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ORIGINAL ARTICLE

EMOTIONAL AND BEHAVIORAL CHANGES IN EARLY CHILDHOOD IN THE CONTEXT OF THE COVID-19 PANDEMIC

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ABSTRACT

Objective: to investigate the emotional and behavioral changes in children during social isolation and the reasons for these changes in the perception of their caregivers. **Method:** a descriptive study in which data were collected on the routine and behavior of children aged between 18 months and 6 years, before and during the COVID-19 pandemic, through a virtual interview conducted in 2020 with the child's caregiver. The data were analyzed using descriptive frequency analysis and comparative analysis between children under and over 3 years old. Categorical variables were grouped based on similarities. **Results:** 68 caregivers and children aged between 19 months and 5 years and 8 months participated. All of them reported changes in their routines throughout the pandemic. There was an increase in the time spent on electronic devices (75.3%) and playing (67.6%); an increase in the frequency of sleep disturbances (30.9%), crying (48.5%), fear (58.8%), irritation (73.5%); difficulty following orders (58.8%); greater demand for attention (79.4%); increased consumption of sweets (61.8%) and fried foods (29.4%); and decreased concentration (34.3%). Changes in routine were considered the main reason for the behavioral problems observed. **Conclusion:** the routine modifications caused by the pandemic led to emotional and behavioral shifts in children, which potentially affected their development.

Keywords: Child. Preschool. Social isolation. Child development. COVID-19. Emotional adjustment. Child behavior.

INTRODUCTION

Early childhood, which encompasses the first six years of life, is a period of significant development across physical, cognitive, and socio-emotional domains. During this time, children acquire essential abilities that serve as the foundation for more complex skills later in life[1].

Socio-emotional development involves the expression of emotions in social contexts, the construction of social experiences, and the understanding of emotions[2] being deeply influenced by social factors[3]. Exposure to adverse environments presents measurable risks to children's learning, behavior, mental health, and physical health[4]. Pathological processes associated with a range of disorders begin early and have their most profound and lasting effects in the first few years of life[4].

The sudden change in children's routines caused by the COVID-19 pandemic, especially due to social distancing and isolation measures, has raised concerns about emotional and behavioral changes during this crucial period in children's lives. These changes have hindered the monitoring of child development by health professionals, which has contributed to the late identification of emotional and behavioral changes in this population[5].

Subsequent research following this study has found similar conclusions about the effects of social isolation on the child population. Due to the pandemic, approximately 10.75 million children under the age of five worldwide experienced some form of developmental deviation by February 2021, linked to the closure of schools and early childhood care services[6]. A

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systematic review of psychological signs and symptoms during the pandemic found that 34.5% of children suffered from anxiety, 41.7% from depression, 42.3% from irritability, and 30.8% from lack of attention[7]. In Brazil, caregivers reported an increase in negative behaviors, including bad behavior (43.1%), agitation (41.2%), difficulty sleeping (26.8%), and aggressiveness (15%) among children aged 0 to 5 years[8].

This study was conducted during the first year of the COVID-19 pandemic and aimed to investigate emotional and behavioral changes in children due to social isolation, as well as the reasons for these changes as perceived by their caregivers. The objective was to understand the impacts children faced to support the development of strategies for health and education services to address these needs. The findings were shared with professionals in these sectors in several municipalities in São Paulo, where the team collaborates on early childhood projects. Additionally, this knowledge can help guide care planning in similar situations in the future.

METHOD

This is a descriptive study with a quantitative approach, conducted virtually. After being promoted on social media platforms (Facebook and WhatsApp), individuals expressed interest in learning more about the research by completing an online form and providing their contact details (name, email, and phone number). The researchers then reached out to the caretakers to explain the study and arrange the interview based on their interests and availability.

The population consisted of caregivers of children living in Brazilian municipalities that were adhering to social isolation measures. The sample was limited to children who were at least 15 months old when social isolation began in Brazil in March 2020, as these children were more likely to have established routines and be affected by the changes.

Due to social isolation, a purposive convenience sample was selected. The participant recruitment process employed the "snowball" method[9], which involved publicity through the university where the researchers were affiliated, as well as through social media platforms.

Data collection occurred between July and August 2020. The interview script was developed based on the document "Repercussions of the COVID-19 Pandemic on Child Development"[5]. This review study addressed research about the current pandemic as well as previous studies, which concluded that social isolation can lead to behavioral and emotional changes, such as lack of attention, anxiety, sleep disturbances, discomfort, and agitation. The script was organized into the following sections: 1. Personal information about the child; 2. Routine before and during social isolation; 3. Data on the child's behavioral and emotional changes before and during social isolation; 4. The child's expressions about the COVID-19 pandemic; and 5. Family living and working conditions.

The questions concerning the characterization of children's routines and behaviors included closed-ended alternatives, such as: Does the child report missing daycare/preschool/school, friends, family? with options: Yes, No, Not applicable. As for elimination options, the question was: The child: Wears diapers; Identifies the need and asks for help; Identifies the need and can go alone; Cannot control it. The comparative questions between routines before and during the pandemic focused on frequency (Always; Almost always; Sometimes; Rarely; Never). To gather detailed information about behavioral changes, specific alternatives were provided. For example, regarding sleep, the options included: Wakes up at night; Has difficulty sleeping; Has difficulty waking up; Has nightmares; Agitation; Others. For all questions, there was an option for "no answer." The data from the open-ended questions, which focused on the perceived reasons for the mentioned changes, were categorized into four variables: 1) changes in routine, such as spending more time at home and/or fewer activities; 2) emotional issues, including feelings of fear, longing, stress, anxiety, parental attention, and/or nightmares; 3) use of electronic devices; and 4) age. The children's responses were grouped into two categories: "direct questions about COVID-19" and "responses from family members".

The interviews lasted approximately 45 minutes and were conducted via virtual platforms (Google Meet, Teams, WhatsApp, and Zoom). In instances where the interviewee was unable to

access these tools, the questionnaire was completed using Google Forms, as was the case for five families. The interviews were carried out by two final-year nursing students who had received prior training and were supervised by their academic advisor and the lead researcher. Upon completion of each interview, a leaflet prepared by the research team was provided to participants, offering guidelines and suggestions to assist with coping strategies. The leaflet included recommendations on how to care for, protect, and communicate with the child, as well as a list of reliable online resources for further consultation.

The objective data were tabulated and subjected to descriptive frequency analysis and Pearson's chi-square test. A comparative analysis was performed between children under 3 years of age and those 3 years of age or older, in order to determine whether there was a relationship between the variables and age, taking into account the distinct developmental characteristics and levels of understanding between the two groups.

The study was approved by the Ethics Committee of the School of Nursing at the University of São Paulo (EEUSP) (CAAE: 32633220.5.0000.5392, opinion 4,057,918) and adhered to the ethical and legal guidelines outlined in Resolution 466/12 of the National Health Council. All participants provided virtual consent via the Informed Consent Form (ICF).

RESULTS

The sample consisted of 68 caretakers, including 66 mothers (97.0%), one father (1.5%), and one grandmother (1.5%), in addition to children aged from 1 year and 7 months to 5 years and 8 months, with an average of 3.47 years. Most participants lived in the state of São Paulo (63: 92.6%). The homes had, on average, 5.32 rooms (ranging from 2 to 7), with 4 residents (from 2 to 7) and 1.9 children (from 1 to 5). All residences had water and electricity (68: 100%), cell phone and internet (68: 100%). Most also had garbage collection (67: 98.5%) and sewage (64: 94.1%), television (67: 98.5%) and computer (64: 94.1%). Most children had a health record (64: 94.1%) and did not have any physical or mental illnesses (49: 72.1%). Table 1 presents other general characteristics of the sample.

Table 1. Sociodemographic characteristics of the children's families. São Paulo, 2020

Variables	N	%
Home		
Owned/financed	46	67,6
Leased	21	30,9
Irregular	1	1,5
Family income		
5 or more minimum wages	46	67,6
2 to 4 minimum wages	17	25
1 to 2 minimum wages	3	4,4
Working conditions of the person in charge		
Formal employment	43	63,2
Self-employed	13	19,1
State employee	9	13,2
Unemployed	1	1,5
Retired	1	1,5
No answer	1	1,5
Receives government aid (*Bolsa Família*, emergency aid or daycare aid)	9	13,2

Source: Research data. Prepared by the author.

The children's routines changed for all of them through the pandemic. Before the pandemic, the majority attended early childhood education institutions (60: 88.2%), which provided a structured routine with set times for waking up, sleeping, and eating meals. There was a reduction in the number of children with health monitoring, falling from 64 (94.1%) to 28 (41.2%). Before the pandemic, 4 (5.9%) caregivers worked from home, while this number increased to 33 (48.5%) during the pandemic. The mother was the main caregiver in both periods (54: 79.4% before and

56: 82.4% during the pandemic).

The most significant behavioral and emotional changes observed were as follows: a 30.9% increase in children experiencing sleep disorders; a 58.8% increase in children having difficulty following orders; a 73.5% rise in irritability; a 79.4% increase in demand for attention; a 48.5% increase in crying; a 58.8% rise in fear; a 75.3% increase in the use of electronic devices; a 34.3% reduction in concentration span; 67.6% of children spending more time in play; and a 69.4% increase in children requiring assistance with eating, as detailed in Table 2 and the subsequent text.

Table 2. Frequency of sleep disorders, difficulty following instructions, irritability, attention-seeking behaviors, and crying in children, before and during social isolation. São Paulo, 2020

Variables	Never or Rarely				Sometimes		Almost Always or Always			
	Before		During		Before	During	Before		During	
	n	(%)	n	(%)	n (%)	n (%)	n	(%)	n	(%)
Sleep disorders	43	-63,3	28	-41,2	9 (13,2)	19 (27,9)	16	-23,5	21	-30,9
Difficulty following orders	22	-32,4	13	-19,1	28 (41,2)	24 (35,3)	18	-26,5	31	-45,6
Irritation	33	-48,5	30	-44,1	23 (33,8)	15 (22,0)	12	-17,6	35	-51,5
Demand for attention	10	-14,7	0	0	22 (32,4)	8 (11,8)	36	-52,9	60	-88,2
Crying	28	-41,2	12	-17,6	25 (36,8)	23 (33,8)	15	-22,1	33	-48,5

Source: Research data. Prepared by the author.

The sleep disorders that showed an increase were: nightmares (rising from 10: 14.7% to 17: 25.0%), agitation (increasing from 12: 17.7% to 14: 20.6%) and difficulty sleeping (rising from 8: 11.8% to 17: 25.0%). There was a slight decrease in the number of waking up during the night, with the percentage (dropping from 31: 45.6% to 29: 42.7%).

Before social isolation, a small proportion of children showed or reported fear (33.8%), while more than half of the children demonstrated behaviors associated with fear and/or reported experiencing fear (40: 58,8%).

As for attention span, there was an increase in the number of children who spent less time on activities such as talking and/or playing. The proportion of children staying engaged for up to 10 minutes rose from 27.3% (18 children) to 34.3% (23 children), meanwhile, the number of children remaining engaged for 10 to 20 minutes decreased from 31.8% (21 children) to 19.1% (13 children). However, there was an increase in the number of children who stayed engaged for 20 to 30 minutes, from 16.7% (11 children) to 25.4% (17 children).

Before the pandemic, most children spent nearly two hours/day on electronic devices (35 children, or 51.5%). During the pandemic, this duration increased, with 33 children (48.5%) using devices for three to four hours a day, and 25 children (36.8%) spending more than four hours on them.

About the time spent playing at home, before the pandemic, most children played between three hours (23: 33.8%) and four hours or more a day (23: 33.8%). Throughout the pandemic, 82.4% of children played primarily with their parents (56 children), 77.9% with friends (53 children), and 72.1% played alone (49 children). During this time, most children increased their playtime to more than four hours a day (46 children, 67.6%), with 89.7% playing with their parents (61 children) and 83.8% playing alone (57 children). Only one child (1.5%) kept regular contact with friends.

Regarding daily living activities, significant changes were observed in children's diets. Before social isolation, only 25 children (36.8%) required assistance with eating; during the pandemic, this number increased to 36 children (52.9%). In terms of food consumption, before the pandemic, most children regularly consumed grains (66: 97.1%), fruits (62: 91.2%), root vegetables (62 children, 91.2%), and vegetables (56 children, 82.4%). A minority also consumed fried foods (10? 14.7%) and sweets (16: 23.5%). During social isolation, there was a decrease in the consumption of fruits (56: 82.4%), root vegetables (54: 79.4%), and greens (37: 54.4%), while the consumption of sweets (42: 61.8%) and

fried foods (20: 29.4%) increased. During the pandemic, some children began eating more frequently (17: 25.0%), showed food selectivity (8: 11.8%), and/or experienced decreased appetite (6: 8.8%).

The reasons perceived by caregivers as related to children's emotional and behavioral changes during the pandemic included one or more of the themes described below.

The changes in sleep (42: 61.8%) were primarily attributed to changes in routine (23: 54.8%), emotional issues (13: 31.0%), use of electronic devices (6: 14.3%), and age (5: 11.9%). Difficulty following orders (40: 58.8%) was most often linked to changes in routine (26: 65.0%), emotional issues (13: 32.5%), and age (7: 17.5%). The main causes of increased irritability (50: 73.5%) were changes in routine (44: 88.0%), age (5: 10.0%), emotional issues (4: 8.0%), and use of electronic devices (4: 8.0%). The most frequently cited reasons for the increased demand for attention (54: 79.4%) were changes in routine (37: 68.5%), emotional issues (9: 16.7%), and age (4: 7.4%). The rise in crying frequency among children (44: 64.7%) was attributed to changes in routine (28: 63.6%), emotional issues (13: 29.5%), and age (3: 6.8%).

Table 3 presents a comparison between children under 3 years old and those 3 years old or older. Sleep disorders were the only variable that showed a significant difference between the age groups, being more prevalent in children under 3 years old before the pandemic ($p<0.001$). Both age groups showed increases in irritation, sleep disorders, demand for attention, manifestations of fear, time spent using electronic devices, and time spent playing, without significant differences between them. Notably, the likelihood of a child increasing the time spent using electronic devices during social isolation, compared to the pre-pandemic period, was 98.5 times greater, regardless of age.

Table 3. Children's behaviors according to age group under 3 years old and 3 years old or older. São Paulo, 2020

Children's behaviors	Children < 3 years old N=28		Children > 3 years old N=40		
	N	**%**	**n**	**%**	***p-value***
Changes in sleep before the pandemic	14	50	2	2	<0,001
Changes in sleep during the pandemic	17	60,7	10	25	0,21
Irritation always or almost always before the pandemic	5	17,9	7	17,5	0,97
Irritation always or almost always during the pandemic	14	50	24	60	0,41
Demand of attention before the pandemic	19	67,9	23	57	0,03
Demand attention during the pandemic	25	89,3	35	87,5	0,82
Fear before the pandemic	9	32,1	14	35	0,8
Fear during the pandemic	13	46,4	27	67,5	0,08
Time spent using electronic devices > 4 hours before the pandemic	2	7,1	1	2,5	0,36
Time spent using electronic devices > 4 hours during the pandemic	14	50	17	42,5	0,3
Playing between 3 and 4 hours before the pandemic	14	51,9	19	48,7	0,84
Playing more than 4 hours a day during the pandemic	19	67,9	27	67,5	0,8

Source: Research data. Prepared by the author.

Regarding children's changes due to COVID-19 and family interactions on the topic, it was observed that adults did not address discussions about the subject. Most children had never asked about it (37: 54.4%), while 13 asked rarely or sometimes (19.1%) and 14 asked almost always or always (20.6%). For the children who asked questions (27: 39.7%), their caregivers reported responding through conversations (21: 77.8%) or games (6: 22.2%). In terms of the emotions expressed in the children's reactions, the following were identified: anxiety (11: 35.5%), sadness (10: 14.7%), indifference (15: 22.0%), anger (6: 8.8%), fear of someone becoming sick or dying from COVID-19 (4: 5.9%), and agitation (4: 5.9%).

DISCUSSION

The findings of this study on the emotional

and behavioral changes of children during social isolation due to COVID-19, and the perceptions of those responsible for these changes, emphasize the importance of maintaining attention to the effects of events that can constitute traumatic experiences in childhood. The concept of adverse childhood experiences emerged from numerous studies investigating the long-term effects of childhood trauma, identifying 10 types of experiences that impact child health and development, with lifelong consequences[10]. Recently, there has been discussion about expanding this list to include additional experiences, taking into account different contexts. In this respect, the global health crisis caused by COVID-19 has been analyzed and proposed as an adverse childhood experience due to its significant impacts on caregiving environments[10].

Changes in children's and families' routines, associated with social isolation and the fear related to the events of the pandemic, led to increased sleep difficulties, anxiety, and mood swings. Although an objective assessment of the children was not conducted, these behaviors were clearly noticeable to parents and were measured using objective indicators that were included in the interview script.

Children's sensitivity to context is shaped by various interactions, such as those within community and family environments, as well as developmental stages. In this sense, the challenging context of the COVID-19 pandemic has affected the sensitive developmental period of the children in this study, marking moments that serve as unique windows of opportunity for both positive and negative influences on their development[1].

Thus, children who never or rarely experienced sleep disorders began to show changes, such as later bedtimes and wake-up times, nightmares, agitation, and difficulty falling asleep. It is well-known that insufficient sleep not only compromises children's quality of life but also impacts family dynamics[11]. Similar results were observed in groups of preschool children in other contexts during the same timeframe[12, 13].

Increased anxiety and mood changes have also been observed in several studies[13-15] involving children during the COVID-19 pandemic. The negative impact of the pandemic on family life was linked to anxiety symptoms and problematic behaviors in 3-year-old children, while in children aged 4 to 5 years, this impact was associated with increased sleep disorders and anxiety symptoms[13]. In Italy, preschool children with typical and atypical development showed heightened anxiety, externalizing behaviors, aggressiveness, and oppositional defiant issues[14]. Parents of Latino children aged 3 to 5 years reported increased crying and developmental regressions[15]. In Argentina, caregivers of children and adolescents reported irritability, greater demands for attention, increased attachment, difficulty concentrating, argumentative behaviors, fighting, tantrums, increased frustration tolerance, and impulsivity. Children aged 3 to 8 years had the highest levels of dependence-withdrawal, aggressiveness-irritability, and impulsivity-attention span[16]. On the other hand, it is crucial to recognize that adversities do not always result exclusively in negative effects.

An increase in playtime, especially outdoors, and more time spent interacting with siblings were identified as factors that positively impacted children's socio-emotional development[17]. This positive outcome may stem from the establishment of a new routine and the adjustment to changes, which in turn strengthens self-esteem and resilience. Positive parenting practices, such as maintaining good sleep hygiene and fostering a harmonious family environment with open communication between parents and children, were associated with fewer sleep disorders in the confined group[12]. Therefore, with proper support, overcoming difficult situations can lead to positive outcomes for children.

The lack of initiative from caregivers in addressing the pandemic situation suggests a limited understanding of how children process such experiences, potentially underestimating their ability to comprehend and seek emotional security. As a result, distraction measures, such as increased exposure to electronic devices and screens, may take precedence. This, however, creates another issue for children's well-being, as excessive screen time is widely discouraged due to its harmful effects, including poor sleep quality, increased agitation, anxiety, drowsiness, memory problems, and lack of attention[18].

In this context, the importance of

strengthening the role of nurses, particularly in primary care, has been emphasized to achieve better outcomes in child care[19]. Families that understand the developmental process and recognize the importance of communication with children of all ages are better prepared to support them in navigating difficult situations. This can be achieved through care that is based on "respect for families and grounded in the principles and guidelines for child care"[19]. Adopting a family-centered care approach in monitoring a child's development and growth is an effective way to strengthen families[19].

This applies to all the findings discussed so far, including changes in diet, concentration, and attention demands. These behaviors may be linked not only to emotional factors but also to the challenges families face in balancing work within the home environment while managing their children in this difficult context.

It is worth noting that the study sample consisted of individuals with a homogeneous and steady socioeconomic profile, features that can be considered protective and that differ from the reality of a large portion of the Brazilian child population. Nevertheless, significant changes were observed in the children's behaviors, which deserve attention, particularly concerning the potential long-term effects and risks to socioemotional development. These findings raise concerns about the condition of children in greater social and economic vulnerability.

Another aspect to consider is the data collection timeframe, which took place four months after the onset of this health crisis. The findings are linked to a time of sudden changes and adaptations, not only for children but also for adults, due to the uncertainty created by the lack of knowledge about the disease and the absence of accommodation and support measures that were in place at the time.

CONCLUSIONS AND CONSIDERATIONS

The pandemic has significantly altered family routines, leading to changes in children's behavior, as reported by their caregivers. The suspension of in-person schooling, the shift to remote learning, extended time spent at home, restricted contact with relatives and friends, lack of recreational spaces, and reduced physical activity have all contributed to several changes. These include increased screen time, more frequent disruptions in sleep patterns, difficulty following orders, increased demands for attention, increased crying, fear, irritability, greater need for assistance with eating, increased consumption of sweets and fried foods, and reduced concentration. These behaviors reflect, and may further contribute to, changes in children's socioemotional development, which require careful attention.

Considering that early childhood is a critical time for overall development, it is crucial to conduct further studies exploring the relationships between the pandemic and its long-term effects on the socio-emotional domain. Additionally, it is important to implement strategies that focus on embracing and communicating with children, offering them opportunities to positively process the experiences they have lived through this time. This can be achieved, particularly, by educating families on comprehensive child development and the care needed to promote this development.

ALTERAÇÕES EMOCIONAIS E COMPORTAMENTAIS NA PRIMEIRA INFÂNCIA NO CONTEXTO DA PANDEMIA DE COVID-19

RESUMO

Objetivo: investigar alterações emocionais e comportamentais de crianças em isolamento social e os motivos dessas alterações na percepção dos responsáveis. **Método:** estudo descritivo em que foram coletados dados sobre a rotina e comportamentos de crianças entre 18 meses e 6 anos, antes e durante a pandemia de COVID-19, por meio de entrevista virtual realizada em 2020, com o responsável pelos cuidados da criança. Os dados foram analisados por meio de análise descritiva de frequência e análise comparativa entre crianças menores e maiores de 3 anos. As variáveis categóricas foram agrupadas por similaridade. **Resultados:** participaram 68 responsáveis e crianças com idades entre 19 meses e 5 anos e 8 meses. Todas mudaram a rotina durante a pandemia. Houve aumento do tempo gasto em aparelhos eletrônicos (75,3%) e em brincadeiras (67,6%); aumento da frequência de alterações no sono (30,9%), choro (48,5%), medo (58,8%), irritação (73,5%); dificuldade para obedecer a ordens (58,8%); maior demanda de atenção (79,4%); maior consumo de doces (61,8%) e frituras (29,4%); e diminuição da concentração (34,3%). As mudanças de rotina foram consideradas os principais motivos para os problemas de comportamento. **Conclusão:** as mudanças na rotina acarretadas pela

pandemia produziram alterações emocionais e comportamentais nas crianças, que, potencialmente, afetaram seu desenvolvimento.

Palavras-chave: Pré-escolar; Isolamento social. Desenvolvimento infantil. COVID-19. Ajustamento emocional. Comportamento infantil.

CAMBIOS EMOCIONALES Y DE COMPORTAMIENTO EN LA PRIMERA INFANCIA EN EL CONTEXTO DE LA PANDEMIA COVID-19

RESUMEN

Objetivo: investigar cambios emocionales y de comportamiento en niños en aislamiento social y los motivos de estos cambios en la percepción de los responsables. **Método**: estudio descriptivo en el que se recogieron datos sobre la rutina y los comportamientos de niños entre 18 meses y 6 años, antes y durante la pandemia de COVID-19, por medio de entrevista virtual realizada en 2020, con el responsable del cuidado del niño. Los datos fueron analizados a través del análisis descriptivo de frecuencia y análisis comparativo entre niños menores y mayores de 3 años. Las variables categóricas fueron agrupadas por similitud. **Resultados**: participaron 68 responsables y niños de edades entre 19 meses y 5 años y 8 meses. Todos cambiaron la rutina durante la pandemia. Hubo aumento del tiempo dedicado a aparatos electrónicos (75,3%) y juegos (67,6%); aumento de la frecuencia de alteraciones en el sueño (30,9%), llanto (48,5%), miedo (58,8%), enfado (73,5%); dificultad para obedecer órdenes (58,8%); mayor demanda de atención (79,4%); mayor consumo de dulces (61,8%) y frituras (29,4%); y disminución de la concentración (34,3%). Los cambios de rutina fueron considerados como las principales causas de los problemas de comportamiento. **Conclusión**: los cambios en la rutina traídos por la pandemia produjeron cambios emocionales y de comportamiento en los niños, que, potencialmente, afectaron su desarrollo.

Palabras clave: Preescolar. Aislamiento social. Desarrollo infantil. COVID-19. Ajuste emocional. Comportamiento infantil.

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