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# Mothers' Understanding of Brain Development in Early Childhood: A Qualitative Study in Brazil

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## Abstract

To analyze mothers' understanding of child brain development and their stimulus practices with children in the first months of life. Qualitative research, with 18 Brazilian mothers, over 18 years of age, used semi-structured interviews to identify their perspectives on important healthcare outcomes, based on reflexive thematic analysis. Mother's accounts displayed little understanding of child brain development, focusing on the development of neuropsychomotor skills. There was relative uncertainty about the daily care practices that would provide appropriate child stimuli, through which to provide promotion and protection of child development. Maternal knowledge about child brain development indicates a need to strengthen parenting practices in early childhood. Expanding this knowledge and practices can contribute to parental caregivers being immediate providers of child development, to detect vulnerabilities and early difficulties. In addition, this approach would promote involvement in daily care and increase shared responsibility in the construction of strengthened executive functions for good child development.

## Keywords

child, brain development, health promotion, early childhood, nursing

## Introduction

Comprehensive health care for children in the first years of life is paramount for safe and healthy growth and development, ensuring their well-being in biological, psychological, and social dimensions (Brazelton & Greenspan, 2000; Shonkoff, 2011). The quality of child growth, development, and safety has been highlighted as a challenge for health professionals as well as for parents and caregivers (Jeong et al., 2021; Mello et al., 2014; Shonkoff & Fisher, 2013).

New evidence suggests that 250 million children under 5 years of age do not realize their full potential, especially in low- and middle-income countries (Black et al., 2017; Yamaoka et al., 2021). This directly affects the human development of the country, thus increasing social inequalities (Spencer et al., 2019; United Nations Development Programme, 2016).

In this context, the best way to reduce levels of social inequality and poverty is to invest in early childhood—from birth to 6 years of age (Heckman et al., 2010; Spencer et al., 2019), to avoid the high cost of living in the future (Richter et al., 2017). In addition, children need positive, social, and affective interactions, as well as adequate child care by people who are responsible and committed to ensuring healthy

child development and growth (World Health Organization [WHO], 2018).

Constant monitoring of children's growth and development is extremely important. In primary health care, there is a range of activities that are very important in the early identification of any problems thus enabling early intervention to promote quality of life. These activities include active listening during consultations, home visits, childcare consultations, health education, and health promotion (Bick & Nelson, 2016; Britto et al., 2017; Fox et al., 2010). How parents, caregivers, and health professionals interact with the child is important for the protection and defence of the child (Andrade et al., 2013; Edmond et al., 2019; Reticena et al., 2019). Scientific evidence shows that stimulating children's brain development in the early years of life is critical to success in adulthood (Britto et al., 2017; Richter et al., 2017; Shonkoff, 2011).

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Faced with such evidence, the present investigation assumes that there are gaps in maternal knowledge about brain development in the first months of life and that there is little understanding of the stimulatory and protective practices used by mothers during their child's initial development (Cuartas et al., 2020; Kendall & Langer, 2015). Thus, the objective is to analyze mothers' understanding of children's brain development and the stimulus practices they use with their children in the first months of life, to promote and protect their child's development.

## Method

Simple descriptive qualitative research was undertaken in a medium-sized Brazilian municipality with families residing in areas covered by Family Health Units (FHU). Family Health Units (FHU) is part of the Family Health Strategy (FHS), which aims to promote the quality of life of the Brazilian community, with comprehensive, continuous care. The strategy facilitates the development of knowledge of the family and the neighborhood. It seeks to identify health problems, provide comprehensive assistance and promote intersectoral actions and partnerships (Paim et al., 2011). The FHU is composed of a multidisciplinary professional team, which has at least one general practitioner, one generalist nurse, one nursing assistant, and six community health agents. This strategy is based on the Unified Health System (SUS), which is a national public and universal health system. The SUS has as principles universality, accessibility, coordination, continuity, integration, responsibility, humanization, equity, and social participation (Macinko & Harris, 2015).

Data collection was conducted following consent for the project from the Municipal Health Secretary of Ribeirão Preto and the approval of the Research Ethics Committee of the University of São Paulo at Ribeirão Preto College of Nursing, number 2.541.288.

The inclusion criteria of the study were:

- Mothers over 18 years of age with children born between 1st and 31st March 2018.
- Mothers of children who were born in hospitals linked to the Unified National Health System (SUS).
- Mothers of children who were receiving follow up at an FHU.

Exclusion criteria were:

- Mothers of children whose follow up care was discontinued at the FHU.
- Mothers who moved to a different area and consequently changed FHU coverage area.
- Mothers not contacted after three attempts at a home visit.
- Premature infants with congenital abnormalities or neurological sequelae.

Thus, from 24 eligible mothers, 3 mothers refused to participate due to lack of time, 2 were excluded because they had moved the FHU coverage area, and 1 was excluded because it was not possible to contact them after three attempts. Thus, 18 mothers participated in the study.

Semi-structured in-depth interviews (Minayo & Costa, 2018) were used to provide participants with the freedom to report their experiences, to explore the mother's understanding of children's brain development and the stimulus practices they use with their children in the first months of life. Each mother was interviewed twice, once when their child was between 4 and 6 weeks of age, and again when their child was between four and four and half months of age, to capture data on the mother's understanding and experiences of their child's development. Data collection was carried out between April and July 2018. The study had consent to access the mother's address details and telephone number from the Municipal Health Secretary of Ribeirão Preto-Brazil. Mothers were contacted by telephone when the research objective. The written Free and Informed Consent were signed by mothers after explanations on the objective and possible benefits and risks of this study. Once the mother had consented the home visit was scheduled. The interviews were in Portuguese language and conducted at home. The duration of the interviews ranged from 40 minutes to an hour. The interview guide included questions based on the aspects of child development listed in the Brazilian Child Health Handbook (Brazil, 2018), aspects about how mothers perceive the child's brain development, and the daily practices of care and development stimulus (see Appendices 1 and 2).

The interviews were recorded using an audio recorder, in mp3 format. Each interview was then transcribed verbatim and anonymized. After transcription and analysis, the audio recordings were deleted.

One mother did not participate in the second interview due to the death of her child before she reached 4 months of age. Thus, this mother's responses are not included in the reports from the second set of interviews.

## Data Handling and Analysis

Reflexive thematic analysis was chosen as a method to direct the analysis of the data, aiming to identify, analyze, and report themes from the data, to portray the context of the participants. Additionally, in reflexive thematic analysis, coding is open, with no use of any coding framework, and themes are a creative and active process (Braun & Clarke, 2020).

In this present study, the following steps were performed: (1) data familiarization and writing familiarization—anonymous transcriptions were created in Word document; reading and re-reading data set; notes during the documents; (2) initial code generation—the transcriptions were then imported into NVivo® Pro 11 software (Qualification Recognizes Services International)—each transcript was

**Table 1.** Characteristics of the Participants.

Age variation of participants				
20–34 years old				
Previous parenting experience				
First pregnancy	1 child	2 children	3 more children	
05	10	02	01	
Obstetric history of mothers				
Had never attempted to conceive before	History of miscarriage		Unplanned pregnancy	
03	04		07	
Schooling				
Incomplete elementary school	Incomplete high school	High school	Incomplete university	University
04	03	05	04	02
Family month income U\$300–U\$2,200				
Number of residents in the household 2–5 people				
None of the mothers stated that they used alcohol, drugs, and tobacco during pregnancy and after childbirth				

analyzed and organized items into meaningful groups; (3) generating initial themes from coded and collected data—these were coded in NVivo to facilitate comparison across all of the transcripts and the identification of patterns and themes in the data and diagramming; (4) developing and reviewing themes—themes were reworked and codes were refined; (5) defining and naming themes; and (6) writing the report—which is presenting of a concise and interesting account of the data, both within and across themes (Braun & Clarke, 2020; Campbell et al., 2021).

## Findings

In this qualitative research, the mother's understanding of children's brain development were found to align with the participants' characteristics and their context. The experiences reported by the mothers are related to the number of years of formal education, the number of children, pregnancy planning, and family income as shown in Table 1.

## Thematic Findings

The findings of the study demonstrate the mother's experiences and understanding of child brain development and child health care at home. Three themes were identified from the data: *Child development: mother's expectations of brain function*; *Child development stimulation: the initial months at home*; *Problems that affect children's brain development: maternal understanding*.

## Child Development: Mother's Expectations of Brain Function

During the interviews mother demonstrated some understanding about child brain development in baby's first month, relating to the contribution of the brain to neuropsychomotor aspects, such as primitive reflexes and babbling as a precursor of language, as well as improvement of hearing, sight, and touch.

*Brain development, in the beginning, is more what we call neuropsychomotor, right? It will be more related to reflexes, motor control, a little of the social, especially of the smile, that social smile already begins. So, it is this control, the babbling starts. Then, the beginning of a language. (M5, Baby 1 month)*

Mothers recognized the importance of the brain for social development in childhood, allowing greater interaction with the family.

*It (the importance of the brain) interferes with everything he's showing us. One hour he smiles, responds to encouragement. I think all this is linked to the baby's brain development. (M12, Baby 1 month)*

*Along with this the social, the social one that I say is already the smile, to identify this social interaction. (M5, Baby 1 month)*

In addition, mothers demonstrated their knowledge of the development they are expecting to see in their child over the next few months, as they were able to identify some of the

milestones of brain development considered essential to monitoring healthy child development.

*Thus, at 2 months she is expected to have this control of the head. After 4 months or so, I hope she already has started to have a palmar grip and has already lost the first reflexes. At 6 months she will be sitting right, after sitting, already be doing that discharge in weight, to go to crawl. So, I hope that in 7, 8 months, she's already crawling, so she's going to start standing up at 9 months or so. (M5, Baby 1 month)*

Difficulties in accessing information about the next stages of child development and adequate and necessary stimuli were mentioned. The justifications were related to the lack of time in daily life.

*So, I'll tell you what I remember about her [another daughter, 4 years old] too because I do not have time to look, for example at the Internet and the book. What I remember is with six months sitting, crawling with eight to nine months, but I do not remember other details. (M12, Baby 4 months)*

It is noteworthy that mothers with their firstborn child reported that they had no idea about the role of the brain in child development, both in the first and fourth month of the baby's life.

*I'm a first-time mom. So I do not understand pretty much anything. From the brain, I have no idea. (M3, Baby 1 month)*

*I have no idea, no. We are first-time parents. (M9, Baby 4 months)*

Another aspect that stands out is that mothers have little understanding about the needs of early childhood development. They mainly reinforce the relationship between the brain and physical/motor skills in the baby's first month.

*I understand that she is learning things at the right time, is developing right, like moving her little hands, her little arm, trying to form her little head, I understand that. (M10, Baby 1 month)*

*I think he's going to have the toughest nut. But I have not had [experience with babies] for 12 years. I do not even know (laughs). (M11, Baby 1 month)*

Baby bathing and sleeping were other aspects emphasized. Situations that present a risk of suffocation or a fall were not linked to the process of child development.

*When he goes to bathe in it, he wants to get more upright, and when I turn him on his back to wash his clothes, I cannot get him to kneel anymore. He stands, forcing his leg. In bed he rolls a lot, he flips everywhere. The time I wake up, there are times, he's almost under me. Then you have to get and push (the baby), the good thing is that I wake up easy like that, you know? He grunts, I pick him up and I get him (M16, Baby 1 month)*

Mothers' statements demonstrated gaps in their knowledge, particularly those with the first child in the first month of life.

## Child Development Stimulation: The Initial Months at Home

Mothers presented a picture of understanding that, from conception onwards, adequate stimuli are essential to promote children's brain development, and that the interactions, affection, dialogue, and involvement of other family members are important.

*When I came home from work at night, I took my shower and talked [during pregnancy], smoothed my belly, those things. My mother did too [. . .], she sang. (M3, Baby 1 month)*

*I used to talk, sometimes I would listen to a little music to relax, I would also rock my belly, I would love it. If I felt like this, something, she moving her little foot or arm, I kept moving. My husband also participated, and the 4-year-old sister was also talking. (M12, Baby 1 month)*

After birth, mothers emphasize that affection and attention directed toward the child are the main stimuli to ensure healthy development for children.

*I think the affective issue is also important, she feels this affection of the parents, thus, the family. So, in this sense of affection, I think it's an appropriate stimulus, right? (M5, Baby 1 month)*

*I think the mother has to be a hundred percent with the child. So, I think the attention, well, the care you have with the child is very important. (M4, Baby 1 month)*

Participants also pointed out that performing specific activity such as singing lullabies, exchanging looks, talking, and using a mobile phone stimulated their children. Mothers' reports suggest that such activities contribute to brain development in the first month of life.

*My sister sings a lot to him. [. . .] I put on lullabies, I talk a lot. He laughs, tries to talk, but does not know-how. I say: 'mama's love'. He looks a lot at me, looks a lot. (M3, Baby 1 month)*

*I sing the songs of 'Patati patatá', 'Ciranda cirandinha', 'If this street were mine', I sing a lot of things, he has fun, he laughs. My sister picks up and sings, and he likes to play. (M3, Baby 4 months)*

Reading and telling stories for infants were not mentioned as part of proper stimuli for brain development. Yet, lack of stimulation was seen as detrimental to early childhood development.

*I think the stimulus makes a lot of difference because we even have a case of a child in the family, my daughter's cousin. That he is now*

*2 years old and he had no encouragement at all, and there they even suspected that he had autism but he did not. It was a lack of encouragement, he spent all day in front of the television and it was not a children's show, it was anything he had been through, newspaper, novel. So, his parents did not play with children, they did not take them for a walk, they did not have to do anything different, baby play, riding, that kind of thing, they had very little. [. . .] The parents are separated, then the grandparents got to care for him as if it were a shared guardianship. grandparents super stimulate the child, but the bike and walk of bicycle, little game and I do not know what, it did an interactive thing. The child changed, developed a thousand percent. In less than 6 months, he's another child. (M12, Baby 1 month)*

The active participation of the father was highlighted as an important element to child development, even among couples who were not in a fixed relationship, favoring presence and interaction. Coexistence with other family members was reported as a beneficial source of development in childhood.

*Also has the father of the three, who is different, different from the father of L. Both are very present. So, the father of L. and I do not have a fixed relationship, but he is very present. He just left here. Whenever he can, he's coming, he's very present, yes, he's a participatory parent. (M18, Baby 1 month)*

*The family is very close together here. (M3, Baby 4 months)*

At 4 months of age, mothers reported performing more stimuli than they did when infants were 1 month old. Jokes like singing, telling stories, peekaboo, facing the mirror, activities for sensory stimuli of hearing, sight, and touch were applied with children.

*I say: 'Congratulations to you, on this dear date, many congratulations, many years of life' [mother singing]. Then I threw the stick at the toy? cat [smiling while doing]. (M8, Baby 4 months)*

*There are colorful little toys that make a noise that I bought, if we show it, shaking, the colors attract attention. (M2, Baby 4 months)*

*When I put her in front of the mirror, she laughs, looks at herself, and laughs. (M4, Baby 4 months)*

Mothers cited dialogue with their child as a way to stimulate and perceive the reactions of the baby at 4 months, to ensure a greater bond between mother and child.

*We talk a lot. When it is just the two of us alone, we talk, as she is my friend. I say: 'Good morning, God bless you. She is quiet, but when she sees me, she jumps because I think she already knows me'. (M8, Baby 4 months)*

*I ask: 'How was your day? Did you miss Mom? Played? Took a shower?'. Then, he says: 'ahhh, ahhh'. He starts issuing the little ones. I say: 'Oh, where's Mommy's love? Where is my life?'. (M3, Baby 4 months)*

Daily care practices are also seen as a means of interaction, perception, and stimulation of babies' brain development. Thus, the reports show that, over the months, maternal trust and creativity in the caring process had been strengthened.

*In the bath, I put the shampoo glass, and then she goes taking it, she goes and hits her hand in the bathtub to get it, she's very smart. [. . .]. Also, in the trolley, I hung a line and put some toys. Another thing I also did was wash orange, lemon, I gave it to her and she kept laughing [. . .]. Histories I tell, I have her little book. (M6, Baby 4 months)*

## Problems That Affect Children's Brain Development: Maternal Understanding

Mothers reported that they understood that some problems can directly affect children's brain development, based on the physical and social environment, potentially harming to the child.

*First, I see that it is a physical issue. If you have had any malformation if you have any syndrome if you have any pathology, which I think will hinder the development of the child. Then I see that the environment can also disrupt. If it is an environment that does not give the appropriate stimulus, that the parents do not interact with the child, that the child is very much in the cradle, has no toy, is not stimulated. (M5, Baby 1 month)*

*For example, my mother is a smoker, I avoid as much as possible getting close when she is smoking because it will affect his health. Therefore, if it is the health part, we will rather be affected, the person can drink and for example, the person who drinks want to catch him and knock him down. (M1, Baby 1 month)*

It was pointed out, by mothers, that social and environmental aspects, particularly domestic violence, lack of affection and attention, smoking, and alcoholism could all have a negative influence on children's brain development. It is, therefore, fundamentally important to identify any risks to the developing child in their environment.

Mother's talk was permeated by preoccupations with negative situations, particularly physical or verbal aggression and excessive stimuli in the environment.

*I was staying the first week with my mother-in-law, it's not a quiet place, it disturbs, you know? There has to be noise from day to day because she [Baby] has to know what day is and what night is. However, I think that place was heavy, intense, very loud, it affects us and brings stress. And if we're anxious we give it to him. (M6, Baby 1 month)*

The use of cell phones and tablets for young children were mentioned as worrying and prior maternal experiences of their negative impact provided an opportunity not to use them again with the youngest child.

*With her [Baby] I do not use the cell phone. Sometimes, if she's with me, I use that aside and then I realize she even pays attention to the light, but I do not, no. I already messed with my other son [5-year-old son], because when he reaches a certain age, the Tablet is perfect, especially when you are in public. [ . . . ]. Today he even knows when we go to the restaurant, and there is no kid area, he already sits down and says: 'I want the cell phone'. He already associates that I give him to be quiet in the place, he already wants the cell phone. (M5, Baby 4 months)*

*I see the lack of stimulation as a problem. The issue of development is a lot of encouragement, affection, love and everything. In the case of development, I think it is more the stimulus. (M12, Baby 1 month)*

The lack of financial resources was highlighted as a limiting the use of auxiliary materials in child development. Mothers recognized the importance of stimulating children and shared the difficulty of choosing between clothes and toys when financial resources are limited.

*I think there should be some material to help mothers. It is too expensive to pay. That neither, he has lost much the clothes already, and then between buying a toy to stimulate and little clothes, I prefer little clothes, right? Therefore, I think it should rather have [more features]. (M15, Baby 1 month)*

## Discussion

Mothers' understanding of children's brain development was focused mainly on the development of neuropsychomotor skills. In the motor milestones, they pointed out the control of the neck and head, rolling over, palmar grasp, sitting, crawling, and walking, as an indication of the brain developing. Where cognitive milestones are concerned, participants demonstrated an understanding that brain development is necessary for learning, emphasizing that the beginning of language is visible in the babbling baby and later with the appearance of speech. In social milestones, mothers identify the child's smile, gaze, and early dialogue, recognizing the brain as a vital organ that must be developed to facilitate greater social interaction of the child with the family and vice versa.

Mothers' knowledge about child development and early childhood parenting varies in different societies (Bornstein et al., 2020; Khatib et al., 2020; Safadi et al., 2016; Zhong et al., 2020), and the first 4 months were chosen in this qualitative research to gather data to find out what Brazilian mothers know about children's brain development.

Children's brain development is, for the participants, a somewhat unknown phenomenon, especially those with the first child. The results suggest that there is a recognition of the relevance of development in the early months of childhood, based on the mothers' knowledge and understanding. In addition, mother's uncertainty and lack of awareness deserves more attention in the field of child health.

Importantly, maternal understanding of children's brain development can guide the identification of children's vulnerabilities and needs in the early development process. The child development process is complex and involves interactions in the family environment, influenced by their contexts, characteristics, stimuli, and practices (Khatib et al., 2020; Orth, 2018). The identification of parental caregivers' understanding of child brain development is important, as it is likely to affect how they care for their child (Bornstein et al., 2020).

Maternal perceptions of the first months and years of life is an important factor, and it was found that their knowledge focuses more on physical aspects (Aldayel et al., 2020), with gaps in the perception of cognitive and socio-emotional skills (Safadi et al., 2016; Zhong et al., 2020), as in the present research.

The maternal understanding of the importance of interacting with their child, illustrated in their reports of talking, singing, and telling stories to their children, suggests an understanding of its contribution to children's development. However, these aspects were not clearly identified as contributors to brain development. These activities were perceived by mothers to contribute to language development, as found in other studies (Bornstein et al., 2020; Norholt, 2020).

Some mothers expressed concerns about the use of equipment such as mobile phones and tablets with a small child, setting limits on everyday use. Television and cell phones are the devices most used by small children daily for more than an hour, particularly between 1 and 2 years old (Chang et al., 2018). Moreover, other research was pointed out, there is a high prevalence of exposure to mobile devices in children below 60 months of age (Kiliç et al., 2019).

Furthermore, the social aspects of children's brain development were identified by the participants as inherent to dialogue and interaction with the child, suggesting an approach to the construction of parenting. On the other hand, the construction of the affective bonds created between parental caregivers and children are also linked to the physical and socioemotional maturity, essential to this phase of life, as the scientific literature points out (Morelli et al., 2015; Scherer et al., 2019).

Participants, both primiparous and multiparous, demonstrated gaps in their knowledge during the interviews about children's brain development, permeated by doubts regarding what is appropriate for each age, brain functions, and the children's learning, as well as the use of the electronic media as a source of stimuli. These knowledge gaps indicate the need for programs to promote and monitor child health, from preconception care through early childhood, to enable children to reach their full potential (Cardoso & Marín, 2018; Grantham-McGregor et al., 2020; Prime et al., 2020). It is increasingly essential for adults to understand that brain development is shaped in early childhood, and that parenting requires increased knowledge of child development (Bornstein et al., 2020), and support to exercise good parenting practices at home (Jeong et al., 2021).

There is still little appreciation of psychosocial aspects of development in the general population, indicating little knowledge about brain development, not identifying that the child's learning begins in gestation and may hinder good development in early childhood (Worthman et al., 2016). However, the majority of parents and caregivers emphasize the stage of adolescence as the most important phase of development (Worthman et al., 2016).

A wide range of different reasons have been found to account for parents' knowledge deficit, concerning child care and development. Some studies have already identified a range of maternal factors associated with fragile maternal care for children, including low interest, lack of preparation, little information, unplanned pregnancy, low education, low age of mothers (Cardoso & Marín, 2018; Gil et al., 2020; WHO, 2020), and maternal history (Nuttall et al., 2015).

Mother's lack of knowledge about children's brain development can directly influence the quality of care, for example, through not providing enough age-appropriate stimulation, making the achievement of developmental milestones vulnerable and uncertain. When the child is placed in non-stimulating and vulnerable environments, children's development can be hampered to a lesser or greater extent (Bick & Nelson, 2016). Some environments can be characterized by neglect, having long-term consequences, delaying children's brain development, and resulting in weaknesses in executive functions (Shonkoff, 2011; Spratt et al., 2012). Understanding the mechanisms by which poverty affects the brain, parents' behaviors, and children's language development is very important, with implications for identification, treatment, and social policies (Pereira et al., 2017; Perkins et al., 2013; WHO, 2020).

Mothers' talked about how overloaded they were after the birth of their child, as they were taking care of the baby and continuing to be responsible for household chores. This can be potentially stressful and, consequently, create a negative environment.

The scientific literature indicates that family dynamics that lead to impulsive behavior cause harm to children or other family members, such as neglect, negative communication such as shouting and insults, or inconsistent discipline (Cates et al., 2012; Macana & Comin, 2015), and physical punishment and even maternal depression (Campos & Rodrigues, 2015; Carvalho & Lima, 2014; Jeong et al., 2021).

The participants pointed out that the absence of stimuli is negative for early childhood development, and the involvement of other family members was considered part of the child care and development process, which may help to mitigate the influence of negative care environments.

Among other things, mothers highlighted that environments with a lack of affection and attention, violence, excess of stimuli, smoking, and/or alcoholism can directly influence children's brain development. The concept of toxic stress applies here, as situations that have such severe adversities,

where there is no adult support, interfere with learning development, generating negative behaviors, and poor health with long-term repercussions (Gershoff, 2016; Gil et al., 2020).

## Strengths and Limitations of the Research

The strengths of this study are that it gave the group of Brazilian mothers a voice to express experiences and practices in daily child care and shed light on their knowledge of infant brain development. A variety of different characteristics was represented in the sample, limiting the details of experiences and knowledge about early childhood brain development. Information on planned and unplanned pregnancies was not investigated.

## Implications for Nursing Practice

It is important to emphasize the practices that stimulate children's development. Health promotion and child health surveillance need to focus on the development of parenting skills to enable optimum child development.

Although some mothers reported difficulties in accessing information and knowledge about adequate stimuli for their children and that they did not have enough time or material resources, the importance of affection, interaction, and dialogue was acknowledged to be important. The need for stimuli for their babies was mentioned by participants in the fourth month of their baby's life, when they reported contemplating playing hide-and-seek, standing facing the mirror, and telling stories like those used with older children. The reports suggest that in the course of the child's first months mothers gain confidence and creativity in the process of stimulating development in early childhood.

The promotion of parental care at home requires professional support that monitors child health and development, enhancing the involvement of parents in care, providing support, and improving co-responsibility in the child care process (Mello et al., 2014). Nurses can provide child health support for mothers (Landy et al., 2012), through developing parenting skills and positive maternal-child interaction (Henderson, 2009), consequently improving the maternal life course (Olds et al., 2010). The actions of nurses in home visits are focused on measures to protect child health and development, observation of, and intervention for, childcare, and to prevent situations where children's rights are violated (Andrade et al., 2015). Another study found that mothers who are supported in this way are emotionally and verbally more responsive during the first 2 years of their child's life in comparison with mothers who did not regularly receive such visits (Kemp et al., 2011).

In the research reported here, the findings suggest three types of needs that may support child development surveillance in the field of primary health care: strengthening care, improving knowledge, and demystification of ideas.



Strengthening care needs include nurturing care from the beginning of life, with positive interaction, affection, and understanding children's needs, such as breastfeeding, healthy eating, vaccination, prevention of domestic accidents, sleeping, hygiene, and clothing. Knowledge needs involve learning about the relevance of brain development and its sensitive periods, including the need to understand about protecting children from toxic stress, based on a quiet environment, stimulating interaction through songs, telling stories, playing outdoors, and moderating the use of electronic media. Ideas that need to be demystified are that the brain develops alone and that the responsibility lies solely with the health professionals and educators; the use of sophisticated toys with the illusion that they are more stimulating for the child; and that when the child is well there is no need for routine health follow-up.

### Directions for Future Research

Expanding mother's knowledge about child brain development and parenting practices can contribute to parental caregivers being immediate providers of child development. It will contribute to the detection of vulnerabilities and early difficulties, enabling early intervention, and promote parental caregivers in daily care. In addition, it is important to expand co-responsibility in the construction of strengthened executive functions for adequate child development.

Further research is needed to explore the impact of characteristics such as educational level, number of children in the household, and income on mothers' understanding of children's brain development. Additionally, there is a need for large scale research to establish the generalizability of findings to the wider population and determine the size of the problem in order to direct future healthy policy in Brazil.

### Conclusion

This qualitative investigation has provided some insight into mothers' knowledge of children's brain development and how they see this in their child's motor, social, and cognitive skills.

The findings provide pertinent directions to healthy and timely practices, particularly those performed and/or coordinated by nurses, ensured and strengthened by scientific evidence of care and promotion of early childhood development. It is also important to emphasize that such practices are inter-related with the fundamental principles of primary health care, involving first contact, continuity of care and carer, comprehensiveness, and coordination of care management.

Moreover, it is important to emphasize the importance of access to health and advocacy involving the participation of families and the community. Political guidelines based on sustainability, intersectionality, and strong investment in the first years of life are very important, which will bring lower costs and many benefits for the prevention of social inequalities and will maximize potential child development, including the

increase of home visiting programs to improve parenting capacities. It should be mentioned that child development and learning are not exclusive to families, political guidelines also need to be directed toward protective interventions.

Many issues related to child health care have been discussed nowadays and this study aimed to contribute to child care and development, to strengthen nursing performance in the longitudinal follow-up of children, and improvement of the quality of care to families.

## Appendix I

### *Interview Guide: Data Collection Part 1—First Month After Birth*

Mother initials: \_\_\_\_\_ Mother age: \_\_\_\_\_

Mother's schooling: \_\_\_\_\_

Have you ever had an abortion? ( ) Yes ( ) No

How many pregnancies were planned? \_\_\_\_\_

How many kids do you have? \_\_\_\_\_

Do you drink? ( ) Yes ( ) No Do you smoke? ( ) Yes ( ) No

Do you use drugs? ( ) Yes ( ) No

Guiding Questions:

1. What is a children's brain development for you? Can you tell more about it?
2. Do you think the child begins to learn from when?
3. What do you usually do on a day-to-day basis for him/her to develop?
4. How do you realize that your child is developing?
5. In your opinion, what do you think makes the child develop well?
6. In your opinion, what brings problems to the child's development during the first year of life?

## Appendix 2

### *Interview Guide: Data Collection Part 2—Fourth Month After Birth*

Guiding Questions:

1. How do you think your child is developing?
2. What do you usually do on a day-to-day basis to develop?
3. In your opinion, how could you stimulate your child's brain development?
4. What can your child do today? (the skills)
5. What do you think he/she is learning?
6. What tools or who do you look for when you have questions about your child's development?

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