

Systematic Review

Revisão Sistemática

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Preterm newborn readiness for oral feeding: systematic review and meta-analysis

Prontidão do recém-nascido prematuro para a alimentação oral: revisão sistemática e metanálise

ABSTRACT

Purpose: To identify and systematize the main studies on the transition from enteral to oral feeding in preterm infants. **Research strategy:** Articles that describe the transition from oral to enteral feeding in preterm infants were located in MEDLINE, LILACS, and SciELO databases. **Selection criteria:** Original studies, with available abstract, published in the last 10 years were included. **Data analysis:** Analysis of the methodology and the main results of the studies, and meta-analysis of the effects of sensory-motor-oral stimulation at the time of transition to full oral feeding and duration of hospitalization were conducted. **Results:** Twenty-nine national and international publications were considered. Most studies were clinical trials (44.8%) and did not use rating scales to start the transition process (82.7%). In the meta-analysis, positive effect of stimulation of the sensory-motor-oral system was observed with respect to the transition time to oral diet ($p=0.0000$), but not in relation to the length of hospital stay ($p=0.09$). However, heterogeneity between studies was found both in the analysis of the transition time to full oral feeding ($I^2=93.98$) and in the length of hospital stay ($I^2=82.30$). **Conclusion:** The transition to oral feeding is an important moment, and various physical and clinical characteristics of preterm infants have been used to describe this process. Despite the impossibility of generalizing the results due to the heterogeneity of the studies, we have noted the importance of strategies for stimulation of sensory-motor-oral system to decrease the period of transition to full oral feeding system.

RESUMO

Objetivos: Identificar e sistematizar os principais estudos sobre a transição da alimentação enteral para alimentação oral em prematuros. **Estratégia de pesquisa:** Foram localizados artigos que descrevem a transição da alimentação enteral para oral em prematuros, nas bases MEDLINE, LILACS e SciELO. **Crítérios de seleção:** Foram incluídos estudos originais, com resumo disponível, publicados nos últimos dez anos. **Análise dos dados:** Foi realizada análise da metodologia e dos principais resultados dos estudos, além de metanálise dos efeitos da estimulação sensório motora oral no tempo de transição para alimentação oral plena e no tempo de permanência hospitalar. **Resultados:** Foram consideradas 29 publicações, nacionais e internacionais. A maioria dos estudos foi composta por ensaios clínicos (44,8%) e não utilizou escalas de avaliação para iniciar o processo de transição (82,7%). Na metanálise, observou-se que o efeito das estimulações do sistema sensório motor oral é positivo em relação ao tempo de transição para a dieta oral plena ($p=0,000$), mas não em relação ao tempo de permanência hospitalar ($p=0,09$). No entanto, foi encontrada grande heterogeneidade entre estudos, tanto na análise do tempo de transição para alimentação oral plena ($I^2=93,98$) quanto em relação ao tempo de permanência hospitalar ($I^2=82,30$). **Conclusões:** A transição para alimentação oral é um momento importante e várias características físicas e clínicas dos prematuros têm sido utilizadas para descrever esse processo. Apesar da impossibilidade de generalização dos resultados devido à heterogeneidade dos estudos, observou-se a importância de estratégias de estimulação do sistema sensório motor oral para a diminuição do período de transição até a alimentação oral plena.

Study carried out at the Universidade Federal de Minas Gerais – UFMG – Belo Horizonte (MG), Brazil.

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INTRODUCTION

Prematurity may be understood as a risk condition for the newborn (NB), once the anatomical and physiological immaturity associated to preterm birth predisposes the NB to a series of difficulties in adapting to their postnatal life⁽¹⁾. It is common that, in the beginning of life, the preterm newborn (PTNB) is not able to feed orally, being necessary the use of alternative feeding methods until they are able to take up oral feeding⁽²⁾.

Some characteristics are described as associated to difficulties in establishing oral feeding for PTNB, such as physiological and neurological immaturity, muscle hypotonia, hyperreactivity to environmental stimuli, instability controlling body temperature, respiratory disorders, short alertness periods, cardiorespiratory syndromes, and alterations. Besides, the immaturity of the sensory-oral-motor system is common, which may lead to an inability to suck and/or coordinate the functions of sucking, swallowing, and breathing, with a negative impact on the oral feeding skills⁽³⁻⁵⁾.

As a result, the PTNB are traditionally fed by gavage until they are able to successfully feed orally^(3,6). The process of transition from gastric to oral feeding is one of the great challenges the PTNB must overcome after achieving their physiological stability. The difficulty in the process of transition from enteral to oral feeding occurs in more than 30% preterms⁽⁷⁾.

In clinical practice, it is noticeable that there is a difficulty in pinpointing the ideal moment to start the transition from gastric to oral feeding. The process of transition to oral feeding is carried out in a rather distinct way between the services of care to PTNB, and little is known about the techniques and dietary intake routes used during the transition periods⁽⁸⁾. It is observed that, many times, the main indicators used for the transition from gastric to oral feeding are physical and isolated criteria, such as gestational age (GA), the corrected one, and the weight⁽⁹⁾. However, these criteria alone may be incomplete to indicate the readiness for oral feeding, suggesting other factors such as oxygen saturation and heart rate during feeding, clinical stability degree, maturity, and the performance of the NB in nonnutritive sucking (NNS)⁽¹⁰⁾.

The decision about the moment when to start weaning from the probe still does not show unanimous answers, being necessary the participation of the whole team in the definition of the criteria. Evaluation protocols were created to aid professionals in taking the decision when to start oral feeding⁽¹¹⁻¹⁵⁾.

The American Academy of Pediatrics defines the ability of full oral feeding as one of the criteria for hospital discharge of the PTNB⁽¹⁶⁾. The early start of oral feeding in the PTNB brings economic benefits as well as physical and emotional ones to the NB, among which, the reduction of time using gastric prone and, consequently, of complication resulting from its use⁽¹⁷⁾.

Some strategies are used to improve motor and oral abilities of the PTNB, such as the NNS and oral stimulation programs. These techniques are described as important by contributing for the PTNB to achieve independent oral feeding earlier in time, reducing hospitalization time, reducing hospital medical costs, and allowing greater interaction and mother-child bond⁽¹⁸⁻²⁷⁾.

Thus, understanding the behavior of the PTNB at the moment of transition from enteral to full oral feeding and promoting oral feeding at appropriate and safe moments must be the objectives of the teams assisting the PTNB.

This systematic review was carried out with the objective of identifying and systematizing the main studies describing the process of transition from enteral to full oral feeding in the PTNB and verifying the impact of interventions on the motor and oral sensorial system on the time of transition to full oral feeding and on the time of hospital permanence.

RESEARCH STRATEGY

This is a systematic literature review, whose methodology was based on previous studies^(28,29) and on recommendations on the theme^(30,31).

Searches were conducted in the BIREME virtual library for access to the scientific database of LILACS, at PubMed for access to indexed journals in MEDLINE, besides researches in SciELO database. The search strategies used for each database are given in Table 1. For the management of references, the EndNote Web 3.1 tool was used.

After locating the studies, a screening process was performed from the title and abstract of the articles, a process carried out by two speech language pathologist evaluators, independently.

SELECTION CRITERIA

The studies that met the following criteria were included: being original with available abstract; having been published in Portuguese, Spanish, or English; describing the moment of transition from enteral to oral feeding in the PTNB; and having been published within the last years (2003 to 2012).

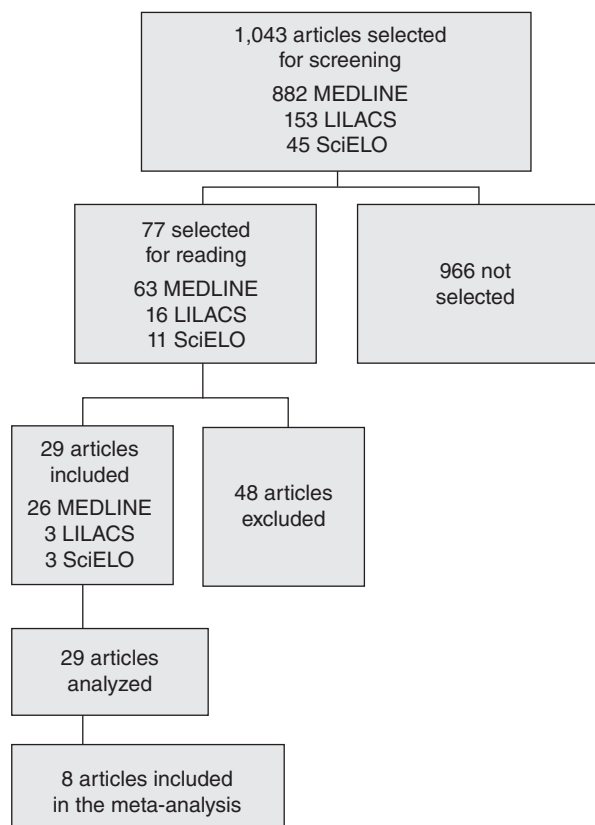
Theoretical and review articles were excluded, along with articles evaluating the PTNB who had already initiated oral feeding (Figure 1).

The articles should fulfill the inclusion criteria, considering that each inclusion or exclusion question of the article allowed, from evaluators, three answers: yes, no, and maybe. When the article obtained only "yes" and/or "maybe" answers by both evaluators, then the publication was included. However, obtaining "no" answers by both evaluators led to the exclusion of the article from the analysis. The results from both evaluators were compared and, in the cases with disagreement as for the inclusion or exclusion of an article, a consensus meeting was carried out. In case of no consensus, it would be requested that the article was assessed by a third evaluator. To assess the agreement among investigators at the moment of selection of the articles, a reliability analysis was performed (Kappa)⁽¹²⁾. For the articles selected in the screening, we continued with their complete reading and data collection. Finally, an analysis and discussion of the data obtained was performed, in addition to the meta-analysis of clinical trials in relation to the motor and oral sensorial stimulation effect in the days of transition to full oral feeding and time of hospitalization.

All necessary information for the analysis of the articles were collected and registered, such as researched database,

Table 1. Strategies of search in databases, performed in the months of April and May 2012

Database	Search strategy
MEDLINE	("Sucking Behavior"[Mesh] OR "Feeding Behavior"[Mesh:noexp] OR "Deglutition"[Mesh] OR "Bottle Feeding"[Mesh] OR "Breast Feeding"[Mesh] OR "Infant Nutritional Physiological Phenomena"[Mesh:noexp] OR "Sucking Behaviors" OR "Feeding Patterns" OR "Eating Behavior" OR "Feeding Behaviors" OR Deglutitions OR Swallowing OR Bottle feeding OR Breast feeding) AND ("Infant, Premature"[Mesh] OR Premature OR Prematurity OR preterm) AND (english[Language] OR portuguese[Language] OR spanish[Language]) NOT (review[Publication Type] OR systematic review[Publication Type] OR meta analysis[Publication Type] OR meta-analysis[Publication Type]) NOT (infection[Title/Abstract] OR surger*[Title/Abstract] OR virus*[Title/Abstract] OR bacteria*[Title/Abstract]) AND ("2003"[Date - Publication]: "3000"[Date - Publication])
LILACS	("Comportamento de Sucção" OR "Comportamento Alimentar" OR Deglutição OR "Alimentação Artificial" OR "Aleitamento Materno" OR Mamadeira OR "Fenômenos Fisiológicos da Nutrição do Lactente" OR "Conducta en la Lactancia" OR "Conducta Alimentaria" OR "Conduta an Alimentação" OR "Padrões Alimentares" OR "Eating Behavior" OR "Feeding Patterns" OR Deglución OR "Alimentación Artificial" OR "Lactancia Materna" OR Amamentação OR Biberones OR "Sucking Behavior" OR "Feeding Behavior" OR "Deglutition" OR "Bottle Feeding" OR "Breast Feeding" OR "Infant Nutritional Physiological Phenomena" OR "Sucking Behaviors" OR "Feeding Patterns" OR "Eating Behavior" OR "Feeding Behaviors" OR Deglutition OR Swallowing OR "Bottle feeding" OR "Breast feeding") AND ("Prematuro" OR Prematur\$ OR preterm) AND (da:2003\$ or da:2004\$ or da:2005\$ or da:2006\$ or da:2007\$ or da:2008\$ or da:2009\$ or da:2010\$ or da:2011\$ or da:2012\$) AND LA:(ES OR PT OR EN)
SciELO	("Comportamento de Sucção" OR "Comportamento Alimentar" OR "Deglu\$" OR "Alimentação Artificial" OR "Aleitamento Materno" OR "Mamadeira" OR "Fenômenos Fisiológicos da Nutrição do Lactente" OR "Conducta en la Lactancia" OR "Conducta Alimentaria" OR "Conduta na Alimentação" OR "Padrões Alimentares" OR "Eating Behavior\$" OR "Feeding Pattern\$" OR "Alimentación Artificial" OR "Lactancia Materna" OR "Amamentação" OR "Biberones" OR "Sucking Behavior" OR "Breast Feeding" OR "Infant Nutritional Physiological Phenomena" OR "Sucking Behaviors" OR "Feeding Behavior\$" OR "Swallowing" OR "Bottle feeding") [Assunto] and (Prematur\$ OR preterm) [Assunto] and 2003 or 2004 or 2005 or 2006 or 2007 or 2008 or 2009 or 2010 or 2011 or 2012 [Ano de publicação]

**Figure 1.** Stages in the selection of the articles

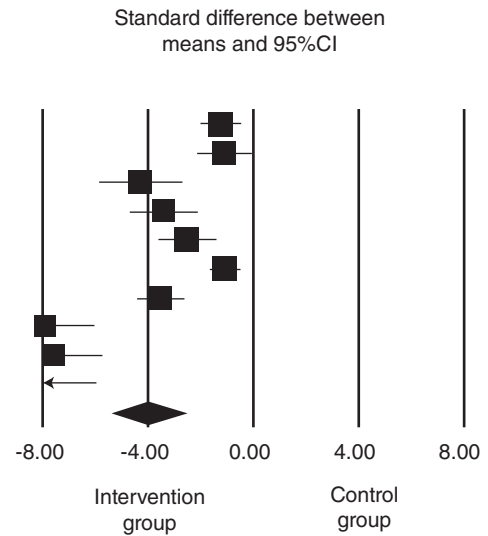
name of the article and first author, year of publication, design of the study, objective of the study, place where it was conducted, and use of assessment scales.

As for the results found in the articles, we collected information on the sample size and on the profile of the NB, such as gender, GA at birth, birth weight, Apgar 5-minute score, and number of days in mechanical ventilation (MV). Besides, we collected data on the process of transition from enteral to full oral feeding, such as corrected GA and weight at the time of the first oral feeding, indicators of the abilities in oral feeding, such as proficiency (amount of milk consumed within the first 5 minutes/total milk volume), efficiency (mL/min) and consumption (amount of milk consumed/prescribed amount of milk), corrected GA and weight in full oral diet, corrected GA and weight at hospital discharge, number of days until full transition to full oral feeding, and kind of feeding at discharge, besides weight gain during the entire transition process.

DATA ANALYSIS

To evaluate the agreement among the investigators, a reliability analysis was performed, resulting in Kappa (k) of 0.59, a reliability considered as moderate⁽³²⁾. There was a disagreement among evaluators in 85 studies and, after the consensus meeting, 77 articles were included for complete reading and 29 were included in the final analysis. The data were analyzed in two stages. First, a descriptive analysis of the methodology and results was performed. Up next, a meta-analysis of the clinical trial studies was made, with the objective of verifying the impact

Study	Statistic for each study					
	Standard difference in means	Standard error	Variance	95%CI	Z-score	p-value
Fucile, 2005	-1.228	0.385	0.149	-1.983—0.472	-3.186	0.001
Lessen, 2011	-1.103	0.493	0.243	-2.070—0.137	-2.237	0.025
Boiron, 2007 (GE 1)	-4.287	0.813	0.661	-5.881—2.693	-5.271	0.000
Boiron, 2007 (GE 2)	-3.423	0.669	0.448	-4.735—2.111	-5.114	0.000
Boiron, 2007 (GE 3)	-2.498	0.557	0.310	-3.589—1.407	-4.487	0.000
Lau, 2012 (GE 1)	-1.056	0.308	0.095	-1.661—0.452	-3.426	0.001
Lau, 2012 (GE 2)	-3.523	0.476	0.227	-4.456—2.589	-7.397	0.000
Fucile, 2011 (GE 1)	-7.927	0.953	0.908	-9.795—6.059	-8.318	0.000
Fucile, 2011 (GE 2)	-7.620	0.932	0.869	-9.447—5.792	-8.172	0.000
Fucile, 2011 (GE 3)	-8.767	1.057	1.117	-10.838—6.695	-8.296	0.000
Random effect model	-3.970	0.720	0.518	-5.381—2.560	-5.517	0.000



Caption: SG = stimulation group; 95%CI: confidence interval of 95%
Figure 2. Forest-plot of transition time to full oral feeding

of the interventions in the motor and oral sensorial system on the time of transition to full oral feeding and on the time of permanence in the hospital. The Stata 10 and Comprehensive Meta-Analysis software were used⁽³³⁾. The model of random effects was adopted for presenting a more conservative estimate than the models of fixed effects. The forest-plot graphic was used to summarize the estimates. The Q test and the I² index were used to evaluate the heterogeneity among studies and their magnitude, respectively. Percentages of the I² index of approximately 25% (I²≤25), 50% (25<I²<75), and 75% (I²≥75) were considered, respectively, low, medium, and high heterogeneity. The results presenting significance level ≤0.05 were considered statistically significant associations.

RESULTS

Among the 1,043 articles located for screening, 77 were selected for a complete reading and after this reading, 48 articles were excluded. Most excluded articles did not evaluate the moment of transition to oral feeding or the NB participants in the researches had already received oral feeding. The final sample included 29 articles, with 12 articles published between 2003 and 2007^(10,20,21,23,34-41) and 17 published between 2008 and 2012^(8,22,24-27,42-52).

Characteristics of the publications

Among the articles selected for screening, 41.2%^(20-25,27,34-39,41-52) of the ones from the MEDLINE research were included in the final analysis, 27.3%^(10,26,42) from SciELO, and 18.7%^(8,10,48) from LILACS. Of 29 publications, 86.2% were in English^(20,21,23-25,27,34-36,38-41,43-52) and 13.8% in Portuguese^(8,10,26,42). No publications in Spanish were found. The countries with the higher number of publications were the following: the United States, with 16 publications^(20-22,24,25,35-41,44,47,49,52), Brazil with

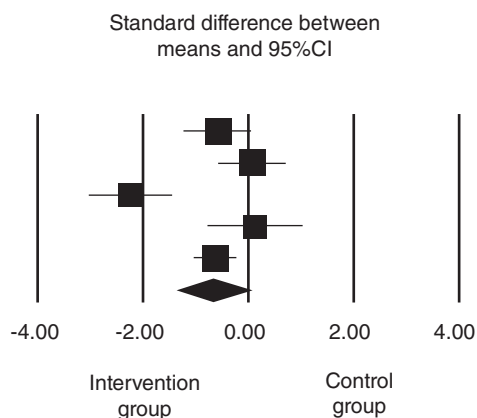
7^(8,10,26,42,48), and Swede with 2^(46,50). The size of the samples varied from 15 to 472 PTNB. This important number of studies carried out in Brazil (24.1%) may have been because searches in the LILACS (of Latina American journals) and SciELO databases were performed.

In relation to the design of the selected studies, it was observed that 44.8% were clinical trials (13 studies)^(10,20-27,34,41,51,52), 31.0% were retrospective studies (9 studies)^(8,35,37,40,42-45,50), 20.7% were prospective studies (6 studies)^(36,38,39,46-48), and 3.5% were cross-sectional studies (1 study)⁽⁴⁹⁾. Therefore, it is observed that most studies consisted of clinical trials. Knowing that the acquisition of full oral feeding is one of the criteria for hospital discharge and for the reduction of hospitalization costs and improvement of the mother/NB bond, several studies have been proposed in search of efficient strategies so that full oral feeding is acquired in an earlier and safer moment.

Most studies (82.7%) did not use standardized evaluation scales to determine whether the PTNB was able to take up on oral feeding at the moment of the evaluation. In these studies, the decision of beginning oral feeding was from doctors and legal guardians or defined rules were used to carry out the transition. The most often used scales in the studies (five studies) were the following: Neonatal Oral-Motor Assessment Scale (NOMAS)⁽³⁵⁾, Preterm Infant Breastfeeding Behavior Scale (PIBBS)⁽⁴⁶⁾, Clinical Pathway⁽²⁰⁾, and the scale of the stages of suction⁽²¹⁾.

Therefore, despite being available in the literature, standardized protocols, with tested discriminatory reliability and validity⁽¹¹⁻¹⁵⁾, in most studies, they were not used. Health services often use strict protocols, with previously established rules, which do not evaluate the particular development of each NB, which many times results in delays in starting oral diets and in the evolution to full oral feeding. It is believed that the use of validated scales provides a transition from prone to oral diets in a safer and sooner way, reducing the risks for the health of the PTNB^(9,11,12,14).

Study	Standard difference in means	Standard error	Statistic for each study			
			Variance	95%CI	Z-score	p-value
Fucile, 2011 (GE 1)	-0.538	0.326	0.106	-1.177-0.101	-1.650	0.099
Fucile, 2011 (GE 2)	0.126	0.325	0.106	-0.511-0.764	0.388	0.698
Fucile, 2011 (GE 3)	-2.178	0.410	0.168	-2.981-1.374	-5.313	0.000
Lessen, 2011	0.177	0.460	0.212	-0.725-1.080	0.385	0.700
Rocha, 2007	2.577	0.206	0.043	-0.981-0.173	-2.798	0.005
Random effect model	-0.591	0.349	0.122	-1.275-0.093	-1.693	0.090



Caption: SG = stimulation group; 95%CI: confidence interval of 95%
Figure 3. Forest-plot of hospital permanence time

Variables used in the description of the transition process to oral feeding

Different physical and clinical characteristics of the PTNB were described during the process of transition from enteral to oral feeding: GA and weight at the time of the first oral feeding and in full oral feeding, efficiency, proficiency, and consumption in the first oral feeding, type of feeding at the time of hospital discharge, transition techniques into oral feeding, GA, weight, and days of life at the time of hospital discharge, and weight gain during the transition process to oral feeding.

In relation to the characterization of samples of the PTNB included in the studies, it was observed that all studies described the GA and birth weight of the included NB. The average GA at birth varied from 25.6 to 39.1 weeks and the average weight at birth varied from 815 to 3,564 grams (some studies included compared PTNB to regular NB, justifying the variability of GA and birth weight). The number of days in which NB remained in MV was a variable described in few studies (13.8%)^(37,46,47,50), as well as the 5-minute Apgar described only in 17.2% studies^(8,21,27,44,47).

The average corrected GA at the moment of the beginning of oral feeding was described in 96.5% studies^(8,10,18,20-26,34,39,41-47,48,50-52), varying from 27.6 to 36.4 weeks. The weight at the moment of the beginning of oral feeding was described in 44.8% studies^(8,21-23,26,27,34,35,37,39,40,43,48), varying from 1,500 to 2,065 grams.

The number of days of life when oral feeding was initiated was described in 41.3% studies^(22,25,26,34,36,39,40,43,46,49-51). Eleven studies used the measuring of skills for oral feeding (proficiency and/or efficiency) in the description of the transition process to oral feeding^(22,25,26,34,36,39,40,43,46,49-51).

The use of proficiency and/or efficiency measures was observed in 37.9% studies. The higher prevalence of observations of the abilities of oral feeding in the evaluation of the results in oral feeding may be justified by the ease of use of these criteria. Lau et al.⁽⁵³⁾ and Lau and Smith⁽⁵⁴⁾ defined the levels of oral feeding abilities from the observation of the combination between proficiency and efficiency, contributing to

the determination of the development stage of abilities for oral feeding and facilitating the use of appropriate strategies to stimulate the motor and oral sensorial system. Owing to the ease to apply the evaluation, without the need of using specific tools, these evaluation criteria regarding the prematurity in the transition process to full oral feeding have been greatly used.

Due to the differences in relation to the methodology of the studies, some moments it was difficult to compare the results found. Besides, some of the studies included for the analysis of the methodology did not present important data, such as weight at the moment of the beginning of full oral feeding, number of days until full oral feeding, and corrected GA in full oral feeding.

In clinical trial studies, the effect of stimulation to the motor and oral sensorial system and other clinical approaches during the time of hospital permanence was compared, such as for the gain of weight during the transition process, efficiency, proficiency and consumption during feeding, in the stage and extent of suction, in frequency of suction and expression, in the duration of suction groups and feeding, in the number of adverse events during feeding, in the behavioral state, and in the behaviors of readiness to oral feeding, besides the volume of milk wasted during feeding^(10,20-27,34,41,51,52).

The NB in the groups who had their motor and oral sensorial system stimulated had significantly better results regarding feeding efficiency^(21,22,41,52), proficiency⁽²²⁾, consumption^(21,22,52), stage of suction^(25,52), duration of feeding^(41,52), time of hospital permanence^(27,34,51), adverse events during feeding⁽⁵¹⁾, readiness behaviors⁽⁴¹⁾, and volume of milk wasted during feeding⁽²²⁾.

For the meta-analysis of the effects of stimulation of the motor and oral sensorial system in the number of days for the complete transition to oral feeding, five studies were included⁽²¹⁻²⁵⁾. For the meta-analysis of stimulation effects of the motor and oral sensorial system at the time of hospitalization, three studies were included^(22,24,34).

In Figure 2, we observe a forest-plot graphic in which each line represents a study. For the studies that used more than one intervention group, we opted for performing the isolated

analysis of each experimental group in relation to the control group of the study and, therefore, some studies are described in more than one line of the graphic due to the existence of more than one intervention group. The squares represent the standard difference between the averages in relation to the number of days for the transition to full oral feeding and the lines, their confidence intervals (CI). In the last line, represented by a rhombus, it is verified that, in the combinations of the results of the studies, there is statistical significance, showing that the NB who received some kind of motor and oral sensorial stimulation had a shorter time of transition to full oral feeding than the ones who did not have any kind of stimulation. However, there was a great heterogeneity among studies ($Q=149.69$; $p=0.000$; $I^2=93.98$).

Figure 3 also shows a forest-plot graphic, in which each line represents an included study. Similar to Figure 2, some studies are described in more than one line because they presented more than one experimental group. The squares represent the standard difference among the averages in relation to the time of hospital permanence (days) and the lines, their GA. In the last line, represented by a rhombus, in the combination of results, it is verified that there was no statistical significance because the GA goes through zero and the p-value was 0.09. Besides, a great variability was observed among studies, with values of $Q=22.60$ and $I^2=82.30$.

A great heterogeneity among studies was observed, both for the analysis of the transition time to full oral feeding and in relation to the time of hospital permanence. This high variation was due to methodological differences, limiting generalization of the estimates. The studies included used different types of stimuli, with suction and swallowing exercises, motor and oral support, and peri- and intraoral muscle stimulation, with frequency and intensity varying among groups, making the comparison among them impossible^(21,22,24,25,34). However, despite the impossibility of generalization of the results due to the heterogeneity of the studies, the importance of strategies of stimulation of the motor and oral sensorial system was observed to reduce the transition period to full oral feeding.

CONCLUSION

From this systematic review, it was possible to understand the complexity of the process of transition from enteral to oral feeding. From the analysis of the variables described in the studies, the variability of indicators related to the process of transition to oral feeding and the importance of using standardized evaluations for the aid of health care teams in determining the appropriate and safe moment for the NB to take up oral feeding, still underused, were verified.

Besides, despite the impossibility of generalization of results due to the heterogeneity of the studies, in the meta-analysis, we observed the importance of strategies for the stimulation of the motor and oral sensorial system for the anticipation of the transition period to full oral feeding, with consequent decrease of the hospital time of permanence and costs. It is suggested that future studies comparing the effects of similar interventions

in relation to the kind of stimuli and stimulation time length are carried out.

**AHL and MGC were responsible for the collection and tabulation of the data, and writing and preparation of the manuscript; AALF and MCFB monitored the collection and analysis of the data, orienting the stages of execution and preparation of the manuscript.*

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