REVISTA O MUNDO DA SAÚDE

Health profile of infants participating in early stimulation services: methodological study

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Abstract

Due to the lack of precise instruments for the care of children and the scarcity of data that can characterize the clientele served in specialized services, research concerning the development of instruments that facilitate the work process and essential data collection for the health care network is needed. This study aimed to build and validate an instrument to assess the health profile of infants treated at early stimulation services in the Massif de Baturité and Sertão Central, CE. This methodological study was carried out from April/2018 to March/2019 and was divided into three stages. Research was approved by the ethics committee under opinion No. 3.114.405. In the first stage, the instrument was built from national and international literature. In the second stage, five nurse judges validated the instrument, determining if items of the instrument were appropriate and were added to according to the opinion of these judges. In the third stage, the instrument created was applied to the children's medical records. It is possible to characterize the infant population based on the mothers' sociodemographic, gestational and obstetrical traits, dietary profile, anthropometrics, and health status. It was demonstrated that most of the children had problems related to the gestational and obstetric aspects of their mothers, congenital diseases, and previous and current diseases. It is concluded that it was possible to create and evaluate, together with the judges, an instrument to highlight the scenario of child health in the regions under study.

Keywords: Health. Infant. Growth and Development.

INTRODUCTION

Childhood is a complex phase, as significant changes occur in the emotional, cognitive, spiritual, relational, and physical realms, making knowledge about the process of growth and development important for all professionals in the area[1].

Child development is characterized as being complex and multifactorial, which consists of a dynamic process that begins in intrauterine life, involving several aspects: physical growth, neurological maturation, and the construction of skills related to behavior and the realms of cognition, socialization, and affection of the child[2]. Thus, because it is an important period, it requires its due attention and care. Therefore, when there are changes in these areas, children may present delays, or risk of developmental delays. Making it necessary to

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follow-up in specialized services.

Thus, the main problems that lead children to be seen in specialized services are: Chronic Childhood Encephalopathy (CCE), Down Syndrome, Pervasive Developmental Disorders (autistic spectrum disorders), microcephaly, cognitive deficits, malformations, and developmental delays by infectious diseases[3]. It is known that these pathologies have a direct link with the child's birth conditions, socioeconomic and cultural factors, the mother's clinical and obstetric history, prenatal care, as well as environmental and genetic factors.

Therefore, it is necessary to know each of these aspects that influence the development of this population, as they can act as a health indicators, which are nothing more than instruments used to measure a reality, serve as a guiding parameter, which can manage, evaluate, and plan health actions, in order to allow for changes in processes and results. Furthermore, the instrument is important for conducting the actions proposed in a strategic planning to the final result.

Within the clinical practice of child health care, additional instruments are used sporadically, in addition to an existing child health record booklet, which allows for a broad collection of information to support strategies in the child's health care network and actions to promote child development[4].

However, knowing the absence of precise instruments for the care of children and the scarcity of data that could characterize the clientele served in specialized services in the regions of Sertão Central and Maciço de Baturité in Ceará, it is important that research for the creation of instruments be developed in order to facilitate the work process and essential data collection for the health care network.

Thus, the following questions were raised: How to develop an instrument, based on the literature, for the care of children in specialized services? What is the health profile of the children assisted in this type of service?

The research in question is justified by the need to create an instrument to identify the profile of children assisted in the specialized service to aid further studies, and to direct actions and interventions through the identification of problems or situations that affect the growth and development of these children. Therefore, it is noteworthy that this study is crucial for early diagnosis and specific interventions, as well as guiding intervention/ experimental studies and directing health guidelines.

Thus, the present study aimed to develop and apply an instrument to assess the health profile of infants treated at early stimulation services in the Massif de Baturité and Sertão Central, CE region.

METHODOLOGY

This was a methodological study divided into three stages in which are comprised of the construction, assessment with judges, and application of an instrument for data collection. This allowed for the characterization of the health profile of children treated at the specialized early stimulation services of the Massif of Baturité and Sertão Central polyclinics.

The Baturité Massif Polyclinic covers the following municipalities: Baturité, Itapiúna, Capistrano, Aracoiaba, Guaramiranga, Aratuba, Mulungu, Palmacia, and Pacoti. The Sertão Central Polyclinic is a reference center in the specialized service of 10 municipalities in the State of Ceará, including Ibicuitinga, Ibaretama,

Choró, Quixadá, Quixeramobim, Banabuiú, Milhã, Solonópole, Senador Pompeu, and Pedra Branca.

Both polyclinics are part of the public service and serve patients through referrals from other centers within healthcare network in the state of Ceará. The service process is commanded by the state regulation center that organizes the patient waiting lists via and electronic system. When the patient's vacancy is released, they go to the polyclinic and register themselves to proceed with outpatient follow-up according to the reason for which they were referred. The professional staff of the specialized service in the field of pediatrics is composed of nurses and nurse technicians, pediatricians, physical therapists, and speech therapists.

The role of nurses in this scenario occurs through the nursing consultation, with guidance focused on anthropometric measures, vaccination schedule, infant diet, and identification of complaints when the children's mothers are investigated.

1st stage: Construction of a child health clinical evaluation instrument

The construction of the instrument consisted of a bibliographic review carried out in the Scientific Electronic Library Online (SciELO), Pubmed, Web of science, and Latin American and Caribbean Health Science Information Center (LILACS) databases. The following guiding question was used: What factors should be evaluated that comprise the health profile of infants? The keywords in English were used: infant, newborn, and child development, with the Boolean terms of the descriptors (AND and OR).

Inclusion criteria were: original articles, studies from the last 5 years at the time of the search (2013-2017), language (Portuguese, English, and Spanish), availability (full text, free access). The exclusion criteria were: not meeting the research objectives and theme and repeated studies. Thus, 20 articles were selected in Scielo, 2 articles in Pubmed, 24 articles in Web of Science, and no articles in LILACS, totaling 46 articles. To complement the data search, the Ministry of Health manual on growth and development and a book related to the theme were also used.

After reading the materials in full, the variables necessary to compose the instrument were selected: anthropometric characteristics of the infant, dietary characteristics of the infant, sociodemographic characteristics of the caregiver, and obstetric and gestational characteristics of the mother. Thus, the instrument consisted of six topics, namely: Current Health History; Past Health History; Infant food profile; Sociodemographic characterization of the caregiver; General characterization of the caregiver; Gestational and obstetric characteristics of the mother.

2nd stage: Evaluation of the instrument by nurse judges

In the second stage, the instrument was submitted to the sieve of nurse judges to evaluate the appearance, clarity, objectivity, content, relevance, precision, credibility, modality, normality, and simplicity.

For the judge selection, the following criteria were used: being a nurse; has experience in nursing care and/or teaching in the area of child health; participates in a child health research group. The sampling process was non-probabilistic by judgment. It is important to note that such nurses were recruited through electronic contact. Initially, invitation letters were sent and, after acceptance, the informed consent form (ICF) was sent, and its return was requested with a signature. An invitation was sent to ten nurses, however, the sample size for this stage consisted of five nurse judges. Of these, three had doctorates in nursing and two

had masters degrees in nursing.

Based upon this, the main item "Do they have Basic Sanitation?" was suggested to be changed to "Do they have a sanitary waste network?". Since basic sanitation is more comprehensive, the item was adjusted according to the evaluation of the judges.

Regarding the mother's obstetric and gestational characteristics, it was suggested that the item to measure the frequency of ingestion of licit and illicit substances be added. With this, the item for the frequency of ingestion of licit and illicit substances was added with the options: daily, weekly, monthly, and rarely. Furthermore, in the infant's dietary profile, the time of exclusive breastfeeding in months was added. In the end, the items of the instrument were adjusted and added according to the opinion of the judges.

In this context, the comments of the nurse judges are highlighted below, namely:

Judge 1: "Overall, it has a good quality and is suitable for the purpose of the study."

Judge 2: "The form is relevant for the assessment of infants in the proposed environment."

Judge 3: "I believe the topic is relevant. Therefore, the research may result in an important panorama for the health of children in the specialized service network."

It was considered in these evaluations that the instrument would facilitate a more objective and clear recording of data from the changes made in the specialized service. It is worth mentioning that the nurse judges had no contact or affiliation with the health services where this instrument would be applied.

3rd stage: Application of the instrument to survey the health profile of children

At this stage, the instrument, already evaluated by the nurse judges, was applied in the specialized health services located in Maciço de Baturité and Sertão Central from April 2018 to March 2019. The sample was established through the inclusion criteria of medical records of children up to 2 years of age treated at the aforementioned polyclinics; and the exclusion criteria were those with an incomplete medical record or in the archives. The sampling process at this stage was non-probabilistic and by convenience.

In a meeting with each director of the health center and the study researchers, dates were scheduled for data collection, which would take place twice a week. Data collection took place through consulting medical records, filling out the instrument from the analysis of the reference/referral forms, outpatient registration sheet, and health care forms of professionals from the early stimulation center. It is worth remembering that the place where this procedure took place was a room with restricted access.

Subsequently, the data were compiled into a database in a Microsoft Excel program®, imported into the Epi Info program® and descriptive statistical analysis was performed.

The study complied with the recommendations of Resolution 466/2012 of the National Health Council and was approved by the Research Ethics Committee (REC) of the University of International Integration of Afro-Brazilian Lusophony under protocol number 3.114.405.

RESULTS

Overall, 68 medical records of children treated at the specialized service were evaluated, of these, 27 records referring to the specialized service of Baturité and 41 records referring to the specialized service of Sertão Central. Below, Table 1 presents the sociodemographic characterization of the children and their families.

Table 1 – Sociodemographic characterization of children. Redemption-CE, 2019.

Variables	Mean	Max Min
Adjusted age (in months)	12	23 1
Sex	**n**	**%**
Male	39	57.35
Female	29	42.65
Birthplace		
Quixadá	24	35.29
Fortaleza	13	19.12
Baturité	9	13.24
Others*	21	30.88
No information	1	1.47
Housing type		
Own	10	14.7
No information	58	85.3
Housing Conditions		
Masonry	27	39.7
No information	41	60.3
Sanitary sewage network		
Yes	28	41.18
No	14	20.59
No information	26	38.23
Garbage collection		
Yes	32	47.06
No	10	14.71
No information	26	38.24
Running water		
Yes	31	45.59
No	11	16.18
No information	26	38.24
Caregiver Type		
Father	9	13.24
Mother	50	73.53
Grandmother	8	11.76
Cousin	1	1.47

Variables	Mean	Max Min
Adjusted age (in months)	12	23 1
Caregiver's Marital Status	**n**	
Lives with a partner	43	63.24
Lives without partner	17	25
No information	8	11.76
Caregiver Occupation		
Farmer	22	32.35
At Home	14	20.59
Student	9	13.24
Unemployed	4	5.88
Others **	13	19.12
No information	6	8.82
Caregiver's education		
Incomplete elementary	11	16.18
Complete elementary	11	16.18
Incomplete high school	12	17.65
Complete high school	21	30.88
Incomplete higher education	3	4.41
Complete higher education	5	7.35
No information	5	7.35
Caregiver has Learning Disability		
No	59	86.76
No information	9	13.24
Caregiver has mental illness		
Yes	3	4.41
No	58	85.3
No information	7	10.29
Caregiver has genetic illness		
Yes	1	1.47
No	59	86.76
No information	8	11.76
Caregiver Congenital Disease		
No	60	88.24
No information	8	11.76

*Aracoiaba, Aratuba, Capistrano, Caucaia, Guaramiranga, Ibicuitinga, Itapiúna, Mulungu, Pacoti, Quixeramobim. ** Retired, Attendant, Self-employed, Hairdresser, Seamstress, Civil Servant, Teacher, Nurse Technician.

Next, Table 2 presents the gestational and obstetrical characterization of the mothers.

Table 2 – Gestational and obstetric characterization of mothers. Redemption-CE, 2019.

Variables	Mean	Min	Max
Maternal age at pregnancy (in years)	27.3	15	4
pregnancies	2	1	7
abortions	0.3	1	3
Pregnancy	**Nº**	**%**	
Desired and planned	18	26.47%	
Unplanned	39	57.35%	
Unplanned and unwanted	8	11.76%	
No information	3	4.41	
Carried out prenatal			
Yes	65	95%	
No information	3	5%	
Type of delivery			
Vaginal	24	35.29%	
Caesarean	44	64.71%	
Pregnancy complications			
Yes *	42	61.76%	
No	24	35.29%	
No information	2	2.94%	
Complications in childbirth			
Yes **	9	13.23%	
No	56	82.36%	
No information	3	4.41%	

*Anemia, Chikungunya, Diabetes gestacional, Doença Hipertensiva Específica da Gestação, Hemorragias, Infecção pelo Zika Vírus, Óbito fetal de 1 gemelar, Placenta prévia, Pré-eclâmpsia, Infecção do Trato Urinário. ** Eclampsia e desmaio, Pico Hipertensivo, Pré-eclâmpsia, Sofrimento fetal

In this opportunity, the dietary characteristics of children are presented in Table 3.

Table 3 – Infant food characterization. Redemption-CE, 2019.

Variables	Mean	Min	Max
Breastfeeding duration (months)	5,9	0	18
Breastfeeding	**N**	**%**	
Yes	38	55.88%	
No	26	38.23%	
No information	4	5.88%	
Difficulty to feed			
Yes	32	47.05%	
No	31	45.59%	
No information	5	7.35%	
Food allergies			
Yes	3	4.41%	
No	55	80.88%	
No information	10	14.70%	
Food preferences		1	
Breast milk		3.23%	
Others *	39	57.35%	
No information	20	29.41%	

*Pasty Foods, Crushed Food, Beans, Milk Formula, Fruits, Rice Dough, Porridge, Mucilon, Sweet or Salted Porridge, Bread, Soup, Juice.

The reasons found related to weaning from breastfeeding were: low production of breast milk, difficulty in suckling, choking, introduction of new foods to the child, incorrect attachment to the breast, and low milk production due to medication.

Among the reported difficulties in eating are: difficulty picking up food, choking, breathing difficulties, coughing, oral leakage. Regarding allergies, allergies to lactose and cow's milk protein were mentioned.

Next, the anthropometric characteristics of the children are presented in Table 4.

Table 4 – Anthropometric characterization of the infant. Redemption-CE, 2019.

Variables	Mean	Min	Max
Gestational age at birth (weeks)	35.3	25	42
Birth weight (g)	2.430	0.390	4.955
Length at birth (cm)	42	31	51

The congenital diseases mentioned in the children's medical records were: heart disease, adrenal hyperplasia, cytomegalovirus, bronchopulmonary dysplasia, skeletal dysplasia, encephalocele, encephalopathy, hydrocephalus, myelomeningocele, polyctemia, zika virus infection, laryngomalacia, microcephaly, cerebral palsy, systolic murmur, torticollis, ventriculomegaly, and lissencephaly.

The previous conditions by which the children were affected are: anemia, neonatal asphyxia, pulmonary atresia, acute viral bronchiolitis, conjunctivitis, malnutrition, pulmonary dysplasia, hydrocephalus, hydrops fetalis, hemorrhage, holoprosenphaly, jaundice, oral immaturity, early and late neonatal infection, acute kidney failure, type 2 chiari malformation, myelomeningocele, facial paralysis, polyctemia, pneumonia, cervical control problem, absent cochleo-palpebral reflex, late neonatal sepsis, neonatal fungal sepsis, respiratory distress syndrome, and cardiovascular murmur.

With regards to current diseases in the infants, the following stand out: anemia, delayed neuropsychomotor development, neurogenic bladder, respiratory distress, chronic encephalopathy, hydrocephalus, cerebral palsy, prematurity, down syndrome, sinus tachycardia, and ventriculomegaly.

Of the infants who used medication, the classifications used were: antibiotics, non-steroidal anti-inflammatory drugs, vitamin supplements, anticonvulsants, antidopaminergic drugs, and anxiolytic-sedatives.

Below, Table 5 presents the characterization of the infants' health.

Table 5 – Characterization of infant health. Redemption-CE, 2019.

Variables	N	%
Vaccination schedule		
No pendencies	6	8.8
Pendencies	17	25
No information	45	66.1
Allergic reaction to vaccine		
Yes *	3	4.4
No	10	14.7
No information	55	80.8
Congenital disease		
Yes	31	45.5
No	36	52.9
No information	1	1.47
Previous conditions		
Yes	51	75
No	17	25
Current Disease		
Yes		
64		
94.1		
No	4	5.8
Medication use		
Yes	13	19.1
No	17	25
No information	38	55.8
Hospitalization		
Yes **	45	66.1
No	19	27.4
No information	4	5.88
Inpatient drug treatment		
Yes	32	47
No	31	45.5
No information	5	7.3
Surgeries		
Yes	11	16.7
No	57	83.8

*Fever, vomiting. ** Duration: average 34.8 days – minimum 1 day – maximum 180 days

DISCUSSION

The work process in the specialized health services covered in this study operate so that the children referred by primary care centers could be attended without the existence of work instruments. These instruments would gather a set of important information for their care and would facilitate the identification of the health profile this public. The services provided were reported records in medical records, but the scarcity of information and absence of data was still considerable.

The development of suitable instruments plays an important role in health research and assessment. When the researcher develops an adequate and precise instrument, they have a greater assurance about the quality of their results and details about the situation studied[5]. Morevoer, it is necessary to submit the constructed instrument to a sieve of judges, who must be selected with criteria, as it is desirable that they have theoretical knowledge, skill, clinical experience, and qualifications in the area in question[6].

Child development is considered a multifactorial process, influenced by different contexts. In this sense, sociodemographic aspects represent important factors.

It was observed that most of the children were male. The same was found in similar studies[7-8], still associating the male sex with the prevalence of neurological diseases, including cerebral palsy, which is a finding in this study in the characterization of the health of infants[9].

Good housing conditions for the family and the main caregiver are, in general, favorable for stimulating the domains of child development[10,11]. Marital status of caregivers in this study is characterized as a positive factor, to the contrary of other studies found in the literature[12-13], as well as their level of education (greater than 8 years) which significantly influenced neuropsychomotor development of children[7,8,13-15]. The absence of mental, genetic, and congenital diseases in caregivers is also a protective factor for child development[11].

Regarding obstetric conditions, data on unwanted or unplanned pregnancy, type of delivery, low or high maternal age, and the number of abortions represent a conflicting factor for the child's health profile and impairment in the course of their neuropsychomotor development, mainly, at two years of age[16,17].

The main clinical pregnancy complications found in this study (UTI, pregnancy-induced hypertensive syndromes, and anemia) predispose them to intrauterine growth restriction, low birth weight, and prematurity, which are situations found in the results of this study, which are in line with the literature[18].

Regarding food, when based on breastfeeding, natural, and healthy foods, there is a positive association with brain development, so that the repercussions extend into adulthood[19-21]. Mainly, when there is difficulty for infants to eat, this characterizes a risk factor or a developmental delay itself[21].

Prematurity and low birth weight individuals are more susceptible to having restrictions during their life trajectory, especially in motor, behavioral, and learning skills, and are more frequently referred to early stimulation services[7,22].

The pending vaccinations of children is another fact that drew attention. However, in this scenario, failure to comply with the vaccination schedule depends on a set of factors, including the health situations faced by the children in this study[23].

The congenital alterations identified in this study are related to hereditary factors, exposure to substances, infections, and radiation during intrauterine life and a lack of adequate care during the mother's reproductive phase[24]. These

situations, when dealt with in the context of primary health care, with an emphasis on reducing women/pregnant women's exposure to risks, effective prenatal care and early identification of diseases have had positive impacts on this situation and on child development[25].

The analyzed data also showed a significant number of hospital admissions of children assisted by both specialized services. Within this context, one study has pointed to the hospitalization process as a risk factor for changes and developmental delays[26]. Along with the hospitalization process, the use of medication in the pediatric population demonstrated considerable values in the study. Even with the understanding that the use of drugs is necessary, children have specific behavioral and physiological characteristics and the potential for exposure to risks[27].

It is also noteworthy that in this study, a large number of records were observed with no information, this fact compromises child health care, as well as makes it difficult to carry out more in-depth studies that aim to address aspects related to the health profiles and child development. In both data collection scenarios there was no specific form where all the variables explored in this research were, which affirms the importance of creating and applying the questionnaire developed, as it helps collect important data for care in the specialized services and the integration of the service as a network.

Health information is of great relevance for the continuity of care. However, the weakness in filling out records related to child monitoring prevents them from being used as a dialogic tool between professionals and family members, also making it difficult for this information to be shared by professionals at different levels of care[4]. Thus, this fact represents an interruption in the surveillance of child growth and development, and consequently, in the integral care of a child's health.

It is worth mentioning that investigative studies guide the conduct of health professionals, particularly in the application of more effective interventions aimed at the reality of the clientele, as well as contribute necessary information to the specialized services for improving the care provided.

CONCLUSION

It was possible to develop and apply an instrument to characterize the profile of children assisted by specialized services in the Sertão Central and Maciço de Baturité regions. With this, it was possible to observe that the children mostly had problems that are related to themselves, encompassing the gestational and obstetric aspects of the mothers, congenital diseases, as well as previous and current diseases.

The findings in this study reinforce the need for communication within the health care network. When contemplating the profile of children surveyed in the specialized service, these data can support health reports of the service itself, highlight the reality of the scenario in these regions in relation to child health, in addition to directing studies and health actions in this area.

It is imperative to highlight that investigative studies whose databases are records/handbooks limit the collection of information necessary for monitoring the control of the service provided. Therefore, it was necessary to build and validate an instrument with ample power to aggregate information.

CRediT author statement

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