

Clinical validation of nursing diagnosis “Willingness for improved infant development”

Validação clínica do diagnóstico de enfermagem “Disposição para desenvolvimento melhorado do lactente”
Validación clínica del diagnóstico de enfermería “Disposición para desarrollo mejorado del lactante”

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ABSTRACT

Objective: to conduct the clinical validation of nursing diagnosis “Willingness for improved infant development”. **Method:** a cross-sectional study, conducted in a *Centro de Saúde da Família* (Family Health Care center), with 45 healthy breastfed infants. The instrument for collecting the data was prepared based on the literature and validated by nurses. It contained the following variables: sociodemographic, gestational, and obstetrical variables; breastfed infant’s nutritional profile; evaluation of the defining characteristics of the proposed nursing diagnosis. **Results:** all the defining characteristics were found to have high sensitivity values (>90%), positive predictive values (>65%), negative predictive values (>66%); however, low specificity values (<32%). In this study, the defining characteristics we found to have estimates (>0.50) within the ROC curve, which provides good sensitivity and specificity. **Conclusion:** this study verified the structural elements of the proposed nursing diagnosis to be relevant in the clinical context, which justifies the need for its being employed with children, taking into account its contribution to improving nursing care. **Descriptors:** Growth and Development; Breastfed Infant; Nursing Diagnosis; Validation Studies; Terminology.

RESUMO

Objetivo: realizar a validação clínica do diagnóstico de enfermagem “Disposição para desenvolvimento melhorado do lactente”. **Método:** estudo transversal, desenvolvido no Centro de Saúde da Família, com 45 lactentes saudáveis. O instrumento de coleta de dados foi construído com base na literatura e validado por enfermeiros. Nele, continham as variáveis: sociodemográficas, gestacionais e obstétricas; perfil alimentar do lactente; avaliação das características definidoras do diagnóstico de enfermagem proposto. **Resultados:** todas as características definidoras obtiveram valores de sensibilidade elevados (>90%), valores preditivos positivos (>65%), valores preditivos negativos (>66%); entretanto, valores baixos de especificidade (<32%). Neste estudo, as características definidoras apresentaram estimativas (>0,50) na curva ROC, o que confere boa sensibilidade e especificidade. **Conclusão:** este estudo verifica os elementos estruturais do diagnóstico de enfermagem proposto como relevante no contexto clínico, o que justifica a necessidade de ser empregado na clientela infantil, tendo em vista sua contribuição para o aperfeiçoamento do cuidado em enfermagem. **Descritores:** Crescimento e Desenvolvimento; Lactente; Diagnóstico de Enfermagem; Estudos de Validação; Terminologia.

RESUMEN

Objetivo: realizar la validación clínica del diagnóstico de enfermería “Disposición para desarrollo mejorado del lactante”. **Método:** estudio transversal desarrollado en el Centro de Salud de la Familia con 45 lactantes saludables. El instrumento de recolección de datos fue construido en base a la literatura, y validado por enfermeros, incluyendo variables: sociodemográficas, gestacionales y obstétricas del diagnóstico de enfermería propuesto. **Resultados:** todas las características determinantes obtuvieron valores de sensibilidad elevados (>90%), valores predictivos positivos (>65%), valores predictivos negativos (>66%), aunque

también bajos valores para especificidad (<32%). En este estudio, las características de definición presentaron estimaciones (>0,50) en la curva ROC, lo cual brinda buena sensibilidad y especificidad. **Conclusión:** este estudio verifica los elementos estructurales del diagnóstico de enfermería propuesto como relevante en contexto clínico, lo que justifica la necesidad de emplearlo en pacientes infantiles, tomando en cuenta su contribución al perfeccionamiento del cuidado de enfermería.

Descriptores: Crecimiento y Desarrollo; Lactante; Diagnóstico de Enfermería; Estudios de Validación; Terminología.

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INTRODUCTION

In the clinical context, nurses face the task of judging and selecting nursing diagnoses which best represent a given set of defining characteristics. However, these professionals also face many difficulties in establishing the most adequate human response, mainly when they do not know the clinical indicators of a comprehensive and continuous phenomenon, as child development is configured, whose reference axis involves biological, affective, psychic, and social aspects⁽¹⁾.

Specifically in NANDA-I taxonomy⁽²⁾, the nursing diagnoses that belong to domain 13, which is named Growth/Development, refer to collective or individual phenomena, which implies discrepancies regarding the use of the terms, as observed: *Risk for disproportionate growth; Delayed growth and development; and Risk for delayed development.*

On the other hand, the defining characteristics of some of the diagnoses in the aforementioned domain do not cover all development dimensions, once they only emphasize domains - motor (fine and gross), emotional, and cognitive - which are expressed as if they were implicitly destined to children, without specifying particularities for this age range in the title (label) or in the conceptual definition of the diagnosis. In this sense, nurses face challenges when proposing interventions that focus on such a comprehensive, yet confusing and incomplete, diagnosis.

A previous study on the analysis of the concept of development in breastfed infants and its validation among nurses who are proficient in this topic pointed out that the "development" phenomenon among breastfed infants showed three domains that cover child development, namely physical, cognitive, and psychosocial domains. Besides that, the authors conducted, based on the specific literature, a careful survey, which comprised creating the definition of a nursing diagnosis in the health promotion category, as well as its defining characteristics. This was later analyzed by nurses who are proficient in child health and nursing taxonomy fields in order to establish a nursing diagnosis in the health promotion category⁽³⁾.

After this evaluation, the proficient nurses found it relevant to establish this nursing diagnosis in the health promotion category under title "Willingness for improved infant development (Please specify whether physical, cognitive, or psychosocial) with the following definition: "Constant changes in the maturing of physical, cognitive, and psychosocial structures that may be improved and are enough for a breastfed infant to reach increasingly complex functions in their motor skills, thoughts, social relationships, and in knowledge aspects (learning, memory, language, thought, judgment, and problem-solving)"⁽³⁾.

Because this nursing diagnosis falls into health promotion category and because no related factors exist, the nurses deemed

necessary to include the defining characteristics in the final preparation of the diagnosis, which totaled six, in three development domains: 1) physical; 2) cognitive; and 3) psychosocial. They are: 1) defining characteristics of the physical domain: Has satisfactory growth, within the expected anthropometric indices (weight, length, head circumference, mid-upper-arm circumference, tricipital and subscapularis folds) for their age and gender, and Performs fine and gross motor skills according to age parameter; 2) defining characteristics of the cognitive domain: Adequately expresses their initial perception and processing skills and Expresses language according to their age pattern; 3) defining characteristics of the psychosocial domain: Establishes a mutual relationship with parents and/or primary caregivers according to their age pattern and Displays social behavior patterns within their age pattern.

In this sense, establishing nursing diagnoses then becomes a hard task as no studies exist that define the predictive power of clinical indicators (defining characteristics). Besides that, this task involves the identification of nursing diagnoses in regards to growth and development because these are very complex phenomena, whose selection requires that nurses be aware of which characteristics comprise which phenomena.

Due to that, studies for construction and validation of nursing diagnoses components are believed to be able to contribute to a nurse's clinical reasoning, particularly when the studied phenomena (growth and development) are potentially frequent in the clinical nursing practice of child care in primary health care, in which nurses periodically track children's growth and development. Brazil's Full Child Health Care Program (PAISC - *Programa de Assistência Integral à Saúde da Criança*) creation in 1984 implemented a set of basic health care initiatives targeting full health care and focusing on prevention initiatives. Among these initiatives is child development supervision by nurses, via the Child Health Care Booklet (*Caderneta de Saúde da Criança*)⁽⁴⁾.

In this context, when facing the task of judging the defining characteristic that is relevant to a nursing diagnosis, they highlight validation studies for supporting the care that should be employed in nursing care. Besides that, when a nurse chooses a health promotion diagnosis, it means an individual/family and their community are making the shift between a specific health care level to a higher one, with willingness to improve⁽²⁾. Based on this, a breastfed infant/caregiver is found to have adequate growth and development according to their age range, but wishes to achieve better health levels.

In consonance with this, in the evaluation of child growth and development, nurses give priority to a child's health care needs upon the clinical judgment of the human responses presented, guide the planning of their actions, and

establish health prevention and promotion behaviors. In order to achieve that, this activity requires professionals to follow a practice that is based on employing nursing diagnoses that meet the real needs of children.

Consequently, studies with diagnoses on the health promotion category may support nursing care, contribute to the legitimacy of the human response presented by children, and provide them with better care. In order to achieve that, the validation process is a constant concern in the measurement of nursing phenomena, through which clinical evidence are collected, which will establish their robustness and authenticity⁽⁵⁾.

Before this statement, the validation of a nursing diagnosis is an important step for the development of professional knowledge and practice, especially because it increases the reliability of diagnoses and promotes the refinement of a set of clinical indicators, which makes them reliable both in practice and for training purposes⁽⁵⁾.

OBJECTIVE

To clinically validate the defining characteristics of the proposed nursing diagnosis "Willingness for improved infant development (Specify whether physical, cognitive, or psychosocial development)", by evaluating the accuracy of diagnoses through specificity, sensitivity, and predictive value of the proposed defining characteristics.

METHOD

Ethical aspects

Pursuant to the recommendations from Resolution 466/12 from Brazil's National Health Care Council, regarding human research⁽⁶⁾, the study was evaluated and had its implementation approved by Federal University of Ceará's Research Ethics Committee (Comepe). The data collection and diagnostic inference started after subjects' parents/guardians and diagnosing nurses signed informed consent forms.

Study design, location, and period

This is a cross-sectional study conducted in a Family Health Care Center located in the peripheral region of the municipality of Fortaleza/CE. The data were collected between December 2012 and January 2013 by the researcher and two other nurses.

Population and sample: inclusion and exclusion criteria

The study population comprised healthy breastfed children who were patients of the related health care unit, through nursing appointments. 45 breastfed infants who were supposedly healthy and being monitored for growth and development in a Family Health Care Center took part in the study. Infants suffering from chronic diseases (asthma, acute and chronic kidney failure, cardiopathies) and syndromes as confirmed by medical diagnose were excluded.

The sample was consequently selected and the age range (the first two years of life) being restricted to breastfed infants is justified by the fact that the major child development changes are observed in this period⁽⁷⁾.

Study protocol

The instrument used for collection of data was planned based on a previous concept analysis that established the possible defining characteristics and their respective operational definitions. These components were submitted to content validation by 18 nurses who were proficient in topics child health and taxonomies⁽³⁾. The instrument used contained the following variables: a) sociodemographic variables; b) gestational and obstetrical variables; c) Breastfed infant's nutritional profile; d) Evaluation of the defining characteristics of the nursing diagnosis Willingness to breastfed infant's improved development (Please specify whether physical, cognitive, or psychosocial development). Regarding this item, the instrument had option regarding the presence or lack of defining characteristics.

It should be highlighted that, before the collection of data, a pilot test was conducted with four breastfed infants who met the established criteria. However, these breastfed infants were not taken into account in the final sample. The test was conducted in order to verify the time spent for evaluating a breastfed infant; the material required for this; the promotion of interaction with the child and their guardian, in order to standardize the evaluation, especially regarding the questions that should be asked upon finding the presence or lack of defining characteristics for the diagnosis proposed.

Based on this, we found that a minimum period of 30 minutes would be necessary to evaluate each infant, taking into account that the interaction with infants or their guardians is characterized as something that is subjective and peculiar of each person. At this time, we also identified that the relevance of some defining characteristics relied on the observation of the infant while they interacted with their guardians or while they used toys. Furthermore, this observation led to the development of strategies to minimize the difficulty in evaluating a characteristic, such as extended interaction spans and use of simpler and varied toys. Thus, we established some devices for evaluating infants: manual pediatric table scale; scientific anthropometer, measuring tape in centimeters, dolls and little rubber balls, musical mobiles, wooden stacking blocks, little bucket, baby rattles, mat, portable radio.

Afterwards, during nursing appointments, the nurse and the researcher conducted preliminary evaluations regarding the breastfed infants' health conditions. These data were obtained through physical exams and queries to the Family Health Care Center, and according to the data on the breastfed infants' health care/vaccination booklets. The physical exam focused on evaluating child development.

After this preliminary evaluation, those who met all inclusion criteria were examined in regards to sociodemographic variables, nutritional profile, gestational, obstetrical, and predictive variables (defining characteristics).

In order to achieve this, it was required to explain the following criteria to the raters during the collection of data, regarding their confirmation of defining characteristics:

- a) For the defining characteristic *Has satisfactory growth, within the expected anthropometric indices for their gender and age*, we established that the values of weight, length, and head circumference indices should corroborate those recommended by the literature⁽⁸⁾.

- b) For the defining characteristic *Adequately expresses initial skills of perception and processing*, three evaluation indices were included (habituation and dishabituation; visual preference, intermodal transfer) to be tested. We established that the presence of at least two of them would be enough for defining the presence of a characteristic.
- c) For the defining characteristics that mentioned the term "according to their age range pattern" in their titles, we established their presence when the age classification of the evaluated indicator matched the age of the evaluated infant. They are: *Performs fine and gross motor skills according to age parameter*; *Expresses language according to their age pattern*; *Establishes a mutual relationship with parents and/or caregivers according to their age pattern*; and *Displays social behavior patterns within their age pattern*.

Thus, subjects were regarded as either or not having the nursing diagnosis "Willingness for breastfed infant's improved development" by three nurses who were considered proficient in pediatrics. This evaluation followed three criteria: academic and professional background in the field of nursing diagnoses and child care, according to the scores established by Fehring⁹.

After the data were collected by the nurses and the researcher, each nurse who was proficient in the field received a summary of each breastfed infant's case, which showed their sociodemographic data, gestational and obstetrical variables, nutritional profile, and defining characteristics present. The proficient nurses were not informed regarding the presence or absence of outcomes (defining characteristic). The purpose in the participation of each specialist was to keep the diagnostic inference from suffering influences from the researcher who collected the data.

In order to achieve that, the nurses evaluated all previously formulated cases, and, when there was a disagreement, the case of this specific infant was discussed with another nurse, who was co-responsible for the study but had not taken part in the data collection.

Analysis of results and statistics

We used Excel 2007 in order to create the data spreadsheets, and Statistical Package for the Social Sciences (SPSS) software was

used in the statistical analysis. The numeric variables were expressed in regards to central tendency and dispersion measures. The absolute and percentage frequencies were considered for the descriptive analysis. Shapiro-Wilks test was used in order to check the numerical data for normality/symmetry, as it is recommend for statistical treatment of samples below 50. The accuracy analysis of the defining characteristics for the proposed nursing diagnosis used sensitivity and specificity tests, positive predictive values, and negative predictive values, area under ROC curve, and Efficiency (E).

Furthermore, we employed ROC curve to compare multiple clinical indicators and evaluate the accuracy of the clinical indicators. And Efficiency (E), which expresses the clinical ability to properly classify subjects who either have the clinical condition or not. Accuracy of efficiency (E) of a variable (defining characteristic) consists of its ability to represent what is actually proposed⁽¹⁰⁾.

RESULTS

Most breastfed infants treated were males (55.6%) raised by mothers (95.6%) who lived with a partner (82.2%) and were up to 24 years old (50%). Besides that, 50% of the infants' parents/guardians had studied for up to 12.00 years and earned family incomes of up to a monthly minimum wage.

Half the breastfed infants were up to 5.0 months old, with a birth weight of 3,100 g (IQR 694 g), and were 49.35 (± 2.43 cm) cm long at birth. Below is the distribution of the defining characteristics of the nursing diagnosis "Willingness for improved development of breastfed infants", present in evaluated infants.

In Table 1, we can observe that the defining characteristics were present in a great deal of the breastfed infants, when clinically evaluated at the Family Health Care Center. Among them, the defining characteristic *Has satisfactory growth, within the expected anthropometric indices for infant's gender and age* was found in all (100%) breastfed infants evaluated, and the defining characteristic *Expresses language according to age pattern* was found to be absent in 13.3% of the evaluated breastfed infants.

Below, in Table 2, are presented the accuracy measures regarding the defining characteristics of the nursing diagnosis proposed.

Table 1 – Distribution of the defining characteristics of the nursing diagnosis proposed in the health promotion category, Fortaleza, Ceará, Brazil, 2013 (N = 45)

| Defining characteristics | n | % |
|---|----|-------|
| Has satisfactory growth, within the expected anthropometric indices for infant's gender and age. Present | 45 | 100.0 |
| Performs fine and gross motor skills according to age parameter. Present | 42 | 93.3 |
| Absent | 3 | 6.7 |
| Adequately expresses their initial perception and processing skills. Present | 44 | 97.8 |
| Absent | 1 | 2.2 |
| Expresses language according to age pattern. Present | 39 | 86.7 |
| Absent | 6 | 13.3 |

To be continued

Table 1 (concluded)

| Defining characteristics | n | % |
|--|----|------|
| Establishes a mutual relationship with parents and/or primary caregivers according to age pattern. | | |
| Present | 40 | 88.9 |
| Absent | 5 | 11.1 |
| Displays social behavior patterns within age pattern. | | |
| Present | 43 | 95.6 |
| Absent | 2 | 4.4 |

Table 2 – Distribution of the accuracy measures of the defining characteristics for the Nursing diagnosis "Willingness for improved development of breastfed infants" (Please specify whether physical, cognitive, or psychosocial development), Fortaleza, Ceará, Brazil, 2013

| Domain | Defining characteristic | S (%) | SP (%) | PPV (%) | NPV (%) | (E) (%) | ROC (%) |
|--------------|--|-------|--------|---------|---------|---------|---------|
| Physical | Has satisfactory growth, within the expected anthropometric indices for infant's gender and age. | 100.0 | 0.00 | 64.44 | 0.00 | 64.44 | 0.50 |
| | Performs fine and gross motor skills according to age parameter. | 96.5 | 12.5 | 66.6 | 66.6 | 66.6 | 0.54 |
| Cognitive | Adequately expresses their initial perception and processing skills. | 100.0 | 6.25 | 65.9 | 100.0 | 66.6 | 0.53 |
| | Expresses language according to age pattern. | 96.5 | 31.2 | 71.29 | 83.3 | 73.3 | 0.63 |
| Psychosocial | Establishes a mutual relationship with parents and/or primary caregivers according to age pattern. | 100.0 | 31.2 | 72.5 | 100.0 | 75.5 | 0.65 |
| | Displays social behavior patterns within age pattern. | 100.0 | 12.5 | 67.4 | 100.0 | 68.9 | 0.56 |

Note: S: Sensitivity; SP: Specificity; PPV: Positive predictive value; NPV: Negative predictive value; (E): Efficiency; ROC curve - Receiver-Operating Characteristic curve.

According to the data analysis in table 2, all the defining characteristics mentioned were found to have high sensitivity values (above 90%), positive predictive values above 65% and negative predictive values above 66%; however, low specificity values (below 32%) were found.

ROC curve estimates the sensitivity and specificity of the defining characteristic through the size of the area below the curve. In this study, the defining characteristics were found to have estimates above 0.50, which provides good sensitivity and specificity.

Furthermore - regarding the efficiency values, which reinforce the ability to classify the breastfed infants as either having the nursing diagnosis or not - this ability can be classified as good in this study, having in mind that such values are above 64%.

In this sense, it is important to highlight that the defining characteristic that belongs to the physical domain of the diagnosis, named *Has satisfactory growth, within the expected anthropometric indices for infant's gender and age*, was found to have high average sensitivity (100%) and efficiency (64.4%) values, but was found to have specificity and negative predictive values null for the diagnosis (0.0%).

DISCUSSION

In this study, most breastfed infants who were patients at the Family Health Care Center were observed to live in the municipality of Fortaleza-CE, to be males, to be under the care of their mothers, who lived with partners.

A study states that living with their fathers is a factor that favors the proper development of children, having in mind that recognizing the role of a father with his child is one of the decisive factors for cognitive development and social development⁽¹¹⁾. Corroborating this, fathers are known to be increasingly involved with the direct or indirect education of their children, which is completely different from the past, when mothers alone were responsible for rearing their children. At that time, fathers represented a symbol of domination and power over families.

Concerning this, the need for a father figure in the child development process takes place between six and 12 months of age, when children find themselves inserted in the so-called early genital organization, and during their adolescence, when the genital maturation forces children to define their role in procreation, with a more intense movement during adolescence for children to reach more autonomy. The everyday body contact between babies and fathers is a reference in the psychic organization of children, due to its structuring role in the development of the ego⁽¹¹⁾.

In this study, the majority of mothers were restricted to house-keeping duties, which corresponds to a protective factor, having in mind that the home environment has been pointed out as an extrinsic factor of potential influence over a child's motor development, particularly due to the characteristics of home as the first environment experienced by a breastfed infant in their early life, the interaction with parents, the variability of stimulation, and the toy availability, which were also considered to be critical indicators for quality of child care and their health promotion⁽¹²⁾.

On the other hand, a few mothers had different jobs, which included secretary, businesswoman, female janitor, seamstress, cashier, retired workers, and autonomous workers, which represents ensured improvements in socio-financial conditions, access to health care information, having in mind that the working mothers were aware of their children's gradual and progressive changes, especially when in contact with other mothers who experienced the same things.

Besides that, half of the breastfed infants were five months old. The lactation period is also known as early childhood. This phase includes the major and quickest changes in a child's development, mainly in regards to the neuropsychomotor domain⁽⁷⁾.

Half of the breastfed infants were found to have birth weight and length within the average normality patterns, according to the values recommended by the WHO (2008)⁽⁸⁾. The health state of a child at birth is an important factor that determines their survival and quality of life. Specifically because growth is influenced by intrinsic (genetic) and extrinsic (environmental) factors, among which nutrition, hygiene, housing, and the general care of children stand out, as they end up accelerating or slowing down this process⁽⁷⁾.

The weight is the most used anthropometric measurement in the nutritional evaluation of newborns and children and is closely related to growth, which varies at birth, according to the gestational age and due to the amount of total body water, while length is the best indicator of linear growth and reflects the lean body mass. It is determined by an individual's genetic potential and suffers less influence from the intrauterine environment⁽¹³⁾.

In regards to education levels and family income, half of the infants' guardians studied for 12.00 years and earner family incomes of a monthly minimum wage. The study subjects were found to have negative socioeconomic conditions, even when their mothers or guardians had good education levels.

The education level of a mother is a factor that is directly related to a higher variety of stimulation, interaction with their babies, and cognitive development. In general, the socioeconomic and educational factors have also been studied for their correlation with educational parent practices, and there seems to be influence from education and socioeconomic levels in the choice of educational strategies by parents. We must consider that knowing the impact of socio-environmental factors in a child's development in their first years of life is fundamental for creating strategies to prevent delays and promote child development, including by health care professionals⁽¹⁴⁾. Maternal knowledge supports better planning of situations that assist more adequate decision-making in regards to child care.

In regards to the accuracy of the clinical indicators for diagnosis *Willingness for improved development of breastfed infants*, the evaluation of the predictive and sensitive values of the defining characteristics that were present in the diagnosis conducted herein can be generally inferred to have positive predictive values above 65% for the proposed nursing diagnosis. In this context, the determination of sensitivity, specificity, and predictive power of the clinical signs (defining characteristics), associated with a nursing diagnosis, is an important part of the validation of nursing diagnoses, as it establishes the set of characteristics in the clinical environment, which determine the presence or absence of a diagnosis⁽¹⁵⁾.

In this sense, the accuracy of nursing diagnoses is defined as a rater's judgment regarding the degree of relevance, specificity, and consistency of existing clues (defining characteristics) in order to determine the presence of the diagnosis that represents a patient's true clinical condition; that is, their real need⁽¹⁶⁻¹⁷⁾.

Based on this, most defining characteristics determine the presence of the proposed diagnosis; however, they still need to be analyzed, possibly in the application of such characteristics in other health scenarios or in situations in which children are becoming chronically ill, in the attempt to find health situations that may interfere in child development.

Also from this perspective, the defining characteristics had low specificity values, with the exception of the defining characteristic *Establishes a mutual relationship with parents and/or caregivers according to age pattern*, whose value was above 30%. Such values are possibly justified by the sample size, which was relatively small (N=45).

In this context, this characteristic regards to a mutual regulation process: children and parents/caregivers who communicate properly, which favors interpreting other people's behaviors. This normally takes place during everyday duties, when parents perform tasks of cooking, sewing, and sweeping, and are surprised by their children copying the same task. This behavior pattern may start after an infant is six months old, when they start judging the possible consequences of events and imitate complex behaviors⁽¹⁸⁾.

In this sense, the proposed diagnostics can still be predicted as a wide one, having in mind that child development is configured because it is comprehensive and includes different sub-dimensions such as physical, motor, cognitive, psychosocial, spiritual, moral, sexual development, among other types. Because of this, this study, as presented, as confined to studying child development in its physical, cognitive, and psychosocial dimensions.

On the other hand, other defining characteristics, such as: *Adequately expresses their initial perception and processing skills; Establishes a mutual relationship with parents and/or primary caregivers according to age pattern; Displays social behavior patterns within their age pattern* were pointed out as characteristics that had little importance in predicting the presence or absence of the proposed nursing diagnosis (negative predictive values 100%).

In contrast, the defining characteristic named *Has satisfactory growth, within the expected anthropometric indices for infant's gender and age*, was found to have high average sensitivity (100%) and efficiency (64.4%) values, but was found to have specificity and negative predictive values null for the diagnosis (0.0%). Anthropometric indices are important tools to evaluate growth, and they may be used along with weighted relationships regarding gender and age, in a way to predict the nutritional state of a children by establishing classifications such as malnutrition degrees through statistical tests, percentiles, and Z scores⁽⁷⁾.

Consequently, the positive predictive ability of the characteristic was high (64.4%), which means this defining characteristic determines the presence of the diagnosis proposed, and its absence invalidates the nursing diagnosis.

This analysis is highlighted to have undergone influence from the clinical indicators that made up such defining characteristic, such as weight, length, head circumferences, thoracic

circumferences, and arm circumferences, having in mind that they were collectively evaluated in the diagnosis inference by specialist nurses. Besides that, as already described, all infants had it as a defining characteristic, because their anthropometric values were observed to match their ages and genders, according to the reference values adopted by the literature⁽⁸⁾.

Finally, after this clinical validation stage, the proposed nursing diagnosis named *Willingness for improved development of breastfed infants* (please specify whether physical, cognitive, or psychosocial) obtained the following defining characteristics: *Has satisfactory growth, within the expected anthropometric indices for infant's gender and age; Performs fine and gross motor skills according to age parameter; Expresses language according to their age pattern; Adequately expresses their initial perception and processing skills; Establishes a mutual relationship with parents and/or caregivers according to their age pattern; and Displays social behavior patterns within their age pattern.*

Some limitations were found during the execution of this study, as follows: small breastfed infant sample size, because the data collection period coincided with the Christmas break period in the municipality's Basic Health Care Units, and the difficulty in recruiting nurses who were proficient in the pediatric field in order to establish the clinical judgment of the responses from the breastfed infants through the analysis of clinical cases.

The proposal of validating this nursing diagnosis may enable a better execution of the stages of nursing history, nursing diagnosis, and planning of interventions, in a specific and accurate way for surveying and analyzing possible risky changes in child development. At the level, nurses who are aware of all the defining characteristics are able to create clinical prevention protocols and to more efficiently intervene with breastfed infants, having in mind that interventions must be focused on the child development phenomenon, which is configured to be comprehensive and to include growth itself, with a codename of physical development, which is widely used in the relevant literature.

CONCLUSION

All the defining characteristics mentioned were found to have high sensitivity values, positive predictive values above

65%, and negative predictive values above 66%; however, low specificity values (below 32%) were found. Therefore, they are good at predicting the nursing diagnosis proposed in the health promotion category.

It is important to highlight that the defining characteristic that belongs to the physical domain of the diagnosis, named *Has satisfactory growth, within the expected anthropometric indices for infant's gender and age*, was found to have high average sensitivity (100%) and efficiency (64.4%) values, but was found to have specificity and negative predictive values null for the diagnosis (0.0%). Consequently, its positive predictive ability was high (64.4%), which means this defining characteristic determines the presence of the diagnosis proposed, and its absence invalidates the nursing diagnosis; this low specificity value, however, means the characteristic needs to be revised, once it has several sub-dimensions: weight, length, skin folds, and circumferences. This also requires nurses to analyze them individually through criteria that indicate normality or abnormality values.

In summary, the defining characteristics built were found to have positive predictive values above 65% for the nursing diagnosis proposed in this study. On the other hand, the defining characteristics *Adequately expresses their initial perception and processing skills; Establishes a mutual relationship with parents and/or caregivers according to age pattern; Displays social behavior patterns within their age pattern* were pointed out as characteristics that had little importance in predicting the presence or absence of the proposed nursing diagnosis (negative predictive values 100%).

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