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RESEARCH ARTICLE

Parental knowledge and caregiving practices related to early childhood development

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Abstract

Background: *Early childhood development (ECD) is a critical period for achieving milestones in cognitive, motor, and socioemotional development. Parental knowledge of ECD influences the manner in which children are stimulated, as evidenced in previous studies, particularly in developing countries. This study examined parents' understanding of ECD, their stimulation and caregiving practices, and the sources of information that they utilize in the Mexican context.* **Methods:** *A descriptive cross-sectional field study was conducted using a questionnaire validated by a panel of experts and a pilot test. A total of 536 mothers and fathers from socioeconomic levels C–, D+, and D/E residing in three Mexican cities were surveyed using non-probability convenience sampling. The questionnaire inquired about respondents' knowledge, stimulation practices, and sources of information related to ECD.* **Results:** *In all, 60% of the surveyed parents did not consider the first 3 years of life as a relevant learning stage. Although 44.3% of mothers and 37.6% of fathers identified early learning (at 0-3 months), few socioemotional activities were considered relevant. Only 33% were familiar with the term "early stimulation," and television was the most consulted medium (30%).* **Conclusions:** *It is necessary to raise awareness among parents about the importance of play, as well as socioemotional and communicative activities in ECD. The quality of information disseminated through mass media should be improved and public policies to strengthen parental education should be promoted.*

Keywords: *Early childhood development. Early stimulation. Early education. Parenthood.*

Conocimiento parental y prácticas de crianza relacionadas con el desarrollo infantil temprano

Resumen

Introducción: *El desarrollo infantil temprano (DIT) es de crucial para alcanzar los hitos en el desarrollo cognitivo, motor y socioemocional. El conocimiento parental sobre el DIT influye en las formas en que se estimula a los niños, y estudios previos ha evidenciado estas brechas, especialmente en países en desarrollo. Este estudio examinó el conocimiento de los padres sobre el DIT, sus prácticas de estimulación y cuidado, y las fuentes de información consultadas, en un contexto mexicano.* **Métodos:** *Se realizó un estudio de campo transversal descriptivo mediante un cuestionario validado por expertos y una prueba piloto. Se encuestó a 536 padres y madres de niveles socioeconómicos C–, D+ y D/E en tres ciudades mexicanas, usando muestreo no probabilístico por conveniencia. El cuestionario indagó sobre los conocimientos, prácticas de estimulación y las fuentes de información relacionadas con DIT.*

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Resultados: *El 60% de los padres encuestados no consideró los primeros tres años de vida como relevantes para el aprendizaje. Aunque el 44.3% de las madres y el 37.6% de los padres identificaron el aprendizaje temprano (0-3 meses), pocas actividades socioemocionales se consideraron como relevantes. Solo el 33% conocía el término "estimulación temprana," y la televisión fue el medio más consultado (30%).* **Conclusiones:** *Se requiere sensibilizar a los padres sobre la importancia del juego y las actividades socioemocionales y comunicativas en el DIT. Es necesario mejorar la calidad de información en medios masivos y promover políticas públicas para fortalecer la educación parental.*

Palabras clave: *Desarrollo infantil temprano. Estimulación temprana. Educación inicial. Parentalidad.*

Introduction

Early childhood development (ECD) is a process of change in which children learn to master increasingly complex levels of movement, thought, feelings, and relationships with other people; this process occurs when children interact with their biophysical and social environment[1]. During the first 5 years of life, 90% of neuronal circuits are formed, including those involved in sensory, cognitive, and linguistic functions. This period is therefore critical for the subsequent development of the individual[2].

A parent's understanding of ECD exerts a profound influence on their parenting practices and, consequently, on the developmental outcomes of their children[3,4]. Several risk factors have been identified as being detrimental to childhood development, with primary risk factors including poverty, malnutrition, health problems, and an under-stimulating environment[5-7]. The recognition of this problem has led to the creation of programs that encourage social interactions and responses so that successful attachment can be established between parents and their children[8]. Thus, in recent years, different studies have focused on the concept of parental cognition to integrate their values, beliefs, goals, and knowledge of childhood development and educational practices[3,9,10].

Previous studies have revealed significant gaps in parents' understanding of ECD. For example, many caregivers do not know when children begin to interact with their environment or mistakenly assume that long-term memory is established after 6 months of age. This creates the false notion that if young children are exposed to violence, they will not experience repercussions[11]. This absence of relevant knowledge can negatively impact parenting practices. Caregivers may fail to recognize the significance of early stimuli and adverse experiences, which can affect their children's cognitive, emotional, and social development. These findings have primarily been observed in developed countries; however, data from developing countries are limited. Therefore, it is imperative to assess the extent of this knowledge in the Mexican population to generate culturally relevant data.

This study examined the extent of parents' knowledge regarding ECD in a developing country, the practices they implement to stimulate this development, and the primary sources of information they utilize to acquire this knowledge.

Methods

To achieve the objective of this research, it was conducted in two stages. In the first stage, the questionnaire was developed and validated. In the second stage, parents' knowledge of ECD was examined.

Stage I

Some tools that were previously developed and validated in other countries[8,12-14] do not fit our population for sociocultural reasons; hence, it was considered necessary to develop a new culturally relevant questionnaire.

This questionnaire was designed to explore parents' knowledge of childhood development during the first 3 years of life. It also aimed to identify the stimulation practices that parents use with their children and their sources of information regarding their children's development.

A group of 10 experts developed the questionnaire. This group constituted members of both civil associations and public health institutions, including psychologists, pediatricians, and pediatric neurologists with expertise in ECD. This group of experts developed a first version of the questionnaire, which was validated by a panel; the experts reviewed each question in terms of clarity, relevance, and content. Following a deliberative process aimed at reaching a consensus, adjustments were implemented to address the identified discrepancies. These adjustments were deemed necessary to ensure the questionnaire's capacity to accurately represent the dimensions under investigation. Following this, a pilot test was conducted with a group of 15 mothers and fathers of children under 3 years old. The test was conducted at the

Table 1. Example of question types and questionnaire response forms

Dimension	Sample question	Type of question	Type of response
Demographic data	What is the highest level of education you have completed?	Closed-ended	Predefined options (elementary, middle school, high school, etc.)
	How old are you?	Open-ended	Numerical response
Parents' profile	How old were you when you had your first child?	Open-ended	Numerical response
	How many children do you have?	Closed-ended	Predefined options
Parental knowledge	When do you think children begin learning?	Open-ended	Open response
	What would you say are the main things children learn between 0 and 3 years of age?	Open-ended	Responses coded according to categories: motor, cognitive, language, etc.
Relationship with the child	How often do you perform the following activities with your child (e.g., singing, dancing, talking, etc.)?	Likert-type scale	Very often, Somewhat often, Regularly, Not often, or Never.
Sources of information	When you have doubts or need information about your child's care, what do you do?	Closed-ended (multiple)	Yes/No for options such as doctor, internet, family, books, etc.

neurodevelopmental research unit of the "Hospital Infantil de México Federico Gómez" to verify that the questions were comprehensible.

After the pilot test, the group of experts adjusted the questions based on the feedback received from the parents, thus achieving a final version of the questionnaire by unanimous consensus of the panel.

The subsequent stage delineates the structure of the questionnaire, including its final characteristics, implementation modalities, and the results obtained. Table 1 shows an example of the types of questions and the response formats used in each section of the questionnaire.

Stage II

A descriptive cross-sectional field study was conducted. The sample size was determined based on a 95% confidence interval for proportion; it included a standard error of 4.22%, which determined the need for 541 parents to be interviewed. A non-probability convenience sample was used to select the participants.

Data collection was conducted between September 11 and 18, 2015, using a traditional field survey method. The face-to-face surveys were conducted by trained staff using tablets in high-inflow areas such as parks, shopping malls, markets, hospitals, and health centers in Mexico City, Guadalajara, and Monterrey.

Table 2. Demographic characteristics of the surveyed fathers and mothers

Characteristics	Parents surveyed	
	n = 536	(%)
Location		
Mexico city	215	(40.1)
Guadalajara	162	(30.2)
Monterrey	159	(29.7)
Socioeconomic level		
D–	160	(29.9)
D+	218	(40.7)
C	158	(29.5)
Age (years) at the time of the interview		
< 20	116	(21.6)
21-30	280	(52.2)
31-40	127	(23.7)
> 40	13	(2.4)
Educational level		
Primary school	37	(6.9)
Secondary school	322	(60.1)
High school or higher	177	(33.0)
Occupation		
Studying/working	219	(40.9)
Home	308	(57.5)
Unemployed	9	(1.7)
No. of children		
1	316	(59.0)
2	142	(26.5)
≥ 3	78	(14.6)
Gender of respondent		
Male	165	(30.8)
Female	371	(69.2)

Table 3. Responsible for childcare according to child's age group

Study question	Age of youngest child (months)							
	0-12		13-24		> 24		Total	
	n = 184		n = 171		n = 181		n = 536	
Total	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Sex of youngest child								
Female	96	52.2	83	48.5	87	48.1	266	49.6
Male	88	47.8	88	51.5	94	51.9	270	50.4
Who takes care of the child?								
Mother	157	85.3	141	82.5	152	84.0	450	84.0
Father	16	8.7	14	8.2	10	5.5	40	7.5
Other	11	6.0	16	9.4	19	10.5	46	8.6
Who bathes the child?								
Mother	162	88.0	149	87.1	159	87.8	470	87.7
Father	14	7.6	14	8.2	8	4.4	35	6.5
Other	8	4.3	16	9.4	14	7.7	31	5.8
Who changes the child?								
Mother	155	84.2	145	84.8	161	89.0	461	86.0
Father	17	9.2	15	8.8	9	5.0	41	7.6
Other	12	6.5	11	6.4	11	6.1	34	6.3
Who feeds the child?								
Mother	156	84.8	143	83.6	157	86.7	456	85.1
Father	16	8.7	14	8.2	10	5.5	40	7.5
Other	12	6.5	14	8.2	14	7.7	40	7.5

Table 4. Period in which parents believe that an infant's learning begins

Period	%	n
During pregnancy	5.4	29
From birth	24.1	129
From 1 to 3 months	18.1	97
From 4 to 6 months	12.1	65
From 7 to 12 months	25.7	138
From 12 to 24 months	6.5	35
> 36 months	2.6	14
When they can speak	0.9	5
When they can walk	1.3	7
When they begin to go to school	2.8	15
Do not know	0.4	2
Total	100	536

Mothers and fathers with children under 3 years of age were interviewed. They had socioeconomic levels of C– (monthly income between $13,500 and $23,000 MXN), D+ (between $7,500 and $13,500 MXN), and D/E (< $7,500 MXN) and were available to participate in a face-to-face survey that lasted approximately 30-40 min. The socioeconomic classification of the participants was determined using the system of the "Asociación Mexicana de Agencias de Investigación de Mercado y Opinión Pública" (AMAI)[15]. These socioeconomic levels were considered because they represent 87% of family households in Mexico according to the "Encuesta Nacional de Ocupación y Empleo" (ENOE)[16].

On contacting the participants, the surveyors identified themselves as members of a survey-conducting specialized agency. They explained the general objectives of the study, highlighted the importance of the respondents' answers, and informed them that their participation was voluntary, without any personal data collected, there were no retribution for participation, and that the approximate duration of the survey would be 30-40 min focused on questions about their parenthood. Furthermore, they guaranteed the confidentiality of participant information through a privacy notice and informed them about data handling. Finally, they requested verbal consent from the participants before starting the survey. No personal information or sensitive personal data were collected, and all data were anonymized since the first data collection.

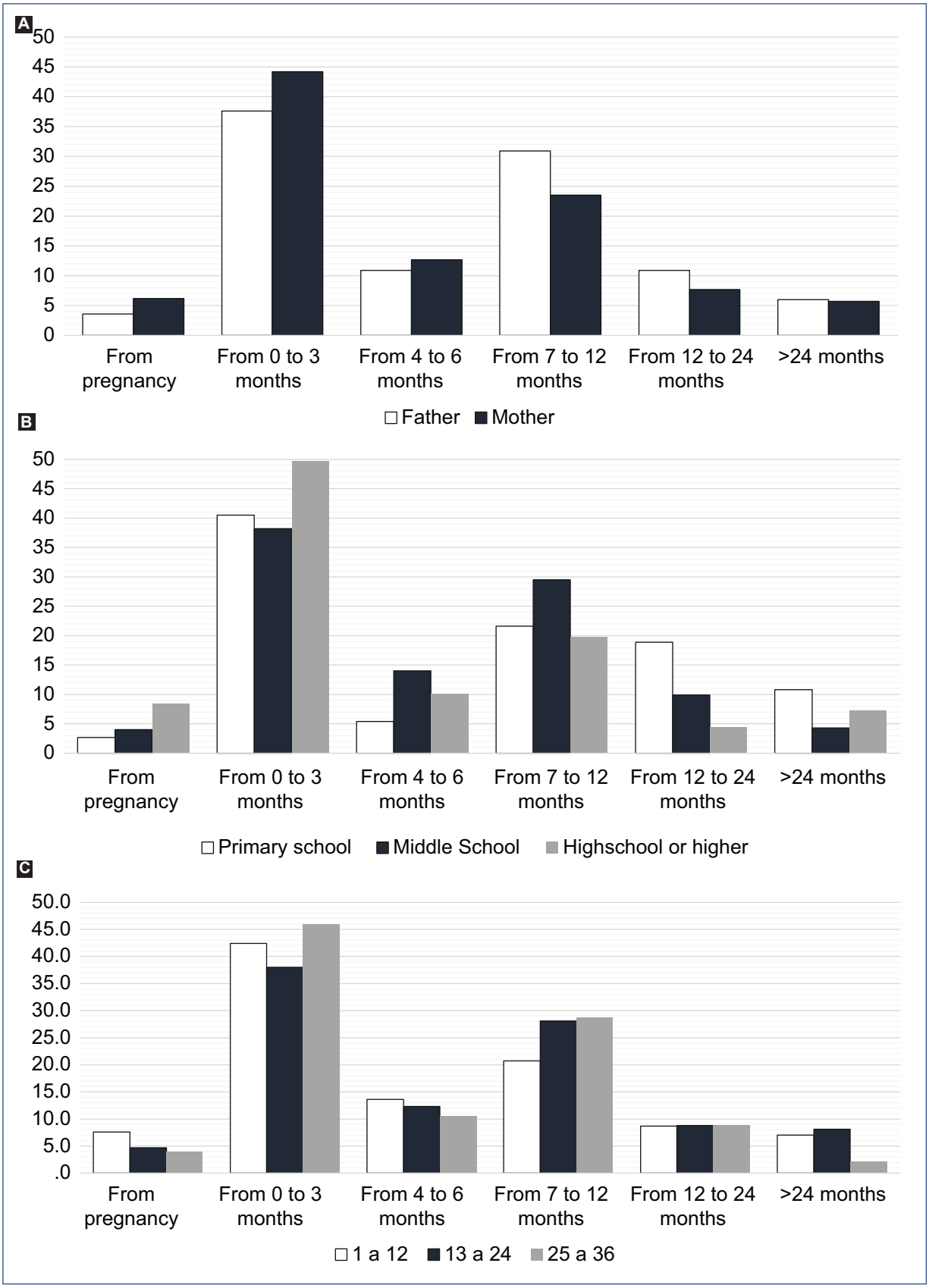

Figure 1. Parents' responses to the question "at what age do children start learning?." **A:** comparison by sex of those interviewed. **B:** comparison by academic level of those interviewed. **C:** comparison by age group of the youngest child.

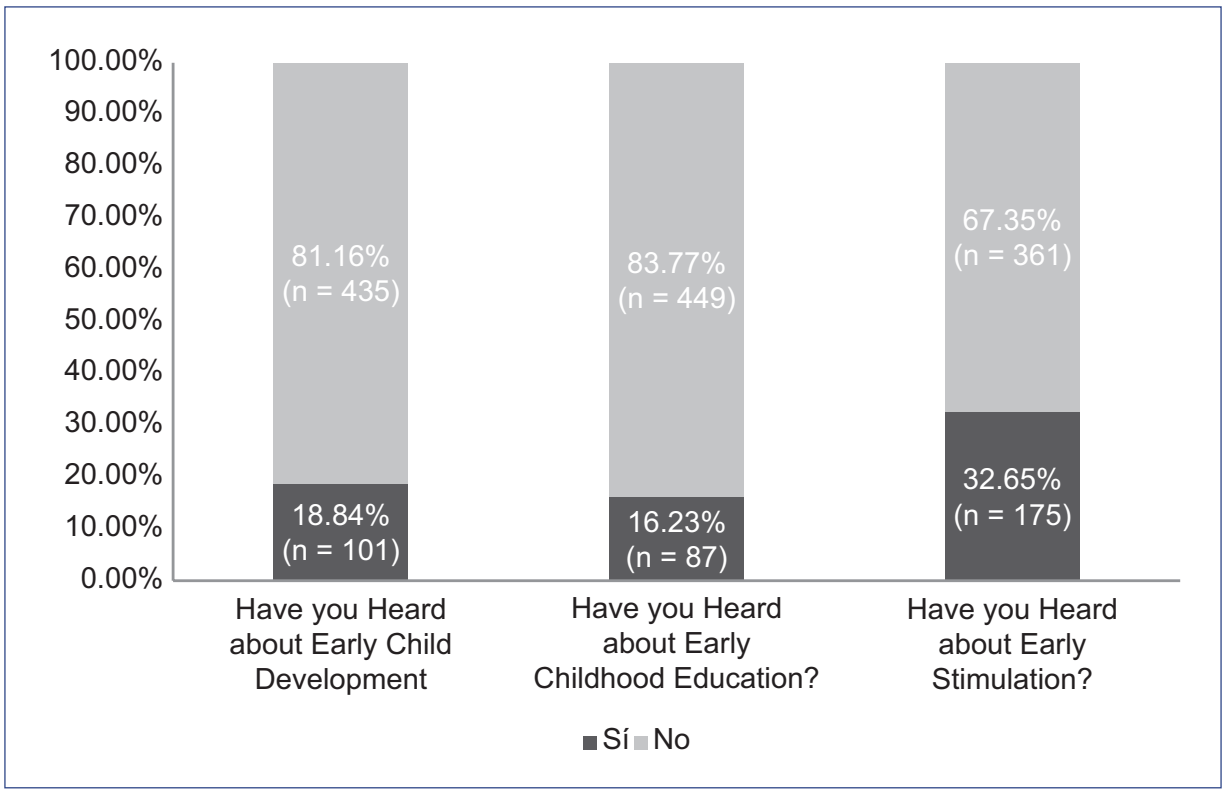

Figure 2. Parents' knowledge of terms related to early childhood development (n = 536 respondents). Percentage of parents who have heard about early childhood development, early education, and early stimulation.

Instrument

The questionnaire comprised three sections, each containing different types of questions. Open-ended questions were used to explore parents' perceptions and knowledge, and closed-ended questions were employed to collect structured information; Likert-type scales were used to measure frequencies. Table 1 summarizes the types of questions and response formats used in each section of the questionnaire.

The first section collected general information through 15 questions designed to obtain sociodemographic data such as age, gender, place of origin, socioeconomic status, number of children, and their ages.

The second section aimed to explore parents' knowledge of ECD and their caregiving practices. It included 10 questions, both structured and open-ended. Multiple-choice questions were employed to identify children's main caregiver as well as the person in charge of looking after the children in terms of bathing, feeding, and diaper changing. In addition, one of the questions concerned how many hours a day the participants spent taking care of their children. Open-ended questions were used to investigate parents' perceptions of the age at which children begin to learn and what they consider to be the first thing they learn.

Thereafter, participants were shown a series of prepared cards with 16 activities that parents perform on a daily basis with their children, such as singing, dancing, talking, playing, hugging, and going to the park. Participants were asked to rank these activities by importance and to indicate which ones they considered the most important. Based on these answers, the researchers grouped the activities into different developmental domains, such as adaptive, socioemotional, motor, communication, and cognitive. Finally, participants were shown a list of specific activities, adjusted according to their child's age group (0-12 months, 13-24 months, and 25-36 months), and they were asked to evaluate the frequency with which they performed each action using a five-point scale: very often, somewhat often, regularly, not often, or never.

The third section focused on the sources of information used by parents to care for their baby. Three

Table 5. Distribution of activities by developmental area that parents consider to be the first and the most important thing that babies learn

Development area	Activity	The baby learns it first		It is the most important thing the baby learns	
		%	n	%	n
Adaptive	Suction	1.5	8	2.2	12
	Breast/bottle feeding	3.2	17	0.9	5
	Asking for food	5.2	28	3.4	18
	Eating	17.9	96	17.2	94
	Sphincter control	0.6	3	2.1	12
Cognitive	Identifying things	1.1	6	2.1	12
Communication	Crying	9.7	52	3.2	18
	Babbling	5.8	31	1.1	6
	Identifying voices	2.8	15	0.6	3
	Simple words	6.3	34	3	17
	Speaking	8	43	16.8	98
	Listening	3	16	0.6	3
	Imitating words	0.6	3	1.9	10
Motor	Sitting	1.9	10	1.3	7
	Crawling	4.3	23	5	29
	Walking	4.5	24	22.4	130
	Head support	1.1	6	0.9	5
	Grasping objects	0.9	6	1.1	6
Not learned	Breathing	1.3	7	0.4	2
	Seeing	2.1	11	0	0
	Moving	1.1	6	0.4	2
Personal-social	Laughing	2.6	14	1.7	10
	Identifying people	6	32	3.4	20
	Playing	1.3	7	1.9	11
	Other activities	7.2	38	6.4	6
Total		100	536	100	536

questions were included to identify whom parents turn to when in doubt about their child's development, with options including doctor, relatives, friends, professional journals, and the internet. Multiple-choice questions were used to determine which media parents considered most appropriate and the extent of their perceived credibility. Finally, the questionnaire explored whether parents were familiar with the terms "early childhood development," "early education," and "early stimulation." For this, open-ended questions were used to inquire more deeply into participants' knowledge of these concepts.

Analysis of results

A descriptive analysis was performed with absolute frequencies and percentages for sociodemographic characteristics, as well as for responses related to care practices, activities, and sources of information. The statistical software package SPSS version 25 was used.

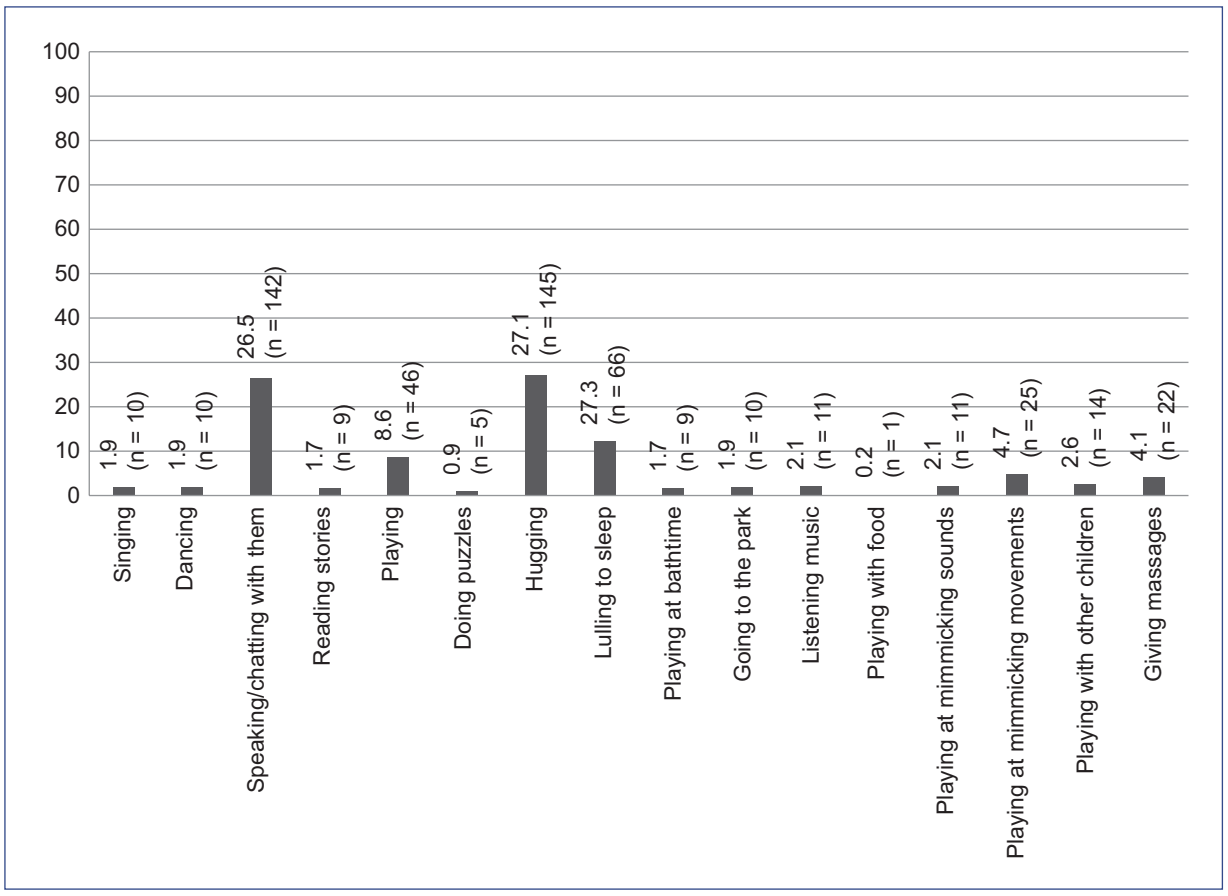

Figure 3. Activities that parents consider most important for early childhood development. n = 536 respondents.

Results

The study included 541 questionnaires, of which five were excluded from the results because they contained errors in data collection. Table 2 shows the demographic characteristics of the respondents. The most represented age group was 21-30 years (52.2%, n = 280), followed by 31-40 years (23.7%, n = 127). Most participants were female (n = 371; 69%). Furthermore, 59% (n = 316) reported having only one child at home, and 70.6% (n = 378) belonged to socioeconomic levels D+ or D–. The highest level of education for 322 respondents (61%) was secondary school.

Table 3 shows children's caregivers according to the child's age group. For all age groups, regardless of the sex of the children, it was found that the mother was the primary caregiver and was in charge of most of the activities related to childcare, with a percentage between 82.5% (n = 141) and 89% (n = 161).

In addition to the sociodemographic characteristics, this study focused on three main objectives: analyzing parents' knowledge of ECD, exploring the practices they use to stimulate such development, and examining the sources of information they use to obtain knowledge related to ECD. The results are shown below, organized according to these objectives.

Parents' knowledge of ECD: The results showed that 25.7% (n = 138) of the interviewees indicated that their children began learning between 7 and 12 months of age (Fig. 1). Furthermore, 24.1% (n = 129) of the respondents considered that their children began learning from the moment that they were born. A smaller percentage of respondents, 5.4% (n = 29) indicated the onset of learning occurs in the prenatal period (Table 4).

Regarding parents' knowledge of ECD, we found that only 32.65% (n = 175) of the respondents had heard of early stimulation, 18.84% (n = 101) had heard of ECD, and only 16.23% (n = 87) of respondents had heard about early education (Fig. 2).

Practices performed by parents to stimulate childhood development: According to 27.8% of respondents, skills from the adaptive domain of development were the first things that their children learned. Of these skills, "eating"

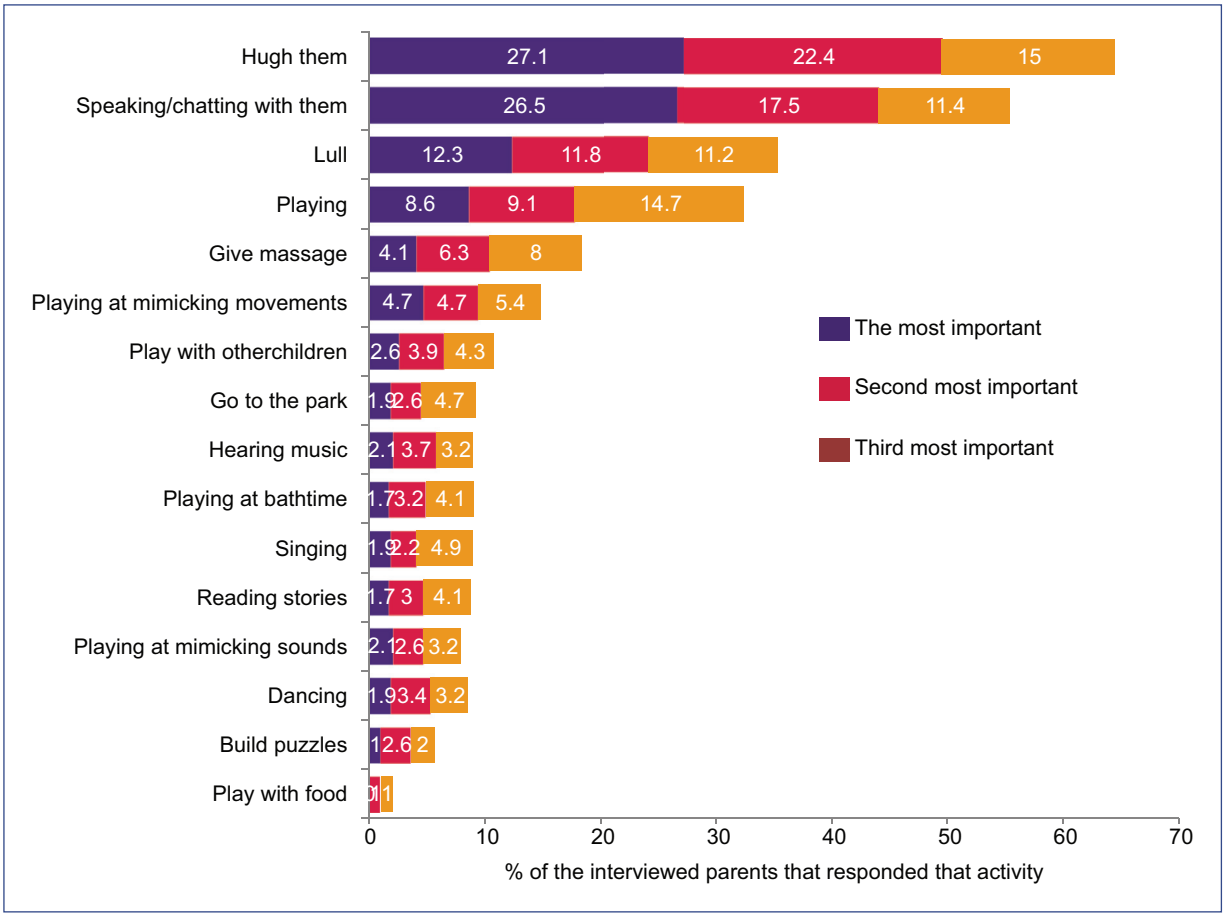

Figure 4. Percentage distribution of the importance given by parents to activities that can be performed in the initial years of life.

was the most frequently mentioned (17.9%). When asked about the most important thing to learn in the first 3 years of life, participants mentioned the motor domain most frequently, with "walking" being the most commonly mentioned skill (22.4%); others indicated "eating" (as part of the adaptive domain; 17.2%) and "speaking" (as part of the communication domain; 16.8%) (Table 5).

When parents were asked about the most important activities they perform with their children, 27.1% (n = 145) mentioned "hugging" and 26.5% (n = 142) "talking" (Figs. 3 and 4).

When asked about the source of information they considered most appropriate for obtaining information regarding childhood development, 30% (n = 161) of respondents indicated television, followed by school or daycare (19.3%, n = 103) and the internet (15.7%, n = 84). However, 16.8% (n = 90) of respondents considered television as the least suitable media to obtain information about ECD, followed by work (14.9%, n = 80) and radio (15.7%, n = 84) (Fig. 5).

Discussion

This study provides culturally relevant data as it is to our knowledge of the few studies in Mexico that examines parents' knowledge of ECD. The results of this study indicate that 60% of parents do not consider the first 3 years of life to be a sufficiently significant stage of learning or development. This finding matches what was reported by Ertem et al. in Turkish mothers, who are unaware that behaviors such as vocalizations and social smiling, as well as brain development in general, occur early in life[8].

Different studies have reported that parents' understanding of the moment when children begin to learn has important implications. On the one hand, if parents consider that skills are acquired later, they may not sufficiently stimulate their children or detect delays in development, which may have a negative impact[8]. On the other hand, if they consider that skills should be acquired earlier than expected, this could lead to

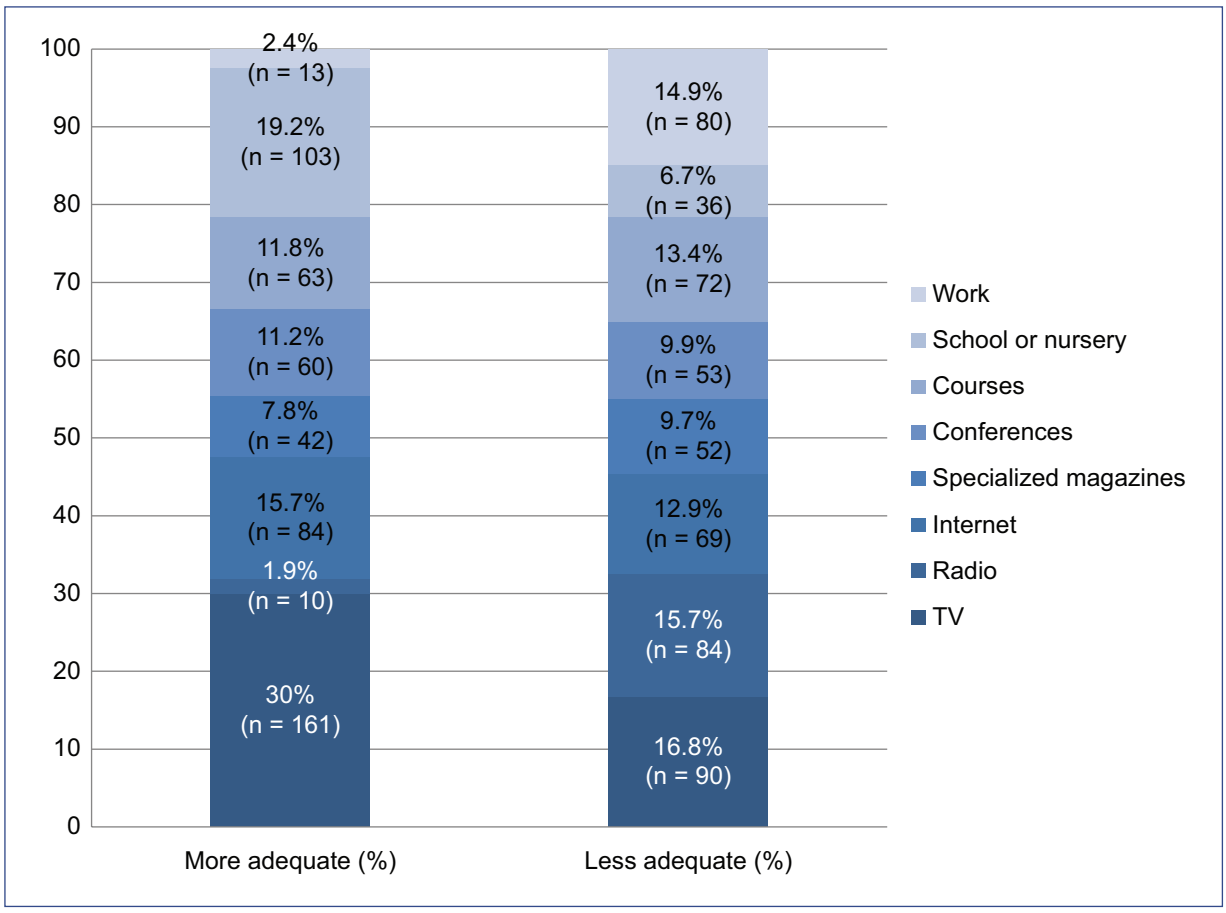

Figure 5. Parents' perceptions of the most and least appropriate media to search for information on early childhood development (ECD) (n = 536). Percentages of parents' responses regarding the means they consider most appropriate and least appropriate for obtaining information about ECD.

unrealistic expectations and reduced toleration of the child's behaviors, which are risk factors for negative parenting practices such as abuse[17,18].

In addition, only 33% of respondents had heard about early stimulation, 19% about ECD, and 16% about early education, which indicates a lack of access to accurate information regarding these concepts. This may limit parents' ability to implement informed practices for the care and development of their children.

It was found that the activities parents perform to stimulate their children's development do not necessarily match with the domains that they consider most important in childhood development. For example, only 11% of parents who responded that hugging their children is an important activity for development consider that the socioemotional domain is important in children's learning. Activities such as lulling the child to sleep or massaging them were identified as being only 12% and 0% important, respectively, in the socioemotional domain. Thus, although parents frequently performed activities that correspond to the socioemotional domain, they did not identify these activities as essential for children's learning.

Similarly, the participating parents identified "eating" (17.9%), "walking" (22.4%), and "talking" (16.8%) as the most significant skills during the initial years of life. This reflects a greater valuation of motor and adaptive skills, whereas communication and socioemotional skills, although practiced, are not recognized as a priority.

This disconnection between what parents do and the impact it has on ECD indicates the need to sensitize parents about the importance of their actions. In particular, the findings highlight the need to communicate the importance of attachment and affection, as well as that of playing and performing communicative activities, which are valuable means of learning and for ECD.

Regarding parents' sources of information, it was found that parents' information was based on beliefs and ideas shared by family and friends, which was

normally incomplete and/or incorrect; this finding matches with the results of similar studies[8,11,12,15]. In our study, 30% of respondents indicated that television was their main primary source of information for topics related to ECD; however, 16.8% of responders also considered it to be the least appropriate source, which shows an ambivalent perception of its usefulness and reliability. Furthermore, options such as conferences, courses, and specialized journals were rarely selected as suitable media, which could reflect low accessibility to or knowledge about these alternatives. It is very important to evaluate the type of information that is provided by a source and implement strategies to improve its quality to allow for the proper use of mass media; according to Dichtelmiller and colleagues, differences in development of up to one standard deviation can be found among children of parents with better knowledge regarding ECD[19].

Mexico has witnessed a substantial surge in investment directed toward ECD over the past decade, along with the emergence of initiatives tailored to the most disadvantaged segments of society[20]. However, it is imperative to implement and strengthen early education and childhood development programs, taking into consideration the findings of Heckman and colleagues; from a macroeconomic perspective, for every dollar invested in ECD, three to seven dollars are recovered[21-23]. Consequently, there is a compelling need to enhance the training of primary care health professionals and pediatricians in the area of ECD. This enhancement is crucial for facilitating the timely detection of developmental delays and improving the quality of information provided to parents.

Although fathers are increasingly involved in parenting, mothers remain the main caregivers and the ones most responsible for infants. According to figures from the "Instituto Nacional de Estadística y Geografía" (INEGI), between 2010 and 2015, the number of female heads of household increased by 1.4%, now representing 27% of Mexican families[24,25]. This indicates a change in the social paradigm; therefore, in future years, we will see a greater number of fathers involved in parenting activities. It is interesting to highlight that while a negative correlation has been found between maternal employment and development[26,27], the factors involved lie in the time that mothers spend with their children; however, additional research suggests that this effect can be counteracted if fathers invest additional time in parenting[28]. Moreover, paternal involvement in parenting benefits the neurocognitive development of children[29-34].

The study has important limitations. First, it uses a non-probability convenience sampling, which limits the ability to generalize the findings to other populations, especially in rural contexts or for individuals at higher socioeconomic levels.

Another limitation is the inherent subjectivity of self-reported responses, which may be influenced by cultural bias, social desirability, or misinterpretation of the questions. Finally, although the sample size was adequate for the descriptive analyses, it was insufficient to perform more complex analyses or to detect significant differences in subgroups. Another important limitation is that the survey was conducted some years ago, although there were no recent publications about these topics, and it could serve as a baseline or comparison for further studies.

Despite these limitations, the study provides a basis for future directions of research and intervention programs by specifying areas that require attention, such as raising awareness among parents concerning the importance of activities related to socioemotional and communicative development, as well as reviewing the quality of mass media information sources.

Conclusion

The findings of this study indicate that in the sample surveyed six of ten parents pay inadequate attention to their child's developmental progress during the initial 3 years of life in some ways. This observation indicates their potential oversight of this period as a stage of significant learning and child development, and the need for massive media campaigns focused on parents about the awareness of the crucial importance of the 1st years of life.

The socioemotional dimension is practiced spontaneously, especially by mothers, but it is not valued as a means of learning and knowledge. This notion extends to the domain of play, underscoring the significance of effective communication and the cultivation of awareness concerning the pivotal role of affective relationships and games in educational and learning contexts. This finding could help in the planning of ECD campaigns reinforcing the idea of the bonding, attachment and interaction to be crucial, where there is no need for expensive things to promote development because the most valuables activities to promote development are given naturally through the interaction with the child.

Considering the perceived lack of information that the most vulnerable families in our country have on ECD topics, it is necessary to establish public policy aimed at educating parents in addition to the policies already in place focused on detecting and handling developmental disorders.

Although fathers are increasingly involved in parenting, mothers are still clearly the main caregivers, underscoring the necessity for emphasizing the importance of co-parenting.

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Conflicts of interest

The authors declare no conflicts of interest.

Ethical considerations

Protection of humans and animals. The authors declare that no experiments involving humans or animals were conducted for this research.

Confidentiality, informed consent, and ethical approval. The study does not involve patient personal data nor requires ethical approval. The SAGER guidelines do not apply.

Declaration on the use of artificial intelligence. The authors declare that no generative artificial intelligence was used in the writing of this manuscript.

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