384.1
NB's gestational age at NNS	33.9	1.3
NB's days of life at NNS	11.1	10.9
NB's weight at NS ²	1836.4	373.9
NB's gestational age at NS	34.0	1.3
NB's days of life at NS	11.8	10.9
NB's weight at the first OF ³	1948.1	326.2
NB's gestational age at the first OF	34.5	1.2
NB's days of life at the first OF	15.7	13.8

¹ Non-nutritive sucking² Nutritive sucking³ Oral feeding

In the assessment of readiness for the oral route, 31 NBs (68.9%) “were ready for the oral route” according to the POFRAS scores. NBs that were not ready (31.1%) needed a mean of 2.9 days to achieve this result.

The mean LATCH score in the first breastfeeding was 5.6 (SD = 2.6).

Concerning oral skill levels measured with the finger feeding technique, 26 NBs (57.8%) were at level 4, that is, of greater maturity for the oral route.

The mean time to achieve the exclusive oral route was 5.5 days (SD = 4.3 days).

The analysis of the transition time from the tube to the oral route per quartile showed that 25% (Quartile 1 – Q1) of the NBs reached the oral route within 2 days, 50% (Q2) reached it within 4 days, 75% (Q3) reached it within 8 days, and 100% (Q4) reached it within 16 days.

Analyzing the transition time for each of the variables using Kaplan-Meier curves, a significant difference was found in gestational age at birth, birth weight, readiness (POFRAS), proficiency (finger feeding), and feeding route at hospital discharge. Hence, these variables entered the multivariate Cox regression model ($p < 0.20$) (Table 3).

Table 3. Analysis of the transition time from feeding tube to oral route and study variables

Variables	p-value
GA ¹	<0.001**
Weight	<0.001**
Readiness for OF ²	0.066*
LATCH	0.246
Oral skill level	0.307
Proficiency	0.116*
Efficiency	0.232
Weight at tube removal	0.244
GA1 at tube removal	0.498
Feeding method at discharge	0.033**

* Significant at 20%. ** Significant at 5%.

¹ GA: gestational age² OF: oral feeding

The survival curves of the statistically significant variables are shown in Figures 1, 2, 3, and 4.

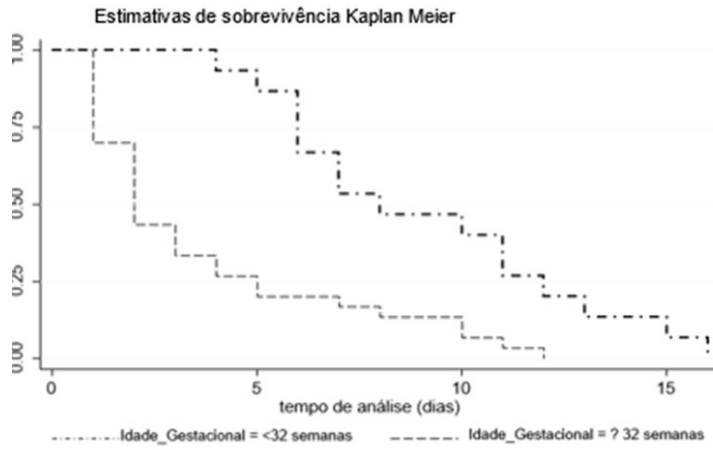


Figure 1. Analysis of survival: transition time from the feeding tube to the oral route and gestational age at birth

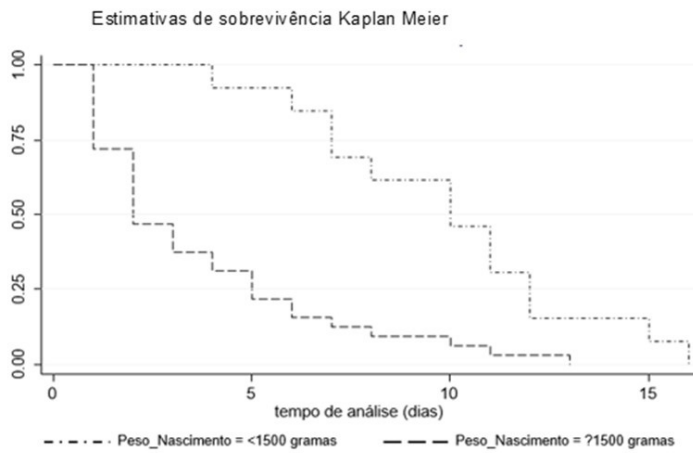


Figure 2. Analysis of survival: transition time from the feeding tube to the oral route nad weight at birth

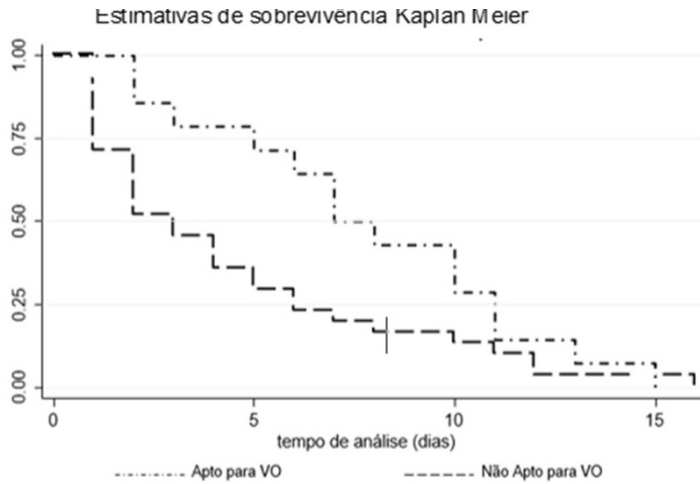


Figure 3. Analysis of survival: transition time from the feeding tube to the oral route and readiness for oral feeding

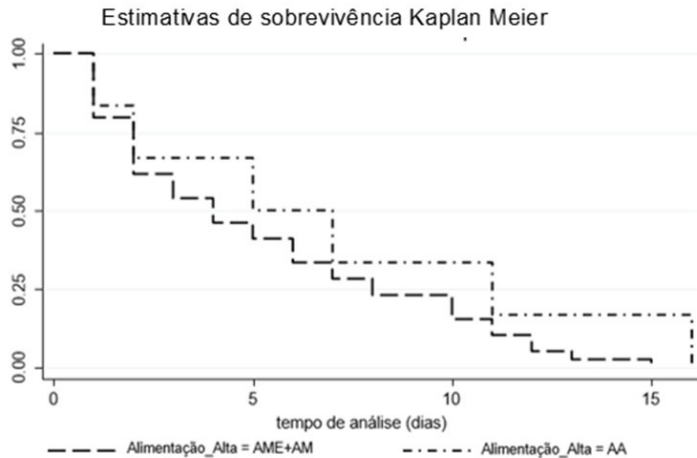


Figure 4. Analysis of survival: transition time from the feeding tube to the oral route and feeding method at hospital discharge

The multivariate Cox regression model is shown in Table 4, indicating that NBs with a gestational age under 32 weeks had a transition time 2.4 times longer than NBs with more than 32 weeks when all the other variables remain constant. Furthermore, NBs weighing under 1,500 g had a transition time 3.6 times longer than NBs weigh-

ing more than 1,500 g. NBs without oral readiness in the assessment had a transition time 2.09 times longer than those that were ready. Finally, NBs who were breastfeeding at discharge, whether exclusively or mixed, reached the oral route 60.1% faster than those who received infant formula at discharge.

Table 4. Results of the cox regression model considering the transition time and variables of the premature newborn and the speech-language-hearing assessment

Variables	Relative risk	Standard error	p-value	RR 95% CI	
GA ¹ (under 32 weeks)	2.34	0.89	0.026	1.11	4.95
Weight (under 1,500 g)	3.98	1.70	0.001	1.72	9.20
Unreadiness for OF ²	2.09	0.76	0.004	1.02	4.26
Feeding (EB+MB) ³	0.39	0.18	0.041	0.16	0.96

¹ Gestational age² Oral feeding³ Exclusive breastfeeding and mixed breastfeeding

At hospital discharge, 25 NBs (55.6%) were on exclusive breastfeeding, 14 (31.1%) on mixed breastfeeding, and six (13.3%) on infant formula.

Discussion

Among the possible limitations of this study, the assessments followed the PTNB routine in the hospital, being carried out at different times, which may have influenced the responses. On the other hand, access to data, the use of standardized assessment instruments, and the maternal presence in most cases were factors that made the study feasible. The strengths of this study include the use of instruments validated in Brazil, which made it possible to measure readiness for the oral route and directly assess breastfeeding. Moreover, the use of NBs' oral skill level classification and the survival analysis indicated significant parameters that can serve as markers of the transition time from the tube to the oral route.

The study identified that gestational age, weight, readiness for the oral route, and the form of feeding at hospital discharge are related to the time to achieve the exclusive oral route in PTNB without associated pathologies.

PTNBs, with their particularities, can have various difficulties regarding the transition process from the tube to the oral route, depending on their clinical characteristics. Therefore, the time spent on this process can be variable, directly impacting the length of hospital stay. This process is a challenge for professionals working in clinical practice¹⁸.

In general, PTNBs require this assistance to transition from the tube to the oral route due to their immaturity and low weight. This study found a predominance of moderately premature NBs (32 to 34 weeks) and low birth weight (between 1,500 g and 2,500 g); the mean age was 32.2 weeks, and

the mean weight was 1,787 g. This predominance can be due to this study's inclusion criteria: PTNB with no associated pathologies. It is known that the lower the gestational age and birth weight, the greater the clinical complications and pathologies in this population, which limited participation in the study¹⁹.

However, 84.4% required oxygen during hospitalization, for a mean of 7.8 days. This can be justified by the high rate of respiratory distress syndrome as the main admission diagnosis. At the time of the SLH assessment, none of the NBs were using supplemental oxygen.

Non-nutritive sucking was assessed at a mean of 33.9 weeks and 1,824.4 g, and most (68.9%) were considered suitable for oral assessment according to the proposed criteria⁷. Thus, the mean gestational age and weight at the date of oral route assessment were very close to those of the non-nutritive sucking (34 weeks and 1,836 g, respectively). NBs that were not suitable for oral administration at the time of the non-nutritive sucking assessment required 2.9 days to reach suitability. This may be due to the maturity of this group considering gestational age, as the literature suggests that the reflexes necessary for feeding and the sucking, swallowing, and breathing coordination are present in NB from 32 to 34 weeks²⁰.

Studies in PTNBs' transition from the tube to the oral route showed variation in weight and gestational age (1,520 to 1,800 g and 33 to 35 weeks), though close to those found in the present study^{13,21-23}. A study that used POFRAS to assess readiness for the oral route identified a mean of 1,888 g and 34.9 weeks to start the oral route²⁴, close to those found in the present study.

Oral route assessment must be safe, using the method most appropriate to NB. The breast is knowingly the most physiological feeding method,

and the transition from the tube directly to the breast can promote breastfeeding²¹. Thus, the preferred initial oral route in the present study was the mother's breast when the mother was present in the hospital. Most mothers (77.8%) remained full-time during NB hospitalization; and among those that were not present or were partially present, half were due to the recommendation of social isolation due to suspected or confirmed diagnosis of COVID-19. It is greatly important to have a welcoming and supportive space for mothers of hospitalized NBs to promote the mother-baby bond. The COVID-19 pandemic has had greater consequences on the lives of these mothers who accompany their NBs in the neonatal unit, making it necessary for the team to provide spaces for active listening and effective information to these mothers²⁵.

It is known that breastfeeding assessment instruments are rarely used in SLH studies, and further research is needed to validate instruments²⁶. The present study used LATCH because it is organized into scores, easy to apply, and validated in Brazil. The mean score in this assessment was 5.9, below that found in a study in premature babies, whose mean score was 7²⁷. Considering that this instrument has a score from 0 to 10, the PTNBs' performance was not satisfactory in the first feeding. It is known that the assessment of oral readiness may not guarantee the success of oral feeding, since other factors are important in nutritive suction, including the coordination of suction, swallowing, and breathing²⁸. When it comes to the mother's breast, this difficulty can be even more evident as it involves several factors related to NBs and postpartum women, who need help and guidance in this process²⁶.

The classification of oral skills into levels has been used in the literature as a simple indicator that quantifies the NB's skill to receive food orally^{23,29}. However, given the particularities involving sucking the mother's breast, it was decided to assess with the finger-feeding technique in this study. Regarding oral skill levels, considering the parameters of proficiency and milk transfer rate, most NBs in the present study were at level 4 (i.e., the most mature), which can be justified by the study population of PTNBs without associated pathologies and, consequently, better clinical conditions. The literature indicates that premature babies can be at any level when evaluated during their first oral feeding, and disparities in oral skills may

even be found in PTNBs of the same gestational age and weight²⁹.

Given this and considering that achieving the exclusive oral route depends on a gradual process in PTNB, the mean time spent in such a process in this study was 5.5 days. This value differs from some studies in the literature that had a higher mean, between 10 and 15 days²¹⁻²³, and corroborates another one whose mean was near the one in this study^{6,30}. It is important to highlight that this difference may be associated with the NBs' profiles, feeding methods, and even the time when the intervention began.

In the present study, NBs with gestational age at birth under 32 weeks had a transition time 2.4 times longer than NBs with more than 32 weeks, and NBs with birth weights below 1,500 g had a transition time 3.6 times greater than NBs above 1,500 g when all other variables were constant. These data corroborate the literature, which identifies that weight and gestational age are inversely correlated with the time needed to reach the oral route^{6,23,31}.

NBs unready for oral feeding in the assessment had a transition time of 2.09 longer than those who were ready when all other variables were constant. These data corroborate a longitudinal study that identified the relationship between readiness for the oral route according to POFRAS and better feeding performance, as well as a shorter transition time from the tube to the oral route³². It also agrees with another study that identified that PTNBs unready according to POFRAS took more days to reach exclusive oral feeding²⁴. It can be suggested that the instrument used to assess readiness addresses important factors for achieving the oral route. Therefore, SLH assessment and intervention are very important for a safe and qualified process.

Finally, most PTNBs were discharged from hospital breastfeeding, whether exclusive or mixed. This variable was significant in relation to the transition time to the oral route, showing that PTNBs who were breastfeeding reached the oral route in less time than PTNBs who were discharged on infant formula. These findings are in line with the literature that identifies an inverse relationship between the presence of breastfeeding and the transition time to oral feeding, reinforcing its importance for mothers and babies²².

Conclusion

The results of this study identified that gestational age at birth under 32 weeks, birth weight under 1,500 g, unreadiness for the oral route in the assessment, and hospital discharge on infant formula are related to the need for a longer transition time from the tube to oral feeding.

Thus, interventions that stimulate the development of oral readiness and oral skill levels during the hospitalization period can help reduce the transition time and encourage breastfeeding, favoring the NBs' health and their bond with their mothers. Moreover, it contributes to early hospital discharge, enabling bed turnover, and ensuring greater access to users of SUS.

References

1. WHO: recommended definitions, terminology and format for statistical tables related to the perinatal period and use of a new certificate for cause of perinatal deaths. *Acta Obstet Gynecol Scand.* 1977; 56(3): 247-53. PMID: 560099.
2. França EB, Lansky S, Rego MAS, Malta DC, França JS, Teixeira R et al. Principais causas da mortalidade na infância no Brasil, em 1990 e 2015: Estimativas do Estudo de Carga Global de Doença. *Rev Bras Epidemiol.* 2017; 20(Suppl 01): 46-60. DOI: <https://doi.org/10.1590/1980-5497201700050005>.
3. WHO. Born Too Soon: The Global Action Report on Preterm Birth [homepage na Internet]. Geneva: World Health Organization; 2012 [acesso em 2021 dez 12]. Disponível em: https://www.who.int/pmnch/media/news/2012/201204_borntoosoon-report.pdf.
4. Caetano LC, Fujinaga CI, Scochi CGS. Sucção não-nutritiva em bebês prematuros: estudo bibliográfico. *Rev Lat Am Enfermagem.* 2003;11(2): 232-6. DOI: <https://doi.org/10.1590/S0104-11692003000200014>.
5. Delgado SE, Halpern R. Amamentação de prematuros com menos de 1500 gramas: funcionamento motor-oral e apego. *Pro Fono.* 2005; 17(2): 141-52. DOI: <https://doi.org/10.1590/S0104-56872005000200003>.
6. Scochi CGS, Gauy JS, Fujinaga CI, Fonseca LMM, Zamberlan NE. Transição alimentar por via oral em prematuros de um Hospital Amigo da Criança. *Acta Paulista de Enfermagem.* 2010; 23(4): 540-5. DOI: <https://doi.org/10.1590/S0103-21002010000400015>.
7. Fujinaga CI, Zamberlan NE, Rodarte MDO, Scochi CGS. Confiabilidade do instrumento de avaliação da prontidão do prematuro para alimentação oral. *Pro Fono.* 2007; 19(2): 143-50. DOI: <https://doi.org/10.1590/S0104-56872007000200002>.
8. Neiva FCB, Leone CR. Efeitos da estimulação da sucção não-nutritiva na idade de início da alimentação via oral em recém-nascidos pré-termo. *Rev Paul Pediatr.* 2007; 25(2): 129-34. DOI: <https://doi.org/10.1590/S0103-05822007000200006>.
9. Wahyuni LK, Mangunatmadja I, Kaban RK, Rachmawati EZK, Harini M, Laksmiastari B, Nugraha B. Factors Affecting Oral Feeding Ability in Indonesian Preterm Infants. *Pediatr. Rep.* 2022; 14: 233-243. DOI: <https://doi.org/10.3390/pediatric14020031>
10. Griffith TT, Bell AF, Vincent C, White-Traut R, Medoff-Cooper B, Rankin K. Oral Feeding Success: A Concept Analysis. *Adv Neonatal Care.* 2019; 19(1): 21-31. <https://doi.org/10.1097/ANC.0000000000000540>.
11. Crowe L, Chang A, Wallace K. Instruments for assessing readiness to commence suck feeds in preterm infants: effects on time to establish full oral feeding and duration of hospitalization. *Cochrane Database Syst Rev.* 2016(8):1-21. DOI: <https://doi.org/10.1002%2F14651858.CD005586.pub3>.
12. Briere CE, McGrath J, Cong X, Cusson R. State of the Science: A contemporary review of feeding readiness in the preterm infant. *J Perinat Neonatal Nurs.* 2014; 28(1): 51-8. DOI: <http://dx.doi.org/10.1097/JPN.0000000000000011>. PMID:24476652.
13. Medeiros AM, Sá TPL, Avelos CL, Novais DFS. Intervenção fonoaudiológica na transição alimentar de sonda para peito em recém-nascidos do Método Canguru. *Audiology - communication research.* 2014; 19(1): 95-103. DOI: <https://doi.org/10.1590/S2317-64312014000100016>.
14. Fleiss JL. Statistical methods for rates and proportions. 2nd ed. New York: John Wiley and Sons; 1981.
15. Conceição CM, Coca KP, Alves MRS, Almeida FA. Validação para língua portuguesa do instrumento de avaliação do aleitamento materno LATCH. *Acta Paulista de Enfermagem.* 2017; 30(2): 210-6. DOI: <https://doi.org/10.1590/1982-0194201700032>.
16. Lau C, Smith EO. A novel approach to assess oral feeding skills of preterm infants. *Neonatology.* 2011; 100(1): 64-70. DOI: <https://doi.org/10.1159/000321987>.
17. Otto DM, Almeida ST. Desempenho da alimentação oral em recém-nascidos prematuros estimulados pela técnica treino de deglutição. *Audiol, Commun Res.* 2017; 22: e1717. DOI: <https://doi.org/10.1590/2317-6431-2016-1717>.
18. Nunes JA, Bianchini EMG, Cunha MC. Saturação de oxigênio e frequência cardíaca em prematuros: comparação entre as técnicas de copo e sonda-dedo. *Codas.* 2019; 31(6): e20180221. DOI: <https://doi.org/10.1590/2317-1782/20192018221>.
19. Chalfun G, Mello RR, Dutra MVP, Andreozzi VL, Silva KS. Fatores associados à morbidade respiratória entre 12 e 36 meses de vida de crianças nascidas de muito baixo peso oriundas de uma UTI neonatal pública. *Cad Saude Publica.* 2009; 25(6): 1399-408. Disponível em: <https://www.scielosp.org/pdf/csp/v25n6/22.pdf>.
20. Moura LTL, Tolentino GM, Costa TLS, Aline A. Atuação fonoaudiológica na estimulação precoce da sucção não-nutritiva em recém-nascidos pré-termo. *Revista CEFAC.* 2009; 11(3): 448-56. DOI: <https://doi.org/10.1590/S1516-18462009000700021>.
21. Medeiros AMC, Oliveira ARM, Fernandes AM, Guardachoni GAS, Aquino JPSP, Rubinick ML et al. Caracterização da técnica de transição da alimentação por sonda enteral para seio materno em recém-nascidos prematuros. *J Soc Bras Fonoaudiol.* 2011; 23(1): 57-65. DOI: <http://dx.doi.org/10.1590/S2179-64912011000100013>. PMID: 21552734.

22. Medeiros AMC, Ramos BKB, Bomfim DLSS, Alvelos CL, Silva TC, Barreto IDC et al. Tempo de transição alimentar na técnica sonda-peito em recém-nascidos baixo peso do Método Canguru. *Codas*. 2018; 30(2): e20170092. DOI: <https://doi.org/10.1590/2317-1782/20182017092>.
23. Yamamoto RCC, Prade LS, Berwig LC, Weinmann ARM, Keske-Soares M. Parâmetros cardiorrespiratórios e sua relação com a idade gestacional e nível de habilidade de alimentação oral de recém-nascido pré-termo. *Codas*. 2016; 28(6): 704-9. DOI: <https://doi.org/10.1590/2317-1782/20162014221>.
24. Yamamoto RCC, Prade LS, Bolzan GP, Weinmann ARM, Keske-Soares M. Prontidão para início da alimentação oral e função motora oral de recém-nascidos pré-termo. *Revista CEFAC*. 2017; 19(4): 503-9. DOI: <https://doi.org/10.1590/1982-0216201719411616>.
25. Rocha ALS, Dittz ES. As repercussões no cotidiano de mães de bebês internados na Unidade de Terapia Intensiva Neonatal no isolamento social devido à COVID-19. *Cadernos Brasileiros de Terapia Ocupacional*. 2021; 29: e2158. DOI: <https://doi.org/10.1590/2526-8910.ctoAO2158>.
26. Oliveira FBN, Fernandes CP, Gurgel LG, Fujinaga CI, Almeida ST. Protocolos de avaliação da amamentação e Fonoaudiologia: uma revisão integrativa da literatura. *Revista CEFAC*. 2019; 21(5): e14018. DOI: <https://doi.org/10.1590/1982-0216/201921514018>.
27. Altuntas N, Kocak M, Akkurt S, Razi HC, Kislal MF. LATCH scores and milk intake in preterm and term infants: a prospective comparative study. *Breastfeed Med*. 2015;10(2): 96-101. DOI: 10.1089/bfm.2014.0042. PMID: 25548967.
28. Prade LS, Bolzan GP, Weinmann ARM. Influência do estado comportamental nos padrões de sucção de recém-nascidos pré-termo. *Audiology - communication research*. 2014; 19(3): 230-5. DOI: <http://dx.doi.org/10.1590/S2317-64312014000300005>.
29. Lau C. To individualize the management care of high-risk infants with oral feeding challenges: What do we know? What can we do? *Front Pediatr*. 2020; 8: 296. DOI: 10.3389/fped.2020.00296.
30. Moreira CMD, Cavalcante-Silva RPGV, Miyaki M, Fujinaga CI. Efeitos da estimulação da sucção não nutritiva com dedo enluvado na transição alimentar em recém-nascido prematuro de muito baixo peso. *Revista CEFAC*. 2014;16(4): 1187-93. DOI: <https://doi.org/10.1590/1982-0216201424212>.
31. Cardoso FS, Pereira DX, Souza DLB, Cavalcanti RVA. Development of oral sensory-motor functions of preterm and low-birth-weight newborns under speech-language pathology care. *Rev Logop Foniatr Audiol*. 2019; 39(1): 4-10. DOI: <https://doi.org/10.1016/j.rlfa.2018.09.004>.
32. Prade LS, Bolzan GP, Berwig LC, Yamamoto RCC, Vargas CL, Silva AMT et al. Relação entre prontidão para início da alimentação oral e desempenho alimentar em recém-nascidos pré-termo. *Audiology - communication research*. 2016; 21: e1662. DOI: <https://doi.org/10.1590/2317-6431-2015-1662>.



This work is licensed under a Creative Commons Attribution 4.0 International License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.