

# Impact of the Covid-19 pandemic on the use of screens in early childhood



*Repercussão da pandemia da Covid-19 no uso de telas na primeiríssima infância*  
*Repercusión de la pandemia de Covid-19 en el uso de pantallas en la primera infancia*

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## ABSTRACT

**Objective:** To identify the impact of the Covid-19 pandemic on the use of digital screens in early childhood, from the perspective of mothers and education professionals.

**Method:** Qualitative study, based on Bronfenbrenner's Bioecological Theory. Nine mothers of children under three years of age, enrolled in daycare centers in a municipality in the state of Paraíba, Brazil, and six education professionals who worked in these daycare centers participated. The data were collected between July and October 2021 via virtual interviews and analyzed according to inductive thematic analysis.

**Results:** The restrictions imposed by the pandemic made screens the only available resource for children's educational activities, interaction, leisure, and distraction, causing an exponential increase in the time they spent in front of screens.

**Conclusion:** The pandemic had a direct impact on the use of digital screens in early childhood, increasing the child's exposure time, according to parents and education professionals.

**Descriptors:** COVID-19. Child development. Mothers. Digital technology. Screen time. Child health.

## RESUMO

**Objetivo:** Identificar a repercussão da pandemia da Covid-19 no uso de telas digitais na primeiríssima infância, na perspectiva de mães e profissionais da educação.

**Método:** Estudo qualitativo, baseado na Teoria Bioecológica de Bronfenbrenner. Participaram nove mães de crianças menores de três anos, matriculadas em creches de um município do estado da Paraíba, Brasil e seis profissionais da educação, que atuavam nessas creches. Os dados foram coletados entre julho e outubro de 2021 por meio de entrevista virtual e analisados conforme a análise temática indutiva.

**Resultados:** As restrições impostas pela pandemia fizeram das telas o único recurso disponível para as atividades educativas, interação, lazer e distração das crianças, causando aumento exponencial no tempo em que essas passaram diante das telas.

**Conclusão:** A pandemia repercutiu diretamente no uso de telas digitais na primeiríssima infância, impactando no aumento do tempo de exposição da criança, segundo os pais e profissionais da educação.

**Descritores:** COVID-19. Desenvolvimento infantil. Mães. Tecnologia digital. Tempo de tela. Saúde da criança.

## RESUMEN

**Objetivo:** Identificar las repercusiones de la pandemia de Covid-19 en el uso de pantallas digitales en la primera infancia, desde la perspectiva de las madres y los profesionales de la educación.

**Método:** Estudio cualitativo, basado en la Teoría Bioecológica de Bronfenbrenner. Participaron nueve madres de niños menores de tres años, matriculados en guarderías de un municipio del estado de Paraíba, Brasil, y seis profesionales de la educación que actuaban en esas guarderías. Los datos se recogieron entre julio y octubre de 2021 mediante entrevista virtual y se analizaron según un análisis temático inductivo.

**Resultados:** Las restricciones impuestas por la pandemia convirtieron a las pantallas en el único recurso disponible para las actividades educativas, la interacción, el ocio y la distracción de los niños, lo que provocó un aumento exponencial del tiempo que pasaban frente a ellas.

**Conclusión:** La pandemia tuvo un impacto directo en el uso de pantallas digitales en la primera infancia, repercutiendo en el aumento del tiempo de exposición del niño, según padres y profesionales de la educación.

**Descriptor:** COVID-19. Desarrollo infantil. Madres. Tecnología digital. Tiempo de pantalla. Salud infantil.

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## ■ INTRODUCTION

Early childhood, an age range from birth to six years of life, can be subdivided into what is called very early childhood, a phase that begins during pregnancy and ends at three years of age (first thousand days of life). This is considered the most critical period for brain maturation, in which negative influence and events, such as those occurring in the Covid-19 pandemic, can cause irreversible harms<sup>(1,2)</sup>.

The Covid-19 pandemic has become a Public Health Emergency of International Importance<sup>(3)</sup>. Measures against this infection caused changes in all contexts of children's lives<sup>(4)</sup>, including the child's interaction in the school environment<sup>(5)</sup>.

In order to contain the spread of the new coronavirus, several sanitary measures were adopted, such as the closure of daycare centers, which provide early childhood education for children up to three years of age<sup>(6)</sup>. These actions not only impacted children's learning but also deprived them of certain guaranteed rights, such as leisure and social interaction, healthcare, and food security<sup>(7)</sup>.

In this context of deprivation and reduced interactions, the excessive use of screens by children emerged as an urgent situation. Children started to spend their time looking at smartphone screens, computers, tablets, televisions and game consoles<sup>(8)</sup>.

On the other hand, it was essential that in times of social isolation children maintained contact with friends and family, even through digital means, as children's social, intellectual and self-regulatory development was potentially at risk<sup>(10)</sup>. This has led to new reflections on appropriate screen time for a child, because, although there are risks to the child's development and health, parents can find ways to use screens for the benefit of their children, getting involved during video games use and of online experiences and encouraging them to remain physically active in front of the screens<sup>(11)</sup>.

The Brazilian Society of Pediatrics (*Sociedade Brasileira de Pediatria* – SBP) recommends not using digital screens by children under two years of age<sup>(12)</sup>. For children aged between two and five, the guidance is that the use of screens does not exceed the limit of one hour per day and that high-quality programs should be prioritized, with parental supervision<sup>(13)</sup>.

Despite these recommendations, with the beginning of the pandemic, questions about this aspect became evident. Before the pandemic electronic devices were used to a lesser extent and tended to be better supervised<sup>(8)</sup>. During the pandemic, parents' remote workload increased and the screen also became a resource for accessing basic education for children, leading parents to be less restrictive with screen time and content<sup>(4)</sup>.

Understanding the changes in the use of digital screens in the first years of life during the pandemic, according to the perception of mothers and education professionals, becomes essential to seek alternatives that can promote adequate use and avoid possible damage that excessive technology use may cause in children.

In view of the above, the question is: What is the perception of mothers and education professionals about the impact of the Covid-19 pandemic on the use of digital screens in early childhood? Therefore, the present study aims to identify the impact of the Covid-19 pandemic on the use of digital screens in early childhood, from the perspective of mothers and education professionals.

## ■ METHOD

This is a qualitative, descriptive-exploratory study, whose interpretation of the findings was based on Bronfenbrenner's Bioecological Theory. The theory is based on the elements Process, Person, Context and Time (PPCT), which are aspects inherent to human development. It indicates that one cannot separate the Person from the space that surrounds them, that is, the Context, which is divided into the levels of complexity Microsystem, Mesosystem, Exosystem and Macrosystem<sup>(14)</sup>.

The first one refers to the environment in which people are inserted and where they establish interpersonal relationships with the closest groups of coexistence (family, teachers and friends); the Mesosystem represents the relationships established between two or more environments in which the person actively participates (for example, family + school or healthcare service); in the Exosystem, the person does not actively participate in this environment, but may have events that affect their development (community, parents' work); and the Macrosystem includes ideologies, values, cultures, ethnicities, religions, forms of government and historical events in the daily lives of human beings<sup>(14)</sup>.

The reference shows that in the course of interactions between human beings and the environment in which they live, there is also the influence of external factors that interfere with child development<sup>(15)</sup>, such as the use of digital screens.

This research complied with the standards and guidelines listed in COREQ (Consolidated Criteria for Reporting Qualitative Research), to ensure the scientific-methodological rigor of the study<sup>(16)</sup>.

The research setting was daycare centers in a municipality located in the hinterlands of Paraíba, Brazil. In this location, the early childhood education network has five daycare centers, totaling 683 enrollments in 2021, corresponding to children aged between zero and three years. During the

data collection period, daycare centers had their in-person operations suspended due to protective measures against the Covid-19 pandemic.

The selection of participants was done through convenience sampling, following the eligibility criteria: for mothers, being a mother of a child aged zero to three years old who used screens and who was enrolled in a daycare center; being over 18 years old and have internet access. It is worth noting that there was no exclusion of participants.

The following eligibility criteria were established for education professionals: have experience in the classroom with children aged between zero and three years old, have worked in daycare for more than two years and have access to the internet, not being on vacation or leave during data collection.

Data collection took place between July and October 2021, remotely, using a telephone call. The management of the daycare centers was previously contacted, who provided a list with names and telephone contacts of education professionals and mothers of children enrolled in the daycare centers. Afterwards, contacts were made to invite them to participate in the study, schedule the interview and establish a previous interaction. At this moment, the researcher and student of a *stricto sensu* postgraduate course at master's level introduced herself and gave a brief explanation about her motivation for the study, as well as the research objectives.

The research was conducted by the main researcher (interviewer), who had experience in qualitative data collection. The pilot test was conducted through interviews one week before the start of data collection and was applied to two participants, including mothers and education professionals. These interviews were not included in the database and all the pilot test process was validated by a professor with expertise on the theme.

Twenty-eight attempts were made to contact the children's mothers, out of which 13 were unsuccessful, one did not meet the eligibility criteria and five declined to participate in the research. Additionally, 16 education professionals were invited, however, five declined and five did not respond to the contact. Finally, the study included nine mothers and six education professionals, five of whom were teachers and one monitor.

Empirical data was collected through in-depth interviews, that is, those that are flexible and dynamic and in which the researcher formulates secondary questions to deepen into the topic. To facilitate this process, a semi-structured script was used, consisting of two parts: participant characterization and a guiding question: "In your opinion, what is the impact of the Covid-19 pandemic on the use of screens by children?"

To characterize the mothers, the following information was collected: codename, age, marital status, number of children, age of children, grade and gender of the child enrolled, number of residents in the household, education, profession, family income, race/ color, religion, number of devices with screen at home, number of people who use devices with screen at home, type of screen most used by the child, daily time of screen use by the child and days of the week on which they use the screen. To characterize professionals, there is code name, age, gender, profession, title, time of professional experience in the service they work in and type of employment relationship.

The interviews, with an average duration of 25 minutes, were recorded on a digital device and were fully transcribed with the support of Microsoft Office Word® version 2019. The completion of the collection of mothers and professionals, separately, was based on the sufficiency criterion, when it is considered that the empirical material enables the understanding of the object of study<sup>(17)</sup>.

The analysis of the results followed the precepts of Inductive Thematic Analysis (ITA). This technique is flexible and has six phases: Familiarization with the data, which consisted of the transcription of the statements, as well as the exhaustive reading and re-reading of the statements; Preparation of initial codes, which consists of coding the important and most recurrent aspects in the statements and grouping the extracts referring to each code; Search for themes, which represents the union of extracts from interconnected codes into potential themes; Review of themes, stage in which the thematic map of the study was created along with its subthemes and codes and a thorough check was performed on all extracts; Definition and naming of themes, in which work was done to adapt the titles of themes, subthemes and codes; and, finally, Production of the final text, a phase in which a final analysis of the selected statements was performed and their connection with the research question and objective<sup>(18)</sup>.

The Bioecological Theory establishes that development is a reciprocal process, resulting from the interaction of the various systems that comprise it<sup>(14)</sup>. Considering that the pandemic modified all the systems elucidated by Bronfenbrenner and, consequently, the human development occurring within them, it was possible to connect the Covid-19 health crisis with the changes in the mesosystems and in the proximal relationships in the microsystems, with a focus on the use of digital screens by children. In this way, Bronfenbrenner's assumptions favored the understanding of the impact of the pandemic on the use of digital screens in early childhood.

The study complied with the ethical guidelines of Resolution No. 466/2012, which deals with research involving human beings, and was approved by the Research Ethics Committee under opinion No.4,736,257. Considering that the interviews were conducted remotely, the Informed Consent Forms (ICF) were sent in advance to the participants and given at the time of the interview, when formal consent for participation and audio recording was requested, through the verbal signaling from the participant. To protect anonymity, mothers were identified by the letter “M” and education professionals by the letters “EP”, both followed by the chronological numbering of the interviews.

## ■ RESULTS

Nine mothers aged between 20 and 36 years old participated in the study. Most mothers had two children and were employed, however, only two women had an income of two minimum wages, the others lived on just one salary or less. The number of residents in each household varied from two to five people.

Regarding education professionals, they were all female, aged between 38 and 54 years old. The six professionals had an effective contract, with professional experience in daycare centers ranging from two to 11 years, so they had the opportunity to get to know the children before the pandemic.

Based on the codes resulting from the analysis of the empirical data, the main theme “Use of digital screens in the microsystems and mesosystems of children in early childhood during the Covid-19 pandemic” was constructed (Figure 1).

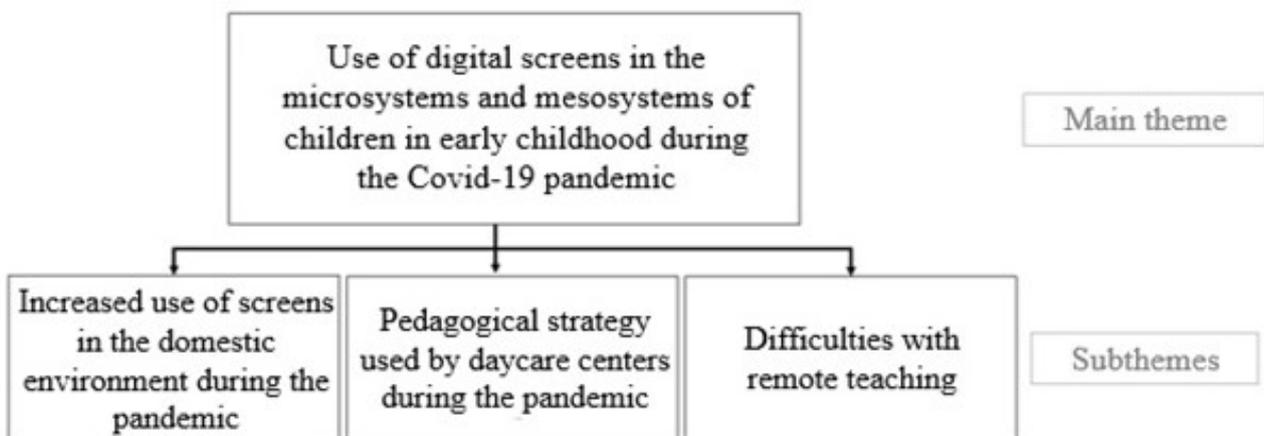
### Increased use of screens in the domestic environment during the pandemic

Regarding the time children were exposed to screens during the pandemic, it is evident from the statements that there was a considerable increase. Due to the social distancing rules implemented, children were unable to have in-person activities at daycare centers and were also prevented from leaving their homes. For this reason, school activities were performed using digital screens. These were also the main entertainment tool for children in the domestic environment.

[At the beginning of the pandemic] *he couldn't go to the park, he couldn't go out, he only had television to watch, so he was hooked. If it weren't for the pandemic, we would walk, go to the park, square, bathhouse, swimming pool, those things [...] We couldn't go out, we just lived at home, so it was only television and cell phones.* (M02)

*Before [the pandemic] my daughter spent the day at the daycare, there she interacted with other children, played, and not now, now she plays at home, but often, she spends more time on her cell phone watching until I become available or until she goes to play with another child. So, it has interfered a lot because the use of screens increased even more.* (M03)

*As people were compelled to stay at home, I think the use of screens increased, because they get tired of television, they get tired of cell phones, so you mix it up during the day, so it doesn't stay the same. If there wasn't a*



**Figure 1** – Thematic map resulting from the Inductive Thematic Analysis containing the main theme and subthemes addressed in this article. Cajazeiras, Paraíba, Brazil, 2021

Source: Prepared by the authors.

*pandemic, the little one would be in daycare, and it's full-time there. (M06)*

The data extracts also emphasized the behavior of mothers in placing their children in front of screens, as these devices capture children's attention allowing mothers to have more time to take care of the house and/or work.

*More because she stays quiet [with the use of the screen], when I'm really busy, then she's chasing me after something, so I say: take the cell phone, go watch. There she is entertained, while I'm doing something else. (M03)*

*For me, working from home, it is a necessary evil. I know it's wrong, I don't like it, but for me it's necessary, they have to be entertained by something [...]. As I need them to be quiet so I can work, I think the amount of time they spend and the number of screens they use has increased exorbitantly. [...] When I need it, it's great, because he stays very quiet. (M06)*

*Sometimes I don't have time to constantly monitoring [the child], so I give her the cell phone to keep her entertained a little while I go take care of the house or something. (M07)*

### **Screens as a pedagogical strategy used by daycare centers during the pandemic**

According to education professionals, distance learning activities were the only possible way to continue teaching children during the pandemic.

*Today [the use of screens] is a necessity, if they really couldn't see [the screens] I wouldn't be able to practice my profession since last year, and they would also be unassisted. So, what we sought was to include (screen) so that they would not be left without any connection with the daycare or without any connection with us. (EP01)*

*Because we know that this is something that exists [the use of screens], and now, after this pandemic, we cannot banish it from our lives, because now we live based on it. Right now I send videos to the children at home, so they can watch and do some activity with their parents. (EP05)*

*The use of screens has become inevitable in relation to our work, due to the current pandemic and remote classes, we realize that all work is being focused exclusively on the parents' cell phones. (EP06)*

### **Difficulties with remote teaching**

According to the statements, the process of teaching and learning children remotely was somewhat worrying, as most families faced financial difficulties that prevented them from providing another phone device to their child, and also the change itself in the teaching format brought with it numerous uncertainties. They also stated obstacles in performing the remote activities proposed to children with support from their parents, since they had little availability and willingness to do this task.

*I have 17 children enrolled and only 11 of them provide feedback and I only know what the parents send me. I'm not following, I don't know what daily life is like at home, what it's like today for them, what I'm sure is that today there is a lot more about the screen. (EP01)*

*I keep imagining these children now in times of pandemic, because they also have parents who are so needy, they can't even afford to have a cell phone. Sometimes there is one cell phone for all the children in the house, there are two or three children who study at different schools. (EP02)*

*One thing is to mediate knowledge in person, another is having to send videos, as is our case. To teach the lesson, you also have to be using these screens, in a way, in my opinion, children get very confused, because one thing is you are clearing that doubt, you see the child's needs, another thing is you mediate through these screens. (EP03)*

*When it comes to the pandemic, parents are not prepared to supervise their children. We send it to the parents via cell phone, but we still don't have the feedback, in a concrete way [...]. This year there was a huge reduction [in learning], because we realize that they still don't identify their own name, which is something they used to do, and we realize that this isn't happening. (EP06)*

*When it's activities, daycare things, she doesn't want to, when she talks about daycare she doesn't want to (do), but when it's cartoons, she wants to [watch]. I say: well, you're going to look at things from the daycare – and she doesn't want to, she wants to watch cartoons. (M01)*

*I don't do the group activities that she [teacher] tells me to, one because I don't have time, and because he [the child] doesn't have the patience to do them. (M06)*

## ■ DISCUSSION

The Covid-19 pandemic caused significant changes in the daily lives of children and their families. The prolonged closure of daycare centers and social distancing measures brought direct impact, with a lack of outdoor activities and the completion of school tasks using a technological device, which contributed to a significant increase in the time spent using digital screens in early childhood, in line with study conducted in Turkey<sup>(13)</sup>.

In non-pandemic contexts, children under three years of age spent most of their time in daycare centers, a scenario that enhances child development, as it allows them to interact with their peers, form the main bonds and receive the necessary stimuli<sup>(19)</sup>. This condition is consistent with Bronfenbrenner<sup>(14)</sup>, as child development occurs based on the child's relationship with those who represent the proximal context or microsystem (parents, caregivers and teachers), in the different spaces in which they are inserted and among them. Therefore, leaving daycare may have implications for their development.

There is still a lack of longitudinal studies that precisely demonstrate the impact of school absence and restrictions from the pandemic in childhood, however, there is evidence that socio-emotional development at this stage may be negatively affected because of this context<sup>(5)</sup>.

The Covid-19 pandemic also forced children's guardians to work from home, the so-called Home Office. This reality required them to develop strategies to take care of their children full-time and fulfill their work duties, with screens being the main strategy adopted for their children's entertainment. Therefore, this reality may have had an impact on interactions between infants and their families<sup>(14)</sup>.

It is important to guide parents about the possibilities and strategies to follow the recommendations regarding the use of screens by children, even more so given the challenges imposed by the digital era and, with the Covid-19 pandemic, in order to avoid harm to the neuropsychomotor development of the child.

A study showed that children aged 24 and 36 months exposed to devices with screens had low scores in a developmental screening test conducted at 36 and 60 months of age. The negative influence of this habit stands out, as the child wastes opportunities to improve their motor and communication skills<sup>(20)</sup>, as well as may experience changes in sleep, learning and concentration difficulties; risk for overweight, and behavioral, psychological issues and sensory changes, such as hearing and vision<sup>(21)</sup>.

Considering this scenario, the United Nations Children's Fund (UNICEF) released more flexible recommendations regarding screen time for children, so that they could adapt to the conditions imposed by social distancing measures. Among these recommendations, the following stand out: that digital media be used by children to communicate and interact with friends and family members, and that children use screens to access videos or games that encourage physical exercise, however, it is necessary for parents to be present when their children are using screens<sup>(11)</sup>.

On the other hand, in the educational context, educational institutions have seen the provision of distance learning, even for young children<sup>(22,23)</sup>, as an opportunity to continue with educational activities. In Brazil, despite social inequality representing a problem in the poorest and least developed areas, where residents face barriers to internet connectivity and digital resources<sup>(24)</sup>, the National Education Council (*Conselho Nacional de Educação – CNE*) authorized the offering of activities in the modality Distance Education (EaD), conducted by educators through technological devices<sup>(25)</sup>.

In this study, the teachers point out concerns regarding student learning, considering the obstacles of distance learning, such as the uncertainty whether the activities were available to the children and whether learning was being made possible, as these were educational activities for young children. Still in this regard, according to some reports from mothers, the children were resistant to virtual teaching, as they spent hours watching cartoons, but were unable to watch the videos from the school.

Remote early childhood education is not capable of fully providing the same experiences as in-person teaching, since interactive and flexible strategies are used in the educational environment in the child's pedagogical development. Furthermore, there are financial and psychological challenges faced by families to ensure that they follow the activities proposed by the educational institution at home<sup>(26)</sup>.

This statement corroborates a study conducted in France, which found changes in teaching resulting from the remote format, such as less organization of classes, instability in students' routines, difficulty for younger children to keep attention for more than 20 minutes, requiring frequent breaks in studies, with lower quality of learning, which explains the non-approval of remote teaching by most of those participants (72.2%)<sup>(27)</sup>.

Digital screens, while they can promote entertainment, the acquisition of information and allow children to learn in a playful way, can also expose them to the unknown and

unprecedented dangers<sup>(28)</sup>, including children under three years of age<sup>(9)</sup>, as caregivers are constantly busy and tired due to work<sup>(13)</sup> and offer mobile devices as a means of fun and distraction for the child<sup>(12)</sup>.

In addition to the pandemic, the excessive use of screens needs to be discontinued or limited, as they are harmful to child development, especially during early childhood. Therefore, it is necessary for schools and families to use again other interaction, play and socialization resources, which provide children with opportunities to promote their development.

The limitation of this study is that the interviews were conducted in a virtual environment, which negatively interfered with the researcher's interaction with the participants and could have made it difficult for some of them to consent. It should be noted that it was not possible to return the transcriptions to the participants, due to the pandemic.

## ■ CONCLUSION

The Covid-19 pandemic directly impacted the use of digital screens in early childhood, with an increase in the child's exposure time, according to study participants.

Although they are commonly used in the domestic environment, during social isolation, screens have become basically the only resource available to assist with teaching in daycare centers, as well as providing interaction with family members, leisure, and entertainment for children.

It is noteworthy that the adaptations made by daycare centers to ensure the continuity of teaching, such as remote teaching, contributed to children being more exposed to screens, changing their microsystem.

Due to limited scientific understanding regarding the impacts, in the short and long term, that the increase in the time of exposure to screens by young children causes harm to their health, this issue should be treated as a priority by public health, as there's a risk of a generation with neuro-psychomotor development problems emerging.

The study highlighted the indiscriminate use of screens by children in very early childhood, therefore requiring attention from parents and education professionals regarding the amount of time children use screens to avoid damage to child development.

It is recommended that longitudinal studies be conducted to investigate the real impact of the use of devices with screens by children under three years of age, in order to find ways to minimize its negative effects.

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