

Parent's influence and perception on the global development of their children during the COVID-19 pandemic

Influência e percepção dos pais no desenvolvimento global de suas crianças durante a pandemia do COVID-19

Influencia y percepción de los padres sobre el desarrollo global de sus niños durante la pandemia de COVID-19

Received: 11/25/2022 | Revised: 12/07/2022 | Accepted: 12/10/2022 | Published: 12/17/2022

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Abstract

This study investigated the influence and perception of parents on the global development of children from birth to 3 years and 11 months of age, during the social distancing period in the COVID-19 pandemic in Brazil. An online survey was shared and answered anonymously by parents between December 2020 and February 2021. The survey consisted of multiple-choice questions considering: children and family characteristics, parents' perception of their children's development, parents' abilities and limitations on children's development and play, and choice of stimuli offered to their children. General descriptive analyses and binary logistic regression were performed. All parents (n=142) reported stimulating new global developmental skills during the pandemic. They (59.2%) reported spending more time playing with their children during the pandemic than before. Most of them let their children play freely (89%) and let them spend more time playing with screen devices (66.1%) during the pandemic. As children were older, parents were more likely to agree that they have been doing activities that could negatively influence their global development, and higher frequency of screen time ($p < .005$). We discuss the possible advantages and difficulties parents have encountered in stimulating their children's global development during this period and their perception of these aspects. This may help guide professionals and shape public policies to strengthen facilities and confront difficulties during pandemic periods. This study might help to understand possible issues that young children and their parents may confront in the near future, as a consequence of the pandemic.

Keywords: Children development; Play; Pandemic; Parents' perceptions; Screen use.

Resumo

Este estudo investigou a influência e percepção dos pais sobre o desenvolvimento global de crianças de 0 a 3 anos e 11 meses de idade, durante o período de distanciamento social na pandemia do COVID-19 no Brasil. Um questionário online foi compartilhado e respondido anonimamente pelos pais, entre dezembro de 2020 e fevereiro de 2021. Esse questionário consistiu em questões de múltipla escolha, considerando: características da criança e família, percepção dos pais sobre o desenvolvimento de suas crianças, habilidades e limitações dos pais no desenvolvimento e brincadeiras das crianças e a escolha dos estímulos oferecidos a elas. Análise descritiva e regressão logística binária foram realizadas. Todos os pais (n=142) relataram estimular novas habilidades de desenvolvimento global durante a pandemia. Estes (59,2%) relataram ter passado mais tempo brincando com suas crianças durante a pandemia do que antes. A maioria dos pais deixou suas crianças brincarem livremente (89%) e passaram mais tempo brincando com dispositivos de telas (66,1%) durante a pandemia. Quanto mais velhas as crianças, mais os pais foram propensos a concordar que faziam atividades que poderiam influenciar negativamente seu desenvolvimento global e maior foi a frequência de tempo em frente às telas ($p < 0,005$). Discutimos as possíveis vantagens e dificuldades encontradas pelos pais para estimular o desenvolvimento global de suas crianças nesse período e sua percepção sobre esses aspectos.

Este estudo pode auxiliar a entender possíveis problemas que crianças pequenas e seus pais podem enfrentar em um futuro próximo, como consequência da pandemia.

Palavras-chave: Desenvolvimento infantil; Brincar; Pandemia; Percepções dos pais; Uso de telas.

Resumen

Este estudio investigó la influencia y percepción de los padres sobre el desarrollo global de niños de 0 a 3 años y 11 meses, durante el período de distanciamiento social en la pandemia de COVID-19 en Brasil. Un cuestionario en línea fue compartido y respondido de forma anónima por padres entre diciembre de 2020 y febrero de 2021. Este cuestionario constaba de preguntas de opción múltiple considerando: características del niño y familia, percepción de padres sobre el desarrollo de niños, capacidades y limitaciones de padres en el desarrollo y juego de niños, y elección de estímulos ofrecidos a ellos. Análisis descriptivo y regresión logística binaria fueron realizadas. Todos los padres (n=142) informaron estimular nuevas habilidades de desarrollo global durante la pandemia. Estos (59,2%) informaron pasar más tiempo jugando con sus niños durante la pandemia que antes. La mayoría de padres dejan que sus niños jueguen libremente (89%) y les dejan pasar más tiempo jugando con dispositivos de pantalla (66,1%) durante la pandemia. Cuanto mayores los niños, más probable que los padres estuvieran de acuerdo en que habían realizado actividades que podrían influir negativamente en su desarrollo global y mayor frecuencia de tiempo frente a la pantalla. Discutimos posibles ventajas y dificultades que encuentran los padres para estimular el desarrollo global de sus niños en este período y su percepción de estos aspectos. Este estudio puede ayudar a comprender los posibles problemas que niños pequeños y sus padres pueden enfrentar en un futuro cercano como resultado de la pandemia.

Palabras clave: Desarrollo infantil; Jugar; Pandemia; Percepciones de los padres; Uso de pantallas.

1. Introduction

Children's learning skills are shaped by the variety and quality of stimuli offered by their family, especially during play and routine care. These stimuli play a determinant role in children's physical, mental, and emotional development (Barnett, et al., 2019). During the COVID-19 pandemic, however, the home environment and familiar dynamics faced several challenges in the whole world.

As daycares and schools closed and baby-sitters and home-helpers were dismissed, children were mostly fully under parents' care. In an unexpected situation, parents had to divide their time between childcare, home care, and remote/non-remote work. Studies have shown that, during the pandemic mothers spent most of their time with housework and childcare (Zhou, et al., 2020). Parents reported that media use increased for children from 3 to 12 years old in the United States during the pandemic (Eales, et al., 2021) Self-reported screen time increased by over 1 hour per day in Dutch and German children and adolescents (4-17 years old) due to school closure (Schmidt, et al., 2020; ten Velde, et al., 2021). In addition, the increased time spent on screen devices by parents and children was associated with higher levels of anxiety (Drouin, et al., 2020) and there was a decrease in the amount of time spent playing outdoors in preschool-aged children (Zhang, 2022).

Despite some studies investigated the impact of pandemic on psychological and behavioral aspects in adults (Bezerra, et al., 2020; Talevi, et al., 2020; Zhang, 2022; Zhang & Ma, 2020, to cite a few) and children (Drouin, et al., 2020; Jiao, et al., 2020; Zhang, 2022), on children care and familiar dynamics (Zhang, 2022; Zhou, et al., 2020), to the best of our knowledge this is the first one to address how those aspects influenced children's global development, considering motor, language, cognitive and adaptive skills during the pandemic.

This study aimed to investigate the influence and the perception of parents on the global development of children from birth to 3 years and 11 months of age, during the social distancing period in the COVID-19 pandemic in Brazil.

2. Methodology

2.1 Study Design and Participants

This research consists of a quantitative study, designed as a descriptive survey type using online form. Survey research is supported by Ponto (2015) as a useful and legitimate type of research, specifically given the main question of this study and the characteristics of our sample. Parents or guardians of children from 0 to 3 years and 11 months of age (< 4 years

old) who lived in Brazil were included. Participants were recruited by means of snowball sampling using advertisements published on social media websites, applications, and e-mail, from December 2020 to February 2021.

The exclusion criteria were: living in other countries, children of other age groups, or not completing at least the first two parts of the instrument used in data collection.

One hundred and forty-one Brazilian parents (Mean age: 35.0 +- 4.8 years) with a child under 48 months participated in the study (additional sample characteristics in Table 1). Participation was entirely online and anonymous. The study was approved by the Ethics Committee (CAAE protocol: 36528020.9.1001.0021) and the participants signed an online informed consent form.

2.2 Data Collection Tool

A structured survey was constructed with multiple-choice questions, predominantly to be pointed out. The survey consisted of 42 questions distributed in 5 parts that addressed the following topics: characteristics of the child and the family and their socioeconomic characteristics (Parts I and V); parents' perception of children's development and abilities (Part II); parents' perception of their abilities and limitations on development and playing (Part III); perception of parents about the choices of stimuli offered to the child and about the daily routine (Part IV).

The survey was developed on the Google Forms[®] electronic platform. Five mothers who were not part of the research team gave their opinion and suggestions on the design, content, and clarity of the questions prior to the recruitment of participants.

2.3 Procedures

Initially, a link (URL) to the survey and a brief explanation of the study was shared among the researchers' personal contacts on social media (i.e., Instagram, Facebook, and WhatsApp). In addition, the link was shared by email in the researchers' personal contacts. Participants filled out the tool at the place and time of their convenience and anonymously. Names and personal data that could identify the participants were not requested. The consent form was made available before the participants had access to the survey, allowing prior knowledge of the objectives, risks, and benefits of participating in the study.

Filling out the survey took approximately 10-12 minutes. In the end, the platform automatically saved the answers in an Excel[®] spreadsheet.

2.4 Data Analysis

General descriptive analyses were performed (mean, standard deviation, and percentages) with the support of IBM SPSS Statistics 28.0, highlighting differences in the participants' answers before and during the pandemic.

Binary logistic regression was performed to create models of the relationship between the predictor variables (knowledge of parents (0=non-experts, 1= experts in development, and children's age) to parents' perception of satisfaction related to playtime (0= do not agree, 1= agree), activities that could have a negative influence on their global development (0= do not agree, 1= agree), quality of time during social distancing (0=less or equal, 1= higher), and frequency of play (0=less or equal, 1= higher), and use of a screen device during social distancing (0=less or equal, 1= higher). Odds ratios and 95% confidence intervals were reported.

3. Results

3.1 Characteristics of the child and the family and their socioeconomic characteristics

A hundred and forty-two parents (Mean= 35.0, SD=4.8 years old) answered the survey. Most of the families were practicing social distancing (81%) at the time of the survey, ranging from 0.5 to 13 months (Mean= 9.0, SD= 2.8 months). Mothers were who responded most to this questionnaire ($n=137$; 96.5%). The mean age of the children was 22.5 (SD= 11.3) months (range= 0 - 47 months old) and 51.8% were male. Most infants were born full-term (87.3%) with no developmental delays (89.4%) (Table 1).

Table 1 - Family and children's personal and demographic characteristics.

Characteristics	Frequency	%	
Children			
Sex	Female	68	48.2
	Male	73	51.8
Gestational age	<28 weeks	1	0.7
	28-32 weeks	2	1.4
	32-34 weeks	1	0.7
	34-36 weeks	14	9.9
	37-40 weeks	104	73.2
	≥ 41 weeks	13	9.2
	Expected date*	7	4.9
Parents/family			
	Mother	137	96.5
	Father	4	2.8
	Non mother or father	1	0.7
Gender	Female	133	93.7
	Male	8	5.6
	PNTA**	1	0.7
Ethnics	Asian	1	0.7
	White	81	58.7
	Indigenous	0	0.0
	Black	3	2.2
	Brown	45	32.6
	Multiracial	8	5.8
	PNTA**	4	2.8
Household income***	Less than \$151	0	0.0
	Between \$ 151 and \$ 320	5	3.5
	Between \$ 329 and \$ 565	7	4.9
	Between \$ 659 and \$ 942	25	17.6
	Between \$ 1,036 and \$ 2,071	47	33.1
	Between \$ 2,166 and \$ 3,766	30	21.1
	More than \$ 3,860	17	12.0
	PNTA**	11	7.7
Level of education	Elementary/Middle School incomplete	0	0.0
	Elementary/Middle School	1	0.7
	High School	9	6.3
	Technician School	1	0.7
	Undergraduate School	41	28.9
	Graduate School	90	63.4
Adults in the house	1-2 adults	131	92.3
	3-4 adults	11	7.7
Children in the house	1	99	69.7
	2	42	29.6
	3	1	0.7

* Parents did not know exactly, but it was on an expected date. ** PNTA: Prefer not to answer. *** Monthly income (Real-dollar exchange: R\$5.31=\$1.00). Source: Authors.

Table 1 presents additional information about family and children characteristics, such as gestational age range, ethnics, household income, respondent's level of education, and the number of adults and children in the house.

3.2 Parents' perception of children's development and abilities

Parents reported stimulating new developmental skills, especially cognitive skills ($n=119$; 83.8%) during the pandemic. Adaptive ($n=113$; 79.6%), language ($n=111$; 78.2%) and motor ($n=96$; 67.6%) skills were also stimulated. All parents reported searching for information on child development ($n=118$; 83.9%) or to have expertise in that field ($n=24$; 16.1%). Most parents searched for that information in a variety of sources, including professionals or friends with an expertise in that field ($n=103$; 72.5%), social media ($n=72$; 50.7%) and/or friends with children ($n=49$; 34.5%). Most parents ($n=86$; 60.6%) also searched for information from scientific sources, such as articles or books about child development.

3.3 Parents' perception of their abilities and limitations on development and play

Parents reported spending more time playing with their young children ($n=84$; 59.2%) or the same time ($n=51$; 35.9%) compared to the time they spent playing with them before the social distancing period. Only few parents ($n=7$; 4.9%) reported spending less time playing with their young children. In general, they reported playing with them up to 30 minutes ($n=5$; 3.6%), between 30 minutes to 1 hour per day ($n=17$; 12.2%), 1-3 hours per day ($n=34$; 24.6%), or more than 3 hours per day ($n=82$; 59.4%).

Specifically for free play, most parents let their children play freely while doing other routine activities, such as work or do household chores ($n=89$, 62.7%), but some of them reported letting their children play freely because it helps their development ($n=44$, 30.9%). Also, most parents let their child choose what to play with ($n=98$; 69.0%) and play with them ($n=118$; 83.1%). Additional information is presented in Table 2.

Parents also reported letting their children spend more time playing with a screen device ($n=94$, 66.2%) during the pandemic compared with before the social distancing period. They reported letting their children play with a screen device for up to 1 hour per day ($n=42$; 29.6%), 1-3 hours per day ($n=59$; 41.5%), or more than 3 hours per day ($n=22$; 15.5%). Only 13.4% ($n=19$) of children did not watch or play with a screen device. The most frequent reason for parents to let their children play with a screen device during the social distancing period was to do work or do household chores ($n=78$, 56.5%) (Table 2).

Table 2 - Types and choices of playtime activities

Category	Answers	n	%	%*
Type of play	I let the child play freely and I observe	48	33.80	
	I let the child play freely, while I do other routine activities	69	48.59	
	I choose the activity and we play together	31	21.83	
	I choose the activity, but I do not participate	6	4.23	
	I let the child choose the activity and we play together	98	69.01	
Choosing playtime activities	Always with intention to improve any skill	20	14.08	19.05
	Almost always with intention to improve any skill	39	27.46	37.14
	I choose with slightly intention to improve any skill	28	19.72	26.67
	I do not choose with the intention of improving a skill, only for the child to have fun	18	12.68	17.14
	NA**	37	26.06	
Types of playtime activities most of the time	Cartoons or musical videos on TV or other screens (cell phone, tablet, notebook)	63	17.70	44.37
	Audio and video calls	5	1.40	3.52

	Baby walker, rocking chairs, jumper, playpen	5	1.40	3.52
	Music and dance (without any screen)	32	8.99	22.54
	Play freely with toys and objects	110	30.90	77.46
	Play freely, running and exploring the house, garden and/or backyard	102	28.65	71.83
	Play outdoors (playgrounds, squares, parks, streets)	35	9.83	24.65
	Other	4	1.12	2.82
Playing with a screen device - reason	So I can take a rest	4	2.90	3.42
	For the child not to make a mess	0	0.00	0.00
	So I can work or do household chores	78	56.52	66.67
	It helps with the child's development	15	10.87	12.82
	My child likes it, regardless of whether it helps or harms my child's development	20	14.49	17.09
	NA**	21	15.22	
Use of devices like baby walkers, rocking chairs, jumpers and playpens	My child does not use those devices	122	85.92	
	For up to 30 minutes per day	6	4.23	
	Between 30 minutes and 1 hour per day	8	5.63	
	Between 1 hour and 2 hours per day	4	2.82	
	Between 2 hours and 3 hours per day	2	1.41	
	For more than 3 hours per day	0	0.00	
Use of devices – compared with before the social distancing	More	9	6.34	
	Less	32	22.54	
	The same	101	71.13	
	NA**	0		
Use of devices - reason	So I can take a rest	0	0.00	
	For the child not to make a mess	0	0.00	
	So I can work or do household chores	22	15.49	66.67
	It helps with the child's development	6	4.23	18.18
	My child likes it, regardless of whether it helps or harms my child's development	5	3.52	15.15
	NA**	109	76.76	

*Includes only the parents who answered the question; ** Not answered. Source: Authors.

Table 2 shows additional and detailed information about how parents played with their children most of the time during social distancing, what was the intention behind the activities they chose, and which types of playtime activities children engaged in most of the time. It also brings information related to devices children used during social distancing and the reasons for using those devices.

3.4 Parents' perception about the choices of stimuli offered to the child and about the daily routine

Parents agreed or slightly agreed ($n=92$; 64.8%) their children had been doing activities that could have a negative influence on their global development during the pandemic more than before social distancing period ($n=79$; 55.6%)

At the time the survey was responded, parents reported that they were taking the child to play outdoors ($n=97$; 68.3%), but not since the beginning of the social distancing ($n=80$; 56.3%). However, time spent outdoors was less than before social distancing ($n=65$; 65.7%).

Almost half the parents ($n=75$; 52.8%) reported that they were satisfied with the stimulus/play they had been offering to their child during social distancing, while some parents ($n=51$; 35.9%) were shortly satisfied or even unsatisfied ($n=13$;

9.1%). Some of them ($n=55$; 38.7%) reported having more good quality time with their child during social distancing than before, while others reported having less good quality time ($n=53$; 37.3%) or equal ($n=31$; 21.8%). Most of their time had been used for childcare ($n=94$; 66.2%), work ($n=52$; 36.6%), house care ($n=40$; 28.2%) or was equally divided between childcare, work and house care ($n=45$; 31.7%) during social distancing. They considered that their child demanded a lot of attention ($n=117$; 82.4%), but for some of them it was the same ($n=60$; 42.2%) as before social distancing and for others, it was not the same ($n=61$; 42.9%).

Most of the respondents were the primary caregiver of the child ($n=117$; 82.4%), had someone else to help with childcare ($n=138$; 97.2%), and did not have a housekeeper daily or monthly ($n=75$; 53.6%).

3.5 Perceptions of play and families' characteristics

Logistic regression models were used to analyze the relationship between the knowledge of parents and children's age to the satisfaction related to playtime, quality of time, activities that could have a negative influence on their global development, and the frequency of play and the screen time.

The predictor knowledge of parents was found to contribute to the models for the satisfaction related to playtime ($X^2(2)=7.467$, $p=.024$), and quality of time ($X^2(2)=7.001$, $p=.030$). Parents who were considered non-experts in development were more likely to be satisfied with their children's playtime period (OR = 3.876, 95% CI: 1.328-11.313, $p=.013$), and for having a higher quality of time during social distancing (OR = 3.121, 95% CI: 1.243-7.840, $p=.015$) than those who were experts in development.

The predictor age was found to contribute to the model for activities that could have a negative influence on their global development ($X^2(2)=10.231$, $p=.006$), and for frequency of screen time ($X^2(2)=25.471$, $p<.001$). As children were older, parents were more likely to agree that have been doing activities that could negatively influence their global development (OR = 1.051, 95% CI: 1.015-1.088, $p=.005$), and higher frequency of screen time (OR= 1.097, 95% CI: 1.052-1.143, $p<.001$).

The predictors' knowledge of parents and age were found to contribute to the model related to the frequency of play ($X^2(2)=12.714$, $p=0.002$). Parents considered non-experts were more likely to play more with their children during social distancing than parents considered experts (OR = 4.219, 95% CI: 1.359-13.009, $p=.027$) and parents were more likely to spend time playing with their children as they are older (OR = 1.037, 95% CI: 1.004-1.071, $p=.029$).

4. Discussion

In this survey we investigated the influence and the perception of parents on the global development of children at 22.5 (+11.3) months old during the social distancing period of the COVID-19 pandemic in Brazil. The survey started 9 months after WHO declared the pandemic. We found potential positive and negative influences of social distancing during the pandemic on the children's development according to the parents' reports.

Most of the parents were mothers of children with no developmental delays. Parents reported stimulating new developmental skills during the period of social distancing. Moreover, they reported searching for information on child development in a variety of sources or having expertise in this field. The results are in line with Scarzello et al. (2016), showing that mothers tend to have more knowledge on development, milestones, parenting, and general health than fathers. In addition, it was demonstrated that parents generally access social media for a variety of topics related to children's health information (Bryan, et al., 2020).

It is known that not all effects of home isolation during the pandemic were harmful to children. For example, the level of parental warmth and the quality of time between parents and children increased during the pandemic in the United States (Center for Translational Neuroscience, 2021). Similarly, in the present study children spent more time playing with their

parents (more than 3 hours per day) during the pandemic than before. According to Yogman et al. (2018), the shared communication and interactions that parents and children experience during play can regulate the body's stress response. In addition, receiving higher levels of parental warmth and interaction are known to be associated with experiencing better indices of well-being years later in childhood (Shelleby & Ogg, 2020) and in adulthood (Morian, et al., 2018). Therefore, playing more with parents may have been a potential protective factor for other negative influences on the children's health and development, such as increased screen time and reduced quality of play and outdoor playing time.

Increased screen time is particularly a topic of concern because it has been associated with a greater risk of physical health problems, mental health concerns, and negative outcomes on children's global development, especially those under 2 years old (Radesky & Christakis, 2016; Anderson, et al., 2017; Madigan, et al., 2019; Waller, et al., 2021). In a cohort study of over 2400 Canadian children, Madigan et al. (2019) found that higher levels of screen time in children aged 24 and 36 months were associated with poor performance in children's communication, gross motor, fine motor, problem-solving, and personal-social milestones measured by a screening tool at 36 and 60 months, respectively. Moreover, in a study with 21,526 Chinese children, two or more hours of media exposure per day led to an increase in child mental health problems, after nearly two months of confinement (Li, et al., 2022)

Worldwide recommendations for daily screen time for children under 4 years old are no more than one hour; for infants, screen time is not recommended (WHO, 2019). In the present study, most parents reported that the children spent 1 to 3 hours per day playing with screen devices and that this was more than before the pandemic. Similarly, studies have shown that screen time increased for children and adolescents in the United States, Germany and Netherlands during the pandemic (Eales, et al., 2021; Schmidt, et al., 2020; ten Velde, et al., 2021), according to parents' perceptions. Despite these results being expected, they are important to base assumptions regarding such a topic of concern. Most parents in the present study reported that they allowed their children to play with screen devices so that they could work at home or do their household chores. As reported previously, during the pandemic mothers spent most of their time with housework and childcare (Zhou, et al., 2020). Therefore, the children may have been at increased risk for developmental concerns associated with excessive time using screen devices during the pandemic. Thus, that is a topic to be revisited in the near future.

In this study, we did not question parents screen time use. However, it was already reported that, during the pandemic, not only children, but their parents increased the time spent on screen devices and that was associated with higher levels of anxiety (Drouin, et al., 2020). Mothers of 6-month-old infants have reported initiating screen exposure mainly to calm their infant, but also when feeding, putting to sleep and waiting/entertaining (Wiltshire, et al., 2021). In addition to the time needed to work and to do housework, those could also be the reason why parents allowed the increase of screen use during the pandemic.

Another negative influence of social distancing found in the present study was regarding the children's playing quality. Parents reported that the quality of play was lower than or equal to before the pandemic and that their children spent less time playing outdoors. Similarly, Zhang (2022) also reported a decrease in the amount of time spent playing outdoors in preschool-aged children in China, during the pandemic. According to Yogman et al. (2018), outdoor playing, in particular, by involving the children as active participants, offers opportunities for them to improve sensory integration skills that address motor, cognitive, social, and linguistic domains. In line with this assumption, Hinkley et al. (2018) found that outdoor play is favorably associated with preschool children's social skills. The general recommendation regarding playtime is that children under 4 years old should spend at least 180 minutes in varied physical activities at any intensity spread throughout the day to favor their physical and mental health and wellbeing (WHO, 2019). As the children's opportunities for active play were affected by the pandemic measures of social distancing, this may be a concern for their development in the present study.

4.1 Perceptions of play and families' characteristics

Parents who were considered no experts in development were more likely to be satisfied with their children's playtime period, and for having a higher quality of time during the social distance period than those who were experts in development. Surprisingly and in line with our findings, Taha et al. (2022) found that child quality of life during the pandemic was inversely associated with parental education. In that research, they also found that lower levels of parental worrying were related to a better child quality of life. Higher levels of parental education were associated with higher levels of stress and anxiety during the pandemic (Buechel, et al., 2022) and with a greater decrease in the amount of time playing outdoors (Zhang, 2022). It might be that parents who were experts were more worried and stressed about their child's development and about their child's quality of life. That could be the reason why those parents were more likely to play less with their children during the social period distance than parents considered no experts, as we found. Thus, knowing that their child was under a negative situation for their development led to dissatisfaction about their child's playtime period and the quality of time.

As children were older, parents were more likely to agree that they have been doing activities that could negatively influence their global development, and higher frequency of screen time. Increased child age was also associated with a worse quality of life during the pandemic, in Taha et al. (2022) findings.

As we found, parents were more likely to spend time playing with their children as they were older. As parents had to divide their time between work, household chores and childcare, it might be that the most time spent with the younger children was for basic needs, such as feeding, bathing, and doing the sleeping routine. As children get older, they are more likely to spend some time taking care of themselves. So, parents could have more free time to engage in playing. That would be in line with Kreyenfeld and Zinn's (2021) findings, which has shown that parents of preschool aged children (3-5 years old) increased the time spent on childcare more than parents of older children during the pandemic. Zhou et al. (2020) showed that before the pandemic mothers of children under 15 years of age spent around 2.5 hours/day with childcare. During the pandemic there was an increase in time to around 6 hours/day (40.8 hours/week) for mothers of children under 5 years of age and to around 2.8 hours/day (19.7 hours/week) for mothers of children aged 5-15 years old. Fathers usually spent twice less time with childcare than mothers, in both situations. In the present study, the mean age of children was 1 year and 10 months old and more than half of the parents reported spending most of their time with childcare, which might reinforce that rationale.

5. Conclusion

In summary, parents reported stimulating new developmental skills. They also reported spending more time playing with their young children compared to the time they spent playing with them before the social distancing period. Most parents let their children play freely while doing other routine activities, such as work or do household chores. Parents also reported letting their children spend more time playing with a screen device during the pandemic. They also agreed their children had been doing activities that could have a negative influence on their global development during the pandemic more than before the social distancing period.

In addition, parents who were considered non-experts in development were more likely to play more with their children, to be satisfied with their children's playtime period, and for having a higher quality of time during social distancing than parents considered experts in development. As children were older, parents were more likely to agree that they have been doing activities that could negatively influence their global development, and higher frequency of screen time.

The results of this study may help guide professionals and shape public policies to strengthen facilities and confront difficulties during pandemic periods in countries involved. In addition, this study brings information that might help understanding possible issues infants, children and their parents may confront in the near future, as a consequence of the pandemic.

Future researches should focus on identifying issues children are presenting and its relation to the social distancing during the pandemic. Also, it is important that future researches emphasize what parents can do to guide children development and give parents information about what they should avoid doing.

Acknowledgments

We would like to thank the mothers who gave their opinion and suggestions on the design, content, and clarity of the questions of the survey prior to the recruitment of participants. We also thank Amanda Arguelho for her assistance with the data.

References

- Anderson, Y. C., Wynter, L. E., Grant, C. C., Stewart, J. M., Cave, T. L., Wild, C. E., Derraik, J. G., Cutfield, W. S., & Hofman, P. L. (2017). Physical activity is low in obese New Zealand children and adolescents. *Scientific reports*, 7, 41822. <https://doi.org/10.1038/srep41822>
- Barnett, L. M., Hnatiuk, J. A., Salmon, J., & Hesketh, K. D. (2019). Modifiable factors which predict children's gross motor competence: a prospective cohort study. *The international journal of behavioral nutrition and physical activity*, 16(1), 129. <https://doi.org/10.1186/s12966-019-0888-0>
- Bezerra, A., Silva, C., Soares, F., & Silva, J. (2020). Factors associated with people's behavior in social isolation during the COVID-19 pandemic. Fatores associados ao comportamento da população durante o isolamento social na pandemia de COVID-19. *Ciencia & saude coletiva*, 25(suppl 1), 2411–2421. <https://doi.org/10.1590/1413-81232020256.1.10792020>
- Bryan, M. A., Evans, Y., Morishita, C., Midamba, N., & Moreno, M. (2020). Parental Perceptions of the Internet and Social Media as a Source of Pediatric Health Information. *Academic pediatrics*, 20(1), 31–38. <https://doi.org/10.1016/j.acap.2019.09.009>
- Buechel, C., Nehring, I., Seifert, C., Eber, S., Behrends, U., Mall, V., & Friedmann, A. (2022). A cross-sectional investigation of psychosocial stress factors in German families with children aged 0-3 years during the COVID-19 pandemic: initial results of the CoronabaBY study. *Child and adolescent psychiatry and mental health*, 16(1), 37. <https://doi.org/10.1186/s13034-022-00464-z>
- Center for Translational Neuroscience (2021). Rapid Assessment of Pandemic Impact on Development (RAPID) early childhood. University of Oregon, Center for Translational Neuroscience. <https://www.uorapidresponse.com/>
- Drouin, M., McDaniel, B. T., Pater, J., & Toscos, T. (2020). How Parents and Their Children Used Social Media and Technology at the Beginning of the COVID-19 Pandemic and Associations with Anxiety. *Cyberpsychology, behavior and social networking*, 23(11), 727–736. <https://doi.org/10.1089/cyber.2020.0284>
- Eales, L., Gillespie, S., Alstat, R. A., Ferguson, G. M., & Carlson, S. M. (2021). Children's screen and problematic media use in the United States before and during the COVID-19 pandemic. *Child development*, 92(5), e866–e882. <https://doi.org/10.1111/cdev.13652>
- Hinkley, T., Brown, H., Carson, V., & Teychenne, M. (2018). Cross sectional associations of screen time and outdoor play with social skills in preschool children. *PloS one*, 13(4), e0193700. <https://doi.org/10.1371/journal.pone.0193700>
- Jiao, W. Y., Wang, L. N., Liu, J., Fang, S. F., Jiao, F. Y., Pettoello-Mantovani, M., & Somekh, E. (2020). Behavioral and Emotional Disorders in Children during the COVID-19 Epidemic. *The Journal of pediatrics*, 221, 264–266.e1. <https://doi.org/10.1016/j.jpeds.2020.03.013>
- Kreyenfeld, M.; Zinn, S. (2021). Coronavirus and care: How the coronavirus crisis affected fathers' involvement in Germany, Demographic Research, ISSN 1435-9871, Max Planck Institute for Demographic Research, Rostock, Vol. 44, Iss. 4, pp. 99-124, <https://doi.org/10.4054/DemRes.2021.44.4>
- Li, C., Cheng, G., He, S., Xie, X., Tian, G., Jiang, N., Min, X., Shi, Y., Li, R., Zhou, T., & Yan, Y. (2022). Prevalence, correlates, and trajectory of screen viewing among Chinese children in Changsha: a birth cohort study. *BMC public health*, 22(1), 1170. <https://doi.org/10.1186/s12889-022-13268-9>
- Madigan, S., Browne, D., Racine, N., Mori, C., & Tough, S. (2019). Association Between Screen Time and Children's Performance on a Developmental Screening Test. *JAMA pediatrics*, 173(3), 244–250. <https://doi.org/10.1001/jamapediatrics.2018.5056>
- Moran, K. M., Turiano, N. A., & Gentzler, A. L. (2018). Parental warmth during childhood predicts coping and well-being in adulthood. *Journal of family psychology: JFP: Journal of the Division of Family Psychology of the American Psychological Association (Division 43)*, 32(5), 610–621. <https://doi.org/10.1037/fam0000401>
- Ponto, J. (2015). Understanding and Evaluating Survey Research. *Journal of the Advanced Practitioner in Oncology*, 6, 168-171. <https://doi.org/10.6004/jadpro.2015.6.2.9>
- Radesky, J. S., & Christakis, D. A. (2016). Increased Screen Time: Implications for Early Childhood Development and Behavior. *Pediatric clinics of North America*, 63(5), 827–839. <https://doi.org/10.1016/j.pcl.2016.06.006>
- Scarzello, D., Arace, A., & Prino, L. E. (2016). Parental practices of Italian mothers and fathers during early infancy: The role of knowledge about parenting and child development. *Infant behavior & development*, 44, 133–143. <https://doi.org/10.1016/j.infbeh.2016.06.006>

- Schmidt, S., Anedda, B., Burchartz, A., Eichsteller, A., Kolb, S., Nigg, C., Niessner, C., Oriwol, D., Worth, A., & Woll, A. (2020). Physical activity and screen time of children and adolescents before and during the COVID-19 lockdown in Germany: a natural experiment. *Scientific reports*, *10*(1), 21780. <https://doi.org/10.1038/s41598-020-78438-4>
- Shelleby, E. C., & Ogg, J. (2020). Longitudinal Relationships Between Parent Involvement, Parental Warmth, ADHD Symptoms, and Reading Achievement. *Journal of attention disorders*, *24*(5), 737–749. <https://doi.org/10.1177/1087054719859075>
- Taha, A. A., Azar, N. G., Eisen, A. M., Abdul-Rahman, H. Q., & Hanes, D. A. (2022). Parental Worrying, Family Functioning, and Quality of Life During the COVID-19 Pandemic. *Nursing research*, *71*(2), 96–103. <https://doi.org/10.1097/NNR.0000000000000570>
- Talevi, D., Socci, V., Carai, M., Carnaghi, G., Faleri, S., Trebbi, E., di Bernardo, A., Capelli, F., & Pacitti, F. (2020). Mental health outcomes of the CoViD-19 pandemic. *Rivista di psichiatria*, *55*(3), 137–144. <https://doi.org/10.1708/3382.33569>
- Ten Velde, G., Lubrecht, J., Arayess, L., van Loo, C., Hesselink, M., Reijnders, D., & Vreugdenhil, A. (2021). Physical activity behaviour and screen time in Dutch children during the COVID-19 pandemic: Pre-, during- and post-school closures. *Pediatric obesity*, *16*(9), e12779. <https://doi.org/10.1111/ijpo.12779>
- Waller, N. A., Zhang, N., Cocci, A. H., D'Agostino, C., Wesolek-Greenson, S., Wheelock, K., Nichols, L. P., & Resnicow, K. (2021). Screen time use impacts low-income preschool children's sleep quality, tiredness, and ability to fall asleep. *Child: care, health and development*, *47*(5), 618–626. <https://doi.org/10.1111/cch.12869>
- WHO. (2022). Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age. <https://apps.who.int/iris/handle/10665/311664> Access in 06 July 2022.
- Yogman, M., Garner, A., Hutchinson, J., Hirsh-Pasek, K., Golinkoff, R. M., Committee on psychosocial aspects of child and family health, & council on communications and media (2018). The Power of Play: A Pediatric Role in Enhancing Development in Young Children. *Pediatrics*, *142*(3), e20182058. <https://doi.org/10.1542/peds.2018-2058>
- Zhang, Y., & Ma, Z. F. (2020). Impact of the COVID-19 Pandemic on Mental Health and Quality of Life among Local Residents in Liaoning Province, China: A Cross-Sectional Study. *International journal of environmental research and public health*, *17*(7), 2381. <https://doi.org/10.3390/ijerph17072381>
- Zhang X. (2022). Caregivers' perceived changes in engaged time with preschool-aged children during COVID-19: Familial correlates and relations to children's learning behavior and emotional distress. *Early childhood research quarterly*, *60*, 319–331. <https://doi.org/10.1016/j.ecresq.2022.03.001>
- Zhang X. (2022). Household Chaos and Caregivers' and Young Children's Mental Health during the COVID-19 Pandemic: A Mediation Model. *Journal of child and family studies*, *31*(6), 1547–1557. <https://doi.org/10.1007/s10826-022-02283-4>
- Zhou, M., Hertog, E., Kolpashnikova, K., & Kan, M. (2020). Gender inequalities: Changes in income, time use and well-being before and during the UK COVID-19 lockdown. <https://doi.org/10.31235/osf.io/u8ytc>