

The oral ability of premature children with regard to breastfeeding under the light of the Theory of Causation

Habilidade oral do prematuro na prática da amamentação à luz da Teoria da Causalidade
Capacidad oral del prematuro en la práctica de la lactancia a la luz de la Teoría de la Causalidad

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ABSTRACT

Objective: To reflect on the repercussions of premature babies' oral ability concerning breastfeeding, under the light of the theory of causation. **Methods:** Theoretical production of reflections based on Hobbes's theory of causation. **Results:** The study addresses the understanding of oral abilities as the main accident regarding the capacity of the premature newborn, which, coupled with other accidents that make up the other domains, concerning breastfeeding, is an integral cause of the phenomenon. **Final considerations:** Although there are protocols, even if some of them are inconsistent or incomplete, the use of criteria such as weight and gestational age as standards to understand this readiness can still be observed. However, the effect manifests itself even in the absence of these accidents, showing them as partial causes of the phenomenon, while oral ability is, by itself, a necessary cause for this event to take place. **Descriptors:** Philosophy; Nursing; Causality; Aptitude; Breastfeeding.

RESUMO

Objetivo: O objetivo do estudo foi refletir, à luz da teoria da causalidade, sobre as repercussões da habilidade oral do prematuro na prática da amamentação. **Métodos:** Produção teórica de reflexão sustentada na teoria da causalidade de Hobbes. **Resultados:** Aborda-se a compreensão da habilidade oral como principal acidente no que tange ao desempenho do recém-nascido prematuro, o qual, somado aos outros acidentes que compõem os demais domínios relativos à amamentação, configurase como causa integral do fenômeno em questão. **Considerações finais:** Apesar da existência de alguns protocolos, embora muitos deles inconsistentes ou incompletos, ainda se observa a utilização de critérios como o peso e a idade gestacional como padrões para estabelecer essa prontidão. Contudo, percebe-se que o efeito se manifesta mesmo na ausência desses acidentes, revelando-os como causas parciais do fenômeno, ao passo que a habilidade oral é, sozinha, causa necessária para a consecução desse evento. **Descritores:** Filosofia; Enfermagem; Causalidade; Aptidão; Aleitamento Materno.

RESUMEN

Objetivo: Basado en la teoría de la causalidad, reflejar sobre las repercusiones de la capacidad oral del prematuro en la práctica de lactancia. **Métodos:** Producción teórica de reflexión basada en la teoría de la causalidad de Hobbes. **Resultados:** Se aborda la comprensión de la capacidad verbal como accidente principal en cuanto al desempeño del recién nacido prematuro, lo cual, sumado a otros accidentes que componen los demás dominios relativos a la lactancia, se configura como causa integral del fenómeno en cuestión. **Consideraciones finales:** Aunque la existencia de algunos protocolos, pero muchos inconsistentes o incompletos, aún se observa el uso de criterios como el peso y la edad gestacional como estándares para establecer esta prontitud. Pero, se percibe exactamente que el efecto se manifiesta en ausencia de estos accidentes, revelándolos como causas parciales del fenómeno, al paso que la capacidad verbal es, sola, causa necesaria para el logro de este acontecimiento. **Descritores:** Filosofía; Enfermería; Causalidad; Aptitud; Lactancia Materna.

INTRODUCTION

Every year, approximately 15 million children are born prematurely, corresponding to 1 in every 10 childbirths. More than 1 million of them die due to problems that originate in childbirth complications. In this context, according to numbers from 2010, Brazil was already among the ten countries with the highest number of premature births, with 279.300 cases⁽¹⁾.

Considering that premature births are also nutritional emergencies, different strategies have been implemented to favor the growth and the development of these children and to guarantee that these newborns will survive longer (PTNBs), reducing neonate mortality. Among them, the properties and benefits of breastfeeding stand out. Breast milk is the best nutritional option, since it has a specific composition that is adjusted to nutritional necessities and, mainly, because it is compatible with the metabolic and physiologic limitations of every child⁽²⁾.

However, the logic of nutritional therapy has changed substantially, based on the assumption that the composition of the milk is modeled according to nutritional needs. Therefore, the therapy which, in the past, used the diet of the adult or of the older child as a standard to define that of the neonate was subverted (replaced) by the process of emulating fetal life, that is, the therapy should focus on the offer of nutrients that the neonate would be receiving if still in the uterus⁽²⁾.

It is a consensus in literature that breast milk must be the nutritional reference for the newborn (NB), especially in the case of premature children, since their diet must favor their growth and offer conditions similar to the intrauterine environment, protecting against necrotizing enterocolitis and infections, and leading to a better colonization of the intestine by lactobacilli and bifidus factor, which prevent, through selective action, new bacteria from colonizing the gastrointestinal tract and increase eating tolerance. Additionally, this promotes immunological and brain development, the maturing of many enzyme systems, and the growth of organs and systems of the body⁽²⁾.

Despite the benefits already described in literature for the offering of breast milk, it is important to recognize that offering it through breastfeeding, in the context of premature children, is still a challenge, despite the numerous incentives and action from national and international organs regarding the culture of breastfeeding. The difficulty is not only related to cognitive and emotional hindrances that reflect maternal insecurity, but also to the capacities of the babies. Physiological and neurological immaturity, muscular hypotonia, hyper-responsiveness to environmental stimuli, and inadequate control over suction/swallowing/breathing impair functions that are essential for the breastfeeding process⁽³⁾.

Among these factors, the ones related to the capacities of the premature newborn require knowledge and a professional intervention to overcome the principle according to which clinical conditions related to premature children are contraindicative of breastfeeding⁽³⁾. Transitioning from gastric nutrition to oral nutrition is one of the greatest challenges in the clinical practice of neonatology, since many instruments do not have any type of validation, be it of content, criteria, or construct; or because they are validated for term newborns and used in PTNBs. Furthermore, other instruments that have been submitted to this process do not

present a consensus regarding the standardization of complete parameters about the oral maturity of PTNBs, in order to carry out a safe and efficient transition⁽⁴⁾.

Nowadays, one can observe that there is no consensus with regard to the criteria that health workers and institutions take into account when evaluating oral capacity. In general, there are many protocols whose parameters that are used the most in the evaluation are based on the analysis of weight at birth and gestational age. Both are physical criteria that, in isolation, are not capable of predicting this skill. Additionally, some professionals still use instruments that, coupled with the previously mentioned parameters, add clinical stability as an outcome. However, for most instruments being used, the criteria are evaluated in a subjective manner, depending substantially on professional experience and observation⁽⁴⁾.

It is important to reinforce that the direct causes of ineffective breastfeeding are domains related to maternal difficulties or impairments regarding the development of the PTNBs and their clinical management. As a result, to understand breastfeeding based on Hobbes's theory of causation, it is necessary to take an in depth look at the existing cause-and-effect relations, based on the concepts of integral, sufficient, and necessary cause that give substance to the phenomenon being studied.

OBJECTIVE

To reflect on the repercussions of the oral ability of premature babies in breastfeeding under the light of causation theory.

METHODS

This is a theoretical and reflective study, developed as part of the requirements of the subject Philosophy and Epistemology of Science, from the Nursing Post-graduation Program (PhD), in the Universidade Federal do Rio Grande do Norte. The subject, which originates from collective studies and discussions, was taught from March to July 2019, aiming to analyzing the essential epistemological and ontological assumptions of the production of knowledge in the field of nursing.

The study was built based on Hobbes's theory of causation, with regard to demonstrating that every effect has its necessary cause. This referent was chosen due to the need to break a chain of events that were, so far, considered to be sufficient causes for the ineffective practice of breastfeeding in premature newborns. As a result, the intellection and the concreteness of existing correlations between the conceptual meanings of cause and effect will be essential to elucidate the phenomenon proposed.

RESULTS

The reflections below are presented in two thematic axes and based on the theory of causation, as proposed by Thomas Hobbes.

THEORETICAL AND PHILOSOPHICAL CONCEPTS RELATED TO THE THEORY OF CAUSATION BY THOMAS HOBBS

Thomas Hobbes (1588-1679) was a philosopher, political theorist, and the author of works that address themes regarding politics,

psychology, mathematics, and physics. His main works are the *Leviathan* (1651), mainly focused on advocating for absolutism and elaborating the thesis of the social contract; *Elementa philosophiae*, which directs the behavior of the social and political bodies that organize society; *De corpore* (1655), work in the same trilogy that addresses the geometrical and physical principles of the movement of material bodies and exposes his physics more precisely; *De homine* (1658), which reflects the desires and the process of human learning⁽⁵⁾.

De corpore, the base of this reflection, addresses the concept of body and movement as essential to understand his entire theoretical construction. Hobbes reduces the reality to moving bodies and their accidents; from then, he concludes that there is no knowledge without an understanding of their causes. Therefore, through reasoning, men are capable of leaving their natural state and enter in a condition of human nature, explained through mechanics⁽⁵⁾.

According to Hobbes, reason is associated to the faculty of men to calculate, while a straight reason refers to the true reasoning, that is, to its concrete and diligent use. It has an instrumental and calculating function. It is instrumental as it indicates the means to obtain certain ends; and it is calculating because reasoning will produce exact definitions and irrefutable conclusions. This calculus is related to the four primary mathematical operations: sum, subtraction, multiplication, and division. At first, it works by attributing names to the concepts we have. Later, the names are correlated, forming assertions or propositions; finally, the propositions are connected to obtain conclusions and elucidations about the true knowledge. The correct use of the names and their correlations is a form by which language recovers causes, effects, and consequences of the phenomena⁽⁶⁾.

Therefore, the human faculty of reasoning is not always right, although reason, as a science, is straight.

The approximation between science and philosophy, which are described in the works of Hobbes, is brought to effect by the use of reason, since both seek the knowledge of their causes and effects based on constructions supported by true propositions obtained from the calculation of the names (straight reason). The body is the base for the calculation of all knowledge possible. Therefore, it is identified as something that occupies a space and exists without depending on human thought. For men to be able to perceive it, the presence of accidents is necessary, since these are unique qualities or characteristics of the bodies. It should be highlighted that the accidents establish a relation of belonging and of dependence on external objects. However, the opposite is not true⁽⁶⁾.

The causal relation proposed in *De corpore* takes place between the accidents and involves an agent and a patient. The cause is made up of accidents related to the agent or patient, who concur for the production of an effect. To understand this relation, it is essential to clarify two concepts that are essential for this relation: contingent accidents and sine qua non causes. When an event comes about, it is necessary to understand the circumstances that preceded it, and, through analysis and resolution, the accidents are isolated, in order to eliminate those that are not related to the effect. These are called contingent accidents, that is, accidents that are not dependent on the cause and do not effectively contribute for the production of the effects⁽⁷⁾.

On the other hand, sine qua non causes are those in which the accident is directly related to the effect it produces, in a relation of

dependency — it is, therefore, a sufficient cause. Once excluded the accidents that are not part of a causal explanation of the production of the effect, it is possible to avoid false propositions and suppositions about the genesis of an event⁽⁸⁾.

Another relevant concept are the integral causes. When all accidents that can lead to the production of the effect are listed, one should evaluate whether them, grouped, can be separated from the concept of the production of the effect. If they are not dissociated, the cause is integral. The sum of these accidents is identified as a sufficient condition, and it is necessary for the production of the effects⁽⁶⁻⁷⁾.

The need for the cause-and-effect relation expands to the entire scope of time, independently of the period in which the events take place. To explain this relation, Hobbes used the concepts of potency and act, comparing them to the notion of cause and effect. Potency is the production of the act in the future, similarly to how the cause is the production of the effect in the past.

REPERCUSSIONS OF THE ORAL ABILITY OF THE PTNBS FOR BREASTFEEDING, UNDER THE LIGHT OF THE THEORY OF CAUSATION

Hobbes believed that, without showing causation, it would not be possible to represent any event or phenomenon. For him, without necessary causation, the scientific discourse becomes impossible; and the event, as a result, is unintelligible, with a representation that can only be attributed to the eternal⁽⁸⁾.

Causation in the context of health is one of the most important conquests of science, being a study subject of philosophers, in their search to understand causes and its principles, and of epidemiologists, who seek to identify causes, quantify effects, and exemplify cause-and-effect relations, to foster the scientific knowledge on the mechanisms of prevention, cure, treatment, and control of diseases and health problems⁽⁹⁾.

Considering this presupposition, it should be highlighted that the direct causes of ineffective breastfeeding can be divided in axes or domains, related to maternal difficulties and limitations; the anatomic-physiological immaturity that affects the development of the PTNBS themselves; and the clinical management by health professionals and hospitals. In this contexts, it is important to reflect, under the light of Hobbes's causation theory, about the representation of the phenomenon "breastfeeding", based on the understanding of the oral ability of newborns as the main accident with regard to the capacity of the PTNBS. This, coupled with other accidents that make up the other domains, is the main cause of the phenomenon analyzed.

It can be noted that the health team underestimates the potential of these NBs, even when premature, to win, when they are stimulated early, the sensory-motor-oral immaturity inherent to premature conditions⁽³⁾.

Therefore, the theory of causation has a relevant role in redirecting the understanding of breastfeeding by giving it substance through the notion of cause and effect. Obviously, the multiple causes involved in breastfeeding are exhaustively known, but, with regard to the sensory-motor-oral function of premature NBs, they are not yet adequately elucidated, considering that early stimuli are vital for the PTNBS to achieve maturity and fully develop their stomatognathic system, which, as a result, would determine their capacity to be orally breastfed⁽³⁾.

Consequently, two cause-and-effect relations are established hierarchically, due to the order of necessity of the events, but they present a relation of dependency and concur, at the end, in the proposition of the same effect, which is an efficient breastfeeding. In the first relation, there are clinical criteria, physical ones, and criteria related to the sensory-motor-oral function as *sine quibus non* causes for the establishment of the oral ability of the premature child, which is presented as an expected event. It, in turn, assumes the condition of accident, so, in tandem with the other accidents, related to the other domains, it constitutes, finally, the *sine quibus non* causes to the effective practice of breastfeeding. Figure 1 summarizes these relations:

must be put together with other accidents that are indispensable for the expected effect/event to take form⁽⁸⁾.

This shows the weakness of the main instruments used to evaluate the oral function, since these protocols, in most cases, use isolated physical criteria as their parameters, or are based on the subjective judgment of the professional with regard to the conditions of the PTNBs⁽⁴⁾. This explains the existence of some protocols that do not have the necessary legitimacy, since they do not undergo, especially, construct validation processes destined to PTNBs, processes to assess the coordination of the motor oral function and use the maternal breast as a means to effective the transition. As a result, some instruments have shown themselves to be inconsistent or incomplete tools to promote an efficient oral feeding. If there are no safe and decisive evaluations of the oral ability, the practice of breastfeeding becomes unfeasible, since oral readiness alone is the necessary cause for this event to take place.

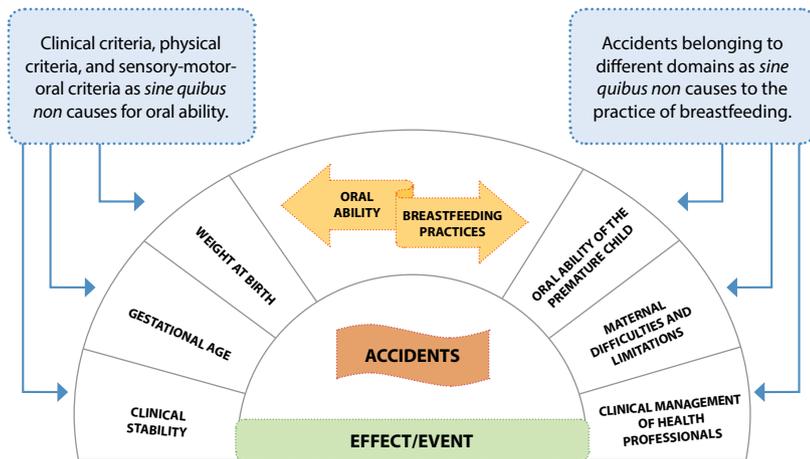


Figure 1 – Clinical criteria, physical criteria, and sensory-motor-oral criteria as *sine quibus non* causes for breastfeeding ability and accidents pertaining to different domains as *sine quibus non* causes for the practice of breastfeeding, Natal, Rio Grande do Norte, Brazil, 2020

FINAL CONSIDERATIONS

Understanding the causal explanation of breastfeeding makes it possible to analyze it from an integral perspective, as an integral cause, in which all accidents proposed are adequately known, valued, and discussed, so that the practice of direct breastfeeding can take place.

Considering, especially, the weight at birth, the corrected age, and the clinical stability as the criteria for the main outcomes in the evaluation of the oral ability of the premature child means to understand them, in the scope of Hobbes theory of causation, as sufficient or necessary causes to produce the expected effect, that is, premature children weighting 1,500 g or more, with a gestational age or corrected age above 34 weeks, and clinical stability, will necessarily be able to be breastfed, since, according to the theory of causation, necessary causes, and, consequently, sufficient causes, are those that, once supposed, will necessarily concur to produce the effect⁽⁸⁾.

Resignifying breastfeeding in premature children, based on the philosophical perspective of Thomas Hobbes made it possible to note that, considering the understanding of the causes and of the relations of causation, it is necessary to consider the phenomenon without its usual fragmentation. This vision make it possible to understand that the practices that, in general, are developed in the Neonate Intensive Care Units, are mistaken courses of action for feeding, focused on the isolated act of breastfeeding after birth, which reduces it to an instinctive act that needs no other preparation or assistance for the nutrition of this PTNB to take place effectively and satisfactorily for all subjects involved in the process.

These outcomes are continuously used, considering that, for many professionals, they predict the anatomical and physiological maturity of the NB. However, literature shows PTNBs who can coordinate oral functions with 32 weeks of corrected age⁽¹⁰⁾. This fact breaks with the causal nexus previously exposed. Additionally, delaying the transition for oral feeding means that tubes will be used longer, and these can significantly interfere in the oral abilities of the newborn, since they change the suction/swallowing/breathing coordination⁽¹⁰⁾.

However, it must be understood that there is not only one accident that explains the cause of this event; contrary to that, there is a group of accidents that, together, are necessary to produce the effect. Therefore, it is adequate to raise awareness about this phenomenon through the proposition of support measures, in its many domains, that include enforcing the effective legislation and policies related to the conditions of work and employment of these women; the development of educational programs targeted at the promotion and maintenance of exclusive breastfeeding, from the prenatal to childcare consultations; and the use of appropriate medical technology. Furthermore, the multidisciplinary team must be prepared to advise and intervene with regard to the difficulties of breastfeeding in PTNBs, through the dissemination, among workers and institutions, of validated scientific evidences about the proposition of legitimate instruments that standardize the professional conducts with regard to the oral ability of premature children.

Therefore, when an effect is manifested, even in the absence of certain accidents, it can be stated, according to Hobbes, that it is determinant, in itself, of the genesis of the effect; but it must be present, being, therefore, a partial cause. Therefore, this effect

REFERENCES

1. Organización Mundial de La Salud. Nacimientos prematuros: notas descriptivas [Internet]. 2018 [cited 2019 Jun 02]. Available from: <https://www.who.int/es/news-room/fact-sheets/detail/preterm-birth>
 2. Ministério da Saúde (BR). Secretaria de Atenção à Saúde. Departamento de Ações Programáticas Estratégicas. Atenção humanizada ao recém-nascido: Método Canguru: manual técnico [Internet]. 3. ed. Brasília: Ministério da Saúde; 2017[cited 2019 Jun 13]. 340 p. Available from: http://bvsm.s.saude.gov.br/bvs/publicacoes/atencao_humanizada_metodo_canguru_manual_3ed.pdf
 3. Cavalcante SEA, Oliveira SIM, Silva RKC, Sousa CPC, Lima JVH, Souza NL. Habilidades de recém-nascidos prematuros para início da alimentação oral. *Rev Rene* [Internet]. 2018 [cited 2019 Oct 06];19:e32956. Available from: http://periodicos.ufc.br/rene/article/view/32956/pdf_1
 4. Bolzan GP, Berwig LC, Prade LS, Cuti LK, Yamamoto RCC, Silva AMT, et al. Assessment for oral feeding in preterm infants. *CoDAS*. 2016;28(3):284-88. <https://doi.org/10.1590/2317-1782/20162015115>
 5. Hobbes T. Elementos de Filosofia: Primeira Seção - Sobre o Corpo. Parte I - Computação ou Lógica. Campinas: IFCH/Unicamp; 2005. 77p.
 6. Silva H. Ciência e filosofia: notas acerca da resignificação de conceitos científicos na filosofia hobbesiana. *Kinesis*[Internet]. 2009 [cited 2020 Feb 07];1(1):22-38. Available from: [https://www.marilia.unesp.br/Home/RevistasEletronicas/Kinesis/HelioSilva\(22-38\).pdf](https://www.marilia.unesp.br/Home/RevistasEletronicas/Kinesis/HelioSilva(22-38).pdf)
 7. Hirata C. A causalidade em Hobbes: necessidade e inteligibilidade. *Cad Espinosanos*. 2010;(23):33-8. <https://doi.org/10.11606/issn.2447-9012.espinosa.2010.89398>
 8. Hirata C. Leibniz e Hobbes: causalidade e princípio de razão suficiente. São Paulo: EDUSP Editora da Universidade de São Paulo; 2017. 272 p.
 9. Mota DM, Kuchenbecker R. Causality in Pharmacoepidemiology and Pharmacovigilance: a theoretical excursion. *Rev Bras Epidemiol*. 2017;20(3):475-86. <https://doi.org/10.1590/1980-5497201700030010>
 10. Yamamoto RCC, Prade LS, Bolzan GP, Weinmann ARM, Keske-Soares M. Readiness for oral feeding and oral motor function in preterm infants. *Rev CEFAC*. 2017;19(4):503-9. <https://doi.org/10.1590/1982-0216201719411616>
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