# COPING WITH PANDEMIC: FAMILIES ENGAGEMENT AND EARLY PARENTAL INTERVENTION TO SUPPORT CHILD DEVELOPMENT DURING AND AFTER THE COVID-19 OUTBREAK

EDITED BY: Rosario Montirosso, Eleonora Mascheroni, Barbara Kalmanson and Mark S. Innocenti
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# COPING WITH PANDEMIC: FAMILIES ENGAGEMENT AND EARLY PARENTAL INTERVENTION TO SUPPORT CHILD DEVELOPMENT DURING AND AFTER THE COVID-19 OUTBREAK

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EDITORIAL
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# Editorial: Coping With Pandemic: Families Engagement and Early Parental Intervention to Support Child Development During and After the COVID-19 Outbreak

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**Editorial on the Research Topic**

**Coping With Pandemic: Families Engagement and Early Parental Intervention to Support Child Development During and After the Covid-19 Outbreak**

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The public health emergency due to Coronavirus disease 2019 (COVID-19) that started more than 2 years ago required significant measures to ensure infection control that resulted in public health, social and economic challenges worldwide. While social-distancing, quarantine, and isolation measures were proved to be effective to reduce community-based transmission, their psychological cost is still increasingly evident (Prati and Mancini, 2021). The uncertainty and lack of predictability associated with the pandemic in these recent years has been a highly stressful and traumatic experience for children, adolescents and their families (Alonzi et al., 2021; Panchal et al., 2021).

A growing body of research is revealing the presence of both short-term and mid-term detrimental consequences on children's mental health and psychological adjustment, suggesting that these may continue long-term for many children. This scenario is exacerbated by the stress experienced by parents, potentially affecting their ability to provide consistent care and support that may negatively impact the parent-child relationship. In these past 2 years, many parents had to care for children while working from home, supervise home-based schooling, and deal with economic uncertainty. Demands that may be even greater for parents who must care for children with special needs or disabilities (Montirosso et al., 2021).

Since parenting is a critical factor in early child development, for this special issue we called for research papers that questioned what factors may amplify or mitigate the negative effects of COVID-19 on children and their parents. In addition, we wanted articles that provided evidence of effective parenting interventions that would support the child as well as the family system in dealing with the challenges associated with the COVID-19 pandemic. We identified four themes in the published articles.

The first theme, stress begets stress, focuses on risk factors related to the caregiving and family environment that can amplify the effect of COVID-19 on child psychological adjustment. Radanović et al. reported that both parent's fear and children's exposure to negative pandemic information were associated with an increase in the children's fear of COVID-19 (this finding was supported by de Vet et al.). Parents scoring higher on separation anxiety and fear of COVID-19 experienced more distress which was associated with higher children distress once they

re-entered child care services. These results were more evident in younger children. Parental distress was not only associated to a higher fear of COVID-19 but also to other contextual factors. Thibodeau-Nielsen et al. found that economic hardships were related to increased caregiver stress, which was associated with children's emotional distress and poorer self-regulation. However, the negative association between parents' stress and children's emotional difficulties was moderated by children's ability to engage in pandemic-related play. Finally, de Vet et al. focused on the impact of COVID-19 on child wellbeing after the lockdown, when the Child Care Services reopened. Younger children and children with parents scoring higher on separation anxiety experienced more distress after the reopening. These studies highlight the need to study moderators of stress during high stress events both during and after the events.

Another theme, stress multipliers, is reflected in the studies that analyzed subjects already in at-risk situations that may potentially amplify the stress effects of COVID-19. The psychological adjustment associated with the pandemic can be particularly difficult for all individuals, research suggests that the psychological impact of COVID-19 may be more severe for some at risk populations (Boyraz and Legros, 2020; Chaix et al., 2020; Stefana et al., 2020). Manuela et al. observed an increase of depression symptoms in mothers of extremely preterm children (born before 32 weeks gestation) hospitalized in Neonatal Intensive Care Unit (NICU) during the COVID-19 pandemic, which were associated with less postnatal attachment and higher maternal stress. He et al. focused on economically vulnerable families. The difficulties (lay-offs, reduced work, etc.) faced by low-income families during the pandemic put them at higher risk for negative short and long-term consequences. In these families, parents reported increased financial strain and more mental health difficulties, especially for fathers, during the pandemic. Moreover, children exhibited more behavior problems compared to before the pandemic. These studies emphasize the need for research on approaches to reduce stress in vulnerable groups during high-stress times.

While some research focused on risk factors and at-risk condition that can negatively affect the wellbeing of children and parents, others have focused on protective factors. The third theme, promoting positive family behaviors, focused on promoting resilience and teaching positive behavior among the family system. Both Johnson et al. and Mariani Wigley et al. observed that parent's ability to teach children resilient behavior, to enhance acts of kindness and to develop trusting relationships can improve child adjustment during the pandemic. The potential contributions of family resilience during the COVID-19 pandemic to parents and children had more positive outcomes for low-income families (He et al.). Baggett et al. reported low-income and depressed mothers, at high risk for poor developmental outcomes, were supported by an internet-based parenting intervention with virtual coaching. Evidence-based remote coaching interventions were reported as crucial during the pandemic, especially for at-risk families. Preliminary findings from an ongoing randomized controlled trial study showed rates of successful progression into intervention that were at least as favorable as those reported in routine studies of home visiting intervention programs outside of pandemic. These studies demonstrate approaches to maintain positive family behaviors during times of high stress.

Our fourth theme focuses on child services (care and early intervention) during the pandemic and some very interesting findings resulted. As a consequence of the COVID-19 outbreak child care services all over the world were temporarily closed to minimize the spread of the virus. However, in most of the cases these organizations worked hard to continue serving children and their families during the COVID-19 lockdown using online applications. These new service approaches seemed to have a positive impact on families. Nossa et al. reported that online, organized activities decreased the sense of loneliness and boredom for children and acted as a crucial support for parents. For children with special needs, Vilaseca et al. observed that the virtual provision of Early Intervention services was positively perceived by parents, especially for parents who took care of their child during the day and used online tools before the lockdown. Telematics (virtual) intervention during COVID-19 became an opportunity for practitioners to encourage families' participation, promoting an effective model of family-centered care. These studies demonstrate thoughtful and effective methods to continue services when the services are unavailable in-person.

The main themes that emerged from our Research Topic are useful to guide policy makers and health/care practitioners in protecting child and parent mental health and promoting child development post-pandemic. The critical need of support for parents was clear in many of the research papers. To address widespread family challenges and needs during the pandemic, some key considerations will be important. First, implementing evidence-based programs that can treat parents' fear, parenting stress, and parents' mental health are crucial. The research suggests a continued focus on parents with depressive symptoms, and methods to promote supportive and sensitive parenting and family resilience. Second, to meet the needs of families most at risk, ensuring low cost, flexible and remote support is needed. Support that considers a variety of online, telephone, or physically distanced service delivery options to accommodate family schedules and comply with physical distancing. Third, novel technologies providing digital delivery of psychological services for families played a crucial role during the pandemic. These new approaches need to become part of our service options post-pandemic, as they allow outreach to a large number of families. More research on the effectiveness of virtual or tele-services designed for families experiencing a range of health, household and psychosocial risk factors, are of crucial importance. Research that examines not only outcomes but the factors around what works best for whom. One aspect of the pandemic is that it has increased our awareness of the devastating impacts of risk factors on parents and children but has also, more positively, allowed us to think in new ways about how we work with families using new technologies while improving access to services and improving outcomes.

## AUTHOR CONTRIBUTIONS

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# Don't Think That Kids Aren't Noticing: Indirect Pathways to Children's Fear of COVID-19

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The present study is couched within Rachman's three-pathway theory of fear acquisition (Rachman, 1977, 1991). Besides the direct contact with the objects of fear, this model also includes two indirect pathways to fear acquisition: negative information transmission and modeling. The study aims to explore the contribution of these three factors to the level of children's fear of COVID-19. The sample consisted of 376 children (59.6% girls), aged 7–19 ($M_{age}$ = 12.77, $SD_{age}$ = 3.57), and one of their parents ($M_{age}$ = 42.88, $SD_{age}$ = 6.00). The survey was conducted online during the COVID-19 national state of emergency in the Republic of Serbia. The children assessed their fear of COVID-19, general fearfulness, negative information transmission, and modeling by their parents, as well as the level of exposure to negative information outside their home. The parents assessed their own fear of COVID-19 and trait anxiety. Parents' anxiety, children's age, and children's general fearfulness were used as covariates. The results of our path analysis provide support for Rachman's notion of indirect pathways. The more the parents were afraid of COVID-19, the more they expressed this (either verbally or through their behavior), which in turn led to an increase in the children's fear of COVID-19. Furthermore, children's exposure to negative information related to COVID-19, provided by their teachers and peers or stemming from the media, directly contributed to the level of children's fear. The results of the study emphasize the importance of caregivers' behavior during global health crises and provide some clues as to what caregivers may do to protect their children's mental health in such circumstances.

**Keywords: fear, COVID-19, children, parents, indirect pathways**

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## INTRODUCTION

The COVID-19 pandemic has raised many important questions related to children's coping mechanisms in stressful situations, as well as to their general psychological functioning during global health crises. Various studies conducted during the ongoing pandemic showed negative effects of the pandemic on children's mental health (Brown et al., 2020; Jiao et al., 2020; Orgilés et al., 2020; Pisano et al., 2020; Smirni et al., 2020). People's fears related to COVID-19 seem to be normative during the pandemic and have the adaptive function of inducing people to take care of themselves and others. However, the crisis is still ongoing, and it is not clear when it will end. Thus, normative fears of adults and children might develop into clinical fears that disrupt mental health not only during the crisis, but also afterwards.

Traditionally, a direct traumatic experience with the objects of fear was considered to be the dominant path to the development of clinical fears and phobias, as emphasized in the conditional model of fear development (Askew and Field, 2008). This model assumes that people associate a neutral stimulus with traumatic events, which then leads to a fear reaction. As a result, a previously neutral stimulus starts to elicit a fear reaction by itself. Although this pathway to fear development is empirically well-supported (Field and Davey, 2001), already 30 years ago Rachman (1977) noticed that some other factors, not related to traumatic experiences, also contribute to the development of children's fears. Rachman (1977, 1991) formulated his three-pathway model, which, besides direct conditioning, also includes indirect learning processes. These indirect pathways to children's fears include observing fearful reactions of people around the child (vicarious learning or modeling, see Askew and Field, 2008, for more details) and negative information or instructions related to the objects of fear (negative or threat information transmission). These indirect pathways can also trigger the acquisition of fear [see Muris and Field (2010), for more details] or anxiety (Percy et al., 2016). Rachman's model has gained wide empirical support [see King et al. (1998), for details] and has been incorporated into new models of fear acquisition [e.g., Field and Davey (2001) and Muris and Merckelbach (2001)]. However, one of the main methodological issues raised about the empirical validation of Rachman's model is the validity of retrospective accounts. In order to overcome this issue and be able to study the effects of negative information transmission in more controlled conditions, researchers have developed a prospective paradigm (Field et al., 2001) and conducted experimental studies, which also supported Rachman's theory about the role of the indirect pathways in the development of fears.

Furthermore, Rachman's model was used as the theoretical framework in the study of children's fear of Swine Flu (Remmerswaal and Muris, 2011) in a naturalistic context and with real-time assessment of fear during the peak of the 2009 Swine Flu pandemic. Like the 2009 Swine Flu pandemic, the COVID-19 pandemic is a public health crisis during which heightened levels of fear are experienced. The COVID-19 pandemic is therefore another naturalistic context for further exploration of children's fears and the influence of the behavior of people around them on developing or increasing their fears during global health crises.

Various studies have shown that children's fears can start developing within the family context, and that, if not recognized and treated, growing fears can lead to psychopathology later in life. Communication with children is important for fear management [e.g., Rapee et al. (2009)]. Consequently, the role of parents' behavior is the most frequently explored factor in the development of children's specific fears. Parents' abilities to efficiently manage their fears and cope with stress are especially crucial during crisis periods such as the COVID-19 pandemic [e.g., Duan et al. (2020)], not only when it comes to their own well-being, but also when it comes to the well-being of their children. The results of a recent study by Spinelli et al. (2020) have shown that parents who were dealing with more difficulties related to the COVID-19 lockdown conditions reported a higher level of stress, which in turn increased their children's stress levels. Parents' medical fears such as dental fear [e.g., Tahmourespour et al. (2014)] or fear of a specific disease [e.g., Remmerswaal and Muris (2011)] have been shown to correlate significantly with these fears among their children.

The current study is based on the previously mentioned correlation study about children's fear of Swine Flu. In this study, Remmerswaal and Muris (2011) investigated the contribution of negative (threat) information (provided by parents) to children's fear of Swine Flu during the peak of the 2009 Swine Flu pandemic in the Netherlands. The results of their study showed that parents' threat information partially mediated the correlation between the parents' and children's fear of Swine Flu. This is one of many studies that supported Rachman's idea that negative information and threat narratives may be a risk factor for children's fear. Furthermore, the experimental study conducted by Muris et al. (2010) also showed that parents could induce children's fear beliefs by providing threatening narratives related to the object of fear.

In addition to the indirect pathway of verbal threat information transmission, on which the study about Swine Flu focused, the current study also includes another indirect pathway related to observing others' fearful reactions, namely modeling. Askew and Field (2008) showed that fear can be transmitted even in the absence of direct contact or verbal threat information. They conducted an experimental study that demonstrated that children's fear increased for novel animals which they saw paired with scared faces. It also took longer for the children to approach a box with the animals they had previously seen paired with scared faces. Furthermore, Gerull and Rapee (2002) showed that children expressed greater fear and avoidance of stimuli, which were followed by their mothers' adverse reaction.

Our study includes children's real-time assessments of their parents' fearful reactions during the COVID-19 national state of emergency. This indirect pathway may be particularly important in a pandemic. Even if parents try to hide their fear in the verbal communication with their children in order to protect them, non-verbal communication is more difficult to control because it is not always conscious or planned.

The third indirect pathway included in the current study was threat information to which the children were exposed outside the communication with family members, for instance, in interactions with their peers and teachers, on the internet, or in the news. This pathway is particularly important for our study because of the specific circumstances of the COVID-19 pandemic, including online schooling and frequent news reports about COVID-19 on television and on the internet. Due to all these factors, during the COVID-19 national state of emergency, children may have been exposed to a vast amount of negative information concerning the COVID-19 pandemic, and it is therefore vital to examine the contribution of this pathway to the levels of children's fear of COVID-19.

Furthermore, there are important factors that may interfere with the connection between parents' and children's fear. Anxiety, by its very nature, implies increased fear of many different things and parents with higher levels of anxiety may be more afraid of COVID-19. In addition, parents' anxiety levels

may affect their children's fear of COVID-19. Muris et al. (2010) established the important role of parents' trait anxiety level in children's fear. After receiving ambiguous information related to the object of fear, parents who scored higher on anxiety told their children more negative stories related to the object of fear, which in turn led to higher fear levels in their children. An insightful study by Remmerswaal et al. (2016) showed that a brief training by parents can influence their children's information search bias. Children who received negative training by the parent (meaning that the parents were instructed to encourage their children to search for negative information) exhibited an increase in negative information search, as well as in fear. Parents who are more anxious and more afraid of COVID-19 are more focused on searching for negative information, which their children may notice in everyday settings. In addition to the correlation with modeling and negative information transmission, parents' anxiety and fear level may also be associated with the children's exposure to negative information related to COVID-19 outside the communication with family members. Children's age is also an important factor for fear regulation. Previous research showed that children's levels of fears decreased with age [e.g., Gullone and King (1997)]. Furthermore, a preliminary study conducted in the Shaanxi Province of China during the COVID-19 pandemic showed that younger children aged 3–6 were more likely than older children to manifest the fear that someone in the family might have the infection (Jiao et al., 2020). Finally, it is plausible to expect that children's general fearfulness is associated with their specific fear of COVID-19, which can be considered one of the medical fears incorporated in children's general fearfulness. Since all the mentioned factors are associated with fear acquisition in children, they are included in this study as covariates of the primary variables of the study.

Our research was conducted during the national state of emergency in the Republic of Serbia that was declared on March 15, 2020. Universities, schools, preschools, and nurseries were closed, as well as the state borders. Frequent curfews during evening hours and weekends were introduced as one of many measures in order to slow down the spreading of COVID−19. Information on the numbers of the infected and the deceased, as well as new prevention and prohibition measures were often broadcast on all TV channels. Since the mortality rate is the highest among the oldest, citizens were urged not to visit their elderly parents and not to take their children to visit their grandparents. Those older than 65 were instructed not to leave their residences during the national state of emergency. School classes were broadcasted on national TV channels. Considering all measures taken by the authorities, the children spent their time mainly in the family home with more limited live interactions with their peers and other important figures.

Based on the same theoretical framework as the previously described studies of fear acquisition pathways, our study aims to explore children's fear of COVID-19 during the national state of emergency in Serbia, in the light of Rachman's three-pathway model, controlling for parents' anxiety, children's age, and children's general fearfulness. The study's main hypothesis is that children's fear of COVID-19 may be connected with their parents' fear of COVID-19 through parents' fearful reactions and verbal transmission of negative information related to COVID-19. Our main hypothesis is that information transmission and modeling will partially or fully mediate the relationship between parents' and children's fear of COVID-19, while conditional learning and negative information to which children are exposed outside the family will affect children's fear of COVID-19 directly. Since the COVID-19 crisis is particular in many respects, our study needs to remain more exploratory than explanatory in nature.

# METHOD

## Participants

The initial database consisted of 1,412 parent–child dyads. As a first step, all incomplete questionnaires and questionnaires completed only by parents or only by children were removed from the database. After this step, a total of 378 dyads remained. As an additional selection criterion, the questionnaires, for both the children and the parents, ended with a question related to answering the questions honestly ("*It is very important to us to know if you answered all the questions honestly. Please select the answer below which describes your answers most accurately*"). All the children reported that they answered the questions *mostly* or *completely honestly*. However, two parents reported that they answered the questions *completely dishonestly*. At the second step, the data obtained from these participants were excluded from the study (together with the data obtained from their children). The final sample therefore included 376 children (59.6% girls), aged 7–19 ($M = 12.77$ years, SD = 3.57), and one of their parents ($n = 376$), aged 27–67 ($M = 42.88$ years, SD = 6.00). During the lockdown, 35.1% of the parents worked from home, while the remainder either worked outside home (17.6%), sometimes at home and sometimes outside home (13.0%), or did not work at all (34.3%).

## Procedures

Due to the COVID-19 pandemic, a national state of emergency was declared in Serbia, including lockdown, school closures, and frequent curfews. Therefore, the only possible way to collect data was through an online survey. We launched a survey via SoSci Survey (Leiner, 2020). The survey was available during the national state of emergency (from April 16 to May 6, 2020) and took ∼20 and 15 min for children and parents to complete, respectively. The invitation for participation in the study was distributed via social networks. Information on the study was presented to the parents, requesting their consent for their and their child's voluntary and anonymous participation in the study. If they had more than one child aged 7–19, we asked them to participate in the study with the younger child. If the parents had agreed to participate, the children were asked to complete the questionnaires first. It should be noted that we strongly advised the parents not to interfere with their children's responses, emphasizing the importance of obtaining the children's independent responses for the study. However, we did ask the parents to help younger children complete the questionnaire if they had some technical issues or if they struggled to understand the questions. The final part of the questionnaire contained posters with information related to

**TABLE 1 |** Descriptive statistics, reliability coefficients, and intercorrelations for study variables.

| Variable | M | SD | $\alpha$ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Children | | | | | | | | | | | | |
| 1. Age | 12.77 | 3.57 | – | – | | | | | | | | |
| 2. Fear of COVID-19 | 2.82 | 0.83 | 0.85 | −0.14** | – | | | | | | | |
| 3. Fearfulness | 2.46 | 0.68 | 0.83 | −0.21** | 0.41** | – | | | | | | |
| 4. Modeling | 2.33 | 0.77 | 0.71 | 0.13* | 0.42** | 0.29** | – | | | | | |
| 5. Family Transmission | 3.41 | 1.18 | 0.63 | 0.06 | 0.38** | 0.21** | 0.45** | – | | | | |
| 6. Non-Family Transmission | 2.40 | 0.83 | 0.58 | 0.38** | 0.36** | 0.14** | 0.35** | 0.19** | – | | | |
| Parents | | | | | | | | | | | | |
| 7. Fear of COVID-19 | 2.73 | 0.74 | 0.86 | 0.03 | 0.49** | 0.32** | 0.55** | 0.36** | 0.20** | – | | |
| 8. Cognitive Anxiety | 1.70 | 0.63 | 0.87 | 0.06 | 0.17** | 0.27** | 0.37** | 0.12* | 0.21** | 0.44** | – | |
| 9. Somatic Anxiety | 1.40 | 0.53 | 0.89 | 0.08 | 0.19** | 0.19** | 0.36** | 0.16* | 0.19** | 0.37** | 0.69** | – |

*$p < 0.05$; **$p < 0.01$.

interesting home activities, as well as online educational materials for children, along with useful information for parents about children's reactions to crisis situations, which may occur during the lockdown and different help methods which parents can use to teach their children how to cope with stress.

## Measures

### Children

*The Fear of COVID-19 Questionnaire for Children* (FC19Q-C) was constructed for the current study to measure children's fear related to COVID-19 (**Supplementary Appendix A**). The measure consisted of 14 items in total, out of which three items were modified from the Fear of Swine Flu Questionnaire (henceforth FSFQ), which was constructed to measure children's fear of Swine Flu during the 2009 Swine Flu Pandemic (Remmerswaal and Muris, 2011). Cronbach's alpha for FSFQ reported by Remmerswaal and Muris is 0.81. The items from the FSFQ used in the present study are the following: "*Would you be scared if you had the coronavirus?*," "*Are you more afraid to become ill since the coronavirus's outbreak?*" and "*Would you be scared if someone you know had the coronavirus*?" In accordance with the suggestion to use a simpler answering format for children (Brasic Royeen, 1985; Mellor and Moore, 2014), younger children (7–11 years old) were asked to answer the questions using a three-point Likert scale ranging from 1 (*false*) to 3 (*true*), while adolescents (12–19 years old) had to answer the questions using a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The answers on the three-point scales were weighed and transposed on the five-point scale, after which the mean FC19Q-C score was computed. A higher score indicates a higher level of COVID-19 fear. The internal consistency of the two subscales is satisfactory (**Table 1**).

We tested Rachman's model using several questions for the assessment of direct experience with the object of fear. Firstly, we asked the participants if they had been infected ("*Have you been infected with the coronavirus?*"). Since the children could have had direct experience with COVID-19 in case of illness of their parents or siblings as well, we also asked them if someone in their family had been infected with COVID-19. Furthermore, we used two short measures for the assessment of the other two pathways of fear acquisition: negative information transmission and modeling (**Supplementary Appendix B**). We constructed the Non-Family Information Transmission Scale (NFITS) to assess the level of negative (threat) information to which the children have been exposed outside the family, from their teachers, peers, on TV or on the Internet. In addition, we created the Family Information Transmission Scale (FITS), which included three items related to parents' threat information. This scale was constructed following the model of the Sources of Information about the Swine Flu Scale (SISFS, Remmerswaal and Muris, 2011). Cronbach's alpha for the parents' threat information scale reported by Remmerswaal and Muris was 0.79. Finally, we constructed the Modeling Scale (MODS), which included nine items related to different fearful reactions and behaviors of the parents that their children may have observed during the COVID-19 pandemic. For all described instruments, the younger children used a three-point Likert scale ranging from 1 (*never/rarely*) to 3 (*every day*) to answer, while the older children used a five-point Likert scale ranging from 1 (*never*) to 5 (*every day*). The answers on the three-point scales were weighed and transposed on the five-point scale. Higher scores indicate higher levels of negative information transmission or higher level of modeling. The internal consistency of these scales is satisfactory (**Table 1**).

We modified the shortened version of the *Fear Survey Schedule for Children* (FSSC-R; Ollendick, 1983) to measure children's fear of specific situations and stimuli. This questionnaire is a widely used self-report measure via which specific fears and general fearfulness in youths can be measured. Our modified questionnaire included four items related to fears of small animals (e.g., spiders), four items related to the fear of danger and death (e.g., being hit by a car or a truck), three items related to the fear of failure and criticism (e.g., being teased), four items related to the fear of the unknown (e.g., the dark), and four items related to medical fears (e.g., getting a shot from the doctor). In addition to these 19 items, which were presented to both the younger and the older children, five more items were added to the questionnaire presented to the older children. This was done due to the difference in specific fears between younger and older children [e.g., Bauer (1976)]. Following previous

studies about adolescents' fears [e.g., Ollendick and King (1994), Lane and Gullone (1999), and Michalčáková et al. (2009)], these additional items were created to address the fear of being abandoned (e.g., being left behind by my friends) and the fear related to identity (e.g., something is wrong with me).

We asked the children to indicate their fear level on a three-point Likert scale ranging from 1 (*not afraid*) to 3 (*afraid*) for the younger children and on a five-point Likert scale ranging from 1 (*not afraid at all*) to 5 (*very afraid*) for the older children. As for the FC19Q-C, the answers on three-point scales were weighed and transposed on the five-point scale. The score of the children's fears was obtained as a mean value of the responses across all 19 items for the younger children and all the 24 items for the older children. A higher score indicates a higher level of general fearfulness. The internal consistency of this questionnaire is satisfactory (**Table 1**).

### Parents

*The Fear of COVID-19 Questionnaire for Parents* (FC19Q-P) is a modified version of the FC19Q-C used to assess parents' fears related to COVID-19. This questionnaire has the same 14 items as the FC19Q-C, adapted for adults, which need to be answered on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The internal consistency of the FC19Q-P is satisfactory (**Table 1**).

To measure the parents' trait anxiety, we used *The State-Trait Inventory for Cognitive and Somatic Anxiety* (*STICSA;* Ree et al., 2000). We used only the trait version of this inventory (measuring to what extent, in general, the statement is true for the participants) to measure 10 cognitive symptoms of anxiety (e.g., "*I cannot get some thought out of my mind*") and 11 somatic ones (e.g., "*My muscles are tense*"). To answer, the participants used a four-point Likert scale ranging from 1 (*not at all*) to 4 (*very much so*). Cronbach's alphas for the inventory pertaining to cognitive and somatic symptoms of anxiety are satisfactory (**Table 1**).

# RESULTS

## Analytic Plan

A path analysis was conducted to examine the associations between the children's fear of COVID-19, the parents' fear of COVID-19, and the direct and indirect pathways of fear acquisition. SPSS (version 26) was used for descriptive statistics and correlation analysis, whereas Amos (version 22) was used for conducting path analysis (Arbuckle, 2013). As a direct conditioning measure, we asked the children if they or someone in their family had been infected with COVID-19. Only three participants (0.8%) reported that they had been infected, and six of them (1.6%) reported that someone in their family had been infected with COVID-19. Due to the small number of children who directly experienced COVID-19, conditional learning as a direct pathway to fear was excluded from the analysis.

Considering the exploratory nature of our study and the study's primary goal to explore the mechanisms of children's acquisition of fear related to COVID-19, we started from the full, saturated path model. The model included the following primary study variables: Parent's fear of COVID-19, Children's fear of COVID-19, Non-family information transmission, Family information transmission, and Modeling. The latter three were used as measures of pathways included in children's fear acquisition.

The model fit was assessed by examining the comparative fit index (CFI; Marsh and Hau, 2007) and the Tucker–Lewis index (TLI; Bentler, 1990). With values $>0.95$, both indicate a good model fit. Further, the root mean square error of approximation (RMSEA; Hu and Bentler, 1999) with a value $<0.05$ and the $p$-value 0.000 indicate a good model fit.

A bias-corrected bootstrapping procedure (10,000 draws) was used for estimating the standard error and confidence interval for the total, direct, and indirect effect of Parents' fear of COVID-19 on Children's fear of COVID-19 through Non-family information transmission, Family information transmission, and Modeling. This approach was chosen since it generates the most accurate confidence intervals for the estimates of the effects, reducing Type I error rates and increasing power over other similar tests (MacKinnon et al., 2002). The model was trimmed according to the path analysis results. Non-significant paths were excluded one by one in a backward fashion.

## Selections of Covariates

Since previous studies had shown that parents' trait anxiety level could intensify negative information transmission (Muris et al., 2010; Remmerswaal et al., 2016), Parents' somatic anxiety and Parents' cognitive anxiety were selected as covariates of both Parents' fear of COVID-19 and Children's fear of COVID-19. Similarly, since children's fears have a normative, developmental path and change with age (Gullone and King, 1997), the measures of Children's general fearfulness and Children's age were defined as covariates of Parents' anxiety, Parents' fear of COVID-19, Children's fear of COVID-19, as well as of the three pathways of transmission. Since Child gender showed no correlation with Children's fear or any of the fear acquisition pathways, the same model was analyzed with the whole sample. All the above-mentioned covariates (Parents' somatic anxiety, Parents' cognitive anxiety, Children's general fearfulness, and Children's age) were introduced in the initial, saturated model, assuming their direct effect on the primary study variables. In the final model, only those with significant associations with any of the relevant variables were included.

## Model Results

Descriptive statistics and correlations for the study variables are presented in **Table 1**. As expected, Children's fear of COVID-19 is correlated with Children's general fearfulness and negatively correlated with Children's age. Children's fear of COVID-19 is also correlated with Parent's fear of COVID-19, Parent's anxiety, and all the examined pathways of fear acquisition. On the other hand, Parents' fear of COVID-19 is correlated with Parent's cognitive anxiety, Parents' somatic anxiety and all three fear acquisition pathways. Non-family information transmission, Family information transmission, and Modeling are all correlated with Children's age and Children's general fearfulness, as well as with Parents' trait anxiety. The model analysis showed that the hypothesized model (**Figure 1**) fits the empirical data [$\chi^2$ (5, $n$

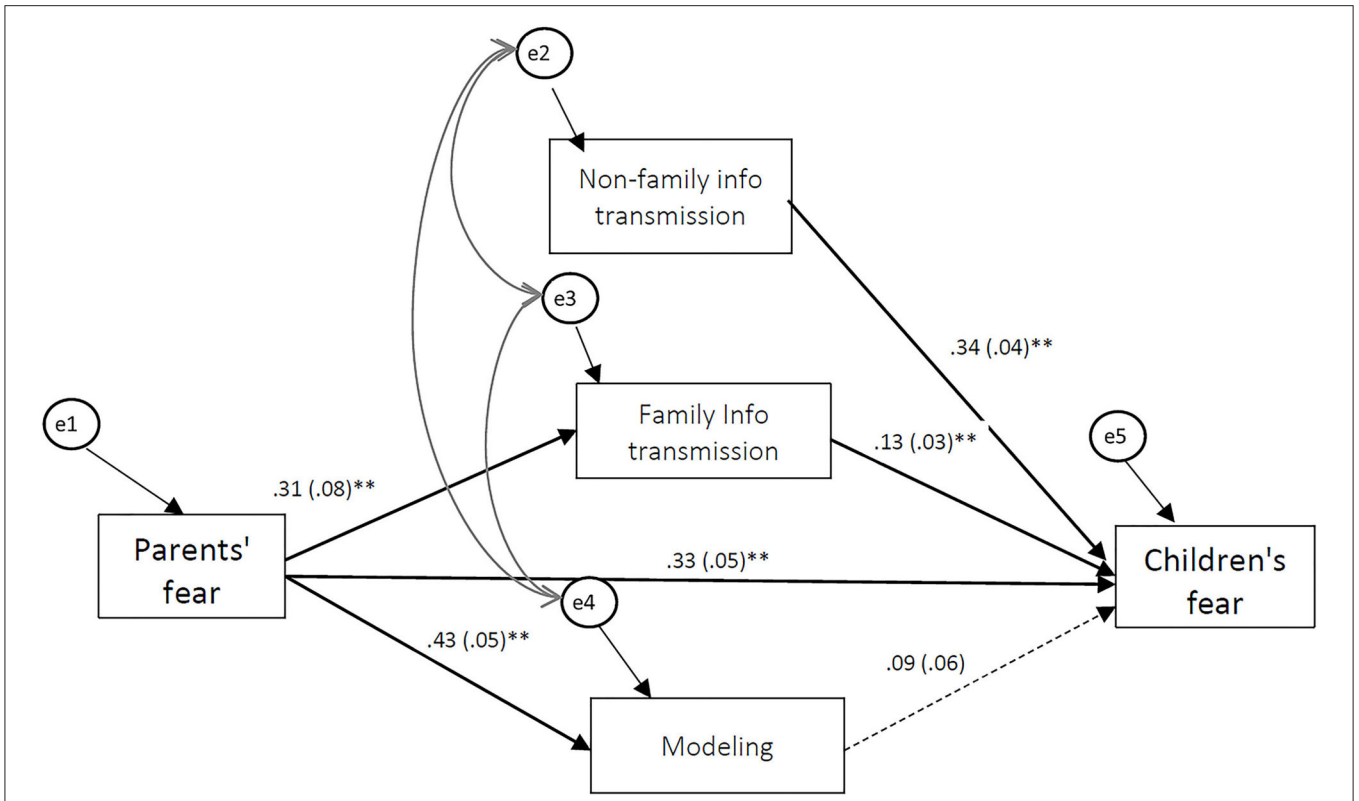


**FIGURE 1 |** Path Model Predicting Children's Fear of COVID-19. Statistics are standardized regression coefficients. Children's age, general fearfulness, and parental anxiety were used as covariates but are not depicted. The dotted path is marginally significant, significant paths are bolded. $^{**}p < 0.01$.

**TABLE 2 |** Standardized regression coefficient for regression model.

| Relations | | | Standardized regression weights | *p* |
|---|---|---|---|---|
| Parental cognitive anxiety | −> | Parents' fear of COVID-19 | 0.379 | *** |
| Children's general fears | −> | Parents' fear of COVID-19 | 0.223 | *** |
| Parents' fear of COVID-19 | −> | Family information transmission | 0.313 | *** |
| Parents' fear of COVID-19 | −> | Modeling transmission | 0.427 | *** |
| Children's general fears | −> | Non-family information transmission | 0.190 | *** |
| Children's general fears | −> | Family information transmission | 0.113 | 0.026 |
| Children's general fears | −> | Modeling transmission | 0.150 | 0.001 |
| Children's age | −> | Non-family information transmission | 0.419 | *** |
| Children's age | −> | Modeling transmission | 0.154 | *** |
| Parental cognitive anxiety | −> | Non-family information transmission | 0.145 | 0.002 |
| Parental cognitive anxiety | −> | Modeling transmission | 0.150 | *** |
| Parents' fear of COVID-19 | −> | Children's fear of COVID-19 | 0.334 | *** |
| Non-family information transmission | −> | Children's fear of COVID-19 | 0.340 | *** |
| Family information transmission | −> | Children's fear of COVID-19 | 0.126 | 0.004 |
| Modeling transmission | −> | Children's fear of COVID-19 | 0.086 | 0.091 |
| Parental cognitive anxiety | −> | Children's fear of COVID-19 | −0.135 | 0.002 |
| Children's specific fears | −> | Children's fear of COVID-19 | 0.193 | *** |
| Children's age | −> | Children's fear of COVID-19 | −0.242 | *** |

$^{***}p < 0.001$.

$= 376) = 7.316$, $p > 0.05$, $\chi^2/df = 1.463$, CFI $= 0.997$, TLI $= 0.982$, RMSEA $= 0.035$, (CI $= 0.000, 0.086$)]. The standardized regression coefficients are shown in **Table 2**. As **Table 2** shows, a Standardized Total Effect of Parents' fear of COVID-19 on Children's fear of COVID-19 is 0.410 (CI $= 0.320, 0.498$), while the direct effect of Parents' fear is 0.334 (CI $= 0.233, 0.433$). The

total indirect effect of Parent's fear on Children's fear through Negative information transmission and Modeling is 0.076 (CI = 0.031, 0.129).

Parents' fear of COVID-19 is directly related to Children's fear of COVID-19 ($\beta = 0.334$, $p < 0.001$). In addition to this direct connection, Parents' fear also indirectly influences Children's fear through two pathways of transmission. On the one hand, Parents' fear of COVID-19 is associated with Family information transmission (FITS) ($\beta = 0.313$, $p < 0.001$) and with Modeling (MODS) ($\beta = 0.427$, $p < 0.001$). On the other hand, Family information transmission and Modeling are associated with children's fear of COVID-19 ($\beta = 0.126$, $p < 0.004$; and $\beta = 0.086$, $p < 0.091$, respectively). However, the third indirect pathway, Modeling, is approaching statistical significance, so this finding should be verified in future research. This implies that the fear transmission mechanisms mediate the relation between Parents' and Children's fear of COVID-19. Parents who were on the average more afraid of COVID-19 passed more of their fear onto their children through verbal (and behavioral) mechanisms, which in turn resulted in their children being, on average, more afraid of COVID-19.

In addition to these family influences, Children's fear of COVID-19 is also associated with Non-family information transmission (NFITS) ($\beta = 0.340$, $p < 0.001$), meaning that those children who were more exposed to external threatening information showed a higher level of fear regarding COVID-19.

The examination of covariate effects is also significant in the interpretation of this model. Parents' somatic anxiety and Parents' cognitive anxiety were tested as covariates of both Parents' and Children's fear of COVID-19. Parents' somatic anxiety has no significant effects. On the other hand, Parents' cognitive anxiety not only affects Parents' fear of COVID-19 ($\beta = 0.379$, $p < 0.001$) but also has a small, direct effect on Children's fear of COVID-19. Interestingly, its effect on Children's fear is negative ($\beta = -0.135$, $p < 0.002$), indicating that the more anxious the parents were, the less afraid their children were. This finding should be verified in further studies. In addition, Parents' cognitive anxiety is associated with two pathways of fear transmission, Non-family information transmission ($\beta = 0.145$, $p < 0.002$) and Modeling ($\beta = 0.150$, $p < 0.001$).

As expected, Children's age is associated negatively with Children's fear of COVID-19 ($\beta = -0.242$, $p < 0.001$), indicating that as the age of the child increased, the fear of COVID-19 tended to decrease. Further, Children's age influences Non-family information transmission ($\beta = 0.419$, $p < 0.001$), as well as Modeling transmission ($\beta = 0.154$, $p < 0.001$), indicating that as children grow older, they are more exposed to information outside home and are therefore more susceptible to modeling influence.

Children's general fearfulness has significant, although small, effects on both Children's ($\beta = 0.193$, $p < 0.001$) and Parents' fear of COVID-19 ($\beta = 0.223$, $p < 0.001$), as well as on all the pathways of fear acquisition (Non-family information transmission, $\beta = 0.190$, $p < 0.001$; Family information transmission, $\beta = 0.113$, $p < 0.026$, and Modeling, $\beta = 0.150$, $p < 0.001$). These findings suggest that children who are generally more fearful are more afraid of COVID-19, and also have parents who are more afraid of COVID-19. In addition, their fear is affected by both pathways of fear transmission.

## DISCUSSION

This study aimed to explore children's fear of COVID-19 in the light of Rachman's model of fear acquisition. We hypothesized that conditional learning would directly affect children's fear and that children's fear would be significantly influenced by parental fear, transmitted indirectly through two pathways, namely, negative information transmission, and modeling. Since the number of children who reported direct experience with COVID-19 as an object of fear was low, we had to exclude direct conditioning from further analysis. Thus, our study is based on the part of Rachman's model related to the indirect pathways of fear acquisition.

We hypothesized that parental trait anxiety, children's age, and children's general fearfulness might be important to control for because of their association with the variables regarding parents' and children's fear of COVID-19. Indeed, the relations between Children's fear of COVID-19, Children's age, and Children's general fearfulness are significant. As in previous studies [e.g., Jiao et al. (2020)], our results have shown that children's fear of COVID-19 decreases with age. Higher levels of children's fear of COVID-19 were associated with higher levels of their general fearfulness, indicating that children's fear of COVID-19 can be considered one of the medical fears among children's specific fears (Ollendick, 1983).

As expected, higher levels of parents' fear of COVID-19 were associated with higher levels of their fearful reactions and negative information transmission. These results are in line with previous studies [e.g., Remmerswaal and Muris (2011)] about other parents' specific fears, which lead to the transmission of negative (threat) information verbally by instruction or conversation, as well as by fearful behaviors (modeling). The consistency of these findings indicates that this effect is relatively independent of the object of fear and the context.

Interestingly, in a bivariate analysis, higher levels of parents' fear and cognitive and somatic anxiety were positively correlated with the children's exposure to negative information related to COVID-19 outside home. Despite this observed trend, parents' fear did not predict negative information transmission outside the communication with family members. However, parents' cognitive anxiety did show such an effect. Remmerswaal et al. (2016) showed that when mothers were instructed to direct their children toward searching for negative information (which we assume parents who scored higher on fear and anxiety did), their children displayed an increase in searching for negative information and in fear. In line with these findings, we assume that the children of the parents who scored higher on anxiety and fear of COVID-19 were more often searching for negative information about COVID-19 outside their home. However, it is also possible that, regardless of the children's willingness to be exposed to negative information about COVID-19, they were exposed to it, not in communication with their parents but still inside their home. For instance, the parents with increased fear

and anxiety may have been following the news about COVID-19 more frequently. This is indeed quite likely, given the fact that during the COVID-19 national state of emergency in Serbia, daily media conferences with medical experts and politicians were held and broadcast live.

We defined the path model in order to test our central hypothesis and explore whether, as predicted by Rachman's theory, the parents' fear of COVID-19 led to an increase in the children's fear of COVID-19 through the indirect pathways of negative information transmission and modeling. The strongest predictor of children's fear of COVID-19 is parental fear of COVID-19. Thus, our model only partially explains the mechanisms of children's fear acquisition. Based on our findings, it cannot be explained in which way, i.e., via what mechanism, the parental fear directly impacts the children's fear of COVID-19. One possibility is that this study did not cover some of the indirect transmission mechanisms. On the other hand, there may be some direct paths, related to more basic mechanisms, such as the mechanism of emotional contagion, by which the parents' fear directly affects the children's fear. These hypotheses should be investigated in future research.

The significant indirect effect of parental fear on children's fear through negative information transmission and modeling indicates that parents who are more afraid tend to express their fear verbally or through their behavior, leading to an increase in children's fear. Hence, our starting hypothesis about the mechanisms of indirect transmission of parent's fear to children has been partially confirmed. Accordingly, these results support Rachman's theory (Rachman, 1977, 1991) about indirect fear acquisition pathways. The study by Remmerswaal and Muris (2011) about the fear of Swine Flu also showed that the parents' negative information transmission only partially mediated the correlation between the parents' and the children's fear of Swine Flu.

It should be noted that only a very small amount of variance of children's fear could be accounted for by the indirect pathways. This suggests that, in addition to the significant direct contribution of parental fears, there are other pathways, i.e., learning experiences associated with children's fear acquisition. Some authors discuss more complex models and multifaceted etiologies of children's fears and anxiety, including stressful life events, parental rearing behaviors, parental emotion regulation, existing beliefs, and expectations about the possible consequences [e.g., Muris and Merckelbach (2001)]. Subsequent research should examine the role and importance of these characteristics attributed to the family, the parents, and the child. Furthermore, when a crisis has been ongoing for some time, this means that children have been exposed to many sources of information (and disinformation) available at home and outside home. As a consequence, the pathway of negative information transmission outside the family may gain in importance, especially for older children, to whom this information is more accessible. Despite a small indirect effect, our findings indicate that both parental verbal messages and patterns of behavior (modeling) make a significant contribution to the onset of children's fears. In interpreting the effect size of these associations, it should be borne in mind that the data were obtained from two sources (from parents and children). It seems plausible that if all variables in the model had been measured based on parents' self-report, their associations would have been higher.

In interpreting the results, both the moment and the context in which the study was conducted should be considered. Although rigorous measures were introduced in order to prevent the spread of the pandemic, the children's and the parents' fear of COVID-19 was moderate (2.8 and 2.7, respectively, on a scale of 1–5). At the time, it seemed that the epidemic was under control, that the spread of the virus could be contained, and there was a small number of the infected and the deceased. All these factors could have impacted not only the fear of the parents but also their behavior toward and verbal messages to the children. Fitzpatrick et al. (2020) reported similar results about the level of fear of COVID-19. They conducted an online survey in March 2020 on a nationally representative sample of adults in the United States. Their results showed that on a scale from 1 (not at all fearful) to 10 (very fearful) the average scores ranged from 6.8 to 7.2, depending on the region. However, it would be interesting to study the effects of the examined constructs in a more uncertain situation, less under the individual's control, as well as within medical or government systems. Further studies should consider broader contextual factors, which can affect both the parents and the family system and have a direct impact on children's fears.

## Implications

For most children, different fears, the medical ones included, are a common, normative part of their childhood and adolescence. However, some children have trouble dealing with intense fears, which makes their daily functioning more difficult (Muris et al., 2000). In times of crisis, fears tend to intensify, especially those related to the causes of the crisis. Therefore, during an ongoing COVID-19 pandemic, attention should be paid to children's fears related to COVID-19 and the potential risk factors that may intensify and prolong those fears. This study showed the importance of the parents' role during a global health crisis, and it serves as a warning that children are learning even when parents are unaware of it. The results emphasize the importance of the way we communicate with our children in a period of crisis. Since threatening narratives increase children's fears, approaching their concerns differently could be more beneficial, as it may help the children understand the pandemic and positively affect their well-being. To influence children's perspective positively and reduce the intensity of their worries, it may be useful to focus on the positive aspects of a pandemic situation, e.g., more time to play with parents or siblings, various interesting activities that the child can engage in at home, or exploring new ways of schooling. It seems important to send the children a message that they are safe and that the family is taking care of them, as well as to teach them to follow health experts' guidelines, thereby participating in this "battle against the virus." In addition to verbal communication, the results of this study show the importance of behaviors that are not necessarily followed by a verbal message. Parents' non-verbal reactions to the news about the daily numbers of people infected or non-verbal signs of panic when someone is leaving

the house can signal danger to the child on a much larger scale than desired. Some authors emphasize the importance of the dynamics of the family system and mutual communication among its members during an ongoing pandemic [e.g., Prime et al. (2020)]. Children's adaptation to the pandemic conditions, as well as their coping with the psychological consequences (which may even come after the pandemic), depend on many factors, but the family environment is among the most important ones. It should be emphasized that the indirect pathways related to negative information transmission by peers, teachers, the news, or other sources may also increase children's fear. Parents need to be informed about the information their children are exposed to from different sources and discuss it with their children in order to diminish their concern or prevent them from misunderstanding such information. One of the most important suggestions for the parents is to take care of themselves in the first place. Given all the health-related and economic concerns that parents face daily during the ongoing pandemic, it cannot be expected that all parents will always respond to the new challenges in the preservation of children's mental health in a timely and adequate manner. Thus, parents need help and guidance too. In many districts of Serbia, new COVID-19 SOS telephone lines were opened to provide help to those in distress. Furthermore, many institutions and organizations, such as the WHO, CDC, and UNICEF, provide information and guidelines for parents. Providing space for children to express their fears freely and talk about their concerns also provides space for parents to create a safe and positive narrative through which they can communicate to their children that they are safe and understood.

### Limitations and Future Directions

One of the frequent limitations of research on the origin of children's fear is related to retrospective accounts. Our data were collected during the COVID-19 national state of emergency in Serbia, which enabled us to base our study on children's and parents' real-time reports about their fear related to COVID-19. Therefore, our data are arguably not prone to recall bias. Furthermore, a wide age range of children was covered. However, our study still suffers from various limitations. First of all, due to the small number of children who reported that they had been infected with COVID-19, we had to exclude this variable, which made it impossible to explore Rachman's model in its entirety. Future studies should focus on the effects of trauma exposure in children who have been infected with the virus and the psychological consequences that may ensue. It should be emphasized that some instruments are created by the authors for the purpose of this study. Although the internal consistency of these measures is satisfactory, due to the pandemic conditions (e.g., the importance of collecting data soon after the national state of emergency was declared), these instruments lack proper psychometric validation. An additional shortcoming lies in the fact that the data related to the gender of the parents were omitted. Thus, we do not know if the parents' sample consists predominantly of mothers, fathers, or both genders are equally represented. Due to the difference in the prevalence of mental health problems related to affective disorders [e.g., McLean et al. (2011)], and since it has been less frequently explored in previous research, the role of the fathers in the development of children's fear may be significant [see Bögels and Phares (2008), for more detail]. Also, the data related to the parents' gender could be significant for the interpretation of the results and instrumental in gaining additional insight into gender differences in negative information transmission or modeling. Finally, following the suggestion by Field and Storksen-Coulson (2007) that indirect pathways interact mutually, exploring the interactive effects of behavior and verbal negative information transmission may be highly relevant.

## DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Institutional Review Board of the Department of Psychology, Faculty of Philosophy, University of Belgrade, Serbia. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

## AUTHOR CONTRIBUTIONS

AR: research conception and design, instrument development, data collection, data analysis and interpretation, drafting the article (Sections Introduction, Results, and Discussion), and final approval of the version to be submitted. IM: research design, instrument development, data collection, data analysis and interpretation, drafting the article (Sections Method, Results, and Discussion), and final approval of the version to be submitted. SP: research design, instrument development, data collection, data interpretation, drafting the article (Sections Method, Results, and Discussion), and final approval of the version to be submitted. KK: research conception and design, data analysis and interpretation, drafting and revision of the manuscript, and final approval of the version to be submitted. All authors contributed to the article and approved the submitted version.

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## SUPPLEMENTARY MATERIAL

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BRIEF RESEARCH REPORT
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# Depressed and Socioeconomically Disadvantaged Mothers' Progression Into a Randomized Controlled Mobile Mental Health and Parenting Intervention: A Descriptive Examination Prior to and During COVID-19

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Infants of low-income and depressed mothers are at high risk for poor developmental outcomes. Early parenting mediates infant experiences from birth, and early intervention can support sensitive and responsive parent practices that optimize infant outcomes via promoting developmental competencies. However, low-income and depressed mothers experience substantial challenges to participating in early intervention. They also have extremely limited access to interventions targeting depression. Interventions targeting maternal depression and parent practices can improve maternal and infant outcomes. Mobile internet-based interventions overcome numerous barriers that low-resource mothers face in accessing home-based interventions. Pandemic-related stressors likely reduce family resources and exacerbate distress of already heavily-burdened mother-infant dyads. During crises such as the COVID-19 pandemic, evidence-based remote coaching interventions are paramount. This article reports on a mobile intervention for improving maternal mood and increasing parent practices that promote infant development. An ongoing randomized controlled trial study provided a unique opportunity to monitor progression from referral to intervention initiation between two groups of depressed mothers: those prior to the pandemic and during the pandemic. The study also examines mother and infant characteristics at baseline. The sample consisted primarily of Black mothers experiencing extreme poverty who self-referred to the study in a large southern city, which is one of the most income disparate in the United States. Prior to the pandemic, 97% of study participants successfully progressed from consent to intervention, as compared to significantly fewer–86%–during the pandemic. Mother-infant dyads during COVID-19, as compared to those prior to COVID-19, displayed similar pre-intervention demographic characteristics and intrapersonal characteristics.

**Keywords: mobile intervention, remote coaching, maternal depression, parenting, infant, COVID-19**

## INTRODUCTION

The individual and societal costs of depression are enormous, with depression disproportionately affecting women as a leading cause of disability globally (World Health Organization, 2020). Compared to any other time during the life course, women are more likely to experience depression and anxiety in the first year postpartum (Miller and LaRusso, 2011). Women in the United States, who are socioeconomically disadvantaged and identify as a non-dominant culture group member[1], experience depression at a rate of 4–5 times higher than the national average (National Center for Health Statistics, 2016). The burden of depression is borne by mothers as well as their children. Maternal depression can interfere with parenting and compromise children's social-emotional, communication, and cognitive development (Mental Health America, 2018; Goodman et al., 2020; Rogers et al., 2020) interfering with sensitive and responsive parenting practices that are essential for healthy child development (Center on the Developing Child at Harvard University, 2016). Consequently, integrated interventions that target both maternal depression and sensitive and responsive parent practices are crucial to initiate as early as possible postpartum to foster maternal and child health and development (Goodman and Garber, 2017). Hence, multiple professional organizations have called for women to receive depression screening and referral to intervention during the first year postpartum (American Academy of Pediatrics, and American College of Obstetricians and Gynecologists, 2017).

Although universal screening and referral to address depression is recommended by the American Academy of Pediatrics (AAP) and the American College of Obstetricians and Gynecologists (ACOG) (Rafferty et al., 2019), most women do not receive screening and appropriate intervention (Baker et al., 2020). Moreover, Black and Latinx women are far less likely receive intervention as compared to white women (Grote et al., 2007). In the United States, white women are more than twice as likely to use mental health services as compared to Black or Latinx women (Substance Abuse and Mental Health Services Administration, 2015), consistent with the general pattern in which white persons are significantly more likely to receive mental health services when compared to individuals of non-dominant cultures. This disparity exists after controlling for multiple intraindividual characteristics (i.e., factors within the individual) including symptom severity (Ramos and Chavira, 2019).

Depressed mothers, as compared to those who are not depressed, are less likely to enroll and engage in Maternal, Infant and Early Childhood Home Visiting interventions (Maternal, Infant, and Early Childhood Home Visiting Technical Assistance Coordinating Center, 2015). Due to structural and systemic biases, depressed racial and ethnic minority individuals are more likely to be socioeconomically disadvantaged than depressed white individuals in the United States (Bailey et al., 2017). Another contributor to disparities in intervention access in the United States is the redistribution of wealth that has shifted social safety net resources away from the very poor (Moffitt, 2015). Research is not immune to problems of inequity in intervention access. Systemic and structural barriers to recruitment of participants from non-dominant cultures into clinical efficacy and effectiveness trials include distrust in research as well as costs and logistics that impede participation (Durant et al., 2014; Oh et al., 2015). While inclusion of individuals of minority racial and ethnic backgrounds and those who are socioeconomically disadvantaged has increased over the past 40 years (Polo et al., 2019), individuals of European descent continue to be the most prominently represented group. When non-dominant groups are represented in samples, studies often fail to report racial/ethnic characteristics sufficiently to understand intervention engagement or to benefit these populations (Williams et al., 2013). Studies often do not examine racial/ethnic background as moderators of treatment effects, limiting understanding of effectiveness of intervention within these populations (Geller et al., 2011).

In general, recruitment of depressed participants into clinical trials is difficult, and lower resourced individuals are not well-represented within these efforts. In the United States, large numbers of individuals from non-dominant cultures are under- or uninsured, contributing barriers to health-related service receipt (Lillie-Blanton and Hoffman, 2005) as well as inclusion in clinical trials (Cho et al., 2018). Given the ubiquity of digital technologies, mobile health interventions increase intervention access for those who are traditionally missed (Anderson-Lewis et al., 2018). However, currently published studies are extremely limited with regard to reporting successful recruitment and progression into mobile health interventions among non-dominant culture mothers, who are depressed and experiencing significant socioeconomic disadvantage. The lack of systematic studies that focus on mobile recruitment to mobile intervention engagement in this vulnerable group during non-pandemic times is particularly concerning given the pressing need for such interventions during pandemic.

Studies on the effects of COVID-19 on postpartum mothers and their infants are just beginning to emerge. Mothers who are poor and minoritized are disproportionately affected by COVID-19. Additionally, the health care systems that serve them have been severely affected by COVID-19, likely contributing to maternal stress. Two systematic reviews document significantly increased stress for mothers postpartum during the COVID-19 pandemic (Hessami et al., 2020; Chmielewska et al., 2021). The largest review, including 40 pooled studies, showed significantly higher levels of depression during pandemic as compared to prior pandemic among postpartum women (Chmielewska et al., 2021). Pandemic increases in financial stress and isolation-induced loneliness are associated with increased depression, and effects are worse for low-income women (Perzow et al., 2021).

We are currently conducting a clinical trial evaluating the efficacy of an integrated internet-based parenting and depression intervention. The intervention is designed to reduce maternal symptomatology and increase sensitive and responsive parenting practices of mothers to optimize infant outcomes. This study, which takes place within the urban core of a large

[1]Non-dominant culture members are those from disenfranchised, subordinated, and marginalized communities, for example, non-White and lower income.

southern United States city, provides a valuable context in which to describe referral and progressive steps to intervention engagement among two groups of mothers: those prior to and during the pandemic. Results have the potential to provide information about improving access to intervention in general and during pandemic for mother-infant dyads affected by maternal depression, poverty, and minoritization that hinders service access.

This current study describes the progression into intervention for mothers before and during the COVID-19 pandemic. Because researchers may succeed or fail in engaging mothers at multiple points in the recruitment process, we examine the relative success at several points between initial referral and engagement in the intervention as described more specifically below. The current study used data from the ongoing trial spanning a 22-month period prior to the COVID-19 pandemic and a 10-month period following the pandemic to describe referral to and recruitment into the intervention. Because most of the pandemic-involved sample did not have sufficient time in the study to provide an opportunity to complete the entire intervention at the time of this report, we focus on completion of the first intervention session as an indicator of connection to intervention. The trial also provides a unique context within which to compare preliminarily potential pandemic versus non-pandemic group differences for intraindividual characteristics associated with adverse maternal and infant outcomes. The questions we address are:

(1) Do study mothers, whose study experience occurs during pandemic, as compared to mothers prior to the pandemic, show differential success in connecting to the intervention as defined by: (a) percent referred; (b) percent screened for eligibility; (c) percent eligible; (d) percent consented; and ultimately, (e) percent of mothers who initiate intervention?

(2) Do study mothers and infants with pandemic experience, as compared to those prior to the pandemic, differ on intraindividual characteristics that are associated with adverse maternal and infant outcomes, including maternal depression symptom severity, parenting self-efficacy, maternal knowledge of infant social-emotional and communication development and its promotion, and infant negative affect?

## MATERIALS AND METHODS

Our recruitment efforts were aimed at generating a sample inclusive of mothers from non-dominant cultures, who were experiencing socioeconomic disadvantage and elevated maternal depressive symptoms (Baggett et al., 2020a). In so doing, two groups of mother-infant dyads emerged, those whose study experience was prior to the COVID-19 pandemic and those whose study experience occurred during the pandemic. Inclusion criteria were intended to produce a sample of mother-infant dyads, in which infants were at elevated risk for poor social emotional and communication development as a function of maternal depression and adverse mother-infant interactions that exacerbate the detrimental effects of poverty. Prior to initiating human subject activity, all study procedures were approved by the Georgia State University IRB. For inclusive sampling, recruitment strategies included community agency referrals, research staff outreach visits to community agencies and community events, and maternal self-referral. Potentially eligible women were contacted by research staff who described the project, conducted eligibility screening, and obtained informed consent. Consented participants were randomized into one of two parallel intervention arms: (1) Mom and Baby Net (MBN) or (2) Depression and Developmental Awareness (DDAS). MBN is a 14-session, coach-facilitated, online intervention that teaches mothers both cognitive-behavioral strategies to reduce depressive symptoms and specific skills for engaging with their infants to promote infant social communication competencies. DDAS is an informational program designed to improve maternal awareness of depression and understanding of infant developmental milestones. The MBN is a skill-based program designed to promote parental competencies to address affective symptoms and interact positively with their infants. In contrast, DDAS is an informational program that provides relevant content but does not focus on skill acquisition. The two mobile interventions were identical regarding number of sessions, session length, and delivery mechanisms. For more information about the interventions, see Baggett et al., 2020b.

For this report, we focus on the study period January 2018 through May 2021, which provided sufficient study time for participants prior to and during pandemic to have the opportunity to progress from consent to completion of the first remote coaching session. Outcomes between the two groups included description of the following: percent of referred, screened, eligible, consented, and completion of an initial remote coaching session to connect with intervention. We also examined between-group intraindividual characteristics that present risk for adverse mother-infant interactions and poor infant social communication development. These factors included: depression symptom severity, parent sense of competence, knowledge about infant social-communication development and its promotion, and infant negative affect.

### Referral

Whereas maternal online self-referral was the primary referral mechanism prior to the pandemic (Baggett et al., 2020a), it was the exclusive referral mechanism during the pandemic. The project maintained a self-referral mechanism through its website, which provided the following: (1) access to a brief video describing the intervention program; (2) information about the project team; (3) depression screening; and (4) a form for providing contact information to research staff. Prior to the pandemic, to promote awareness of the online self-referral mechanism, the research team posted information on local community agency websites, social media platforms, and in print material available at local community agencies. Additionally, community agency staff provided referrals and our research staff visited community agencies and attended community events, such as resource fairs, at which service agencies advertise their programs. Staff provided interested women with information about the intervention project, screened for inclusion criteria, and referred mothers to the project coordinator for enrollment.

**TABLE 1 |** Demographic characteristics of the pre-intervention sample.

| Variable (*N* = 181) | Value |
|---|---|
| Maternal age in years, mean (SD); range | 28.17 (5.83); 18.54–46.09 |
| Child age in months, mean (SD); range | 6.04 (2.85); 0.59–11.89 |
| Number of children in the home, mean (SD); range | 2.63 (1.41); 1.00–6.00 |
| Maternal race (Black)% (*n*) | 87.84% (159) |
| Maternal ethnicity (Latinx),% (*n*) | 2.76% (5) |
| Maternal education (<college degree),% (*n*) | 83.98% (152) |
| Maternal income,% </= 125% Federal Poverty Guideline, (*n*)* | 84.18% (149)* |
| No significant other, % (*n*) | 73.48% (133) |

*Four missing, so n = 177.

## Sample

Participants referred were mothers of infants aged 0–12 months (***N*** = 438). Mothers were included in the study sample if they had a score of 3 or more on the Patient Health Questionnaire-2 (PHQ-2) (Kroenke et al., 2003) at screening, were a minimum of 18 years old, spoke English, and lived in the local metropolitan area of a large southern city in the United States. Exclusion criteria were: history of psychotic symptoms, residence in homeless or domestic violence shelter, mother or infant receiving intensive medical treatment, and not having permanent legal guardianship of infant. Because there were no significant mean differences by the pandemic-exposed and non-pandemic group (except for infant age), demographic characteristics are presented for the overall sample in **Table 1**. Due to COVID-19 research delays, dyads remained on the waitlist for 2.5 months, during which time COVID-19 study procedures were submitted to and reviewed and approved by the IRB. Consequently, infants in the pandemic-exposed group were on average 2.5 months older than infants in the non-pandemic group.

## Measures

To assess maternal progression from referral through successful recruitment into the study intervention, the following variables were documented by date of occurrence or disposition within the project database: (1) referred, (2) screened for eligibility, (3) eligibility, (4) completion of comprehensive pre-assessment, (5) completion of an intervention orientation session, and (6) completion of the first intervention session. The PHQ-2 was administered online to screen for depression with the established criteria of a score of 3 or higher defined as a positive depression screen. The PHQ-2 is an efficient and well-established measure with strong psychometric characteristics for identifying individuals with depression (Kroenke et al., 2003). At pre-intervention assessment, participants completed a demographic questionnaire to facilitate characterization of the sample for mother's age, ethnicity, race, educational level, income, significant relationship status, number of children in the home, and infant age in months.

Participant intrapersonal risk characteristics were assessed at pre-intervention. The Patient Health Question-9 (PHQ-9) was administered to assess depression severity (Wisner et al., 2013). The PHQ-9 possesses strong psychometric properties for assessing depression severity; a score at or above 20 is suggestive of severe depression (Kroenke et al., 2001). Participants were also administered the Knowledge of Infant Social communication Development and Competency Promotion, which has demonstrated high internal consistency and sensitivity to intervention change (Feil et al., 2020). The Parenting Sense of Competence was designed to measure parent self-efficacy. It is a 17-item, Likert type scale demonstrating adequate psychometrics (Johnston and Mash, 1989). The Infant Behavior Questionnaire-Very Short Form (IBQ-R VSF) was used to assess infant negative affect. Psychometric properties of the negative affect scale have been examined with racially and economically diverse samples and are adequate (Leerkes et al., 2017).

## Analysis

Using data collected between January 2018 and May 2021 on 438 mothers, we describe the progression of 320 mothers referred prior to the pandemic and 118 mothers referred during the pandemic through the six successive points into intervention: (1) referral, (2) screening, (3) eligibility determination, (4) consent to intervention trial, (5) completion of intervention orientation, and (6) completion of the first intervention session. It is important to note that, as displayed in **Figure 1**, some mothers who were referred prior to the pandemic, entered the pandemic experience at subsequent points of progression toward intervention. Following progression description, we then used individual samples *t*-tests to compare intraindividual characteristics mothers with no pandemic experience to mothers with pandemic experience. To control for Type 1 error, we held our examination to four multiple comparisons, providing 80% power to detect small between-group effects ($d = 0.35$ or above) for two-sided tests at $p < 0.0125$, with our lowest sample size of $n = 174$.

# RESULTS

Prior to the pandemic (see **Figure 1**), 320 mothers were referred over a 22-month period resulting in an average of 14.5 referrals per month, equivalent to less than an average of two referrals per day. During COVID-19, 118 mothers self-referred in response to a single provider text blast. Over a 3-day period, the 118 referrals are equivalent to an average of 39 referrals per day. Hence, mothers referred at a relative daily rate of 19.5 times higher during COVID-19 as compared to before the pandemic. Prior to COVID-19, 2.43% of participants were lost to the study after consent as compared to 16.39% lost during the pandemic. Hence, 6.75 times more mothers were lost to the study during the pandemic as compared to prior. When viewing the number of mothers consented during the pre-pandemic period ($n = 123$), less the number of mothers who moved into COVID-19 progression before completing intervention ($n = 13$), 97% of mothers completed

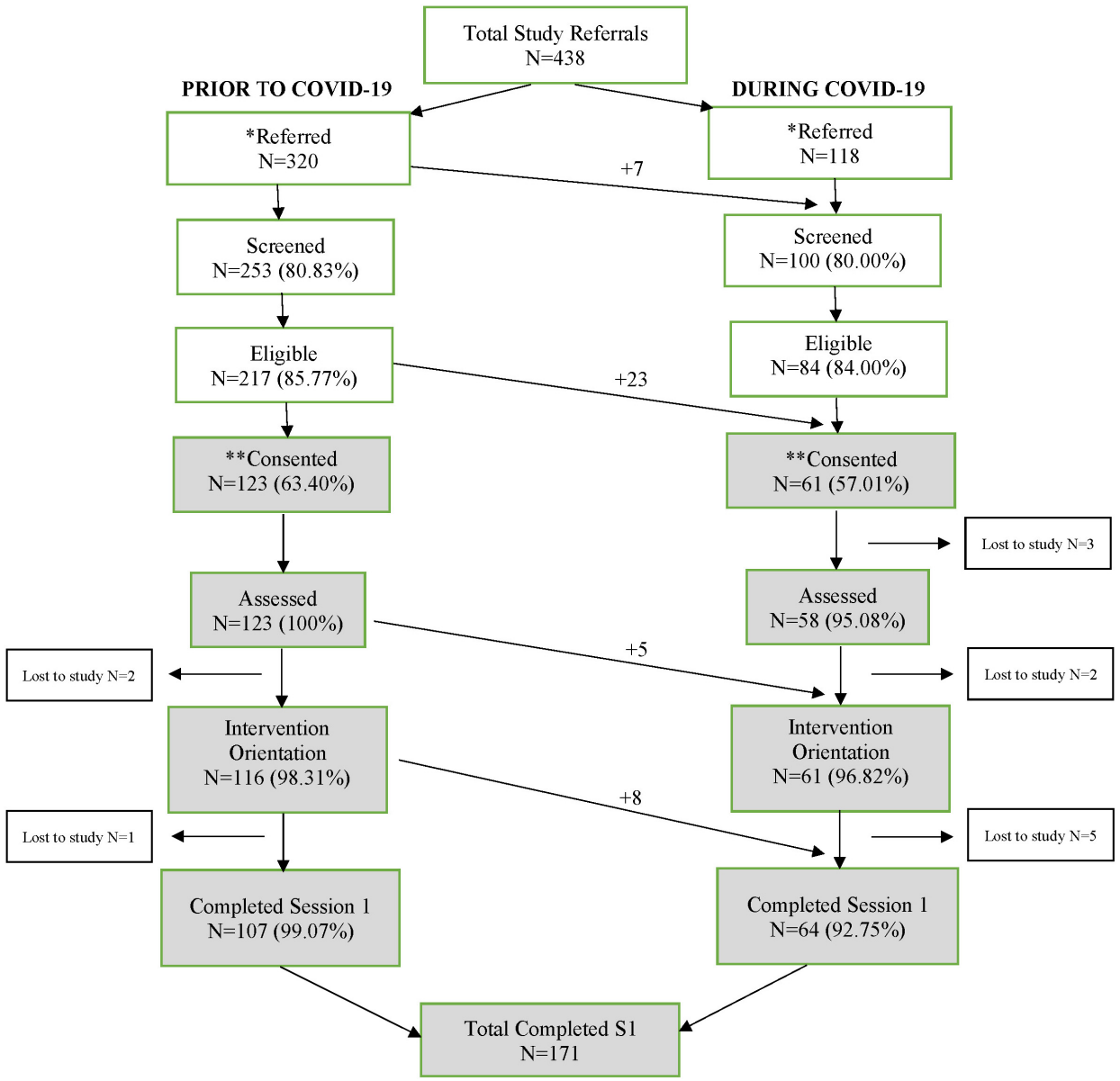


**FIGURE 1 |** Referral to intervention engagement progression. Arrows from left to right signify participants moving from pre-pandemic experience into pandemic experience at each study progression point. *Prior to COVID, 320 mothers were referred over a 22-month period resulting in an average of 14.5 referrals per month, equivalent to less than an average of two referrals per day. During COVID, 118 mothers self-referred in response to a provider text blast. Over a 3-day period, 118 referrals are equivalent to an average of 39 mothers per day. Hence, mothers referred at a relative daily rate of 19.5 times higher during COVID as compared to non-covid. Referral was closed after this 3-day referral period. **It was not possible to consent all referred, screened, and eligible mothers during COVID because this number exceeded the number of open slots for targeted enrolment. Prior to COVID, a 2.43% of participants were lost to the study after consent as compared to 16.39% lost during pandemic. Hence, 6.75 times more mothers were lost to the study during the pandemic.

session. Within the COVID-19 progression, however, 61 mothers were consented, with 13 mothers moving into this progression before intervention connection (total $n$ = 74). Of these, 64 (86%) of mothers completed session 1 during the COVID-19 pandemic.

Our second question focused on intrapersonal risk characteristics of mothers with study experience during pandemic as compared to those prior to pandemic. We conducted $t$-tests, holding examination to four comparisons for sufficient power to detect small effects as described in the Analysis section. As displayed in **Table 2**, there were no significant differences between the pandemic-exposed and non-pandemic group for maternal depression severity, parenting sense of competence, mother knowledge of infant social-emotional and communication development and its promotion, or infant negative affect.

**TABLE 2 |** Intrapersonal risk characteristics by pandemic and non-pandemic group.

| Variable | Non-pandemic group mean | Pandemic group mean | *t*-statistic | *p*-value |
|---|---|---|---|---|
| Depression severity | 0.34 | 0.23 | 1.59 | 0.113 |
| Parent sense of competence | 49.03 | 46.72 | 1.18 | 0.240 |
| Parent knowledge of infant social-emotional development and promotion | 5.28 | 4.87 | 1.00 | 0.319 |
| Infant negative affect | 4.51 | 4.64 | −0.72 | 0.470 |

## DISCUSSION

The purpose of this study was to describe progression into intervention between two groups of mothers: those during the COVID-19 pandemic as compared to those prior to the pandemic. Mobile parenting interventions have the potential during pandemics to broaden access to crucial parenting and mental health supports for underserved communities by reducing instrumental, social, and psychological barriers. They can overcome the public health challenges (e.g., the need for service greatly exceeding capacity of providers), and they provide evidence-based interventions otherwise not available in many communities. To date, these interventions have demonstrated success in many areas, but have also been shown to experience challenges similar to community-based care such as difficulties with recruitment, engagement, and attrition (Lane et al., 2015; Laws et al., 2016; Anderson-Lewis et al., 2018). The COVID-19 emergency created new urgency and opportunity to examine the extent to which mobile parenting and mental health programs can address a sudden and broad breakdown in availability of and access to traditional delivery methods for parenting and mental health interventions. Health systems, including mental health systems, were profoundly affected by the substantial challenges of increased service demand due to elevated stressors and reduced availability of in-person services due to demand for social distancing (Hessami et al., 2020; Chmielewska et al., 2021; Perzow et al., 2021).

Regarding our first research question about progression into intervention, we found that from consent to intervention initiation, study mothers in the pandemic fell away from intervention at a rate of nearly seven times higher than study mothers prior to the pandemic. However, both pandemic and non-pandemic rates of successful progression into intervention were quite high with 97% of mothers pre-pandemic and 86% of pandemic-exposed mothers progressing successfully from consent through comprehensive pre-assessment and intervention orientation to completion of the first intervention session. These findings suggest that recruitment and engagement into a mobile parenting intervention is feasible during a prolonged public health emergency within one of the most income disparate cities in the United States, in which the sample was characterized by poverty, minoritization, low partner support, low education level, and depression. These findings compare very favorably to home visiting interventions, in which pre-pandemic progression from consent to receipt of one intervention sessions range from 56 to 97% with parents who are depressed and facing multiple adversities, least likely to successfully progress to receiving an intervention session (Maternal, Infant, and Early Childhood Home Visiting Technical Assistance Coordinating Center, 2015).

For our second research question, the finding of no differences between study participants with and without pandemic experience, relative to demographics and intraindividual characteristics, including depression severity, parenting knowledge of infant social-emotional development, maternal parenting stress, and infant negative affect—was surprising. However, it is not entirely inconsistent with existing available data. Among the two largest metanalytic studies of pandemic effects on postpartum women and their infants, one found significant pandemic effects on depression and the other did not. The study that focused on general health systems found significantly elevated depression during the pandemic (Chmielewska et al., 2021). However, the other, which focused on existing clinical mental health program patients, showed elevated but not significantly elevated symptoms from pre-pandemic to pandemic conditions (Hessami et al., 2020). Another study found that pandemic financial strain and social isolation were significant drivers of increased depression, especially for low-income women (Perzow et al., 2021). One possibility is that within our study, mothers with depression, who were connected to a supportive intervention early in the pandemic, may have experienced less isolation-induced distress and depression as compared with mothers in the general population who lack such supports. However, this remains to be determined by future study.

Several constraints of the present study and directions for ongoing research should be noted. First and foremost, this is a descriptive study in which participants were not randomized to participate during the pre-pandemic versus pandemic periods. Though an obvious point, it warrants mention because it necessitates caution in interpretation of the findings. It is likely that findings herein are at least partially attributable to pandemic disruptions and stressors. However, we cannot rule out the possibility that other independent factors accounted for lower rates of successful progression in the pandemic group. Moreover, we cannot know whether noted differences in progression of participants through the engagement process were attributable to differences in who chose to participate in the pandemic as compared to non-pandemic cohorts. Although the absence of

observed differences in measured characteristics reduces this likelihood, it is possible that unmeasured differences contributed. Additionally, the inclusion criteria of speaking English limited our ability to recruit non-English speaking participants, which limits our ability to generalize these findings to non-dominant groups excluded by the language requirement. These groups could be considered and centered in future studies. Finally, at the time of this report, the data were not yet available to examine the extent to which the pandemic affected progression through the intervention. Therefore, questions regarding engagement in the interventions, including pandemic effects on attrition, dosage or adherence, time to complete, or relatedly mobile coach behavior and fidelity await further study.

## CONCLUSION

An ongoing randomized controlled trial afforded us the opportunity to examine the extent to which recruitment and engagement into a mobile parenting intervention would be robust to disruptions associated with the COVID-19 pandemic. Our specific case focused on engagement of depressed and socioeconomically disadvantaged mother-infant dyads into a postpartum intervention to reduce depression and promote sensitive-responsive parenting practices that optimize infant social-emotional and communication outcomes. Overall, our findings showed robust referral during pandemic and rates of successful progression into intervention that were at least as favorable as those reported in routine studies of home visiting intervention programs outside of pandemic. These results point to the importance of inclusive recruitment methods—in particular, online self-referral of mothers (see Baggett et al., 2020a for details on recruitment strategies). Moreover, women and infants enrolled in the trial did not differ, as a function of pandemic experience during the study, with regard to maternal depression severity, parenting self-efficacy, knowledge regarding infant social-emotional development, or infant negative affect. These findings suggest that the use of mHealth interventions hold significant promise as strategies for provision of mental health and parenting services during periods of widespread service disruption due to public health emergencies. Although it is too early to know how well these findings will generalize, or whether they will carry over to progression through the intervention phase, they point more broadly to the potential of mobile interventions to enable service delivery for a range of parenting and behavioral health needs during emergency situations.

## DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because these data are part of an ongoing clinical randomized controlled trial. Anonymized data from this substudy can be made available on request. Requests to access the datasets should be directed to KB, kbaggett@gsu.edu.

## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Georgia State University IRB. The patients/participants provided their written informed consent to participate in this study.

## AUTHOR CONTRIBUTIONS

KB and BD: conceptualization, methodology, and project administration. KM and EF: software. KB, BD, CL, and KM: formal analysis. KB, BD, and EF: investigation and resources. KB, BD, and EM: writing–original draft preparation and writing–review and editing. KB: supervision and funding acquisition. All authors have read and agreed to the published version of the manuscript.

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**Conflict of Interest:** KB, BD and EF are the developers of the InfantNet program, the original intervention platform on which the ePALS Mom and Baby Net program application is based.

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BRIEF RESEARCH REPORT
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# Child Adjustment During COVID-19: The Role of Economic Hardship, Caregiver Stress, and Pandemic Play

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The coronavirus disease 2019 (COVID-19) led to many lifestyle changes and economic hardships for families with young children. Previous research on risk and resilience highlights that children's adjustment to family hardships is influenced by caregiver stress, but individual child behaviors and characteristics may protect children from negative outcomes. Interestingly, many children have been reported to incorporate COVID-19 themes in their pretend play. Theory suggests children may do so to cope with pandemic-related stress, but no empirical studies have explored this possibility. The purpose of this study was to understand the process by which COVID-19 economic hardships experienced by a family were related to children's emotional well-being and development and to investigate how this process may vary as a function of children's engagement in pandemic-related pretend play. Caregivers ($N = 99$; mostly high earning families) of preschoolers ages 3–6 years (51% girls, 82% White) living in the United States participated in an online survey at two time points during the pandemic. Result revealed that COVID-19 economic hardships were related to increased caregiver stress, which, in turn, was associated with children's emotional distress and poorer self-regulation. However, engaging in pandemic-related pretend play appeared to protect children's well-being by weakening the adverse association between caregivers' stress and children's emotional distress. Thus, addressing caregiver stress levels and allowing children an outlet to cope with challenges through pretend play could have crucial protective effects on early development and well-being during times of crisis.

**Keywords: COVID-19, child adjustment, pretend play, self-regulation, caregiver stress**

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## INTRODUCTION

*"Hotel is closed. Vacations are canceled. Everybody go home!"*
*-4-year-old engaging in pretend play during the COVID-19 pandemic*

The coronavirus disease 2019 (COVID-19) pandemic upended daily routines for millions of families. To slow the spread of COVID-19, governments limited social gatherings, leading many schools and workplaces to temporarily close. Families sheltered-in-place, hastily adjusted to school and work closures, and limited their contact with non-household individuals (Schuchat, 2020). Many families also experienced significant economic hardship (Gassman-Pines et al., 2020); over 50 million adults with children reported a loss of income from March to October of 2020, and 59

million (60% of those surveyed) experienced difficulty covering household expenses (United States Census Bureau, 2020). There is broad interest in understanding how children are coping with these pandemic-related challenges (Coller and Webber, 2020), with some speculating the importance of play as a potential protective factor for children's well-being and development (e.g., Pelly, 2020).

## COVID-19, Stress, and Development

Research on disease outbreaks highlights the stress-inducing nature of events like the COVID-19 pandemic (e.g., Jones and Salathé, 2009). Although children are likely not immune to experiencing COVID-19 pandemic-related stress (e.g., Gassman-Pines et al., 2020; Patrick et al., 2020), family stress frameworks posit that environmental hardships are more likely to affect children's well-being indirectly through increased caregiver stress (Masarik and Conger, 2017; Prime et al., 2020). One recent cross-sectional study finds support for this theory during the COVID-19 pandemic (Spinelli et al., 2020), but more research is needed to understand the process by which pandemic-related hardships influence children's adjustment over time. Doing so may help identify potential avenues to support children and families during times of crisis.

Furthermore, we must consider how pandemic-related hardships and stress relate to important developmental skills, like self-regulation. Self-regulation encompasses the ability to manage thoughts and behaviors and supports relational, academic, and occupational success as well as physical health throughout childhood and adulthood (Blair and Razza, 2007; Moffitt et al., 2011). Importantly, the manner in which children respond to stressors, particularly long-lasting and unpredictable stressors like those elicited by a global pandemic, may have important implications for self-regulation development (Blair, 2010; Thompson, 2014). Thus, we examined the caregiver and child mental health processes (i.e., caregiver stress and child emotional distress) by which COVID-19 economic hardships may compromise children's self-regulation development.

## Play as a Protective Factor

After the World Health Organization declared COVID-19 a global pandemic, stories emerged of children incorporating the virus and related life-changes into their play (e.g., Cray, 2020; Pelly, 2020; Underwood, 2020). Children were reportedly diagnosing siblings with COVID-19 while playing "doctor," instructing parents to put on masks in pretend restaurants, and treating COVID-19 as an evil villain (Cray, 2020; Underwood, 2020). Pretend play is ubiquitous in early childhood, emerging spontaneously and at predictable developmental periods for children around the world; this suggests that play may serve an important evolutionary function (Lillard, 2017). Developmentalists have noted that children use pretend play to make sense of their world, allowing them to face emotionally-laden scenarios in a safe context and providing opportunities to process and overcome negative emotions (e.g., Knell, 1993; Russ, 2004). Indeed, children who play out stressful experiences (e.g., hospitalized children playing with medical equipment, preschoolers reenacting caregiver separation) generally exhibit decreases in anxiety and distress (e.g., Milos and Reiss, 1982; Rae et al., 1989). Additionally, because children are in charge of their imaginary scenario, pretend play may also provide an opportunity for children to assert control over their environment (Clark, 2003). Thus, children may naturally incorporate pandemic-related themes in their pretend play as a way to cope with the stressful situations stemming from the COVID-19 pandemic.

## The Present Study

In the present study, we explored the process by which COVID-19 economic hardships predict children's emotional adjustment and self-regulation development and examined if engaging in pandemic play serves as a protective factor. We hypothesized that COVID-19 economic hardships would indirectly predict child emotional distress several months later via a positive association with caregiver stress. We further hypothesized that higher levels of child emotional distress would lead to poorer self-regulation skills among children. However, we believed these relations would depend on the extent to which children explored COVID-19 themes in their play, with pandemic play serving as a protective factor.

# METHOD

## Participants

Primary caregivers of children ages 3–6 living in the United States participated in this study by completing two online surveys. A total of 185 caregivers completed the initial Time 1 (T1) survey, and 171 indicated they would participate in a follow-up. Of those 171, 127 caregivers completed a follow-up survey at Time 2 (T2), ∼3 months later; however, we excluded 28 participants because they did not answer questions for the same child on the first and second surveys. Thus, our final sample included responses from 99 caregivers. This final sample did not differ from those who completed the survey only at T1 on demographic or baseline variables. Respondents were mostly mothers (96%). Most of them reported having a college degree (91%), with average annual incomes between $100,000 and $110,000. The children were approximately equally distributed across genders (49 boys, 50 girls), were mostly White (82%), and, on average, 50 months of age (SD = 9.03).

## Procedures

Caregivers were recruited via advertisements on listserv posts and social media websites starting in May of 2020. The T1 survey was distributed via Qualtrics between May and July of 2020 (92% were completed within the first 2 weeks). Participants who completed the T1 survey were entered into a drawing to win one of 40 gift cards ranging in value from $25 to $200. In September of 2020, the T2 survey was distributed by email. All participants received a $20 gift card upon completing the T2 survey. A university Institutional Review Board approved this study.

## Measures

### COVID-19 Economic Hardships

During the T1 survey, caregivers were asked "What changes in employment or income have occurred in your household due to COVID-19?" Caregivers selected all the options that applied to their household from the following list of possibilities: job loss by one adult, difficulty paying bills or buying necessities, having to work longer hours, filing for unemployment, applying for public assistance, and loss of equity in the stock market. From this, we calculated the total number of economic changes per household. Caregivers were also asked, "How much financial strain do you feel right now?" and responded on a 5-point scale ranging from "no strain" to "a lot of strain." Number of economic changes and perceived financial strain were correlated, $r = 0.53$, $p < 0.001$. Thus, we standardized these variables to equate their scales and averaged them to create a COVID-19 economic hardships score. Higher scores indicate greater economic hardship.

### Caregiver Stress

During the T2 survey, caregivers completed the Perceived Stress Scale ($\alpha = 0.89$; Cohen et al., 1983) and an abridged version of the Parenting Stress Scale ($\alpha = 0.81$; Berry and Jones, 1995). The Perceived Stress Scale included 10 items assessing a caregiver's overall feelings of worry and stress during the last couple of months (e.g., "How often have you felt nervous and stressed"). Caregivers responded on a 5-point scale from "never" to "very often." The Parenting Stress Scale also included 10 items assessing a caregiver's stress during the last couple of months as a function of their parenting role [e.g., "Caring for my child(ren) sometimes takes more time and energy than I have to give"]. These items were rated on a 5-point scale ranging from "strongly disagree" to "strongly agree." Scores on these measures were correlated, $r = 0.54$, $p < 0.001$. Thus, we standardized and averaged them. Higher scores indicate greater caregiver stress.

### Child Emotional Distress

Caregivers completed two subscales from the Child Behavior Checklist Parent-Report Form for ages 1.5–5 during the T2 survey (emotional reactivity, nine items, $\alpha = 0.81$; anxiety and depression, eight items, $\alpha = 0.70$; Achenbach, 1999). We selected these subscales to capture children's emotional states during the COVID-19 pandemic. Items included questions about trouble adjusting to new routines, outward displays of negative emotions, and clinging behaviors. Caregivers indicated how true each item was during the last couple of months on a 3-point scale ranging from "not true" to "very true or often true." The subscales used were correlated, $r = 0.79$, $p < 0.001$, so we standardized and averaged them. Higher scores indicate greater child emotional distress.

### Children's Self-Regulation

Caregivers completed two self-regulation subscales of the Early Years Toolbox at both time points (cognitive self-regulation, five items, $\alpha = 0.63$–$0.70$; behavioral self-regulation, six items, $\alpha = 0.73$–$0.80$; Howard and Melhuish, 2017). During the T2 survey, caregivers were specifically asked to think about "the last couple of months." Example items include, "Waits their turn in activities" and "persists with difficult tasks." Caregivers indicated how true each item was of their child on a 5-point scale ranging from "not true" to "very true." Given a strong correlation between the two subscales, $r = 0.39$–$0.51$, $p < 0.001$, subscale scores at each time point were standardized and averaged to create separate T1 and T2 self-regulation variables. Higher scores indicate greater self-regulation abilities.

### Pandemic Play

Caregivers were asked in the T2 survey to describe any play their child had engaged in over the past few months related to the COVID-19 pandemic (see Appendix A in **Supplementary Material** for descriptions of this play). We also asked caregivers to indicate on a 7-point scale how often their child engaged in play related to the pandemic during the last couple of months, with choices ranging from "never" to "multiple times a day." For comparison purposes, we grouped children into two categories: those who engaged in pandemic play infrequently (i.e., between never and less than once a week) and those who engaged in pandemic play frequently (i.e., once a week or more).

## RESULTS

A table of bivariate correlations, means, standard deviations, and ranges for individual measures can be found in the Appendix B in **Supplementary Material**. The correlations among averaged variables used in our analyses are included in **Table 1**. Based on theory and research (Conger et al., 2002), we first used path analyses test whether caregiver stress and child emotional distress successively mediated the contribution of COVID-19 economic hardships to children's self-regulation abilities. To control for family income, child gender, and children's self-regulation at T1, we included direct paths from those variables to significant covariances. We used the bootstrap resampling method with 1000 iterations to estimate standard errors and test mediational effects (Hayes, 2013).

Our path model fit the data well (**Figure 1**). The results revealed a negative, indirect association between COVID-19 economic hardships and children's T2 self-regulation. Formal tests of mediation revealed that caregiver stress and child emotional distress successively mediated the association between COVID-19 economic hardships and children's T2 self-regulation, $b = -0.04$, $SE = 0.02$, $p = 0.02$, 95% confidence interval (CI): $-0.06$ to $-0.01$. In other words, COVID-19 economic hardships were related to increased caregiver stress, which was associated with higher emotional distress and poorer self-regulation in children.

To examine whether children's engagement in pandemic play moderated the abovementioned associations, we first tested two multi-group path models to compare the pattern of associations between the children who engaged in pandemic play infrequently and those who engaged in it frequently. The pattern of associations was similar across both groups of children, except for two paths: caregiver stress to child emotional distress and child emotional distress to T2 self-regulation. In both cases, the paths were significant for the children who engaged in pandemic play infrequently but non-significant for those who engaged in pandemic play frequently. We followed-up these multi-group path models with more robust moderation analyses that

**TABLE 1 |** Bivariate correlations among averaged variables.

| | 1. | 2. | 3. | 4. | 5. | 6. |
|---|---|---|---|---|---|---|
| 1. T1 Income | | | | | | |
| 2. T1 Child self-regulation | −0.05 | | | | | |
| 3. T1 COVID-19 economic hardships | −0.41*** | −0.03 | | | | |
| 4. T2 Caregiver stress | −0.14 | −0.16 | 0.34*** | | | |
| 5. T2 Child emotional distress | −0.16 | −0.10 | 0.19 | 0.45*** | | |
| 6. T2 Child self-regulation | 0.04 | 0.70*** | −0.12 | −0.34*** | −0.34*** | |
| 7. Child age in months | −0.08 | −0.02 | −0.12 | 0.10 | 0.05 | -0.07 |

*T1, Time 1 survey; T2, Time 2 survey. ***$p \leq 0.001$.*

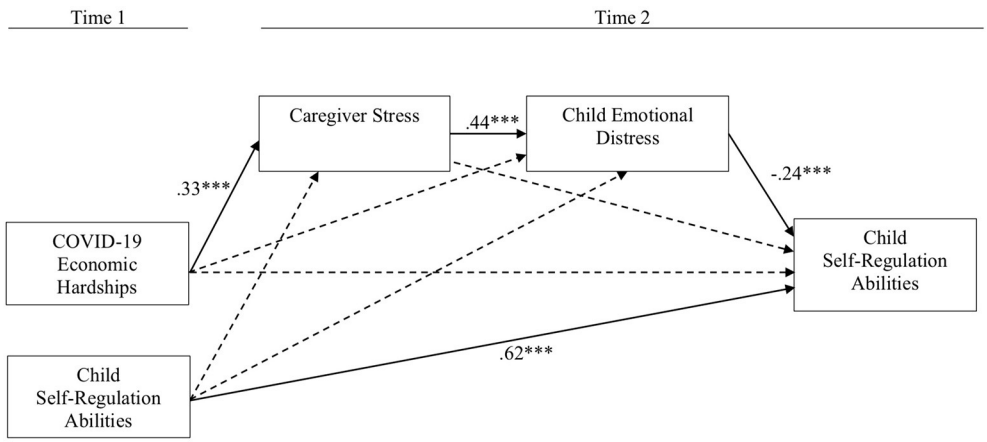


**FIGURE 1 |** Path model. We controlled for family income and child gender, but these effects were non-significant and omitted from the figure to facilitate interpretation. Dashed paths represent non-significant effects. Standardized estimates shown. $\chi^2(3) = 0.58$, $p = 0.90$, RMSEA = 0.00, CFI = 1.00. Non-significant chi-squares indicate good model fit, as do RMSEA values <0.05 and CFI >0.90 (Hu and Bentler, 1999). ***$p \leq 0.001$.

compared the two pandemic play groups to one another rather than examining differences between these groups in separate models. These follow-up analyses revealed the relationship (i.e., simple slopes) between caregiver stress and child emotional distress varied by children's engagement in pandemic play ($b = -0.71$, $SE\ b = 0.27$, $p = 0.01$, CI: −1.24 to −0.18; **Table 2**; **Figure 2**). By contrast, the slopes for the association between children's T2 emotional distress and self-regulation did not vary between the two groups of children, indicating that the frequency of pandemic play did not moderate that association ($b = 0.15$, $SE\ b = 0.23$, $p = 0.51$, CI: −0.31 to 0.62; see Appendix C in **Supplementary Material** for full regression statistics). Thus, children's engagement in pandemic play may protect children by mitigating the adverse contribution of caregiver stress to child emotional distress.

Although we relied on theory and research to support the primary path model, we explored the alternative possibility that T2 caregiver stress and children's self-regulation abilities successively mediate the association between T1 COVID-19 economic hardships and T2 children's emotional distress. The alternative path model fit the data well [$\chi^2(3) = 0.92$, $p = 0.82$, RMSEA = 0.01, CFI = 1.00] and the mediation effect was significant ($b = 0.03$, $SE\ b = 0.02$, $p = 0.05$, CI: 0.01–0.06). The findings from the primary and alternative path models suggest that there may be a transactional association between children's emotional distress and self-regulation. The correlational nature of these variables precludes a direct test of this hypothesis. Pandemic play moderation analyses mirrored the findings above. Together, our primary and alternative path models suggest that COVID-19 economic hardships heightened children's emotional distress and obstructed their self-regulation

**TABLE 2 |** Regression analysis examining how the association between caregiver stress and child emotional distress varied as a function of children's engagement in pandemic play.

| Variable | *b* | *SE b* | *p* | 95% CI |
|---|---|---|---|---|
| Constant | 0.32 | 0.27 | 0.23 | −0.21 to 0.86 |
| Family income | −0.02 | 0.02 | 0.36 | −0.07 to 0.02 |
| Child gender | −0.23 | 0.17 | 0.18 | −0.56 to 0.11 |
| Caregiver stress | 0.59 | 0.10 | <0.001 | 0.39 to 0.80 |
| Pandemic play | 0.04 | 0.20 | 0.85 | −0.37 to 0.44 |
| Caregiver stress × Pandemic play | −0.71 | 0.27 | 0.01 | −1.24 to −0.18 |

*For Pandemic Play, a score of 0 indicated infrequent Pandemic Play (i.e., never to less than once a week) and a 1 indicated frequent Pandemic Play (i.e., once a week or more). The Caregiver Stress × Pandemic Play variable is the product of Caregiver Stress and Pandemic Play scores.*

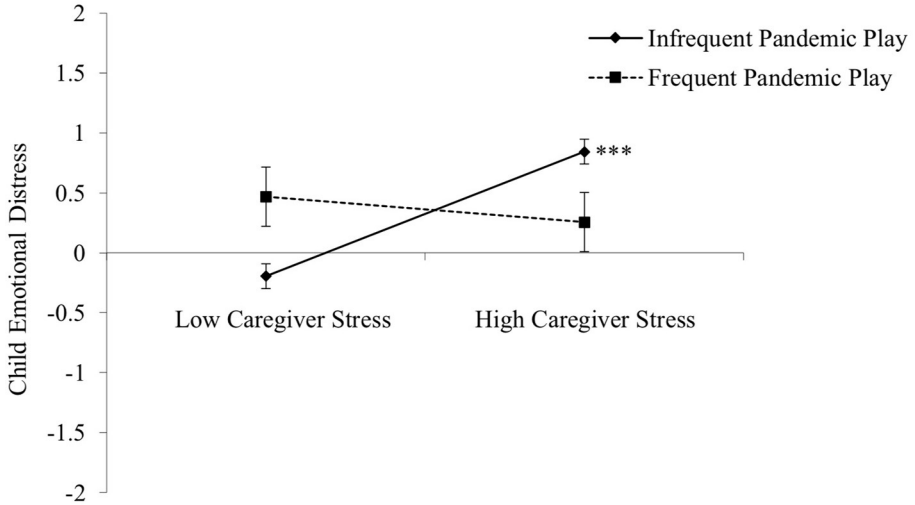


**FIGURE 2 |** Interaction between caregiver stress and pandemic play on children's emotional distress. High caregiver stress is related to increased emotional distress for children who engaged in pandemic play infrequently, but not for those who engaged in pandemic play frequently. ***$p < 0.001$.

abilities by exacerbating caregiver stress. However, engaging in pandemic-related play may reduce children's emotional distress and protect their self-regulation abilities by weakening the extent to which caregiver stress compromises children's emotional adjustment.

## DISCUSSION

The purpose of the present study was to examine the longitudinal processes by which COVID-19 economic hardships contribute to children's emotional distress and self-regulation development and to assess whether pandemic play can serve as a protective factor. As hypothesized, COVID-19 hardships were related to increased caregiver stress, which was associated with increased emotional distress and poorer self-regulation abilities among children. These findings are consistent with prior research on family stress, risk, and resilience (Masarik and Conger, 2017) as well as recent theoretical frameworks for how COVID-19 hardships may impact families with children (Prime et al., 2020; Spinelli et al., 2020).

Our findings also suggest that engaging in pandemic-related play themes may protect young children from the harmful effects of COVID-19 economic hardships by reducing the adverse contribution of caregiver stress on children's emotional distress. Caregiver stress did not appear to heighten the emotional distress of the children who engaged in pandemic play frequently. To our knowledge, this is the first study providing important empirical support to the idea that pandemic-related play may protect children from COVID-19 stressors popularized by numerous media outlets during the pandemic. The idea that play may be an effective means for children to cope with stressful experiences is, however, not new. Play therapy, for example, has been shown to help children cope with trauma and unexpected hardships (e.g., Lin and Bratton, 2015). Yet, play therapy is typically administered in controlled settings with trained therapists guiding children through the play and the processing of their experiences. By contrast, 90% of the children in our sample were reported to initiate pandemic play on their own. As such, this research demonstrates that spontaneous pretend play about unexpected hardships, like the COVID-19 pandemic, could also be an important and accessible way for children cope with stressful experiences.

Previous research and theory on pretend play suggest the following possibilities as to how pandemic play might serve as a protective factor. (1) Engaging in pretend play is typically a fun and enjoyable experience. As children consistently engage in pretend play, they may cultivate a positive environment that could compensate for an otherwise stressful context at home (Russ, 2007; Thibodeau-Nielsen et al., 2020). (2) Pretend play often provides opportunities for caregivers to engage in meaningful and harmonious interactions with their children. In fact, 70% of those reported to engage in pandemic play in our sample did so with an adult at least some of the time. These coordinated interactions between a caregiver and child may help to regulate the child's bodily response to stress (Yogman et al., 2018). (3) Pretend play may provide a safe context in which children can process a wide range of emotions and experiences. Scholars have suggested that reenacting specific stressful events in play is cathartic for children (Russ, 2004). Just as adults verbally share their anxieties or fears as a way to cope with stress, children often express their feelings and thoughts through play (e.g., Chethik, 1989). Doing so may allow any anxieties or fears to gradually fade over time (Knell, 1993; Russ, 2004, 2007). Play may also allow children to assert control over the outcomes of stressful experiences, thus gaining mastery over the situation (Erikson, 1963).

These findings have important implications, even beyond the COVID-19 health crisis. For example, one of the main findings of this study is that COVID-19 economic hardships adversely contributed to children's emotional distress and self-regulation indirectly through caregiver stress. Thus, interventions aimed to reduce caregiver stress levels could play a key role in disrupting

the pathway through which family hardships, both during and after the COVID-19 pandemic, can threaten children's well-being. Furthermore, our data suggest that providing children with ample opportunities to engage in pretend play may be an effective way for caregivers to support their children's emotional well-being during difficult times. Prior to the COVID-19 pandemic, the American Academy of Pediatrics published a report urging pediatricians to write prescriptions for play given the associated developmental benefits (Yogman et al., 2018). In line with their suggestion that play may serve as a possible antidote to the negative consequences of adversity, our findings suggest that pretend play may be an especially important tool to promote well-being during the current global health crisis. It is worth reemphasizing that most children in our study were reported to initiate pandemic play on their own; before we can make specific recommendations about caregiver-initiated pandemic play or other interventions involving pandemic play, more research is needed to understand how, for whom, and in what contexts pandemic play benefits well-being. In the meantime, given the developmental benefits associated with pretend play in general (e.g., Thibodeau et al., 2016; White and Carlson, 2016) and its potential to be a protective factor against adversity for diverse populations of children (Yogman et al., 2018; Thibodeau-Nielsen et al., 2020), caregivers could consider creating opportunities for children to engage in pretend play. Doing so may provide a context for child-initiated pandemic play to naturally emerge among children who are ready to process pandemic-related stressors in this way. If a child naturally incorporates pandemic-related themes into their play, caregivers may consider following their child's lead in this play or simply allowing this theme to play out, as our findings suggest it might help some children further adapt to pandemic life. Outside of the COVID-19 pandemic, caregivers may notice their child playing about other stressful or new experiences, like natural disasters or making new friends on the first day of school (e.g., Buchanan et al., 2009). Together, theory and the results of the present study suggest that allowing children to engage in these forms of play as they occur naturally might be an effective way to alleviate emotional distress that stems from other stressful experiences for some children.

This study also has noteworthy limitations. First, all data were gathered from caregiver surveys and thus reflect caregivers' perceptions. Our results may be affected by shared method variance, which can inflate the variable associations. Second, our relatively small sample consisted of mostly White, highly educated, and high-income families. Yet, the experience of economic hardship is subjective and can lead to increased stress regardless of social class (Masarik and Conger, 2017). Still, the extent to which our findings can be generalized to a larger sample of families from other ethnicities, educational backgrounds, and income levels may be limited. Relatedly, the majority of respondents were mothers, limiting conclusions that can be made with respect to other caregivers like fathers or grandparents. Third, we only examined the frequency with which pandemic play occurred. Our data prevented us from examining the contribution of factors like thematic content of the pandemic play, when and where it occurred, and to what extent others were involved. This limits the recommendations we can offer about caregivers' roles in initiating hardship-related play. Future studies of children's play behaviors should gather data from multiple sources in socioeconomically and ethnically diverse samples.

In conclusion, the present study highlights the process by which economic hardships during the COVID-19 pandemic may hinder children's emotional well-being and self-regulation development, with caregiver stress as a key intervening mechanism. Our findings also add to the growing number of studies suggesting that pretend play can protect children from the harmful effects of adversity (e.g., Thibodeau-Nielsen et al., 2020). Although this study was conducted in the context of the COVID-19 pandemic, the findings are likely relevant beyond this particular global health crisis. Many families experience economic hardship every day (Schiller, 2008). Addressing caregiver stress levels and allowing children an outlet to cope with challenges through pretend play could have crucial protective effects on early development and well-being during times of crisis.

## DATA AVAILABILITY STATEMENT

Deidentified data supporting the conclusions of this article will be made available by the authors upon request.

## ETHICS STATEMENT

This study involving human participants was reviewed and approved by University of Missouri Institutional Review Board. The participants provided informed consent to participate in this study.

## AUTHOR CONTRIBUTIONS

RT-N and FP conceptualized and designed the study, collected data, conducted analyses, drafted the initial manuscript, and reviewed and revised the manuscript. RW conceptualized and designed the study, collected data, assisted in interpretation of the findings, and reviewed and revised the manuscript. AW collected data, assisted in data analysis and interpretation, drafted the initial manuscript, and reviewed and revised the manuscript. SD collected data, assisted in interpretation of findings, and reviewed and revised the manuscript. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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## SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.716651/full#supplementary-material

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# Maternal Stress, Depression, and Attachment in the Neonatal Intensive Care Unit Before and During the COVID Pandemic: An Exploratory Study

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Manuela F, Barcos-Munoz F, Monaci MG, Lordier L, Camejo MP, De Almeida JS, Grandjean D, Hüppi PS and Borradori-Tolsa C (2021) Maternal Stress, Depression, and Attachment in the Neonatal Intensive Care Unit Before and During the COVID Pandemic: An Exploratory Study. Front. Psychol. 12:734640. doi: 10.3389/fpsyg.2021.734640

The main aim of the present study was to investigate the effects of the COVID-19 pandemic on the mothers' postnatal depression, stress, and attachment during their stay in the Neonatal Intensive Care Unit (NICU). Twenty mothers of very premature infants born before 32 weeks of gestational age were recruited at the Geneva University Hospital between January 2018 and February 2020 before the COVID-19 pandemic started. Mothers were screened for postnatal depression after their preterm infant's birth (Edinburgh Postnatal Depression Scale, EPDS), then for stress (Parental Stressor Scale: Neonatal Intensive Care Unit, PSS:NICU), and attachment (Maternal Postnatal Attachment Scale, MPAS) at infant's term-equivalent age. Data were compared with 14 mothers recruited between November 2020 and June 2021 during the COVID-19 pandemic. No significant differences were found in the scores for depression, stress, and attachment between the two groups. However, a non-statistically significant trend showed a general increase of depression symptoms in mothers during the COVID-19 pandemic, which significantly correlated to the attachment and stress scores. Moreover, the PSS:NICU Sights and Sounds score was significantly positively correlated with EPDS scores and negatively with the MPAS score only in the During-COVID group. To conclude, we discussed a possible dampened effect of the several protective family-based actions that have been adopted in the Geneva University Hospital during the health crisis, and we discussed the most appropriate interventions to support parents in this traumatic period during the COVID-19 pandemic.

**Keywords: neonatal intensive care unit, preterm infants, maternal stress, maternal depression, attachment, COVID pandemic**

## INTRODUCTION

The COVID-19 pandemic has been shown to have important public health implications including emotional and social functioning, particularly for populations at risk (Pfefferbaum and North, 2020). It is therefore becoming a priority to investigate its effects on vulnerable populations of newborns. Women who gave birth during the new COVID-19 pandemic showed an increased risk of traumatic birth experiences compared to women who gave birth before the pandemic period (Mayopoulos et al., 2021). Moreover, higher levels of depression and symptoms of anxiety have been documented in the postnatal period since the beginning of the COVID-19 pandemic (Cameron et al., 2020; Davenport et al., 2020; Davis-Floyd et al., 2020; Ahmad and Vismara, 2021). During their child's hospitalization in the neonatal intensive care unit (NICU), mothers of premature babies face not only the known stressors of premature birth but also the issues related to the pandemic (Tscherning et al., 2020).

In the NICUs, although the World Health Organization has recommended healthcare providers to promote close contact, skin-to-skin, and rooming-in throughout the day and night including, during COVID-19 pandemic (WHO and EMRO), the vast majority of NICUs needed to adopt major changes in their care during the emergency period (van Veenendaal et al., 2021). The evident consequences of isolation measures included an increased risk of separation, stress, and depression for parents of preterm infants hospitalized in the NICUs. During periods of restricted visits to their hospitalized baby due to the COVID-19 pandemic, parents expressed psychological distress that could have detrimental effects on the parent–child relationship (van Veenendaal et al., 2021). In several NICUs, the parental access was restricted to one parent only – usually the mother – and the fathers could meet their newborn preterm infants only after hospital discharge (Ancora and Simone, 2021). Moreover, the time that a parent could spend with their infant was significantly reduced and sometimes limited to few hours per day (Lavizzari et al., 2021). In extreme cases, the parental presence was completely denied, and parents could not visit their infants (Muniraman et al., 2020). Parents reported significant impacts on their ability to visit, care for, and bond with their child, and this negative perception was more evident in hospitals with stricter restrictions (Bembich et al., 2020; Muniraman et al., 2020). During periods of restricted visits to their hospitalized baby due to the COVID-19 pandemic, parents expressed psychological distress that could have detrimental effects on the parent–child relationship (van Veenendaal et al., 2021). It is known that the separation policies in the NICU, during sensitive periods of infants' brain development, have detrimental effects on infants (Flacking et al., 2012) and on mother-infant bonding experience (Korja et al., 2012). During the pandemic, NICU policies preserving 24-h parental presence decreased significantly (Mahoney et al., 2020), resulting in a reduction in therapeutic services (i.e., physiotherapy, music therapy, etc.), lactation interventions, and, more generally, in parenting support.

In addition, not only parents but also the staff organization was impacted by the COVID-19 pandemic with consequences on infant's care: the staff was redeployed and non-urgent procedures, such as multidisciplinary therapies, were delayed (Mahoney et al., 2020).

However, no studies at our knowledge investigated the impact of the COVID pandemic on the maternal depression, stress, and attachment scores, by comparing the two periods, before and during the COVID pandemic.

Following the overmentioned, the main objective of the present study was to investigate the effects of the COVID-19 pandemic on the mothers' depression and stress, as well as on the attachment process with their child during the NICU stay. We hypothesized that the COVID-19 pandemic could have a detrimental impact on maternal depression after birth, on maternal stress symptoms during their hospital stay in the NICU, and, consequently, on maternal attachment at hospital discharge.

## MATERIALS AND METHODS

### Participants and Procedure

Participants were recruited at the University Hospital of Geneva before and during the COVID-19 pandemic. Thirty-four mothers were involved in the study: 20 in the Before-COVID period and 14 in the During-COVID period.

COVID-19 was declared a global pandemic by the World Health Organization (WHO) on March 11, 2020 (Cucinotta and Vanelli, 2020). Mothers of infants born very prematurely, before 32 weeks of gestation, in the Before-COVID group were recruited between January 2018 and February 2020, while mothers of infants born very prematurely in the During-COVID group were recruited between November 2020 and June 2021. Women with overt psychiatric symptoms and needing specific psychological or psychiatric treatment were excluded.

Participants were individually approached by the medical staff of the NICU. The Swiss Ethical Committee approved the study and written informed consents were obtained.

Clinical neonatal characteristics of the infants of the recruited mothers in both groups were routinely recorded. Gestational age was based on the best estimate from early ultrasound or last menstrual period. Neonatal sepsis, bronchopulmonary dysplasia (PBD), and major brain injury (such as intraventricular haemorrhage grade 3 or 4 and/or cystic leukomalacia) were defined as previously published (Schlapbach et al., 2012).

Mothers' and infants' characteristics are reported in **Table 1** and were collected in the hospital digital clinical records. To complete the population description, mothers were asked to complete a questionnaire on their Socioeconomic status (SES). The SES was estimated using a validated score based on maternal education and paternal occupation (score ranging from 2 to 12). A lower SES score reflects a higher socio-economic level (Largo et al., 1989).

## MEASURES

A first questionnaire was administered when infants reached 33 weeks of gestational age – the Edinburgh Postnatal Depression

**TABLE 1** | Infants' and mothers' characteristics in the Before- and During-COVID groups.

| | Before-COVID Mean (SD; *N* = 20) | During-COVID Mean (SD; *N* = 14) | *p* |
|---|---|---|---|
| **Preterm infants** | | | |
| Gestational age (weeks) | 29.45 (6.8) | 29.03 (13.5) | 0.57 |
| Birth weight (g) | 1257.25 (388) | 1232.5 (437.4) | 0.85 |
| Height at birth (cm) | 38.63 (3.0) | 37.8 (14.98) | 0.5 |
| Head circumference at birth (cm) | 26.94 (2.4) | 26.11 (3.2) | 0.37 |
| Bronchopulmonary dysplasia (yes/total) | 6 (30%) | 9 (64%) | 0.2 |
| Proven sepsis (yes/total) | 3 (15%) | 5 (35%) | 0.33 |
| Intraventricular hemorrhage grade 3–4 (yes/total) | 0 | 0 | |
| Periventricular leukomalacia (yes/total) | 0 | 0 | |
| **Mothers** | | | |
| Age (<29; 30–39; >40) | 9 (45%); 9 (45%); 2 (10%) | 3 (21%); 6 (43%); 5 (36%) | 0.06 |
| Type of pregnancy (singleton/total, %) | 14/20 (70,0%) | 10/14 (71,4%) | 0.6 |
| Type of delivery (cesarean/total, %) | 15/20 (75,0%) | 10/14 (71,4%) | 0.56 |
| Primiparous (yes/total) | 11/20 (55,0%) | 11/14 (78%) | 0.15 |
| Marital status (couple/total) | 18/20 (90,0%) | 13/14 (92,9%) | 0.64 |

Scale (EPDS) – and two others when the infant reached term-equivalent age, the Parental Stressor Scale: Neonatal Intensive Care Unit (PSS:NICU) and the Maternal Postnatal Attachment Scale (MPAS).

The EPDS was developed to assist health professionals in detecting mothers suffering from postpartum depression, a more prolonged disorder than the "blues" (which can occur in the 1st week after delivery). The scale consists of 10 short statements. A mother checks off one of four possible answers that are the closest to how she has felt during the past week. Responses are scored 0, 1, 2, and 3 based on the seriousness of the symptom (minimum total score = 0 and maximum total score = 30).

Items 3, 5, and 10 are reverse scored (i.e., 3, 2, 1, and 0). The total score is found by adding together the scores for each of the 10 items (Cronbach's $\alpha = 0.77$). The majority of studies utilizing the EPDS use a cutoff score greater than 12 for defining the mothers at risk for depression (Murray and Carothers, 1990) although other cut off scores have been used (Murray and Cox, 1990). Following the indications of the specific literature on depression assessment in the NICU mothers could be considered as at risk for developing postpartum depression when the EPDS were $\geq 10$ (e.g., Teissèdre and Chabrol, 2004; Alkozei et al., 2014).

The PSS:NICU (Miles et al., 1993; Montirosso et al., 2012) was used to assess mothers' perception of stressors originating from the physical and psychosocial environment in the NICU. The instrument includes three dimensions (subscales): Sights and Sounds of the unit (six items), Infant Behaviour and Appearance (17 items), and Parental Role Alteration (11 items): Items were rated on a Likert-type scale ranging from 1 "not at all stressful" to 5 "extremely stressful." A total averaged score was computed for the three subscale, and Overall Stress Level has been computed by the average of all the items; the items rated as "not applicable" were coded as 1 (Montirosso et al., 2012). A cutoff score of $\geq 3$ is used to identify high parental stress (Miles et al., 1993; Montirosso et al., 2012) in the total PSS:NICU scores. The reliability of the scale was good both for the subscales (Sights and Sounds Cronbach's $\alpha = 0.71$; Infant Behaviour and Appearance $\alpha = 0.80$; Parental Role Alteration $\alpha = 0.86$), and the Overall Stress Level ($\alpha = 0.91$).

Maternal attachment was assessed using a self-reported questionnaire, the Maternal Postnatal Attachment Scale (MPAS; Condon and Corkindale, 1998). The instrument consists of 18 items. A total score was obtained by the sum of all the answers (Cronbach's $\alpha = 0.61$), and higher score denotes greater attachment.

## Data Analysis

The EPDS, PSS:NICU stress scores and MPAS have been compared in the two groups, Before- and During-COVID, with *t*-tests. In addition, a threshold for at "risk mothers" was applied for EPDS scores equal or greater than 10 and for PSS:NICU scores equal or greater than 3. The numbers of the mothers at risk were then compared in the two groups with Fisher's exact test instead of chi-square because of the small sample size. Finally, the correlation between EPDS, PSS:NICU stress scores, and MPAS scores was tested using Pearson's correlations separately for each of the two groups.

All the analyses were conducted with SPSS Statistics 27.

Results were considered as significant at $p < 0.05$.

# RESULTS

The two groups were homogeneous and comparable in terms of preterm infant's neonatal characteristics and for the maternal characteristics (see **Table 1**), and no significant differences emerged at the *t*-tests comparison between the two groups. No significant differences were found when comparing *t*-tests between the two groups for the SES score [(M = 4.90, SD = 2.99) for the Before-COVID group and 6.14 (SD 1.75) for the During-COVID group, respectively; $p = 0.17$].

## Comparison of EPDS, PSS:NICU, MPAS Scores, and Before- Versus During-COVID

The mean and standard deviations for the EPDS, PSS:NICU subscales, and MPAS are presented in **Table 2** for both groups, Before- and During- COVID. No significant results were found in the comparisons between the two groups.

## Mothers "At Risk" in the Before-COVID and During-COVID Periods

Considering the limited samples size (the absence of a significant difference at the *t*-test comparisons of the global scores

**TABLE 2 |** Means and standard deviations for the study variables in the Before- and During-COVID groups.

| | Before-COVID Mean (SD; *N* = 20) | During-COVID Mean (SD; *N* = 14) | *p* |
|---|---|---|---|
| EPDS | 8.45 (1.9) | 10.53 (1.8) | 0.13 |
| Total PSS:NICU score | 3.26 (0.69) | 3.34 (0.73) | 0.86 |
| PSS: Sights and Sounds | 2.91 (0.81) | 2.73 (0.75) | 0.52 |
| PSS: Infant Behavior and Appearance | 2.76 (0.88) | 3.05 (0.83) | 0.34 |
| PSS: Parental Role Alterations | 2.97 (1.0) | 2.82 (0.88) | 0.64 |
| MPAS | 87.16 (5.85) | 86.56 (5.15) | 0.50 |

summed and averaged on these two scales), a non-parametric and more sensible test has been conducted on the number of mothers at risk or not of the two groups, Before and During-COVID. Results indicated non-significant differences for EPDS and PSS (EPDS $p = 0.138$; PSS $p = 0.177$, Fisher's Exact tests). However, a trend is present (see **Table 3**) with a lower percentage of mothers in the "at risk" category for higher stress (43.9%) in the Before-COVID group than in the During-COVID group (57.1%). Similarly, for the EPDS score, the mothers at risk of postpartum depression increase from 45.9 to 68.8%.

## Association Between EPDS, PSS:NICU, and MPAS Scores

EPDS scores were positively and significantly correlated with total PSS:NICU scores, as well as with two PSS:NICU subscores – Parental Role Alterations, and Infant Behavior and Appearance, but not with Sights and Sounds scores, in the Before-COVID group.

The PSS:NICU Sights and Sounds score is significantly positively correlated with EPDS scores and negatively with the MPAS score only in the in the During-COVID group. PSS:NICU Sights and Sounds score, EPDS, and MPAS scores were independent in the Before-COVID group.

Negative correlations, albeit non-significant, emerged between PSS:NICU and MPAS scores in both groups, while they were negatively correlated in the During-COVID group.

Correlations between variables in the two groups are presented in **Table 4**.

Raw data will be made available by the authors, without undue reservation, to any qualified researcher.

# DISCUSSION

In the present study, two cohorts of mothers, delivering preterm infants of less than 32 weeks of gestational age before and during the COVID pandemic, were compared in terms of depression after infant's birth, and for stress and attachment at hospital discharge. We hypothesized that the COVID-19 pandemic could have a detrimental impact on maternal depression at birth, on maternal stress symptoms during their hospital stay in the NICU, and, consequently, on maternal attachment at hospital discharge.

**TABLE 3 |** Number and percentage of mothers in the "at risk" categories for postpartum depression higher stress.

| | Before-COVID | | During-COVID | |
|---|---|---|---|---|
| **EPDS score** | | | | |
| Below 10 | 11 | 55.00% | 5 | 31.3% |
| Equal or above 10 | 9 | 45.9% | 11 | 68.8% |
| **Total PSS_Nicu score** | | | | |
| Below 3 | 13 | 65.0% | 6 | 35.0% |
| Equal or above 3 | 7 | 43.9% | 8 | 57.10% |

No significant difference was found in the comparisons between the two groups, but a trend of increased depression, stress, and of decreased attachment scores was found in mothers during the COVID period when compared to the period before the COVID pandemic.

Similarly, analyses of the percentage of mothers classified as "at risk" (Montirosso et al., 2012; Alkozei et al., 2014; data reported in **Table 3**) showed no significant differences between the two groups. However, an increase in the percentage of mothers in the "at risk" category for depression and for higher-stress is found in the during-COVID period.

In the correlation analyses, maternal depression score was positively and significantly correlated with total PSS:NICU scores, and with two PSS:NICU subscores – Parental Role Alterations, and Infant Behavior and Appearance before the COVID pandemic, confirming previous findings (Alkozei et al., 2014). All these correlations were stronger in the During-COVID group than in the Before-COVID group. Most importantly, it was only during the COVID pandemic that depression scores were significantly associated with the PSS:NICU Sights and Sounds and, interestingly, also with the attachment scores. This result shows that depression scores measured in mothers shortly after the infant's birth, and stress for the environment at hospital discharge were more strongly associated to difficulties in attachment during this period of global health crisis.

The PSS:NICU Sights and Sounds is a subscale of the PSS:NICU specifically designed to identify stressors caused by the physical environment of the NICU. This environment, with its constant alarms and unpredictable noises, has well-known short- and long-term deleterious effects on the behavior and development of such vulnerable preterm infants (Graven, 2000; Wachman and Lahav, 2011). Findings of the present study suggest that, during the COVID pandemic, the physical environment of the NICU becomes an even more stressful element that is associated with increased depression and decreased levels of attachment. Preventive and protective actions on the physical environment of the infant and family should therefore be adopted in the NICU – especially during the periods of crisis and health emergency in order to prevent a disruption of infants and dyad well-being (Als et al., 2003; van Veenendaal et al., 2021).

**TABLE 4** | Pearson's correlations for the study variables in the Before- and During-COVID groups.

| | EPDS | Total PSS:NICU | PSS: Sights and Sounds | PSS: Infant Behavior and Appearance | PSS: Parental Role Alterations | MPAS |
|---|---|---|---|---|---|---|
| **Before-COVID** | | | | | | |
| EPDS score | – | **0.46**$^{*}$ | −0.15 | **0.55**$^{*}$ | **0.48**$^{**}$ | |
| Total PSS:NICU score | | – | | | | |
| PSS: Sights and Sounds | | **0.44**$^{*}$ | – | | | |
| PSS: Infant Behavior and Appearance | | **0.91**$^{***}$ | 0.28 | – | | |
| PSS: Parental Role Alterations | | **0.87**$^{***}$ | 0.21 | **0.68**$^{***}$ | – | |
| MPAS score | 0.01 | −0.14 | −0.12 | −0.08 | −0.19 | – |
| **During-COVID** | | | | | | |
| EPDS score | – | **0.65**$^{*}$ | **0.67**$^{**}$ | **0.53**$^{*}$ | **0.70**$^{**}$ | |
| PSS:NICU score | | – | | | | |
| PSS: Sights and Sounds | | **0.78**$^{***}$ | – | | | |
| PSS: Infant Behavior and Appearance | | **0.96**$^{***}$ | **0.63**$^{*}$ | – | | |
| PSS: Parental Role Alterations | | **0.93**$^{***}$ | **0.69**$^{**}$ | **0.86**$^{**}$ | | |
| MPAS score | −0.44 | −0.44 | **−0.64**$^{*}$ | −0.35 | −0.35 | – |

$^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$.
*Bold values represent the significant correlations.*

The correlation results confirm the robust relation between maternal stress and depression after birth in the NICU (Alkozei et al., 2014), and the correlation is stronger during the COVID pandemic, with impacts on attachment scores.

Mothers of preterm infants are known to be at increased risk of postpartum depression and findings from systematic reviews and meta-analysis support the association between preterm birth and postpartum depression (Miles et al., 1992; Lefkowitz et al., 2010; de Paula Eduardo et al., 2019), therefore, psychological support for mothers during their child's NICU stay is recommended (Montirosso et al., 2012). While the health problems associated with a pandemic can be highly stressful for all individuals, research suggests that the psychological impact of these traumas may be more severe for some at risk populations (Boyraz and Legros, 2020; Chaix et al., 2020; Stefana et al., 2020).

Maternal attachment representations toward the prematurely born child are fragile (Forcada-Guex et al., 2011) and protective actions, such as infant and family-centered developmental care, can support the complex attachment process in this delicate period of hospitalization in the NICU (Roué et al., 2017). The present results suggest that this support is even more precious in periods of health crisis.

One of the limitations of the present study is the small sample size. The overmentioned non-significant results could be related to the limited sample size due to the inclusion criteria adopted (specifically, mothers of children born very prematurely and before 32 weeks of gestation), which did not allow higher numbers of recruitments during the pandemic period.

Moreover, the questionnaires we adopted for evaluating depression give a partial description of the two of the most diffused questionnaires for evaluating maternal depression during the perinatal period are the EPDS and the BDI (Beck Depression Inventory Lefkowitz et al., 2010). However, for future studies, we suggest to adopt a multi-dimensional cluster of measures, including interviews, questionnaires and physiological measures (i.e., cortisol measures), to better assess the type of impact that this stressful life event could have in mothers and fathers in the NICU.

As using maternal depression as a primary construct to characterize all severe and prolonged distress in the NICU setting, the present study does not account for the type of trauma or for minor and more transient forms of "baby blues" and for other important aspects of distress (Greene et al., 2015). We also suggest including measures to evaluate this impact in terms of post-traumatic stress disorder (Anderson and Cacola, 2017).

Another limitation, and a possible explanation for the fact that we did not find significant differences between the groups, is that the period of mothers' recruitment started 8 months after the pandemic was declared, so we were not able to explore the period of initial stress and the differential effects of the different pandemic waves on maternal mental health. It is possible that 8 months after the start of the pandemic, mothers may have become slightly adapted to the stress caused by the pandemic, but we were not allowed to carry on any research project during the initial COVID-19 pandemic period.

However, we can also discuss the present results in terms of effects of the NICU policies and protective actions that have been adopted during the pandemic period at the Geneva University Hospital (HUG). By analyzing point by point the potential negative impacts of the COVID pandemic on the NICU policies affecting parent and family access, and patient care reported in the introduction, we can adopt a synoptic perspective and evaluate the NICU protective policies that were adopted at the HUG during the COVID outbreak period.

At HUG, the NICU is organized in single-family rooms, and open access 24/24 h and psychological support has been guaranteed for both parents during all the COVID pandemic period. The pediatric intensive care unit and the NICU were the only two units that were exempted from the visitor restriction. Thus, both parents could be present at the same time with no reduction of their usual participation in the infant's care.

Parents used the same precautions as the health personnel each time they acceded the unit and the use of masks inside the room was mandatory only when a member of the medical-nursing team enters the single-family room. When parents were alone with their babies, they could remove the mask, without interrupting the usual intimacy in communication, the skin-to-skin contact or breastfeeding programs. In case one of the parents was tested positively, a quarantine of 10 days was imposed, including 48 h without symptoms for both parents. The quarantined parents could communicate with their babies *via* a video conferencing system or video call. During the same period, the nurse-medical team communicated with the parents to inform them of their child's progress. Mothers, who breastfed during the quarantine period, could continue pumping milk at home and could bring it to the hospital through a family member.

Family-centered care practices were maintained during the COVID pandemic at the HUG, and the overmentioned actions, which were routine practices before the COVID period and maintained during the pandemic, could potentially be protective against the negative effects of the pandemic on stress, depression and attachment scores in mothers of hospitalized preterm infants.

## CONCLUSIONS

Several protective actions could be adopted in the NICUs during the pandemic period.

In this phase, it becomes imperative to assess parental mental health and to enhance psychosocial support of NICU parents, assuring timely information and finding alternative solutions for parents who cannot visit their infants. Technological devices can be implemented in case of forced separation, in order to maintain the mother's and father's visual and vocal contact with their baby (Epstein et al., 2017).

Early family-based interventions, such Early Vocal Contact in the NICU (Arnon et al., 2014; Filippa et al., 2019), can support parent's sensitive behaviors, increasing their emotional availability, and decreasing stress and anxiety levels during their stay in the NICU. Safely enhancing contact within the dyads or triads, during periods of general isolation from peers and from larger familiar supports, becomes essential (Tscherning et al., 2020). Single family-rooms and individualized newborn care could contain the negative impact of the COVID pandemic (Mahoney et al., 2020). Evidence-based indications on how to safely maintain family-centered developmental care practices in the NICU during the COVID pandemic have been provided (Tscherning et al., 2020; Cena et al., 2021). Future studies are encouraged, in order to evaluate specific protective interventions and policies to be adopted during future possible pandemic experiences or health social crisis.

## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/Supplementary Material, and further inquiries can be directed to the corresponding authors.

## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Swiss Ethical Committee Protocol CCER 2015-00175 (15-295). Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

## AUTHOR CONTRIBUTIONS

FM conceived the presented idea and wrote the draft. FM, FB-M, LL, and CB-T developed the theoretical framework. FB-M, MC, and JA collected data. MM performed the analyses. All the authors provided critical feedback and contributed to the final version of the manuscript. All authors contributed to the article and approved the submitted version.

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# Family Functioning in the Time of COVID-19 Among Economically Vulnerable Families: Risks and Protective Factors

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The ongoing COVID-19 crisis has been particularly harmful to economically vulnerable families with young children. We surveyed 247 low-income mothers and fathers from 142 families in the United States about changes in their family life following the economic and social restrictions imposed by the pandemic. We examined the associations between pandemic-related risk factors such as economic stressors (e.g., loss of job) and social stressors (e.g., exposure to the virus) on family functioning (e.g., parents' mental health, parent engagement, and children's socioemotional behaviors) and the degree to which coparenting support and parents' positivity protected families from the negative effects of these stressors on their wellbeing. We found both positive and negative associations. Mothers and fathers who reported more economic stressors since the pandemic also observed that their children behaved more prosocially and that fathers experienced more mental health difficulties during the pandemic. Mothers and fathers who reported more social stressors reported that they were less engaged with their children and their children exhibited more behavior problems compared to before the pandemic. We also found that mothers and fathers who reported feeling more positive also reported feeling less depressed and stressed during the pandemic and observed that their children had more prosocial behaviors compared to before the pandemic. Compared to before the pandemic, mothers and fathers who reported a more supportive coparenting relationship also reported more parent engagement and observed more prosocial behaviors in their children. In terms of protective factors, high levels of parent positivity during the pandemic protected mothers (less mental health difficulties) whereas high levels of coparenting support protected fathers (less mental health difficulties) from the negative effects of economic stress on their mental health during the pandemic. These findings highlight family processes that could promote resilience in mothers and fathers in the face of pandemic-related economic and social stressors.

**Keywords: COVID-19, parental mental health, parent engagement, socioemotional problems, prosocial behaviors, positivity, coparenting support**

## INTRODUCTION

The ongoing COVID-19 crisis has disrupted all aspects of our lives resulting in unprecedented levels of social and economic distress. The social distancing, isolation, and country-wide lockdown measures to help reduce virus transmission, have also created stressful experiences for families and children. Individuals through their own behaviors and characteristics impact the functioning of the family as a group as well as the functioning of each individual within the family (Cox and Paley, 1997). Research on the effects of the COVID-19 pandemic, other pandemics, and natural disasters on factors that impact family functioning (hereby family functioning) suggests that there may be both immediate and long-term adverse consequences for many children, with early childhood being a particular risk factor (Magson et al., 2021). Studies conducted during the current pandemic show that many parents are facing unemployment; front-line essential jobs; working from home while caring for children; schooling children at home; dealing with economic uncertainty; and, managing a host of family stressors (Canady, 2020; Fontanesi et al., 2020). At the same time, children's lives have also suddenly changed. During the current pandemic, children's routines and childcare experiences have been drastically altered and many may find themselves at home with stressed adults and upset routines (Pachter et al., 2020; de Figueiredo et al., 2021). Overall, these stressors could take a toll on children's ability to cope and on parents' ability to manage the added stress. These stresses can dysregulate children and diminish parents' ability to provide consistent care and support for their children, which can undermine the parent–child relationship and children's socioemotional functioning.

A group that has been particularly affected by the COVID-19 pandemic is economically vulnerable families (Pew Research Center, 2020). Approximately 63% of young Black children and 57% of young Hispanic children ages 5 or younger live in low-income families, defined by incomes about two times the federal poverty line (Pew Research Center, 2020). The uncertainty and adversity low-income families are facing put them at higher risk for detrimental short and long-term consequences. It is likely that the COVID-19 crisis will be particularly harmful to very young children of low-income and less-educated parents who are already at higher risk for poorer outcomes. Parents who already experience economic and other stresses may face additional challenges that stack against their ability to provide adequate care and emotional support for their children (Conger et al., 2010; Neppl et al., 2016).

Yet, studies conducted before the COVID-19 pandemic show that low-income families also demonstrate resilience in the face of adversity, which gives us information about the conditions under which risk factors are not associated with negative outcomes (Masten, 2001). In particular, as models of resilience suggest, factors at the individual and family levels such as being positive about the future and feeling supported in the coparenting role may help buffer the negative impact of stress/trauma on families (Masten and Barnes, 2018). Such research in conjunction with work on risk and vulnerability can help guide public policy and intervention efforts to improve the lives of children at risk for maladaptive outcomes (Masten, 2001).

This paper explicitly explores the potential contributions to family resilience during the COVID-19 pandemic. Specifically, we examine the unique importance of pandemic-induced economic hardships (i.e., job and income loss, inability to make ends meet) and pandemic-induced social stressors (i.e., exposure to the virus, loss of childcare) as they relate to parental mental health, parent engagement with children, and children's socioemotional behaviors among low-income, diverse families. Nascent research on the factors that protect families against the negative effects of the COVID-19 pandemic on family functioning find that parents' positivity or optimism about the future and feelings of support from their families, including partners, play a key protective role (Li and Xu, 2020; Schug et al., 2021). Therefore, we also examine whether parent positivity and a supportive coparenting relationship protect children and parents from the negative effects of economic and social stressors on family functioning. More specifically, we ask: (1) How are pandemic-induced economic and social stressors uniquely associated with family functioning, including parents' mental health, parent engagement, and children's socioemotional behaviors and (2) How do promotive factors such as perceived coparenting support and parents' positivity moderate the association between pandemic-related stressors and parents' mental health, parent engagement, and children's socioemotional behaviors.

### Theoretical Background

We frame this study using a relational developmental systems framework that is commonly used in the field to study resilience (Masten, 2018). Research on resilience has shown that in times of crisis, when individuals experience a high number of risks, people draw on protective processes, including various psychological, social, and economic resources to cope, adapt, or overcome adversity (Masten, 2018). Protective factors are commonly defined as characteristics of the child, family, and broader environment that matter when adversity is high (Masten and Reed, 2002; Masten, 2013; Wright et al., 2013; Masten and Cicchetti, 2016). The interplay between risk and protective factors is central to the concept of resilience, which is defined as the "the capacity of a dynamic system to withstand or recover from significant challenges that threaten its stability, viability, or development" (Masten, 2011, p. 494).

We focus on families with young children because it is a time of unprecedented growth and it is most sensitive to environmental contexts (Shonkoff and Phillips, 2000). As such, economic and social risks or stressors during this period are likely to influence all aspects of development. Although the research is clear that the early years represent an optimal time for brain development, there is less clarity about the factors that might protect children from the adverse effects of poverty and other stressors on family functioning. Research has shown that many children growing up in low-income households are exposed to high quality experiences that promote their development (Cabrera et al., 2007). To bolster these supports, it is critically important to understand the factors

during this pandemic that promote children's social adaptation and family wellbeing in early childhood despite adverse circumstances (Compas et al., 2001). In this study, we examine both the associations between risks and family functioning as well as the promotive factors that might protect children from these negative effects.

A central function of families is to nurture and socialize children to the norms and values of their cultural milieu (Georgas et al., 2001). We focus on the following indicators of family functioning because an extensive body of research has shown them to be significantly and robustly related to young children's social adjustment: children's socioemotional skills, parent engagement in learning activities at home, parents' mental health, coparenting support, and parental positivity (Priel et al., 2019).

The rapid and substantial policy response to the pandemic—extended unemployment insurance and stimulus funds—in many ways protected families from a deeper economic crisis (Ganong et al., 2020). However, little is known yet about the individual- or family-level protective factors that helped people withstand the substantial negative impact of the COVID-19 pandemic on family functioning. Therefore, this study also tests moderation effects.

## Risks Factors and Family Functioning

Risk is typically defined as the elevated probability of a negative outcome that tends to accumulate over time (Evans et al., 2013). The experience of multiple risks is likely to have a cumulative and negative effect on all aspects of family functioning (Evans et al., 2013; Masarik and Conger, 2017). The more risks families experience, the higher the probability of them taking a toll on their wellbeing (Cappa et al., 2011; Crnic and Ross, 2017; de Cock et al., 2017; Rollè et al., 2017). This literature also demonstrates that risks have differential effects on children and families (Griffith et al., 2020; Romero et al., 2020). Families with fewer economic and social resources, as a group, are likely to suffer the most (Duncan and Murnane, 2016). An extensive body of work conducted prior to the current pandemic robustly showed that various types of risk, including economic and social stressors, have short- and long-term effects on all aspects of family functioning, including parents' mental health, parenting and children's socioemotional adjustment (McLoyd, 1990; Harvey and Delfabbro, 2004; Fiorini and Keane, 2014; Masarik and Conger, 2017).

The economic and social impact of the COVID-19 pandemic on children and families and the policies implemented to contain the virus, including lock-down orders, school and childcare closures, new regulations for frontline workers—have resulted in multiple sources of risk and stress for families, including but not limited to worries about the future, fear of being infected or becoming terminally ill, pressures related to working under unsafe conditions, and losing childcare arrangements (Pew Research Center, 2020). These economic (e.g., job loss, inability to pay one's bills) and social sources of stress (e.g., disruption in child care, being exposed to the virus) have the potential to be long-lasting with effects reverberating throughout individuals' lives. Research to date on the associations between the stress caused by this pandemic and families' wellbeing has mostly documented economic and health impacts (Brown et al., 2020; Fontanesi et al., 2020; Lawson et al., 2020; Hertz-Palmor et al., 2021). Because the pandemic is still evolving, the science to understand the pandemic's effects on family functioning, including parenting and mental health, is also unfolding in real time.

Rightly so, early reports of the effects of the pandemic on family functioning have focused on parents of young children (Lawson et al., 2020; Patrick et al., 2020). Decades of research have unequivocally shown that the quality of parenting (e.g., engaging in cognitively stimulating activities, showing love and affection) is critical for children's development (Smith et al., 2000; Caspi et al., 2004). In times of crisis, parents, especially economically vulnerable parents, may be less responsive and nurturing toward their children which can have dire consequences (Roos et al., 2021). Parents who lost their jobs and childcare arrangements because of the pandemic found themselves spending more time with children at home and having to restructure daily routines and activities to accommodate the new changes (Pew Research Center, 2020). Whether or not the increased parental care time was beneficial for children is uncertain. For some families this increased time at home together may result in more opportunities for learning and structured activities, which support social and cognitive skills development (Cabrera et al., 2020; Gregus et al., 2021). But for other families, the increased time during the COVID-19 pandemic may result in more unstructured and chaotic family organization that increases stress and jeopardizes the quality of parenting (Roos et al., 2021). For many economically vulnerable parents with young children, losing childcare may have meant crowded conditions at home as well as increased demands on parents' time to cook three meals a day and provide structured activities for their children, which can take a toll on parental mental health. A survey of 405 parents found that about 40% reported major or severe depression and parenting stress during the pandemic (Lee et al., 2021). For parents who were still working during the pandemic, loss of childcare could have presented sizeable challenges in their ability to continue to work. Under these conditions, increased parenting time with children might result in increased stress and diminished positive parenting, with negative implications for children. The same survey conducted by Lee and colleagues found that parents who reported spending an increased amount of time with their children at home also reported higher child anxiety and other behavioral problems (Lee et al., 2021).

A key aspect of family functioning is parents' mental health (Burke, 2003). The impact of environmental risks on parents' mental health is well understood. In general, parents who feel they have no control over their lives and are unable to stop worrying are at risk for mental health problems and a more taxing home environment (Conger et al., 2010). Because economic vulnerable parents in the U.S. are already at risk for higher levels of mental health problems (Gard et al., 2020), the added stress caused by the COVID-19 pandemic would likely have a cumulative and negative effect on parents' mental health.

Preliminary research conducted during the COVID-19 pandemic has found increased feelings of stress, depression, and anxiety for parents (Russell et al., 2020; Calvano et al., 2021). The negative effects of pandemic-induced economic stress on parenting and mental health confirms the robust findings on how economic stressors such as job loss and inability to pay one's bills, more generally, can negatively impact families (Conger et al., 1994).

## Risk Factors and Children's Socioemotional Development

The development of socioemotional skills (e.g., forming and sustaining relationships with others, experiencing, managing, and expressing emotions) during early childhood is a foundational milestone that supports future learning and development across developmental periods (Sroufe, 2005). Social skills influence children's self-confidence, empathy, and ability to develop meaningful and lasting friendships and partnerships (Eisenberg and Fabes, 2006). Parents and other caregivers foster socioemotional skills by being affectionate and nurturing and engaging in various activities that provide joy and teach children to take turns, listen, and resolve conflict (Belsky, 1990). Thus, any disruption to the quality of parenting is concerning because it has the likelihood of interfering with this process, with potentially long-term negative consequences for children (Eisenberg and Fabes, 2006). Economically stressed parents have children who exhibit less socially competent children than parents who are better off (Duncan and Murnane, 2016).

However, the association between stress and children's skill development is not linear. It should be noted that some studies have found that certain types of risk such as parental report of family financial difficulty (on a scale of 0–5) are sometimes associated with increases in Latino/a youth's prosocial behaviors, especially helping behaviors (Davis et al., 2018, 2020). Helping, sharing, or giving love and support are prosocial behaviors that are intended to benefit others (Padilla-Walker and Carlo, 2014). Studies of young children show that parents teach children to respond with compassion and concern when they witness someone being hurt or expressing a negative emotion such as crying (Farrant et al., 2012; Pastorelli et al., 2015). Studies of Latino families have shown that children are socialized to be caring and nurturing and to exhibit greater concern for others (Eisenberg et al., 2009; Calderón-Tena et al., 2011). Thus, it is possible that stress might be related to increases in children's prosocial behaviors, especially among Latino families.

In this study, we examine how pandemic-related risk factors such as economic and social stressors are associated with important aspects of family functioning, including parenting behaviors, parents' mental health, and children's socioemotional problems and prosocial behaviors.

## Protective Factors and Resilience

Theories of risk and resilience posit that protective factors buffer children from the negative effects of risk and that individuals respond to stress in multiple ways (Putnick et al., 2010; Masten, 2011). Research on stress and resilience has documented how families' previous adverse experiences provided them with the opportunity to develop effective coping mechanisms that can buffer them from the negative effects of new stressors, such as the current pandemic, on themselves and their children (Schug et al., 2021). Research on what promotive factors are protective in the context of risk in general is not extensive and therefore there is a dearth of information about what types of factors are protective globally and at differing levels of risk (Vanderbilt-Adriance and Shaw, 2008; Masten, 2011). In this study, we test the moderation effects of two factors that have been identified in the emerging COVID-19 literature as being protective: parents' positivity and feelings of family support, including coparenting support on children's socioemotional behaviors, parent engagement, and parental mental health (Li and Xu, 2020; Schug et al., 2021).

Pre-pandemic research shows that individuals who are high in positivity have better physical health, higher levels of emotional well-being, more positive social relationships, and improved capacity to cope with a broad range of stressful situations (Brissette et al., 2002; Assad et al., 2007; Kochanska et al., 2007; Carver et al., 2008; Baumgartner et al., 2018). Research with low-income ethnic minority mothers has shown that maternal positivity is associated with lower levels of maternal internalizing symptoms and higher levels of child adjustment (Taylor et al., 2010, 2012). In both mothers and fathers, positivity has been related to effective parenting and children's socioemotional adjustment (Jeon and Neppl, 2019). There is also some evidence that parental positivity acts as a buffer against the negative impact of economic stress on parents' mental health (Taylor et al., 2010, 2012). A study conducted in Germany during the pandemic found that in a large sample of healthcare workers, optimism was significantly associated with lower scores of depressive and anxiety symptoms (Schug et al., 2021). Overall, the literature suggests that positivity helps maintain positive parenting during adverse times and may serve as a psychological resource against the negative effects of economic stress on parents and children. However, the roles of positivity and other family supports during this pandemic have yet to be explored. We thus examine whether coparenting support and parent positivity are not just promotive of good outcomes but also protective, facilitating better parenting interactions with children and better child adjustment.

Coparenting or the ability of couples to work together as a team to manage their parenting responsibilities is a significant promotive aspect of family functioning (Feinberg, 2003; McHale, 2007). The quality of the coparenting relationship has been shown to be one of the strongest factors associated with children's social adjustment (e.g., Cabrera et al., 2012; Palkovitz et al., 2013; Gallegos et al., 2017; Choi and Becher, 2018; Mack and Gee, 2018) and with mothers' and fathers' positive parenting behaviors (Cabrera et al., 2009, 2011; Morrill et al., 2010). In one study in New Zealand conducted during the pandemic, researchers found that the association between depression and negative quality of parenting was found only for couples who reported low levels of coparenting support (McRae et al., 2021). Similarly, a study of 1,547 Chinese parents (age range = 12–60 years) showed that family support (assessed

as using the family support subscale of the Multidimensional Scale of Perceived Social Support) was protective in maintaining mental health (Li and Xu, 2020). It may be that being in a supportive coparenting relationship mitigates the demands that parenting during a pandemic may place on parents. Moreover, parents who feel supported by their co-parent may feel greater confidence in their ability to parent, particularly during a stressful period of time such as the COVID-19 pandemic.

## Current Study

Based on this extant literature, we have two research questions. First, how are pandemic-induced economic and social stressors uniquely associated with indicators of family functioning such as parents' mental health, parent engagement, and children's socioemotional problems and prosocial behaviors? Second, how do promotive factors, such as perceived coparenting support and parent positivity, moderate the associations between pandemic-related stressors and indicators of family functioning? Based on models of risk and resilience, we hypothesize that parents who report a high number of economic and social stressors will also report more depressive symptoms and stress, less parent engagement than pre-COVID period (main effects). Because the association between economic stress and child socioemotional behaviors is inconsistent in the literature, we do not specify a direction for this hypothesis. We also hypothesize that parents high on positivity and enjoying high levels of coparenting support will report fewer depressive symptoms and stress, more frequent engagement, and more prosocial behaviors in their children than parents with low levels of positivity and coparenting support (main effects). Given the state of the empirical evidence, we do not hypothesize about the relative importance of each set of stressors. Finally, we hypothesize that the association between economic and social stressors and family functioning outcomes will be reduced when parents have high levels of supportive coparenting relationship and high levels of positivity (interaction effects).

# MATERIALS AND METHODS

## Procedures

Data were collected from a sample of first-time parents participating in a NICHD-funded longitudinal intervention study (BabyBooks 2 project, BB2) that aimed to give information about child development to low-income parents (removed for blind review). Participating families were recruited from centers that administer the Specific Supplement Nutrition Program for Women, Infants, and Children, health care clinics, emergency department waiting rooms, parks, and community centers in both the Washington, DC metropolitan area and in Orange County, California. To be eligible for the BB2 intervention project, parents had to be first-time parents of a baby less than 9 months of age; be cohabiting, over the age of 18; making less than $75,000 per year; and, literate at a first-grade reading level in either English or Spanish. All infants were full term (37 weeks of gestation or longer). Families were told that the project was aimed at understanding how reading to babies helps them learn and were offered children's books and compensation for their time.

From May to August 2020, eligible parents in the BB2 project were contacted *via* text message about their interest in participating in an online survey study about their COVID-19-related experiences. The survey was hosted on Qualtrics[1] (Qualtrics, Provo, UT), an online survey tool that allows to create, distribute and record survey questions. Once parents consented to participate, they received a personal link to access the survey on their phone; only one parent requested to take the survey on a computer. Parents received either an English or Spanish version, based on their preferred language, and were given a 21-day timeframe to complete the survey. Of the total BB2 sample, 292 parents were still actively enrolled at the time of this survey. All 292 parents were contacted and 247 consented to participate (84.6% of response rate). All data were collected between July 2020 and September 2020. Each participant was compensated with a $20 e-gift-card or cash and was entered in a raffle to win one of four $50 e-gift-cards. To reduce missing data, participants were reminded to complete each survey question automatically by the online survey software. After viewing the reminder, participants were allowed to skip items if they chose to do so. No identifying information was collected during the survey. The personalized survey link was used to match demographic information from the database. Participants spent an average of 26 min to fully complete the survey. Our final sample consisted of 247 parents from 142 families, of which 210 parents were a couple. The remaining 37 parents were 32 mothers and 5 fathers whose partners either did not want to participate or could not.

## Participants

All of the participants were low-income parents with their children between the ages of 22 and 55 months (Mean age = 2.9 years, SD = 0.5) at the time the COVID-19 survey was administered; 48.6% of the total sample ($n = 120$ parents) resided in the greater Washington, D. C. metropolitan area including Virginia and Maryland and 51.4% resided in Orange County, California. Forty-four percent ($n = 108$) of the children were boys and 56% ($n = 136$ children) were girls. The sample included slightly more mothers (55.5%; Mean age = 30.0 years old, SD = 5.8) than fathers (44.5%; Mean age = 32.7 years old, SD = 6.7). The analytic sample ($n = 142$) did not significantly differ from the full BB2 sample ($n = 240$) on household income or education levels assessed as the highest education level in the family. The average annual household income before the pandemic started was USD $40,051 (SD = 25,172). Though the bilingual (Spanish-English) BB2 study's participants are predominately Hispanic, our response rate was greater for Hispanic parents (70%). **Table 1** demonstrates the sample demographics and descriptive data of study variables by parent gender.

[1]https://www.qualtrics.com

**TABLE 1** | Sample Demographics and Descriptive Data by Families and Parent Gender.

| | Combined ($n = 247$) | | Fathers ($n = 110$) | | Mothers ($n = 137$) | |
|---|---|---|---|---|---|---|
| **Demographics** | **M(SD)/%** | ***n*** | **M(SD)/%** | ***n*** | **M(SD)/%** | ***n*** |
| **Parents' Education** | | | | | | |
| Less than high school | 11.7% | 29 | 21.8% | 24 | 3.6% | 5 |
| High school diploma | 19.4% | 48 | 18.2% | 20 | 20.4% | 28 |
| Some college | 30.8% | 76 | 29.1% | 32 | 32.1% | 44 |
| 2–4 year college | 12.1% | 30 | 11.8% | 13 | 12.4% | 17 |
| 4 year college or above | 25.9% | 64 | 19.1% | 21 | 31.4% | 43 |
| **Parents' Ethnicity** | | | | | | |
| White | 7.3% | 18 | 9.1% | 10 | 5.8% | 8 |
| Black | 13.8% | 34 | 12.7% | 14 | 14.6% | 20 |
| Hispanic | 70.4% | 174 | 66.4% | 73 | 73.4% | 101 |
| Others | 8.5% | 21 | 11.8% | 13 | 5.8% | 8 |
| Parent age (in years) | 31.2(6.3) | 245 | 32.7(6.7) | 109 | 30.4 (5.8) | 137 |
| | **Families (n = 142)** | | **Fathers (n = 110)** | | **Mothers (n = 137)** | |
| **Study Variables** | **M(SD)** | **Range** | **M(SD)** | **Range** | **M(SD)** | **Range** |
| Parent Mental Health | – | – | 5.2(3.7) | 0–19 | 6.5(3.6) | 0–18 |
| Parent Engagement | 39.1(6.0) | 10–50 | 18.4(3.8) | 5–25 | 20.5(2.9) | 8–25 |
| Child Socioemotional Problems | 2.5(1.0) | 0–4.8 | 2.4(1.2) | 0–4.8 | 2.5(1.3) | 0–5 |
| Child Prosocial Behaviors | 4.0(0.8) | 0–5 | 4.0(0.9) | 0–5 | 4.1(0.8) | 2–5 |
| Economic Stressors | 1.0(0.7) | 0–2 | 0.9(0.8) | 0–2 | 1.0(0.8) | 0–2 |
| Social Stressors | 0.6(0.6) | 0–2 | 0.6(0.6) | 0–2 | 0.6(0.6) | 0–2 |
| Parent Positivity | 22.4(3.9) | 10–30 | 22.7(4.0) | 10–30 | 22.2(4.9) | 9–30 |
| Coparenting Support | 34.2(7.5) | 2–42 | 35.6(7.2) | 9–42 | 34.1(8.4) | 2–42 |

*Due to missing data on some variables, not all responses to individual items sum to 247 participants or 142 families (Larose et al., 2021).*

## Measures

The predictor variables include four stressful experiences related to the pandemic in both economic and social domains. The economic factor consistsw of self-reported ratings of changes in employment and financial ability to make ends meet since the COVID crisis began. The social factor consists of self-reported ratings of exposure to the SARS-CoV-2 virus and difficulty in accessing childcare since the COVID crisis began. The outcome variables include four key aspects of family functioning: parental mental health, parent engagement, and parent report of changes in child's socioemotional problem behaviors and prosocial behaviors during the pandemic. We also examined two protective factors (moderators) that are likely to buffer the stressful experiences brought by the pandemic on family functioning. The predictors, outcome variables, and moderators are described in detail below as well as in **Table 1**.

**TABLE 2** | Number and Percent of Parents Encountering the COVID19-related Stressors.

| Types of Economic stressors | *N* (total = 242) | % | Types of Social stressors | *N* (total = 244) | % |
|---|---|---|---|---|---|
| No stress | 86 | 35.5% | No stress | 116 | 47.5% |
| Job loss only | 28 | 11.6% | Expose to virus only | 40 | 16.4% |
| Inability to make ends only | 59 | 24.4% | Daycare disruption only | 67 | 27.5% |
| Both job loss and inability to make ends meet | 69 | 28.5% | Both exposure to virus and daycare disruption | 21 | 8.6% |

*Due to missing data on some variables, not all responses to individual items sum to 247.*

### Economic and Social Stressors

We asked participants about changes in four stressful experiences closely related to economic and social life experienced since the national outbreak of SARS-CoV-2 (adapted from Brailovskaia and Margraf, 2020). The survey included four items: (1) job or income loss (2) inability to make ends meet (3) exposure to SARS-CoV-2 virus (4) difficulty accessing childcare. **Table 2** shows the number and percent of families who reported negative impact in these aspects. Responses to questions about income loss and inability to making ends meet were summed into an economic stressor variable. Similarly, we summed both virus exposure and difficulty accessing childcare into a social stressor variable. Both economic and social stressors were entered as ordinal variables (0 = no negative impact, 1 = negative impact in one aspect, 2 = negative impacts in two aspects) for each parent.

#### *Job or Income Loss*

Participants were asked about changes in their employment status since the pandemic began and could choose from "No change," "Lost job/Lost hours" or "Got new job/Gained hours" (Larose et al., 2021). Lost job/h was coded as 1 and no change and new job/gained hours as 0.

#### *Inability to Make Ends Meet*

Participants were asked about changes in their "ability to pay bills" and "ability to buy basic needs" and could choose from

"No change," "Yes, it is easier than before," "Yes, it is slightly more difficult," and "Yes, it is much more difficult." For each item, when participants reported some level of difficulty, they were scored as 1, otherwise they were scored as 0.

We summed job loss/work hours loss and financial struggles to create an economic stressors variable at the individual level ranging from 0 = no economic stress, 1 = one economic stressor, to 2 = two economic stressors.

### *Exposure to SARS-CoV-2 Virus*

Participants reported to what extent they or the people around them (e.g., family members, close co-workers) had been affected by the COVID-19 pandemic (e.g., "I have tested positive myself" or "Someone with whom I live or work tested positive"). The answers from both questions were merged in a single variable, named "Exposure to virus" and transformed into a dichotomous variable (0 = No, 1 = Yes). Participants were considered not exposed (exposure = 0) if they did not endorse the exposure to virus items and instead reported "My physical health has not been affected" and also "The health of those close to me has not been affected." If one of these was not selected (e.g., not positive themselves but people close to them were infected), they were considered as being exposed to the SARS-CoV-2 virus (exposure = 1).

### *Disruption to Childcare*

Mothers and fathers were asked changes in their access to childcare since the pandemic began and could select from "No change," "Yes, it is easier than before," "Yes, it is slightly more difficult," and "Yes, it is much more difficult." If "No change" or "easier than before" was selected, they were scored as 0; otherwise, they were scored as 1.

We summed the virus exposure and difficulty accessing childcare to create a social stressors variable at the individual level ranging from 0 to 2.

We then created parent-level economic and social stressors scores. When both parents in the same family responded, an average score was used. When only one parent in the family responded, that parent's score was used to represent both parents. Therefore, the parent-level economic and social stressors also ranged from 0 to 2 with 5 possible levels. For example, if a parent-level economic stressors score = 0, it means neither parent reported negative change in employment status or financial ability since the COVID; 0.5 = one parent reported negative change in employment status or financial ability; 1 = one parent reported negative changes in employment status and financial ability or both parents reported one negative change, 1.5 = one parent reported a negative change and the other parent reported two negative changes, 2 = both parents reported negative changes in employment status and financial ability. These scores were entered as continuous variables in later analyses.

## Parents' Mental Health

Parental mental health during the pandemic was assessed with three items about perceived anxiety and depression, adapted from the Patient Health Questionnaire, PHQ-4 (Kroenke et al., 2009) and four items of perceived life stress, adapted from the Perceived Stress Scale, (PSS; Cohen et al., 1983).

### *Depression*

Each parent rated how often they have been bothered over the last two weeks on a 4-pt Likert scale with 0 = "Never," 1 = "Sometimes," 2 = "Fairly often," and 3 = "Very often." Items include "Not being able to stop or control worrying.," "Feeling down, depressed, or hopeless.," and "Little interest or pleasure in doing things." One item "Feeling nervous, anxious or on edge" from the PHQ-4 scale was not included in this survey because there was no variability everyone responded feeling anxious.

### *Stress*

Each parent rated how often they experienced stressful situations in the past month. We used 4 items from the PSS to measure the degree to which situations in one's life are appraised as stressful (Cohen et al., 1983). The shortened scale was highly correlated with the original 14-item scale. Participants were assigned 0 = "Never," 1 = "Sometimes," 2 = "Fairly often," and 3 = "Very often" for each of the questions included. These questions asked how often in the past month (1) "you were unable to control the important things in your life"; (2) "things were going your way" (reverse coded); (3) "confident about your ability to handle your personal problems?" (reverse coded) and (4) "difficulties were piling up so high…."

These seven items were added up to a mental health score that ranged from 0 to 21. Higher scores indicate more depressive symptoms and feeling more stressed. The Cronbach's alpha was 0.75, which indicates an acceptable level of internal consistency for the combined scales with the study sample. Mothers' reports of mental health scores and fathers' reports of mental health scores were treated separately because they were not significantly different from each other ($r = -0.01$) and because this is a meaningful characteristic of individual's functioning.

## Parent Engagement

Parents were asked about how often they were doing some specific activities with their child since the COVID-19 pandemic began using a 6-point scale (1 = "not at all," 2 = "Rarely," 3 = "a few times a month," 4 = "a few times a week," 5 = "about once a day," 6 = "more than once a day"). Items include: Playing together, putting the child to bed, going for a walk together, singing songs and telling stories, and reading a book together. The Cronbach's alpha was 0.72, indicating an acceptable level of internal consistency for this measure. Summary ratings of 5 items range from 5 to 30. Higher scores indicate more engagement in these reported activities. We used the sum score of mothers' reports of parent engagement and fathers' reports of parent engagement to assess both parents' total engagement time spent with the child at home. This is an improvement over past studies that assess total parenting behaviors with only one parent, typically mothers. In addition, mothers 'and fathers' reports of engagement were correlated (Pearson r = 0.19).

Thus, we used sum score to capture the total amount of children's "exposure" to parenting from their mothers and fathers. When only one parent in the family responded, we took that parent's score to represent total parenting.

### Child Socioemotional Behaviors

We modified questions from the problems and competence subscales from the Brief Infant and Toddler Socioemotional Assessment (BITSEA; Briggs-Gowan and Carter, 2002) and developed new answer choices to capture parents' perceptions of changes in children's behaviors since the COVID-19 pandemic began.

#### *Child Socioemotional Problems*

Mothers and fathers were asked to rate on a 5-point Likert scale (1 = "a lot less," 2 = "a little less," 3 = "the same," 4 = "a little more," 5 = "a lot more," and "does not apply") how much their child's behavior has changed as compared to before the COVID began. Five types of behaviors were assessed: (1) "been having tantrums and angry outbursts"; (2) "been struggling to manage their emotions"; (3) "been engaging in aggressive behavior such as hitting, biting, scratching and throwing objects…"; (4) "been crying"; and (5) "been needing to be held." "Does not apply" was coded as 0. Ratings of these items were averaged and the scores range from 0 to 5. The Cronbach's alpha was 0.86, indicating a good level of internal consistency for this measure.

#### *Child Prosocial Behaviors*

Prosocial behaviors included three items rated on a 5-point scale as above (1 = "a lot less" to 5 = "a lot more") and "Does not apply." These included: As compared to before the COVID began, has your child (1) "been talking/communicating with you"; (2) "been wanting to help"; (3) "been affectionate (e.g., gives hugs, uses caring words, etc.)." "Does not apply" was coded as 0. Ratings of these items were averaged and the scores range from 0 to 5. Internal consistency was adequate with Cronbach's alpha of 0.65.

When both parents in the same family responded, an average score was used. When only one parent in the family responded, that parent's score was used to represent both parents.

### Parent Positivity

To assesses positivity during the pandemic, we included 6 items from the Positivity Scale (P Scale) that includes self-esteem, life satisfaction, and positivity (Caprara et al., 2012). Sample items include "I have great faith in the future" and "I look forward to the future with hope and positivity." Participants rated their agreement on a 5-point Likert scale (1 = "strongly disagree," 2 = "disagree," 3 = "neither," 4 = "agree," 5 = "strongly agree"). Item 6 ("At times, the future seems unclear to me") was reverse coded before running the analyses. The total score ranges from 6 to 30. The higher scores indicate being more positive or hopeful about the future. Responses had good internal consistency (Cronbach's alpha = 0.79). Because mothers' and fathers' reports of positivity scores were correlated (Pearson $r = 0.25$) and did not differ, mothers' and fathers' scores in the same family were averaged to create parent scores. Reports from single-respondent families were used as parent scores.

### Coparenting Support

To assess perceptions of coparenting support during the pandemic, we used the seven items on the Coparenting Support subscale from the brief Coparenting Relationship Scale (CRS; Feinberg et al., 2012). Items such as "my partner appreciates how hard I work at being a good parent" were rated on a 7-point scale (0 = "not true of us" to 6 = "very true of us"). Summary scores range from 0 to 42. The higher scores indicate more support from the other parent. Responses were averaged and had good internal consistency (Cronbach's alpha = 0.89). Because mothers' and fathers' reports of coparenting scores were correlated (Pearson r = 0.24) and did not differ, mothers' and fathers' scores in the same family were averaged to create parent scores. Reports from single-respondent families were used as parent scores.

## Analytic Plan

The analytic sample consisted of 142 families, including 137 mothers and 110 fathers. For our study variables, less that 2% of data were missing at the parent, including one missing score for parent positivity, and two for coparenting support.

We conducted one path analysis with maximum likelihood (ML) method to calculate estimators using RStudio 1.2.5[2] (PBC, Boston, MA). In the model we allowed the predictors and the outcomes to covary. The model included 4 parent-level predictors (economic stressors, social stressors, parent positivity, and coparenting support), 5 outcomes (maternal mental health difficulties, paternal mental health difficulties, total parent engagement, child socioemotional problems, and child prosocial behaviors), and 1 control variable (highest education level in the family). To examine interaction effects, we added 4 interactions (economic stressors × parent positivity, economic stressors × coparenting support, social stressors × parent positivity, social stressors × coparenting support) in the model. Both main effect and moderation effect models were saturated. The four main predictor variables were first mean-centered and then used to calculate the interactions to reduce multicollinearity among the predictors. We reported standardized estimates of all estimators. Finally, we used simple slopes analysis to visualize the moderation interactions using Process v3.5 in SPSS 27 (Hayes, 2012).

# RESULTS

## Descriptive and Correlation Analyses

Among the 142 families in our sample, 77.5% percent of families reported negative change in levels of economic hardship and 63% reported experiencing at least one social stressor

[2]RStudio Team (2020). RStudio: Integrated Development for R. RStudio, PBC, Boston, MA URL http://www.rstudio.com

since the pandemic. Parent report of each set of stressors is presented in **Table 2**. Parents reported high level of positivity during the pandemic (Mean = 22.4, SD = 3.9) and high level of supportive coparenting relationship since the pandemic (Mean = 34.2, SD = 7.5). Mothers (Mean = 6.5, SD = 3.6) and fathers (Mean = 5.2, SD = 3.7) reported low levels of depression, anxiety and stress during the pandemic. Mothers and fathers reported more engagement with their child since the pandemic began (Mean = 39.1, SD = 6.0). Families reported no change in their children's socioemotional problems since the pandemic began (Mean = 2.5, SD = 1.0); and, reported observing more prosocial behaviors in their children since the pandemic began (Mean = 4.0, SD = 0.8). Mean, standard deviation, range are presented in **Table 1** and correlations of study variables are presented in **Table 3**.

## Path Analysis: Main Effects

We conducted one path model to examine the associations between parent risk factors (i.e., economic and social stressors) and the five outcomes (i.e., mother and father mental health, parent engagement, child socioemotional problems and prosocial behaviors; **Figure 1**).

Parents' increase of economic stressors since the pandemic began was significantly associated with parent report of more children's prosocial behaviors, controlling for family education level. That is, one standard deviation increase in economic stressors was associated with a 0.28 standard deviation increase in child prosocial scores (beta = 0.28, 95% CI = [0.*12, 0.44*], $p < 0.01$), keeping everything else constant. Parents' increase of economic stressors since the pandemic began was positively and significantly associated with paternal (but not maternal) mental health scores during the pandemic (beta = 0.19, 95% CI = [0.*02, 0.37*], $p < 0.05$), controlling for family education level. That is, one standard deviation increase in economic stressors was associated with 0.19 standard deviation increase in paternal mental health scores, keeping everything else constant.

Parents' increase in social stressors since the pandemic began was significantly associated with less parent engagement (beta = −0.27, 95% CI = [−*0.42, −0.13*], $p < 0.001$) and with more parent-reported socioemotional problems in the child as compared to before the pandemic (beta = 0.19, 95% CI = [0.*03, 0.33*], $p < 0.05$), controlling for family education level. That is, one standard deviation increase in social stressors was associated with 0.27 standard deviation decrease in parent engagement score and 0.19 standard deviation increase in child socioemotional problem scores, keeping everything else constant.

During the pandemic, parent positivity showed negative association with mothers' mental health difficulties scores, beta = −0.45, 95% CI = [−*0.60, −0.30*], $p < 0.001$, and fathers' mental health difficulties scores, beta = −0.36, 95% CI = [−*0.54, −0.19*], $p < 0.001$), as well as positive association with parent-reported children's prosocial behaviors since the pandemic began, beta = 0.21, 95% CI = [0.*05, 0.38*], $p < 0.05$, controlling for family education level. That is, one standard deviation increase in parental positivity score was associated with 0.45 standard deviation decrease in maternal mental health score and 0.36 standard deviation decrease in paternal mental health score, and associated with 0.21 standard deviation increase in children's prosocial behaviors score, keeping everything else constant.

Since the pandemic began, more coparenting support was associated with increased parent engagement, beta = 0.27, 95% CI = [0.*11, 0.43*], $p < 0.01$, and parent report of increased prosocial behaviors (beta = 0.18, 95% CI = [0.*02, 0.35*], $p < 0.05$), controlling for family education level. That is, one standard deviation increase in coparenting support score was associated with 0.27 standard deviation increase in parent engagement score and 0.18 standard deviation increase in the prosocial behaviors score, keeping everything else constant.

## Moderation Effects

To test the moderation effects, four interaction terms (economic stressors × parent positivity, economic × coparenting support, social stressors × parent positivity, social stressors × coparenting support) were added to the main effects model. We report three significant interactions.

First, parent positivity during the pandemic, a protective factor, moderated the association between increases in economic stressors since the pandemic and maternal mental health scores during the pandemic, beta = 0.26, 95% CI = [0.*09, 0.42*], $p < 0.01$. The positive association between economic stressors and maternal mental health difficulties was reduced for mothers who lived in homes with high levels of parent positivity.

**TABLE 3** | Zero-order Correlations for All study Variables Aggregated except for Parental Mental Health.

| | Study Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Economic stressors | – | | | | | | | | |
| 2 | Social stressors | 0.19* | – | | | | | | | |
| 3 | Parent positivity | −0.10 | −0.07 | – | | | | | | |
| 4 | Coparenting support | 0.01 | −0.14 | 0.42** | – | | | | | |
| 5 | Mothers' mental health | 0.15 | 0.08 | −0.46** | −0.26** | – | | | | |
| 6 | Fathers' mental health | 0.25** | 0.06 | −0.35** | −0.18 | −0.01 | – | | | |
| 7 | Parent engagement | −0.17 | −0.34** | 0.17* | 0.31** | −0.01 | −0.10 | – | | |
| 8 | Child socioemotional problems | −0.03 | 0.19* | −0.07 | −0.03 | 0.32** | −0.03 | 0.05 | – | |
| 9 | Child prosocial behaviors | 0.21** | 0.06 | 0.24** | 0.26** | −0.11 | −0.01 | 0.03 | 0.17* | – |

*Due to missing data on some variables, not all responses sum to 142. *$p < 0.05$; **$p < 0.01$*

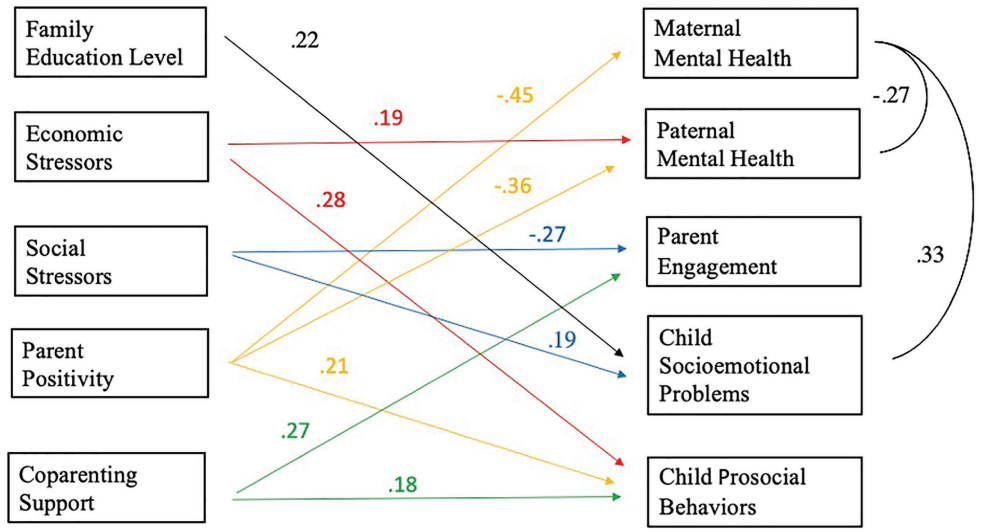


**FIGURE 1 |** The roles of Economic stressors, Social stressors, Parent positivity, and Coparenting support on maternal and paternal mental health, Parent engagement, Child socioemotional problems and Child prosocial behavior controlling for family education level. *Note*. All predictors are mean-centered. For parsimony, errors and non-significant coefficients are omitted from the figure. All standardized coefficients and covariances are significant at $p < 0.05$. Significant paths are color-labeled based on the predictors.

Simple slopes analysis (**Figure 2**) showed that, mothers' mental health difficulties were the highest at low level of parent positivity (−1 SD). At the low level of parent positivity, the association between economic stressors and maternal mental health was negative and non-significant ($b = -0.63$, s.e. = 0.57, $p = 0.27$). At the average level (sample mean), the relationship was positive and non-significant ($b = 0.57$, s.e. = 0.40, $p = 0.16$). Finally, at high level of parent positivity (+1 SD), the relationship was positive and significant ($b = 1.76$, s.e. = 0.57, $p < 0.01$). So, for low and average levels of positivity, mothers' mental health difficulties remained higher independent of the number of economic stressors. Meanwhile, high level of parent positivity kept mothers' mental health difficulties lower, even though this protective effect became weaker as economic stressors accumulated.

Second, parent positivity during the pandemic, a protective factor, moderated the association between increases in economic stressors since the pandemic and parent engagement during the pandemic, beta = 0.27, 95% CI = [*0.11, 0.44*], $p < 0.01$. Simple slopes analysis (**Figure 3**) showed that, parent engagement were the highest at low level of parent positivity (−1 SD). At the low level of parent positivity, the association between economic stressors and parent engagement was negative and significant ($b = -3.6$, s.e. = 0.99, $p < 0.$ 001). At the average level (sample mean), the relationship was negative and non-significant ($b = -1.2$, s.e. = 0.71, $p = 0.09$). Finally, at high level of parent positivity (+1 SD), the relationship was positive and non-significant ($b = 1.15$, s.e. = 1.03, $p = 0.27$). So, for low and average levels of positivity, parent engagement decreased as the number of economic stressors accumulated. For high level of positivity, parent engagement increased as economic stressors accumulated. Therefore, average or high level of parent positivity buffered parents from the negative effect that economic stressors had on parent engagement.

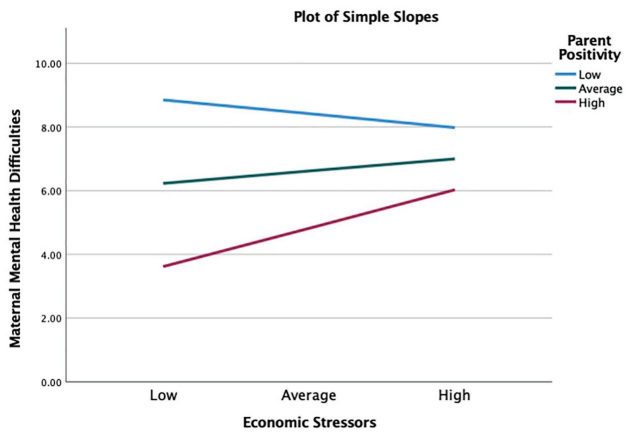


**FIGURE 2 |** Parent positivity moderating the effect of economic stressors on maternal mental health. High = 1 standard deviation above the sample mean, average = sample mean, and low = 1 standard deviation below the sample mean.

Third, more coparenting support since the pandemic began, a protective factor, moderated the association between increases in economic stressors since the pandemic began and more paternal mental health difficulties during the pandemic, beta = −0.30, 95% CI = [*−0.54, −0.06*], $p < 0.05$. The association between economic stressors and fathers' mental health difficulties was significantly reduced for fathers who lived in homes with high levels of coparenting support. Simple slopes analysis (**Figure 4**) showed that, at low level of coparenting support (−1 SD) during the pandemic, the association between economic stressors and paternal mental health was positive and significant ($b = 2.50$, s.e. = 0.61, $p < 0.001$). At the average level (sample mean), the association was also positive and significant ($b = 1.23$,

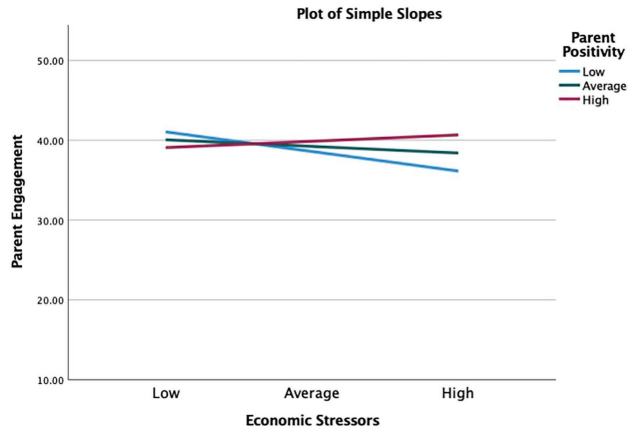


**FIGURE 3 |** Parent positivity moderating the effect of economic stressors on maternal mental health. High = 1 standard deviation above the sample mean, average = sample mean, and low = 1 standard deviation below the sample mean.

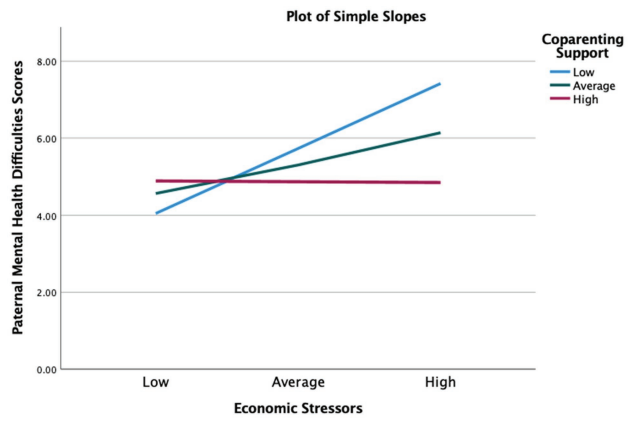


**FIGURE 4 |** Coparenting support moderating the effect of economic stressors on paternal mental health. High = 1 standard deviation above the sample mean, average = sample mean, and low = 1 standard deviation below the sample mean.

s.e. = 0.49, $p < 0.05$). Finally, at high level of coparenting support (+1 SD), the association was negative and non-significant ($b = -0.03$, s.e. = 0.71, $p = 0.97$). So, for low and average level of coparenting support, fathers' mental health difficulties increased significantly as family economic stressors accumulated. However, at the high level of coparenting support, fathers' mental health did not increase as economic stressors accumulated. Therefore, high level of coparenting support buffered fathers from the negative effect that economic stressors had on fathers' mental health difficulties.

## DISCUSSION

The ongoing pandemic has waned in some parts of the world but continues to devastate many communities world-wide. In its wake, it has left a trail of destruction and suffering with as of yet unknown long-term consequences. The results from our analysis can help us understand the impact of pandemic-related economic and social stressors on family functioning in an economically and diverse sample of families. We examine both risks and protective factors, which can help policymakers and practitioners allocate resources judiciously and build on the resilience of these families to support their wellbeing. First, our data show that about 40% of low-income parents reported job loss and more than half of these parents struggle to their make ends meet due to the pandemic. Approximately a quarter of our participants have had some exposure to the virus and more than a third had no access to childcare (see **Table 2**). Given that the sample was predominately Latino and data were collected in the summer of 2020, these rates of COVID-19 exposure were likely modest in comparison to rates now in which Latinos are a disproportionately larger number of cases and fatalities in the U.S (Center for Disease Control and Prevention, 2021). Overall, our results align with other surveys of parents during the pandemic that have found that the majority of mothers and fathers surveyed reported increased financial strain and more than a third experienced increased social stress (Brown et al., 2020; Gassman-Pines et al., 2020). As studies conducted with international samples have shown, the economic stresses of COVID-19 crisis have worsened parents' mental health and stress, especially for fathers in our sample, but also increased children's prosocial responses to the economic stress experienced by their parents (Francisco et al., 2020; Golding et al., 2021; Westrupp et al., 2021). But, as we show in this study, there are subtle but important differences in the ways mothers, fathers, and children's wellbeing have been affected by the pandemic.

There are four key findings of the present research. First, consistent with our hypothesis, we find that half a year into the pandemic parents experienced similar increases in risk factors – social and economic stressors--with similar consequences for family functioning, but with some exceptions. Only fathers reported more mental health difficulties during the pandemic in response to increased economic risk. But, both parents who reported more economic stressors since the pandemic also observed that their children behaved more prosocially (e.g., wanting to help). These findings seem counterintuitive but they are consistent with studies showing that children are taught at a young age to respond with concern and love when they see someone in distress. In this sense, these findings align with previous work with Latinx families with adolescent children, in which parental financial strain was associated with increases in youth's prosocial behaviors, especially helping behaviors (Davis et al., 2018, 2020). In a more recent study of parents of children of 8 years and younger, COVID-19 pandemic-related financial and mental health stresses were similarly associated with increases in children's prosocial behaviors (removed for blind review). The contribution that children's positive reactions can have on family functioning needs to be considered, supported, and encouraged.

Second, both parents reported experiencing similar increases in social stressors (i.e., exposure to COVID and disruption in

childcare arrangements) since the pandemic began with similar negative repercussions for family functioning. Unexpectedly, we found no adverse effects specifically on mothers' or fathers' mental health among the parents in our sample who reported pandemic-induced social stressors. Being exposed to the virus or having no access to childcare for their young children did not significantly worsen their mental health or the perception they had of their children's prosocial behaviors. However, as expected, it substantially undermined their perception that their children were misbehaving such as having more tantrums, and engaging in aggressive behaviors such as hitting. And social stressors were related to less time spent with their children in fun activities such as playing or reading. Disruption of childcare arrangements and more COVID-19 contact likely depleted parents' reserves and increased stress, which can influence children's behaviors and parents' risk for negative parenting such as maltreatment (Brown et al., 2020). In a study of the protective benefits of childcare, Larose and colleagues (2020) found that for families experiencing adversity, parent care was associated with more child externalizing behaviors as compared to childcare attendance.

Although parents who are stressed tend to perceive their children's behavior more negatively, it is also the case that children who are in very stressful situations might have a difficult time coping with sudden changes. The pandemic completely and abruptly changed the childcare environments for many children. It is likely that children who could not understand why they are not able to attend childcare and interact with their friends and teachers as they did before the pandemic, might throw more temper tantrums and be irritable to show their frustration. Children's misbehaviors might also indicate more pandemic-induce family conflict or because everyone is at home at the same time parents have more engagement with their children and more opportunities to witness more problematic behaviors. The connections among social stressors, lower parental engagement, and more problematic behaviors in children are worrisome because the pandemic is ongoing and many parents are dealing numerous contextual challenges such as the aftermath of a COVID-19-related sickness or death due or continued inability to find affordable and consistent childcare.

Our findings are generally consistent with past studies that parents who experience a lot of stress tend to behave less positive toward their children (Brown et al., 2020; Calvano et al., 2021) and extend this literature by showing that some social stressors, in particular changes in childcare arrangements, have negative consequences for fathers, and not just mothers. Feeling anxious and stressed out about getting the virus, passing it to their families, and not having a safe and reliable place for their children have potentially detrimental effect on mothers and fathers with dire consequences for children. Disruption of childcare arrangements and more COVID-19 contact likely depleted parents' reserves and increased stress, which can influence children's behaviors and parents' risk for negative parenting such as maltreatment (Brown et al., 2020). In a study of the protective benefits of childcare, Larose and colleagues (2020) found that for families experiencing adversity, parent care was associated with more child externalizing behaviors as compared to childcare attendance. Programs and policies need to prioritize supporting fathers and mothers by ensuring that reliable and high-quality care and acknowledging that the childcare is also a "father issue."

Third, the silver lining in these findings is that in addition to the real increases in risks experienced by our families, they also reported strengths – or promotive factors – that could help them get through these difficult times. In general, both parents reported similar strengths with one exception. As hypothesized, parents who reported feeling more positive about the future also reported that they felt less stressed and depressed during the pandemic and observed that their children had more prosocial behaviors compared to before the pandemic. Maintaining a positive attitude and hope for the future has shown to be associated with less depression, more adaptation, and general good outcomes in adults (Taylor et al., 2010, 2012; Schug et al., 2021). Programs should build into their services specific attention not just to decreasing depressive symptoms but also to supporting and maintaining positivity and hope for the future.

Another source of support and strength for our families was the support they gave each other in their role as parents. Consistent with our hypothesis, parents who reported a more supportive coparenting relationship compared to before the pandemic also observed more prosocial behaviors in their children and reported engaging in more activities such as reading, or playing with their children since the pandemic began. An extensive literature has consistently shown that parents who support each other as parents are more likely to have better outcomes for themselves and their children (Cabrera et al., 2009; Palkovitz et al., 2013; Choi and Becher, 2018; McRae et al., 2021). Our findings contribute to this literature and show interdependence of family functioning: improving parent–parent relationship spills over in beneficial ways to the father- and mother–child relationships. Collectively, these results suggest that early on in the pandemic, families were trying to cope with these social and economic stressors and that families without economic help would likely continued to feel less positive and perhaps decreased their engagement with children. Given that possibility and our results, policymakers and programs need to support parents' mental health as well as provide economic relief (McFarlane et al., 2017).

Finally, as hypothesized, we identify two dimensions of family dynamics that seem to *protect* families against the adverse effects of COVID-19-related stressors on their wellbeing. Identifying stressors and how they impact family functioning is critically important, but it is just as critical to identify the support systems that families have in place to help them deal with adverse situations. Consistent with our hypotheses, we find evidence that parent positivity and coparenting support, promotive factors -- are instrumental in helping parents stay less stressed and anxious. In other words, these factors protect parents from the negative effects of stress on their mental health. And, here again, we find different protective factors for fathers and mothers. We find strong evidence that the negative association between economic stressors and fathers'

mental health difficulties is attenuated when parents report high levels of coparenting support and high levels of positivity. In particular, parent positivity attenuated the association between economic stressors and mothers' mental health whereas coparenting support mitigated the association between economic stressors and fathers' mental health. Our findings are consistent with a large body of research showing that certain family characteristics operate as buffers or protective factors at particular levels (Davis et al., 2018, 2020), but go beyond it by pointing to more targeted approach to intervening with mothers and fathers and suggest two distinct pointes of intervention. The importance of the coparenting relationship for fathers' mental health and optimism for mothers' mental health cannot be emphasized enough. We know that parents who are less anxious and depressed tend to be more positive parents, which is important for children's wellbeing (e.g., Catalino et al., 2014). Investment in both mothers' and fathers' mental health should be a priority for programs. Our findings present a coherent narrative that supporting and investing in parents' mental health, not just to relieve depression and stress but also to strengthen being hopeful and positive about the future and supporting the coparent relationship are significant mechanisms that can promote wellbeing and protect families against the negative effects of adversity and challenges.

### Limitations

The study is of course not without limitations. First, it is difficult to reveal the directions of associations with a cross-sectional design. Although moderation effects were tested, longitudinal studies are essential for better understanding of the underlying mechanisms between pandemic-related risks and familial functioning. Second, not all items from the original scales were included for several variables. The number of items included in the questionnaire were shorten to decrease the burden on our respondents, who were already very stressed by the pandemic. Therefore, it is not possible to compare these outcomes with the norms established by these scales. Although the items selected for this study have overall adequate content coverage, this could compromise the validity of measures with fewer items because the items that are deleted may contain content that's important to the concept one is measuring. Third, because of time, logistics, and limited funds we were not able to directly assess children. Although our socioemotional measures are summed across both parents when both parents responded, thus somewhat reducing the measurement error, using parents' report of children's behaviors is not ideal. Last but not least, our models account for relatively small amount of variance in the child outcome measures. About 14% of child socioemotional problems and 18% of child prosocial behaviors are accounted for.

### Conclusion

In summary, these results make clear that the consequences of the economic and social pandemic-related stressors on family functioning are still revealing themselves and are similar but also different for mothers and fathers. In a relatively short period of time, the pandemic has drastically and dramatically altered many aspects of our lives, including children's, in ways that have yet to be known. Understanding how mothers and fathers use their resources, including psychological resources, to protect themselves and their families is now more important than ever, as the economic and social cost of the pandemic may be the most damaging and enduring that we have experienced in a generation.

## DATA AVAILABILITY STATEMENT

The summary data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Office for Human Research Protections, University of Maryland, College Park and the Committee for Protection of Human Subjects at the University of California, Irvine. The patients/participants provided their written informed consent to participate in this study.

## AUTHOR CONTRIBUTIONS

NC and SR conceived and designed the study. MH, JR, TC, AA, AM, and MK collected the data and coded the data. MH and JR performed the statistical analyses. NC and MH contributed to the analyses. TC, AA, AM, and MK conducted the literature review, and contributed equally. MH and NC wrote the manuscript, SR, TC, AA, and AM provided feedback/writing of some sections, and all authors provided feedback. All authors edited and gave final approval for publication and were accountable for this work.

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# *COPEWithME*: The Role of Parental Ability to Support and Promote Child Resilient Behaviors During the COVID-19 Emergency

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The COVID-19 pandemic has led to lockdown in many countries and Italy was the first one interested in Europe. The lockdown strategy is an essential step to curb the exponential rise of COVID-19 cases, but it is very demanding for the population involved and especially for children and their families. The aims of the present study are: (a) to explore the psychometric properties of the *COPEWithME* questionnaire, a new tool to evaluate parents' ability to support and promote child resilient behaviors, (b) to investigate the relation between parents' resilience and their ability to support and promote child resilient behaviors with child resilience and child stress-related behaviors assessed during the COVID-19 outbreak. Participants ($N = 158$ mothers, with 6- to 11-years-old children, 53% female), who were volunteers and anonymous, filled out an online questionnaire composed by CD-RISC 25, PMK-CYRM-R, and *COPEWithME*. With regard to the *COPEWithME,* validation exploratory factor analyses revealed a one-factor solution of 18 items. The *COPEWithME* positively correlates both with mothers' resilience and with children's resilience. Mediation analysis showed that the association between mothers' resilience and children's stress-related behaviors was mediated by the mothers' ability to support and promote child resilient behaviors. The *COPEWithME*, to our knowledge, is the first measure of parents' ability to support and promote resilient behaviors in school-age children, a key parenting skill that may help children in dealing with stressful situations such as the COVID-19 outbreak. These findings represent useful insights to advance mental health interventions in the post-pandemic phases suggesting focusing on a family's resources and resilience processes.

**Keywords: COVID-19, stress-related behavior, family well-being, parental resilience, child resilience**

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## INTRODUCTION

The novel coronavirus (COVID-19) rapidly spread all over the word, affecting many countries severely. Italy was the first European country affected by the COVID-19 pandemic outbreak. To ensure infection control and prevent disease transmission, lockdown measures have been implemented, such as quarantine, social-distancing, school closure, and suspension of non-essential activities, requiring in many cases remote

working and families' adjustment to 24/7 interaction. Despite these strategies having proven to be effective in containing the spread of the virus, several studies reported that the COVID-19 outbreak has generated a considerable amount of stress among the population (Xie et al., 2020), resulting in high psychological costs and several negative outcomes for children and their families (Liu et al., 2020). As a result, the risk for developing negative behavioral and psychological outcomes in the developmental age is real and warrants attention. Besides, it is important to consider that addressing risk factors alone loses sight of those protective factors, such as resilience, that are essential to advancing science, services, education, and policies aimed at understanding how children and adolescents respond to crises and how they can be supported (Dvorsky et al., 2020). We refer to resilience as a process, built through learning and memory mechanisms (DiCorcia and Tronick, 2011; Lee et al., 2016), which support the individual and promote well-being when exposed to high levels of stress or adversity (Ungar and Theron, 2020). In fact, recent studies in this regard are suggesting that resilience is not a fixed trait, but instead it can be learned and improved (Booth and Neill, 2017). Due to global lockdown and social distancing, the nuclear family appears to be the main place of learning potential functional coping and adaptation strategies in the context of the COVID-19 outbreak. In this view, the current work would like to better understand how parents' resilience and their ability to teach resilient behaviors to children can influence both child resilience and stress-related behaviors assessed during the COVID-19 outbreak (Prime et al., 2020).

## Families Dealing With Pandemic

### Children

Different evidence suggested that the COVID-19 emergency negatively affected children's physical and psychological well-being (Jiao et al., 2020; Liu et al., 2020). School closure and changing in children's daily routine might interfere both with healthy habits such as outdoor activity, daylight exposure, and with psychological adjustment due to the social distancing measures that prevented in-person relationships with peers for a long time (Cluver et al., 2020). Studies conducted during previous pandemics (i.e., A-H1N1) reported that quarantine and social distancing measures were associated with an increase of 30% of post-traumatic stress disorder rates and psychological distress in children (Sprang and Silman, 2013). As far as the current pandemic emergency concerns, data collected in the COVID-19 affected areas in China revealed that children aged 3 to 18 displayed high degrees of clinginess, inattention, and irritability. It was observed that preschool children displayed fear of losing their caregivers, while school-aged children manifested higher levels of inattention (Jiao et al., 2020). Similarly, a study conducted on a sample of 3,245 Italian children and adolescents revealed that behavioral problems were present in 65% of preschool children and in 71% of school-aged children. Specifically, children under the age of 6 years displayed increased irritability, sleep disorders, and internalizing problems, and children over the age of 6 years showed higher levels of somatic complaints, sleep problems, emotional instability, and irritability (Uccella et al., 2021).

However, beyond addressing adverse outcomes, it is important to focus on protective factors as well as they can buffer the effects of adverse experiences exposure (Dvorsky et al., 2020). Individual resilience, for example, has been shown to preserve psychological well-being even after adverse and traumatic life events in children (Banyard et al., 2017). Resilience can be defined as an individual process that enables positive adaptation in the face of stressful situations and is generally regarded as a multidimensional concept that includes learning and memory processes (DiCorcia and Tronick, 2011; Lee et al., 2016). Several researches identified a wide range of protective and promoting factors associated with positive adjustment in response to adversities determined by both individual and external factors (Zolkoski and Bullock, 2012; Dvorsky et al., 2020). What is implied is that the ability to be resilient can be developed and enhanced from early childhood, throughout the lifespan. Due to measures to prevent the spread of COVID-19, the relationship with the primary caregivers became the core systems supporting the child's ability for self-regulation, learning, problem-solving, motivation to adapt, persistence, and hope, all crucial skills for the development of child resilient behaviors (Masten, 2011). Therefore, understanding the relation between parents' and children's resilience comes in the light of evidence showing that children's adjustment is largely contingent on the overall climate and relationships in a family (Browne et al., 2015).

### Parents

The COVID-19 emergency has put a strain not only on children, but on families' systems in general disrupting habits and requiring a substantial reorganization of time and space, too (Prime et al., 2020). A recent survey conducted in the U.K. showed that parents were experiencing increased stress during the coronavirus outbreak, as they were trying to balance caring responsibilities, home schooling, and working from home (Power, 2020). Evidence coming from prior pandemics (i.e., Ebola) suggested that parents experience greater psychological distress compared to adults without children (Kamara et al., 2017). Moreover, parents are also at higher risk of burnout due to chronic rates of parental stress along with inadequate resources and support (Griffith, 2020). This is of particular concern because parents must manage children 24/7 because of social confinement and school closure. Notably, family factors such as parental distress and irritability have an impact on child outcomes by exacerbating negative and non-functional reactions (Mikolajczak et al., 2018). Prime et al. (2020) recently published a conceptual model illustrating the complex ways in which pandemic disruptions and stress will infiltrate and impede family functioning through negative effects on caregiver well-being and cascading, bidirectional effects on child adjustment (Prime et al., 2020). Their model also aligns with another relevant theoretical model of caregiver resilience by Gavidia-Payne et al. (2015), in which child and family characteristics impact family functioning which, in turn, affects caregiver well-being and self-efficacy, all contributing to quality and resilient caregiving. Moreover, recent research on Italian women revealed that mothers manifest higher symptoms of anxiety disorders compared to mothers without children during the COVID-19 lockdown (Benassi et al., 2020).

Besides, research highlights several caregivers' psychosocial competences that may assist families' and children's coping and adaptation strategies during an adverse situation (Dercon and Krishnan, 2009). Parental resilience is defined as parents' ability to deliver competent, quality parenting to children despite adverse circumstances (Gavidia-Payne et al., 2015). This process has been found to play a key role in families dealing with stressful situations. Researchers have found that children who have been exposed to different kinds of trauma (e.g., war trauma and natural disaster) tend to have a higher level of psychological well-being when the adults in their lives are available to soothe and help them with their overwhelmed emotions (Costa et al., 2009; Diab et al., 2019).

However, to the best of our knowledge, no study has previously inquired how maternal resilience can help children facing a stressor, such as the COVID-19 pandemic, as well as their ability to teach children resilient behaviors. To answer this question, we developed a specific tool to assess parental perception of teaching resilience to their children, namely, the *COPEWithME*.

## The *COPEWithMe* Questionnaire

The child's functional adaptation strategies and individual resilience can be promoted and supported by those systems that are very close to the child, such as relationships with competent and caring adults (i.e., parents, grandparents, teachers, and educators). Dynamic developmental system models of resilience in children highlight that child resilience can depend not only on the adaptive systems within the child, but also on the resilience of their family members (Masten and Cicchetti, 2016; Hostinar and Miller, 2019). During the lockdown period, the close family system became the primary venue for supporting coping and adaptation in the COVID-19 outbreak. In the pandemic scenario, the role of parents was further emphasized by the lack of children's contact with other adults (e.g., teachers and grandparents), assuming a unique key role in promoting and supporting child resilience and their children's positive adjustment (Doty et al., 2017; Masten and Motti-Stefanidi, 2020).

As during previous pandemics or other traumatic events such as a natural disaster (e.g., Hurricane Katrina), parents had to take care of all the children's needs, various organizations and structures have mobilized with the aim of providing psychological support to families. Beyond national and international organizations specialized in health issues (e.g., WHO, IMH), in times of crisis, other channels, such as blogs and social media, play a key role in supporting and helping families (Wiederhold, 2020). Due to the global lockdown and social distancing, these kinds of resources have proven to be essential, offering useful resources to cope with the virus outbreak (Saud et al., 2020). In this regard, several blogs (e.g., Pandemic Parenting, Info About Kids, Chelsea Lee Smith) gave parents specific advice on how they can represent a model of resilience implementing behavioral, emotional, and cognitive processes that could help their children in the enhancement of coping skills and abilities (child resilience). Specific tips included: make the child practice waiting patiently, give the child independence to try new activities, let the child deal with their emotions by not belittling their feelings, and not giving them everything they want.

However, to the best of our knowledge, no studies have investigated whether these strategies were valid, reliable, and effective in successfully supporting and promoting children's resilient behaviors during COVID-19. To this aim, the *COPEWithME* questionnaire was developed including as items key behaviors mostly suggested to parents from institutional guidelines and social tools to promote resilience in children. In the current work, after validating and examining the psychometric properties of this questionnaire, we explored possible associations between parents' and children's resilience, parents' ability to support and promote resilient behaviors in their school-aged children, and children's resilience and stress-related behaviors observed during lockdown due to the COVID-19 pandemic in Italy.

## Aims

The overall aim of the present study was to explore the role of parents' resilience and their ability to support and promote child resilient behaviors toward child resilience and child stress-related behaviors during the COVID-19 outbreak. To this end, three specific aims were outlined. First, starting from the literature on parents' and children's resilience and online sources of parenting advice (i.e., social tool), the questionnaire *COPEWithME* was developed and validated in order to assess parental perception of teaching resilient behaviors to their children. We expect to have a valid instrument to assess parental ability to teach resilient behaviors and to implement behavioral, emotional, and cognitive abilities that could enhance coping skills in their children. Second, the impact of the COVID-19 outbreak on children's well-being was evaluated and, in line with previous research, an increase in stress-related behaviors was expected. The last aim of the study was to test if parental resilience could influence children's stress-related behaviors through their ability to support and promote child resilient behaviors and child resilience. It was expected that greater parental resilience could be associated with higher ability of teaching it to the child and with better child individual skills and resources and, finally, to less stress-related behaviors assessed during the COVID-19 outbreak.

# METHOD

## Participants and Procedures

Data were collected immediately after the end of the first Italian lockdown between May 18 and June 4, 2020, using an online anonymous survey. All participants were parents of children aged between 6 and 11 years, recruited through snowball sampling. Parents, who were contacted using a mailing list, signed a consent to be informed via e-mail. Participants' inclusion criteria included: be more than 18 years old, be an Italian native speaker, and be a parent of a child between the ages of 6 and 11. They were asked to follow a link that led to the survey, and they were informed that pressing the link was deemed as consent to participate. The survey was completed by 166 parents (95.2% mothers) who experienced containment and restrictive measures due to the international health emergency (Prime

Minister Decree, March 9, 2020; Government, 2020). The study protocol was approved by the Psychology Ethics Committee of the School of Psychology, University of Padua (number of protocol: D6B09283C9694D9C8EFCFBD33C713130).

## Measures

### Parental Perception of Teaching Resilient Behaviors

The original version of the *COPEWithME* questionnaire administered in the online survey consisted of 24 items describing possible behaviors the parent taught to their child to be resilient (i.e., be able to deal with it on their own, when they have difficulties doing something, without a parent immediately rushing to help them). For each item, parents were asked to assign a score on a 5-point scale, where 0 means "not at all" and 4 corresponds to "very much." In this scale, the higher the score, the greater the parent effort to teach resilience. The final version of the *COPEWithME* included 18 items.

### Sample Demographics and COVID-19 Related Variables

The socio-demographic section included items asking general information (e.g., parent's age, civil status, educational level, who responded to the survey) and items regarding family composition and characteristics (e.g., children's age and gender). A specific section was devoted to information about the impact of containment on the household on their work organization.

### Parental Resilience

In order to evaluate parental resilience, the Italian version of the Connor-Davidson Resilience Scale 25-Item Score (CD-RISC 25, Connor and Davidson, 2003) was used. The scale consists of 25 items rated on a 5-point Likert scale, ranging from 0 (*not at all agree*) to 4 (*totally agree*). The total score can range from 0 to 100 and the higher the score obtained, the greater the subject's resilience. Regarding the reliability in this study, Cronbach's α was measured indicating a very good internal consistency of the scale ($\alpha = 0.93$).

### Child's Individual Resources

For the purpose of the present study, to assess a child's individual resources, the Personal Resilience subscale of the Person Most Knowledgeable version of the Child and Youth Resilience Measure-Revised (PMK-CYRM-R) was used (Jefferies et al., 2018). This subscale of PMK-CYRM-R includes 10 items to be answered by the parents on a 5-point Likert scale, ranging from 0 (*not at all*) to 4 (*very much*), with a maximum total score equal to 50 points. A higher score is associated with a greater degree of perceived resilience. In this subscale, a child's individual resilience includes personal and social skills (such as ability of problem solving, cooperation, and awareness of personal strengths). The reliability measure of this subscale used for this study obtained a Cronbach's α of 0.76, indicating an acceptable internal consistency.

### Child's Stress-Related Behaviors

In order to assess the impact of COVID-19 outbreak on child well-being, in terms of displaying a specific target behavior, an *ad hoc* list of eight stress-related behaviors was created. Stress-related behaviors included: (1) difficulty standing still; (2) concentration difficulties; (3) nervousness and irritability; (4) tendency to cry for no reason; (5) difficulty falling asleep; (6) restless sleep with awakenings; (7) food refusal; and (8) excessive food seeking. Parent was asked to indicate the presence of each behavior before (i.e., past stress-related behavior, which referred to the presence of the child's stress-related behavior before the COVID-19 outbreak) and during the confinement period (i.e., actual stress-related behavior, which referred to the presence of the child's stress-related behavior during the COVID-19 outbreak).

## Data Analysis Plan

Data were analyzed with the IBM SPSS 22 software and PROCESS macro (Hayes, 2012). Variables were first examined for the presence of outliers and tested for normal distribution of the items (kurtosis and asymmetry ranging from −1 to +1). Exploratory factor analysis (EFA) was run in order to test the factor structure of the *COPEWithME*. A maximum likelihood exploratory factor analysis with a Promax rotation was performed for factor extraction. *COPEWithME* internal consistency was then evaluated through McDonald's ω. Regarding children's stress-related behaviors, paired sample *t*-tests were performed to analyze possible changes between children's past stress-related behavior and actual stress-related behavior. Once stress-related behaviors that significantly increased during the confinement experience were identified, another maximum likelihood exploratory factor analysis with a Promax rotation was performed to identify possible overall factors related to a child's stress-related behaviors. Preliminary correlations were performed in order to test associations between the included variables (parents' and children's resilience, *COPEWithME* score, children's stress-related behaviors). Finally, a sequential mediation model was tested, including parents' resilience as a predictor, *COPEWithME* score, and children's resilience to cope with stressful situations as a mediator, with children's stress-related behaviors as an outcome. The model was controlled for child's age.

# RESULTS

## Descriptive Statistics

Data were collected from 166 families whose socio-demographic characteristics are summarized in **Table 1**.

Descriptive statistics regarding parental resilience, *COPEWithME* scores, PMK-CYRM-R, and children's stress-related behaviors (pre- and during the COVID-19 outbreak) are summarized in **Table 2**.

## *COPEWithME* Factor Structure: Exploratory Factor Analysis (EFA) and Reliability

A maximum likelihood exploratory factor analysis with a Promax rotation was conducted on the 24 items of the original version of the *COPEWithME*, in order to explore the factor structure and to examine the quality of the items in our sample. An initial analysis was run to obtain eigenvalues for each component

**TABLE 1 |** Participants' socio-demographic characteristics.

| **MOTHERS' CHARACTERISTICS (*N* = 158)** | | |
|---|---|---|
| Age (range) | *M* = 43.27 years | *SD* = 4.20 |
| | N | % |
| | *F* = 158 *M* = 8 | 92.54.8 |
| **Marital Status (*N*= 158)** | | |
| Married/Cohabitant | 150 | 94.9 |
| Divorced/Separated | 7 | 4.4 |
| Single | 1 | 0.6 |
| **Education (*N* = 158)** | | |
| Middle school | 16 | 45.6 |
| High school | 72 | 25.3 |
| Bachelor degree | 40 | 10.1 |
| PhD/Master | 30 | 19 |
| **CHILDREN'S CHARACTERISTICS (*N* = 158)** | | |
| Age (range 6–11 years) | *M* = 8.88 *years* | *SD* = 1.41 |
| | N | % |
| **Gender (*N* = 154)** | | |
| Male | 72 | 48.1 |
| Female | 82 | 51.9 |

| **Parents' workplace during COVID-19 (*N* = 153)** | **N** | **%** |
|---|---|---|
| Workplace | 50 | 31.6 |
| Home (smart-working) | 50 | 31.6 |
| Workplace and home | 25 | 15.8 |
| Unemployed | 28 | 17.7 |

in the data. Six components had eigenvalues over Kaiser's criterion of 1 and in combination explained 61% of the variance. However, this method is often criticized for retaining too many factors (O'Connor, 2000; Hayton et al., 2004), so we used Horn (1965) parallel analysis (PA) and Cattell (1966) scree method to determine the number of components. The PA revealed to extract only one factor. Moreover, the scree plot shows a clear inflection after component 1 that further justifies retaining only one component. The maximum likelihood exploratory factor analysis with a Promax rotation was re-run specifying a one-factor solution. Six items were drop out from the original version of the questionnaire. Items were dropped out considering two criteria: (1) item's communalities $< 0.25$; (2) factor loadings $< |0.30|$ (Barbaranelli and D'Olimpio, 2007). **Table 3** shows the final one-factor version of the *COPEWithME*, with the included items ($N = 16$) and their factor loadings. Bartlett's test of sphericity showed that Chi-square was significant at the $< 0.001$ level ($\chi^2 = 1224.021$, $df = 153$), and the Kaiser-Mayer-Olkin measure of sampling adequacy was 0.87. This one-factor solution explained 35% of the variance. McDonald's ω for the final version of the questionnaire was 0.902, demonstrating very good internal consistency (Andrew and Jacob, 2020). To investigate the role of parents' ability to support and promote children's resilient behaviors during the COVID-19 outbreak, we computed the overall mean score of the 18 included items and considered this value in subsequent analyses.

## Child's Stress-Related Behaviors

Paired *t*-tests pointed out that from before to during the COVID-19 outbreak, all the eight behaviors assessed were significantly increased in children (**Table 4**).

Due to the significant increase of all considered behaviors, we considered stress-related behaviors during the confinement period for subsequent analyses.

A maximum likelihood exploratory factor analysis with a Promax rotation was performed to identify possible child's stress-related behaviors (during the confinement) overall factors. Two different factors emerged. The first factor (factor 1) included six stress-related behaviors which referred to children's behavioral problems; the second factor (factor 2) included two stress-related behaviors which referred to sleep problems. Cronbach's α for factor 1 was 0.73, while for factor 2 was 0.70.

The mean scores of these two factors were computed. These two scores were used for the subsequent analyses. The overall mean score for factor 1 was 1.54 ($SD = 0.59$); the overall mean score for factor 2 was 1.67 ($SD = 0.43$).

## Preliminary Correlations

Regarding the relations between parental and child resilience, no significant correlation emerged between CD-RISC 25 and PMK-CYRM-R Personal Resilience subscale ($r = 0.145$, $p = 0.070$). Parental resilience was positively correlated also with the *COPEWithME* score: the more resilient a parent is, the better he or she teaches effective strategies to cope with stressful situations to his or her child ($r = 0.311$, $p < 0.001$). Finally, parental ability to teach effective strategies to cope significantly correlates with better child resilience to cope with COVID-19 ($r = 0.562$, $p < 0.001$). Regarding children's stress-related behaviors observed by parents during the confinement, a higher mean score of factor 1 (i.e., higher level of stress-related behavior) was significantly related to (a) poorer parental resilience ($r = -0.213$, $p = 0.007$), (b) poorer parental ability to support and promote resilient behaviors ($r = -0.319$, $p < 0.001$), and poorer child resilience ($r = -0.249$, $p = 0.002$). No significant correlation emerged with the mean score of factor 2.

## Sequential Mediation Model

The model included parents' resilience as a predictor, *COPEWithME* score as first mediator, child resilience as second mediator, and child stress-related behaviors assessed during the COVID-19 outbreak as outcome (**Figure 1**). The model was controlled for the child's age. As a result, besides the significant positive effect of parental resilience on *COPEWithME* scores ($b = 0.011$, *s.e.* $= 0.003$, $p < 0.001$) and the one of *COPEWithME* scores on child resilience ($b = 3.428$, *s.e.* $= 0.452$, $p < 0.001$), we found a significant negative effect of parental ability to support and promote child resilient behaviors and child stress-related behaviors assessed during the COVID-19 outbreak ($b = -0.178$, *s.e.* $= 0.069$, $p = 0.011$). As parents' ability to support and promote child resilient behaviors decreased, child stress-related behaviors related to the COVID-19 pandemic

**TABLE 2 |** Descriptive statistics of the included variables.

| | M | SD |
|---|---|---|
| CD-RISC 25 | 63.78 | 16.86 |
| *COPEWithMe* | 2.599 | 10.47 |
| PMK-CYRM-R | 22.56 | 0.59 |

| Child stress-related behaviors | Past stress-related behavior | | Actual stress-related behavior | |
|---|---|---|---|---|
| | M | SD | M | SD |
| Factor 1 | | | | |
| Difficulty standing still | 1.53 | 0.63 | 1.82 | 0.73 |
| Concentration difficulties | 1.65 | 0.58 | 2.07 | 0.69 |
| Nervousness and irritability | 1.61 | 0.54 | 1.99 | 0.68 |
| Tendency to cry for no reason | 1.26 | 0.45 | 1.54 | 0.72 |
| Food refusal | 1.13 | 0.33 | 1.23 | 0.47 |
| Excessive food seeking | 1.20 | 0.45 | 1.39 | 0.66 |
| Factor 2 | | | | |
| Difficulty falling asleep | 1.27 | 0.52 | 1.72 | 0.77 |
| Restless sleep with awakenings | 1.22 | 0.47 | 1.38 | 0.58 |

increased. Overall, the three predictors explain the 16% of the variance observed in child stress-related behaviors assessed during the virus outbreak ($F_{(4,149)} = 7.24$, $p < 0.001$). Moreover, the indirect effect of parental resilience on child stress-related behaviors through *COPEWithME* scores is also significant ($b = -0.002$, *boostrap s.e.* = 0.001, *boostrap 95% C.I.*: −0.0048: −0.0003). Parents' ability to support and promote child resilient behaviors to deal with stressful situations emerged as a crucial factor in mediating the relation between parents' resilience and children's stress-related responses to the COVID-19 outbreak. The direct effect was not significant ($b = -0.003$, *boostrap s.e.* = 0.002, *boostrap 95% C.I.*: −0.0073: 0.0006).

## DISCUSSION

The present study was designed at exploring the role of parents' resilience and their ability to support and promote child resilient behaviors in explaining child resilience and stress-related behaviors assessed during the COVID-19 outbreak. In our view, there are two main innovative aspects introduced by this work. First is the implementation of *COPEWithME* as the first tool to assess parents' ability to support and promote resilient behaviors in school age-children. Second, to the best of our knowledge, this study is one of the first to report the link between parental and children resilience in the first month after the end of quarantine in May 2020 in Italy.

The COVID-19 pandemic represents one of the most stressful recent events worldwide and poses a major challenge for the social, economic, and, above all, the psychological resources of the population, so it is very important to investigate the psychological impact of this event on families and children. In this regard, one relevant finding of the present study outlined that during the pandemic, different child stress-related behaviors significantly increased compared to before the COVID-19 outbreak. These findings are in line with several previous research studies emphasizing the dramatic effects of this pandemic in children (Gassman-Pines et al., 2020; Spinelli et al., 2020; Wang et al., 2020). It is therefore clear that children's psychological well-being must be at the heart of the post-pandemic recovery plan. Besides, apart from considering the negative effects of COVID-19, it is also important to take into account those factors that might act, at least partially, as protective factors, such as resilience and the ability to teach resilient behaviors to the most frail.

In order to assess parental perception of having taught effectively resilient strategies to their children, the *COPEWithME* questionnaire was first developed and then validated in the present study. Results showed a valid single factor structure of the *COPEWithME* final version and a strong correlation with the PMK-CYRM-R Individual Resources subscale that measures child capacity to be resilient, supporting a significative concurrent validity.

The central aim of the present research was to investigate the effects of parent resilience on child stress-related behaviors assessed during the COVID-19 pandemic, through the parents' ability to support and promote resilient behaviors and child resilience. As expected, greater parental individual resilience was associated with higher ability of teaching it to the child and with better children's skills and resources. These results are in line with previous findings (Dercon and Krishnan, 2009) that observed that parental personal competences and resources have a positive influence on children's personal coping strategies during an adverse situation. Notably, the consistency of these findings might indicate that this process is relatively independent from the type of stressful situation.

Moreover, contrary to our expectation, parental resilience does not significantly correlate and, consequently, does not directly predict child resilience. Our results seem to indicate that a child's ability to be resilient is supported by good parental function, rather than parental resilience alone. The ability of

**TABLE 3 |** *COPEWithMe* items (Italian and English version) and EFA factor loadings.

| | Italian version | English translation | Item reliabilities | Factor loadings |
|---|---|---|---|---|
| **Item** | | | | |
| 1 | Ho insegnato a mio figlio/a ad: Aspettare il proprio turno (al ristorante o alle giostre) anche senza intrattenimento (tablet, videogiochi, cibo…) | I taught my son/daughter to: Wait his turn (at restaurants or rides) even without entertainment (tablets, video games, food...) | 0.407 | 0.522 |
| 2 | Prendere buone decisioni che avranno un effetto a lungo termine, anche se non sono semplici | Make good decisions that will have a long-term effect, even if they are not simple | 0.419 | 0.580 |
| 3 | Essere consapevole che le cose che possiede non soddisfano il desiderio di felicità | Be aware that the things he owns do not satisfy his desire for happiness | 0.434 | 0.537 |
| 4 | Affrontare le difficoltà e gli ostacoli | Deal with difficulties and obstacles | 0.581 | 0.681 |
| 5 | Avere un atteggiamento positivo verso gli impegni e i compiti scolastici | Have a positive attitude toward school commitments and assignments | 0.653 | 0.741 |
| 6 | Essere paziente quando gioca con gli altri bambini (o fratelli) soprattutto quando lo disturbano nei suoi giochi | Be patient when playing with other children (or siblings), especially when they disturb him in his games | 0.453 | 0.540 |
| 7 | Autocontrollarsi con gli strumenti elettronici (ne limita l'uso solo per momenti prestabiliti) | Self-monitor the use of electronic tools (limits their use only for predetermined moments) | 0.481 | 0.529 |
| 8 | Affrontare le differenti condizioni climatiche vestendosi adeguatamente | Cope with different weather conditions by dressing appropriately | 0.395 | 0.455 |
| 9 | Quando ha difficoltà nel fare qualcosa, riuscire ad affrontarlo da solo, senza che un genitore accorra subito in suo aiuto | When he has difficulties doing something, be able to deal with it on his own, without a parent immediately rushing to help | 0.480 | 0.690 |
| 10 | Non interrompere gli altri quando parlane e sa aspettare il suo turno | Not to interrupt others when speaking and can wait his turn | 0.484 | 0.632 |
| 11 | Essere esposto/a a nuove esperienze e riuscire bene al di fuori degli ambienti a lui/lei familiari | Be exposed to new experiences and doing well outside familiar environments | 0.468 | 0.532 |
| 12 | Quando deve trovare qualcosa, cercarlo da solo | When he needs to find something, look for it himself. | 0.528 | 0.511 |
| 13 | Prendersi cura dei suoi abiti (li rimette a posto, non li lascia in giro) | Take care of her/his clothes (puts them back, doesn't leave them lying around) | 610 | 0.656 |
| 14 | Fare del suo meglio a scuola, anche se richiede dei sacrifici | Do her/his best in school, even if it requires sacrifice | 0.504 | 0.617 |
| 15 | Essere cosciente delle sue responsabilità e doveri (es. rifarsi il letto, prendersi cura della propria igiene) | Be aware of his responsibilities and duties (e.g., making his own bed, taking care of his own hygiene) | 0.615 | 0.653 |
| 16 | Riuscire a trarre il meglio da ogni situazione ed è grato/a per quello che ha | Make the best of every situation and is grateful for what she/he has. | 0.617 | 0.751 |
| 17 | Vivere i propri sentimenti, soprattutto quelli negativi, non sminuendoli e aiutandolo ad affrontarli | Experience her/his feelings, especially the negative ones, not belittling them and helping her/him to deal with them | 0.342 | 0.429 |
| 18 | Ad aiutare gli altri | To help other people | 0.313 | 0.405 |

parents to support and promote resilience positively influences children's individual resources and positive adjustment. Children that live with parents who can be models of resilience promoting behavioral, emotional, and cognitive processes can also positively adapt in the face of stressful situations.

Another unexpected result emerged from the sequential mediation model tested. It showed that the association between parent resilience and child stress-related behaviors was mediated only by the parents' ability to support and promote resilient behaviors and not even by child resilience. As a result, a significant indirect pathway linking parent resilience, *COPEWithME* scores, and child stress-related behaviors emerged showing that the more resilient the parent, the better his or her ability to teach resilient behaviors to the child and the fewer difficulties the child experienced during the pandemic. It is important to point out that resilience does not necessarily suggest immunity against situational stressors. Rather, it can be considered as the ability to process and overcome an ongoing distress (Isokääntä et al., 2019). It is possible to identify two phases that can characterize resilience: adversity (i.e., the exposure to distress in potential trauma) and positive adaptation (i.e., resilience process). Notably, the resilience process is an ongoing interaction between one's personal strengths and weaknesses, and other significant factors in the daily environment (Ungar, 2015). In this framework one can infer that since children are less fully developed socially than adults and have no context in which to process events, they require more support both to promote their resilience and to prevent behavioral problems.

Several studies documented that resilience can buffer the negative consequences of stressful life events (Luthar et al., 2000), also supporting the view that increases in parental resilience

**TABLE 4 |** Comparison between child stress-related behaviors before and during COVID-19 outbreak.

| Stress-related behaviors changes in children from before to during COVID-19 outbreak | *t* | *p* | *Cohen's d* |
|---|---|---|---|
| Difficulty standing still | −6.21 | < 0.001 | 0.42 |
| Concentration difficulties | −8.07 | < 0.001 | 0.66 |
| Nervousness and irritability | −7.63 | < 0.001 | 0.63 |
| Tendency to cry for no reason | −5.60 | < 0.001 | 0.47 |
| Difficulty falling asleep | −7.28 | < 0.001 | 0.69 |
| Restless sleep with awakenings | −4.01 | < 0.001 | 0.31 |
| Food refusal | −3.68 | < 0.001 | 0.27 |
| Excessive food seeking | −4.19 | < 0.001 | 0.33 |

could improve adaptive behaviors in children (Masten, 2011; Doty et al., 2017). In addition, confirming this previous evidence, our results expanded these findings suggesting that parental abilities to promote and support child resilient behaviors play a key role in children's positive adjustment in facing highly stressful events. As no direct effect of parent resilience on child stress-related behaviors emerged, the present findings suggest that being a resilient parent is not in itself a protective factor for the child. The significant effect emerges through the parent's ability to support and promote child resilient behaviors.

Overall, the present findings represent useful insights thinking about family interventions. For clinicians working with parents in the post-pandemic phase, it may be useful to focus on increasing the parents' ability to support child resilient behaviors, in order to achieve two substantial positive effects. First, effectively teaching the child to be more resilient makes the child able to functionally manage an adverse situation. Second, this makes the child more peaceful and, in turn, lowers the burden on the parent. Alongside the current need to think about support interventions among mental health-care providers for families and communities, there is also the need to understand which factors to focus on most. The results of the present study may represent useful insight to advance mental health interventions focusing on families' resilience processes.

Finally, our study has some strengths and limitations. To the best of our knowledge, it is one of the first studies to provide an opportunity to investigate the relation between parents' and children's resilience and parental perception of promoting resilient behaviors in their children, conducted in the month after a lockdown was imposed by the Italian government. However, our study has some limitations. First, the study used a cross-sectional design for evaluating how parents' resilience and their ability to teach resilient behaviors to children can influence both child resilience and stress-related behaviors assessed during the COVID-19 outbreak. Cross-sectional designs are a pragmatic approach that help to constrain time and costs while at the same time identifying key variables and potential relations, as for example, the relations between ability to teach resilient behaviors and child adjustment. In order to enhance our findings, a longitudinal investigation will be essential for stronger causal inferences. Second, a further limitation of the present study was the limited sample size. The current report provides initial investigation of the *CopeWithMe* in Italian mothers. To strengthen our results, further investigations in broader samples are needed. Third, the convenience sampling method may prevent the generalization of our findings. Moreover, since due to the lack of a father's response we only included the mother's response in the final sample, one should be careful about interpreting the present results, since there could be possible parental role/gender differences in terms of promoting and supporting child resilient behavior. Future research using *CopeWithMe* is needed to investigate the role played by fathers in promoting and supporting child resilient behavior during a stressful/traumatic situation. In addition to these aspects, the temporal window of data collection must be considered as a limit, as it started after the end of quarantine and lasted one month. We must be aware that these data are just a snapshot of a contingent situation. We, of course, do not have data about participants' resilience before the quarantine. Finally, since this was not the focus of the current study, only a few main psychometric properties of *CopeWithMe* were tested in the current work. However, there would be some important aspects that future research should consider. First, researchers increasingly suggest that the Classical Test Theory (CTT) approaches such as exploratory factor analysis cannot provide a complete representation of the psychometric properties of an instrument. CTT is not congruent with the idea that resilience is not a fixed trait but instead it can be learned and improved (Booth and Neill, 2017). In order to consider resilience as a state (Ye et al., 2020), further analyses should include different analytical approaches in agreement with the Generalizability Theory. Also, our results suggested a one-facto solution for the *CopeWithMe*; thus, a future important next step would be to confirm that result with model tests for the unidimensional test theoretical models. Moreover, for practical reasons, here we decided to compute the overall mean score of the 18 included items. However, future studies are required to verify whether considering the mean values, as we did, is justified.

## CONCLUSIONS

In emergency situations, such as that caused by the COVID-19 pandemic, identifying effective ways to reduce stress and increase resilience has become a mandate for people from all walks of life, ages, professions, and socioeconomic backgrounds. In particular, families and children are among the first to be focused on and schools and other institutions around them must continue to develop a public health framework to understand the various risks and protective factors of COVID-19 and its aftermath. Several studies highlighted that the ability of a system to cope with an atypical stress situation improves the ability of co-occurring systems (Twum-Antwi et al., 2020). Therefore, as the *COPEWithME* resulted in a valuable tool to

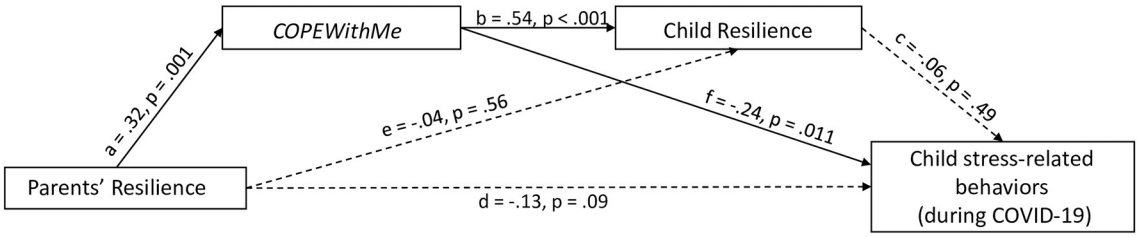


**FIGURE 1 |** Sequential mediation model. The figure excludes the covariate of child age; however, it is included in tests of the model. Standardized effect coefficients are reported.

collect data about parental ability to support and promote child resilient behaviors, it could be useful in planning supporting interventions. Specifically, the *COPEWithME* could be used to plan intervention for caregivers (e.g., teachers, parents) aimed at improving child individual resources to cope with a stress. Thus, present results highlight the importance of thinking about interventions designed to improve child well-being by supporting the parents.

## DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Psychology Ethics Committee of the School of Psychology, University of Padua (number of protocol: D6B09283C9694D9C8EFCFBD33C713130). The patients/participants provided their written informed consent to participate in this study.

## AUTHOR CONTRIBUTIONS

IM and EM contributed to data analysis. IM, EM, and SB contributed to interpretation of findings, drafting, and final approval of manuscript. FB contributed to data acquisition. All authors contributed to the article and approved the submitted version.

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## SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.732745/full#supplementary-material

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# Child Care in Times of COVID-19: Predictors of Distress in Dutch Children and Parents When Re-entering Center-Based Child Care After a 2-Month Lockdown

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As a consequence of the outbreak of the Coronavirus Disease 2019 (COVID-19) child care facilities all over the world were temporarily closed to minimize the spread of the virus. In Netherlands, the first closure lasted for almost 2 months. The return to the child care center after this significant interruption was expected to be challenging, because earlier studies demonstrated that transitions into child care can be stressful for both children and their parents. The current paper retrospectively examined the distress of Dutch children (aged 0–4) and their parents during the first 2 weeks after the reopening of child care centers, and what factors accounted for individual differences in distress. In total, 694 parents filled out an online questionnaire about stress during closure and distress after the reopening of child care centers. Furthermore, questions regarding several demographic variables and child care characteristics were included, as well as questionnaires measuring child temperament, parental separation anxiety, and parental perception of the child care quality. Results showed that younger children and children with parents scoring higher on separation anxiety experienced more distress after the reopening, as reported by parents. Furthermore, children were more distressed upon return when they attended the child care center for less hours per week after the reopening, experienced less stress during closure, and grew up in a one-parent family. With regard to parental distress after the reopening, we found that parents scoring higher on separation anxiety and fear of COVID-19 experienced more distress. Moreover, parents experiencing less stress during closure and mothers were more distressed when the child returned to the child care center. Finally, concurrent child and parental distress after reopening were positively related. The results of the current study may help professional caregivers to identify which children and parents benefit from extra support when children return to the child care center after an interruption. Especially the role that parental separation anxiety played in predicting both child and parental distress deserves attention. More research is required in order to study the underlying mechanisms of these associations and to design appropriate interventions.

**Keywords: re-entering center-based child care, child and parental distress, COVID-19, early childhood, parental anxiety**

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## INTRODUCTION

The outbreak of COVID-19 and the accompanying lockdowns have had an enormous impact on societies and individuals worldwide. It not only caused an immediate international health crisis, but it also gave rise to different challenges regarding other aspects of daily life. The closure of schools and child care centers during lockdowns have put a large strain on families with young children, as has been studied considerably (e.g., Brown et al., 2020; Del Boca et al., 2020; Jones, 2020; Russell et al., 2020; Huebener et al., 2021). However, the return to normal life after the withdrawal of measures deserves attention too. We know from earlier studies that transitions into child care can be stressful for both children and their parents (e.g., Ahnert et al., 2004; Cryer et al., 2005; Klein et al., 2010; Swartz et al., 2016), and returning to the child care center after a 2-month interruption (which was the case in Netherlands during the first national lockdown) might therefore have been challenging for children and parents as well. This idea is supported by a study from the United States (Jones, 2020) that showed that around 85% of parents and professional caregivers expressed their concerns regarding the reopening of child care centers. Therefore, in the current study, the distress as experienced by parents and children (as reported by parents) upon children's return to the child care center was examined. More knowledge on predictors of distress could guide policy makers in comparable future situations and may help professional caregivers to identify children and parents who are most in need of extra support when children re-enter the child care center after a long period of absence.

### Transitions Into Child Care

Earlier studies pointed out that transitions into new child care settings can cause distress for children, resulting in higher cortisol secretion at child care compared to home (Bernard et al., 2015; Albers et al., 2016), especially during the first 2 weeks after the start at the child care center (Ahnert et al., 2004). Furthermore, infants and toddlers showed more behavioral discontent, as indicated by more crying, fussing and clinging to caregivers during the first month after transitioning into a new child care group (Cryer et al., 2005). These observations are in line with attachment theory, which has shown in abundance how trying separations from primary attachment figures can be for (young) children (e.g., Klette and Killén, 2019). Less is known about parental distress during transitions. The small number of studies that do exist show that some parents also experience distress when their child transitions into an out-of-home child care setting (Klein et al., 2010; Swartz et al., 2016). For example, in the study by Swartz et al. (2016) on maternal perspectives regarding the transition of their child into child care, it was found that 39.7% of the mothers were classified as experiencing the transition of their child as difficult themselves.

The process of adjusting to the child care setting after a significant interruption such as after the lockdown, is likely to resemble adjustment to a new child care setting. Below, we describe what is known about child and parental factors in relation to the adjustment to a (new) child care setting. It is conceivable that these factors are also important in explaining individual differences in child and parent distress when children and parents re-adjust to the child care center after an interruption. Therefore, we investigated these factors in the current study. Furthermore, several COVID-19 related factors that might have played a role in the reactions of children and parents after the reopening will be discussed and examined.

### Child-Related Predictors

First, with regard to child characteristics, we know that children's temperament can affect how they adapt to child care (Crockenberg, 2003; De Schipper et al., 2004). It has been shown that children scoring high on fearfulness and irritability have more difficulty adjusting to a child care setting, reflected by higher cortisol levels (Groeneveld et al., 2010), lower well-being (De Schipper et al., 2004), and behavioral difficulties during separations (Swartz et al., 2016). However, a direct link between negative affectivity and stress at child care was not always found (e.g., Albers et al., 2016). Besides negative affectivity, the degree of extraversion of children might also be related to their adjustment to a new child care setting. The transition into child care might be easier for more outgoing children, because they may be less overwhelmed by the new faces and environment, and make contact with the professional caregivers and other children more easily than introverted children. Child temperament might also affect parental distress after reopening, because parents of children with a more difficult temperament might expect a less smooth transition for their child. This could result in more stress (Östberg and Hagekull, 2000) and more negative parental emotions regarding the start of their child at the child care center.

Another relevant child level factor may be the number of hours that children spend in child care. It has been reported that more hours in child care are (moderately) associated with more negative child outcomes, such as behavioral problems (National Institute of Child Health and Human Development Early Child Care Research Network, 2003) and higher stress levels (Lumian et al., 2016). However, for the current study, which focuses on re-adjustment to the child care setting after a 2-month interruption, the number of hours might relate inversely. It could be that especially the children who are attending the child care center for only 1 day a week have more difficulty to adjust, because adjustment takes time for all parties involved. Therefore, the same might apply to the parents of these children, who also need time to get used to their child re-entering the child care center and this might be easier for parents when children attend the child care center for more than 1 day a week.

The final child characteristic this study focuses on that might explain differences in distress around transitions into child care is children's age. Regarding child age, results are mixed, with studies finding younger children to experience more distress during transitions (Fein et al., 1993; Cryer et al., 2005) and studies showing more distress in children beyond infancy (e.g., Swartz et al., 2016). The first might be explained by younger children having less self-regulatory capacities, while Swartz et al. (2016) suggested that older children have developed stronger attachments to parents and therefore might be more wary of (relatively) unfamiliar caregivers at child care. Mothers described transitions with younger children as easier for themselves,

possibly because they believed their child to be unaware of the transition (Swartz et al., 2016), which illustrates the possible link between child age and parental distress.

## Parent-Related Predictors

An important parental factor that might explain differences in child and parental distress during the transition into a child care setting is parental separation anxiety, which can be described as "a parent's experience of worry, sadness, or guilt during short-term separations from the child" (Hock and Schirtzinger, 1992, p. 93). Although separation anxiety has been studied more extensively in mothers, fathers may experience separation distress to a similar extent (Kirby et al., 1994). It is likely that general parental separation anxiety in the context of child care but not related to a specific moment, influences how parents react emotionally to the specific situation of the (re)start of their child into the child care setting. Children of parents who experience more separation anxiety might be in turn unconsciously influenced by these feelings or experience distress because of certain unhelpful parenting practices that arise from parents' separation anxiety. In a study of Israeli-Druze families, maternal separation anxiety was associated with more child separation distress and poorer child adjustment to the child care center (Peleg et al., 2006). Furthermore, maternal distress in response to child distress, a proxy for parental separation anxiety, was found to be associated with less smooth transitions for both children and mothers (Swartz et al., 2016).

Another parental factor is child care quality as perceived by the parent. It was found that parental perceptions of the quality of child care were associated with parental stress (Bigras et al., 2012): parents who thought the child care center of their child was of high quality experienced less stress. For child distress, mothers indicated that more support of the professional caregiver toward the child, which can be seen as an indicator of child care quality, was related to an easier transition for children (Swartz et al., 2016). This support can help children with co-regulating their emotions when they are confronted with the transition, which could explain the easier transition for children in case of more support.

## COVID-19-Related Predictors

Several child and parental factors that are more directly related to the pandemic could also be associated with child and parental distress after the reopening of child care centers, such as parental fear of COVID-19 and child and parental stress during the closure of the child care centers. One study found that throughout the 2009 Swine Flu in Netherlands, parental fear of the disease predicted child fear, partly *via* the transmission of threat information (Remmerswaal and Muris, 2010). For parents, fear of COVID-19 might have influenced how they felt about the return of their child to the child care center, as parents and children were more exposed to health risks as they left their homes. Therefore, parental fear of COVID-19 might predict parental distress after the reopening of child care centers directly and child distress indirectly.

It is likely that during the closure of child care centers, parents experienced stress because they had to combine work (at home) with the care of their child(ren), while children might have suffered from the disruption of normal routine and contacts (e.g., Orgilés et al., 2020). It could be that higher stress levels during the lockdown for both children and parents are related to higher stress levels after reopening, because children and parents who experience more stress during one challenging situation might also experience more stress during another, due to their circumstances or personal characteristics. However, children who experienced more stress because they missed the child care center to a larger extent were perhaps more excited to start again. Furthermore, parents who experienced higher stress levels during the lockdown might have been relieved that they could bring their child to the child care center after 2 months. How child and parental stress during closure could be related to emotional responses after the reopening is therefore difficult to predict, as both directions seem plausible.

## Concurrent Child and Parental Distress

Finally, the effect of parental distress after the reopening of child care centers on concurrent child distress and vice versa was examined in the current study. It is quite well-established that parental emotional reactions co-determine how children cope throughout and after disruptive events. For example, Wilson et al. (2010) found that parental reactions regarding the 9/11 terrorist attacks predicted children's post-traumatic stress symptoms after indirect exposure. Another study showed a positive relation between the intensity of parental distress at the time of an accident and subsequent child trauma symptomatology 5–8 weeks after the event (Gallo et al., 2019). A reciprocal process in which children also influence how parents cope has been proposed as well, although child functioning was found to predict parental outcomes in a smaller number of studies (Cobham et al., 2016). More specifically related to the COVID-19 crisis, Chartier et al. (2021) found a significant association between parental and child traumatic stress related to the lockdown measures. All these studies make clear that parental and child distress around disruptive events are likely to influence each other.

## Aims of the Study

In sum, the objectives of the current study were to investigate whether Dutch children aged 0–4 years and their primary caregiver experienced distress in the first 2 weeks following their return to the child care center after a 2-month lockdown (according to the parent), and what factors accounted for individual differences in child and parental distress. With regard to child characteristics, we expected that children scoring higher on negative affectivity and lower on extraversion would be more distressed upon return, and we expected their parents to feel more distressed as well. Regarding parental factors, higher parental fear of COVID-19, higher parental separation anxiety, and lower child care quality as perceived by the parent were expected to be related to more distress in both children and parents after reopening. Regarding the other predictors, no specific hypotheses were formulated, because of the exploratory nature of these factors (hours in child care, and child and parental stress during closure) or inconclusive findings in

earlier studies (child age). Finally, we expected parental and child distress after the reopening of child care centers to be related positively.

# MATERIALS AND METHODS

## Procedure

The current study was approved by the Ethics Committee of the Institute of Education and Child Studies of Leiden University (ECPW-2020/283). From the 7th of August until the 7th of September 2020 (12.5–17 weeks after the official reopening of child care centers), an anonymous survey was administered *via* Qualtrics Survey Software. The recruitment text with a short summary of the study and the link to the questionnaire was placed on the website of the University, on social media, and distributed online with the help of child care organizations that participated in or showed interest for an earlier research project on child care. Different branch organizations, journals for practice and interest groups helped with the distribution as well, to try to gain national coverage. The introductory section of the survey contained detailed information about the study and questionnaire, and a question to ensure the inclusion criteria were met, i.e., the age of the child was between 0 and 4 years at the time of the reopening of the child care centers, the child had started at a regular center-based child care center before the closure, and the child resumed care after the reopening for at least 2 weeks at the same child care group. The reason for these inclusion criteria was that we wanted to exclude child reactions due to a normal adjustment process when starting at child care or a new group. A second question was inserted to make sure that the parent who filled out the questionnaire was the parent who most frequently brought the child to the child care center during the first 2 weeks after the reopening (because this parent had the most firsthand memories). When parents brought their child to the child care center equally often, they were free to choose who would fill out the questionnaire. We specifically stated that parents could discuss the questions on child reactions upon return with each other. If parents were part of the target group of the study, they were provided with the informed consent. When parents had more than one child, they were asked to fill out the questionnaire for their youngest child that met the inclusion criteria. The questionnaire took around 20–30 min to fill out, but pausing and continuing later was possible.

As an incentive, €20 gift cards to spend on toys were distributed to five randomly selected parents who completed the entire questionnaire and indicated they wanted to join the lottery. Participants could also indicate whether they wanted to receive a report on the most important outcomes of the research project in due time. Both joining the lottery and receiving a report required participants to share their e-mail address with us, which was collected through a separate questionnaire to avoid linkage between their answers and personal data. Since the questionnaire might have elicited negative emotions, we added information about several organizations at the end that parents could reach out to in case they needed support.

## Participants

In **Figure 1**, a flowchart of the selection process for the final sample is displayed. Parents who brought their child to the child care center for emergency child care during the official closure of child care centers—because of their vital profession—were excluded from the current sample, because the situation of these participants was not comparable to that of the other participants. For four participants, it appeared from their answers to an open-ended question that they did not meet the first inclusion criterion (child returning to the same child care group as before the closure), although these parents stated that they did meet this criterion. These participants were excluded from the analyses. Participants who did not complete the questions about their own and their child's distress during the closure and after the reopening of child care centers were excluded as well. This resulted in a final sample of 694 parents and their (youngest) child attending center-based child care. Age and gender of the target child and most child care characteristics were available for the whole sample, while family demographics were only available for 543 participants. For three variables (parental age, the number of months, and hours in child care), some impossible values were reported and therefore treated as missing, which explains the lower number of participants for these variables.

Mothers made up 90.8% of the sample and almost all parents (99.1%) were the biological parent of the child they reported about. The mean age of the children was 27.16 months ($SD$ = 11.12, range = 6–52). Parents ($N$ = 542) were on average 34.45 years old ($SD$ = 4.28, range = 21–47). About half of the questionnaires (52%) was filled in for a boy. In 55.6% of cases, parents had more than one child. Furthermore, 96.5% of the parents and children belonged to a two-parent family. Regarding ethnicity, 93.9% of the parents were born in Netherlands and

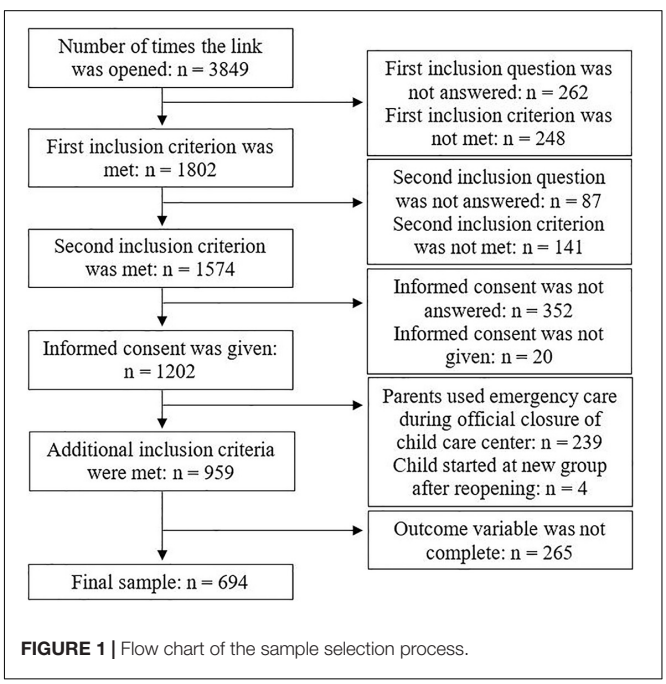


**FIGURE 1 |** Flow chart of the sample selection process.

97.1% only had the Dutch nationality. For the children, these percentages were 99.6 and 97.8%, respectively. The majority of parents (75.6%) completed their education at (applied) university level. In total, 43 parents (7.9%) indicated that their child had general health issues, such as allergies or a premature birth. Finally, 3.7% of the children had a suspected infection with COVID-19 before the reopening of child care centers and this was the case for 7% of the parents.

The mean number of months the children ($N$ = 675) had attended the child care center before closure was 15.34 months ($SD$ = 10.57, range = 0–43). Before closure, children were cared for at the child care center for on average 18.44 h per week ($N$ = 687) and after the reopening, the number of hours per week was the same for 82.6% of the sample. The mean amount of hours at child care after reopening was slightly lower compared to before closure ($M$ = 17.90, $SD$ = 7.96, range = 3–44, $N$ = 678). During the closure of child care centers, 33.4% of parents made use of other types of child care: in most cases children were cared for by other family members. In total, 87.9% of the children were cared for by the same professional caregivers after the reopening, while 12.1% of the children were (partially) cared for by other professional caregivers when they returned.

Power-analyses with G*Power (version 3.1.9.4) showed that the sample size had to consist of a minimum of 171 participants when including 20 predictors, to find an effect size of $f^2$ = 0.15, with a power of 0.90 and α of 0.05. Our sample size exceeded this recommended number of participants. Furthermore, the minimum number of participants for a representative sample was met as well. In total, 328,000 parents received child care allowance in 2018 in Netherlands (Rijksoverheid, 2019). The minimum number of participants for a potentially representative sample, with a confidence level of 95% and a confidence interval of 5, would therefore be 384 (which was calculated with an online tool).

## Measures

### Child Care in Times of COVID-19: Principal Component Analysis

In consultation with a focus group of child care professionals, we constructed a questionnaire about the experiences of children and parents during the closure and after the reopening of child care centers (which we named the Child Care in Times of COVID-19 questionnaire, or in short the CiToC questionnaire, see the **Supplementary Appendix** for the English translation). A non-linear principal component analysis (PCA) was performed on the CiToC questionnaire to explore the potential dimensionality of this new instrument. The non-linear version of PCA was chosen because of the ordinal answering scale of the questionnaire. The PCA with Varimax rotation distinguished four different components (see below), but on theoretical grounds we decided to split one component (parental distress after reopening) into two separate components. The five final components (the two outcome variables and the first three predictors) are described below. Items with component loadings below 0.35 were not included (see the **Supplementary Appendix** for the subscales and items included in the current study). All subscales of the CiToC questionnaire consisted of questions that could be answered by the parent on a five-point scale with the following meanings: (1) totally disagree, (2) disagree, (3) somewhat agree, (4) agree, and (5) totally agree. Therefore, children and parents scoring 2.5 or higher on the subscales were considered to have experienced at least some distress (according to the parent). Since the questions of the CiToC questionnaire focused on distress during the first 2 weeks after the reopening, and children might have needed more time to completely readjust, we also asked parents who stated that their child displayed different behavior around drop-off and collection after the reopening compared to before the closure, how many child care days the child needed to show the same behavior as before. In an earlier report (in Dutch), which was part of the current project, we described the specific measures that were taken after the reopening of child care centers (e.g., 1.5 m distance between adults, quicker drop-off and collection), how these were received by parents and children and what behaviors (negative or positive) children displayed after the reopening (Vrijhof et al., 2020).

### Outcomes

#### *Child Distress After Reopening (CiToC)*

Distress of the child during the first 2 weeks after the reopening of child care centers as perceived by the parent was originally assessed with 19 items. However, the PCA showed six items to load insufficiently onto the component. The other item loadings ranged from 0.58 to 0.88. Of the final 13 items, 7 items addressed the child's reluctant behaviors toward the professional caregivers during the first day after reopening, for example: "My child did not like being touched or picked up by the professional caregivers." The other six items focused on more general behaviors and emotions of the child during the drop-off and collection of the child at the child care center during the first 2 weeks after the reopening. An example of one of these items is: "My child was anxious when dropped off at the child care center." Internal consistency was high (α = 0.93). An overall mean score was computed for the final selection of items. After the recoding of six items, higher mean scores indicated more child distress, as reported by the parent.

#### *Parental Distress After Reopening (CiToC)*

The subscale measuring the self-reported distress of the parent during the first 2 weeks after the reopening of child care centers consisted of seven items. All loadings were sufficient and ranged from 0.38 to 0.76. An illustration of an item is: "I found it difficult to bring my child to the child care center again." Cronbach's alpha was high (α = 0.86). Again, an overall mean score was computed. After the recoding of three items, higher mean scores indicated more self-reported parental distress.

### Predictors

#### *Child Stress During Closure (CiToC)*

This subscale originally consisted of seven items, but two items loaded insufficiently, resulting in five final items. Item loadings ranged from 0.40 to 0.79. An example of an item is: "My child missed the contact with the other children at the child care center." While answering the questions belonging to this

subscale, parents were asked to think back to the closure of child care centers which ranged from the 16th of March to the 11th of May in Netherlands. When items were not applicable to their situation, parents could choose the option "not applicable." Internal consistency was good (α = 0.80). Mean scores were only calculated if more than half of the items were valid, with higher mean scores indicating higher child stress during closure according to the parent.

### *Parental Stress During Closure (CiToC)*

To measure parental stress during the closure of child care centers, we constructed eight items. The items again applied to the period of the first national lockdown. All but two items loaded sufficiently onto the component (range = 0.52–0.79) and were used to construct the subscale. An example of an item is: "I found it stressful to combine my caring responsibilities with my work during the closure." When items were not applicable, parents could indicate this. Cronbach's alpha was adequate (α = 0.76). Mean scores were only calculated if more than half of the items were valid, with higher scores indicating that the parent experienced more stress during the closure (two items were recoded for interpretation).

### *Parental Fear of COVID-19 (CiToC)*

According to the PCA, this subscale was part of the component "Parental stress after reopening." However, as described, we thought it was important to distinguish the three specific items about fear of COVID-19 from the more general items about parental stress after reopening. An illustration of an item belonging to this subscale is: "I was afraid that my child would contract the coronavirus and become sick." Loadings were 0.82, 0.80, and 0.70, and Cronbach's alpha showed good internal consistency (α = 0.88). An overall mean score was computed for the items and higher mean scores indicated more parental fear of COVID-19.

### *Child Temperament*

Child temperament was measured with the validated Dutch versions of the very short form of the Infant Behavior Questionnaire-Revised (IBQ-R; Klein Velderman et al., 2006; Putnam et al., 2014) for infants under the age of 12 months, the Early Childhood Behavior Questionnaire [ECBQ; Putnam et al., 2006, translated by De Kruif, Willekens, and De Schuymer (Rothbart, 2013)] for toddlers between 12 and 36 months of age and the Children's Behavior Questionnaire (CBQ; Putnam and Rothbart, 2006; Majdandžić and Van den Boom, 2007) for pre-schoolers older than 36 months. In these very short versions (with 36 or 37 items in total), parents are asked to indicate on a seven-point scale how often their child displayed certain behaviors during the last 7 days (IBQ-R), 14 days (ECBQ) or 6 months (CBQ). When the described situation did not occur during this period, parents could choose the "not applicable" option. Items load onto three different factors, namely "Negative Emotionality" (IBQ-R) or "Negative Affectivity" (ECBQ and CBQ), "Positive Affectivity/Surgency" (IBQ-R) or "Surgency/Extraversion" (ECBQ and CBQ), and "Orienting/Regulatory Capacity" (IBQ-R) or "Effortful Control" (ECBQ and CBQ). In the current study, we only included the subscales "Negative Emotionality/Affectivity" [α = 0.86 for IBQ-R ($N$ = 36); α = 0.69 for ECBQ ($N$ = 354), and α = 0.70 for CBQ ($N$ = 161)] and "Positive Affectivity/Surgency/Extraversion" [α = 0.50 for IBQ-R ($N$ = 36); α = 0.71 for ECBQ ($N$ = 349), and α = 0.65 for CBQ ($N$ = 161)]. Per subscale, a mean score was calculated, with higher scores indicating more negative affect or more extraversion. Mean scores per subscale were only calculated if more than half of the items were valid.

### *Parental Separation Anxiety*

We used the "Maternal Separation Anxiety" subscale (MSA; 21 items) of the Maternal Separation Anxiety Scale (Hock et al., 1989) to measure the level of general parental separation anxiety. The items were adapted to fit both mothers and fathers. Furthermore, by changing phrases like "when I am away from my child" into "when my child is at the child care center," and "than a babysitter or teacher" into "than professional caregivers," items only relate to situations in which the child is at the child care center. We translated the items into Dutch and had them back-translated for verification by a native speaker in English who is also fluent in Dutch. Inconsistencies were discussed until consensus was reached. The questions could be answered on a five-point scale ranging from (1) strongly disagree to (5) strongly agree. The reliability analysis for the 21 items in the current study showed good internal consistency (α = 0.87, $N$ = 640). Mean scores were calculated only if 75% or more of the items were answered. Higher mean scores indicated higher parental separation anxiety.

### *Parental Perception of Child Care Quality*

The quality of child care from the parent's perspective was measured with the Emlen Scales (Emlen et al., 2000). This instrument can be used in any type of child care arrangement and for children of all ages. We selected the following subscales of the larger scale "Measuring Aspects of Child Care Quality": "Caregiver's Warmth and Interest in my Child" (six items), "Caregiver's Skill" (three items), and "Supportive Parent-Caregiver Relationship" (six items). The items were translated into Dutch and we had them back-translated for verification by a native speaker in English who is also fluent in Dutch. Inconsistencies were discussed until consensus was reached. We slightly changed one item from "I'm free to drop in" into "I'm free to contact," since the latter is more common, especially in times of COVID-19. The statements could be answered on a five-point scale ranging from (1) never to (5) always. All three subscales significantly correlated with each other (range = 0.68–0.70). However, for theoretical reasons, we analyzed the subscale "Supportive Parent-Caregiver Relationship" (α = 0.84, $N$ = 619) separately from the other two subscales which were combined (α = 0.90, $N$ = 619), because the latter two subscales assess the interactions of professional caregivers with the child and the first the interactions of professional caregivers with the parent. Mean scores per subscale were calculated only if 75% or more of the items were answered. Higher mean scores indicate that the parent rated the child care quality more positively.

*Other Predictors*

Child age (in months) at the time of the completion of the questionnaire and child hours at child care per week after the reopening of the child care centers were included as predictors as well.

*Covariates*

Potential covariates were the use of other types of child care during the closure of child care centers (yes or no), whether the child was cared for by the same professional caregivers after the reopening compared to the period before closure (yes or partly/no), the number of months the child attended the child care center before closure, the gender of the child and the parent, parental age (in years), parental educational level (low and middle levels of education vs. high level of education), family composition (one- or two-parent family), whether the parent had more than one child (yes or no), and whether the child had general health issues (yes or no).

## Multiple Imputation

As described, 151 parents had incomplete data on part of the predictor variables. In total, 9.88% of all values were missing. To check whether data imputation was recommendable, the Little's missing completely at random (MCAR) test (Little and Rubin, 1987) was performed and proved to be non-significant [$\chi^2(50324) = 40750.13$, $p = 1.000$]. This meant data were missing completely at random or missing at random. We also compared the complete and non-complete groups on all complete variables. Parents who filled in the entire questionnaire scored lower on parental distress after the reopening [$M = 2.17$ vs. $M = 2.35$, $t(692) = 2.66$, $p = 0.008$], parental fear of COVID-19 [$M = 2.04$ vs. $M = 2.27$, $t(692) = 2.85$, $p = 0.004$], and higher on the number of months their child attended the child care center before closure [$M = 15.86$ vs. $M = 13.49$, $t(673) = -2.42$, $p = 0.016$] compared to parents who did not complete the entire questionnaire. Therefore, the missing values showed a pattern and were likely to be missing at random and not completely at random. Because of this finding, we chose to perform 50 multiple imputations by predictive mean matching (Markov Chain Monte Carlo) with a maximum of 50 iterations for the incomplete variables (Little and Rubin, 1987), and included all variables (covariates, predictors, and outcome variables) in the model. Missing values for the questionnaires were imputed on subscale level.

## Statistical Analysis

Two hierarchical multiple linear regression analyses on the imputed data were performed using IBM SPSS 25.0 (IBM Corp, 2017). In step one, covariates were entered. Covariates were included only if they were significantly correlated ($p < 0.05$) with the outcome variable, as evaluated in the preliminary analyses. In step two, the main predictors were entered and in step three, the concurrent stress of the parent or child (dependent on the analysis) was added. An alpha of 0.05 was used for all analyses. Pooled *F*-tests for the imputed datasets were calculated by using a macro developed by Van Ginkel (2019). Standardized regression coefficients (β's) were averaged over the 50 imputed datasets and effect sizes ($R^2$'s) were calculated by multiplying the mean standardized regression coefficients with the mean bivariate correlations with the outcome variable. The $R^2$'s were subsequently summed to derive the explained variance of the models (Van Ginkel, 2020). Finally, for the purpose of a sensitivity analysis, the results of the regression analyses on the 50 imputed datasets were compared to the results for the complete cases only.

# RESULTS

## Data Inspection

Before the main analyses were performed, we inspected the data. For five predictor variables (hours in child care, parental separation anxiety, both subscales of parental perception of child care quality, and negative affectivity) and one outcome variable (parental distress after reopening) outliers [values with a *z*-score above or below (−)3.29] were observed. Before imputation, outlying values were winsorized, such that all *z*-scores fell between −3.29 and 3.29, while retaining the original order of the data (Tabachnick and Fidell, 2013). After imputation, two to three influential cases per imputed dataset were still observed for the variables with winsorized outliers, but these cases had adequate Cook's and leverage distances and therefore no significant impact on the regression coefficients. The residuals of both models were normally distributed and heteroscedasticity and multicollinearity were absent.

## Descriptive Statistics

In total, 52% of the parents indicated a (mostly negative) change in their child's behavior after the reopening of child care centers compared to before the closure. According to these parents the average number of days that the children needed to readjust was 7.66 child care days ($SD = 8.71$, range = 1–60). Furthermore, 22 parents reported that their child was still not readjusted at the time when they filled out the questionnaire, which was 12.5–17 weeks after the official reopening of the child care centers. The mean level of child and parental distress after the reopening of child care centers was relatively low ($M = 2.18$ for child distress; $M = 2.21$ for parental distress). However, 29.1% of the children experienced at least some distress after the reopening (they scored on average higher than 2.5 on the scale) according to their parent, and this was the case for 31.6% of the parents. Further, 25.6% of the parents were at least somewhat afraid of COVID-19. With regard to the level of stress during the closure of child care centers we found that 73.7% of the children and 71.2% of the parents scored above the threshold. The other descriptive statistics for the complete cases are shown in **Table 1**.

## Bivariate Correlational Analyses

In **Table 2**, the bivariate correlations among the predictors, outcome variables and covariates for both the pooled and complete cases are displayed. Because four dichotomous covariates (child health, family type, parental gender, and caregiver stability) had unequal distributions over the categories, we compared the outcomes of the regular correlations with the

**TABLE 1 |** Descriptive statistics for the predictors and outcome variables.

| | *N* | *M* | *SD* | *Min.* | *Max.* |
|---|---|---|---|---|---|
| **Outcome variables** | | | | | |
| Child distress after reopening[b] | 694 | 2.18 | 0.83 | 1 | 4.92 |
| Parental distress after reopening[bc] | 694 | 2.21 | 0.72 | 1 | 4.71 |
| **Predictors** | | | | | |
| Child age (in months) | 694 | 27.16 | 11.12 | 6 | 52 |
| Child temperament[a] | | | | | |
| Negative affectivity[c] | 551 | 2.09 | 0.89 | 1 | 5 |
| Surgency/extraversion | 510 | 4.95 | 0.74 | 2.83 | 6.83 |
| Child hours in child care (per week)[c] | 678 | 17.90 | 7.96 | 3 | 44 |
| Child stress during closure[b] | 669 | 3.06 | 0.82 | 1 | 5 |
| Parental stress during closure[b] | 683 | 2.95 | 0.85 | 1 | 5 |
| Parental fear of the coronavirus[b] | 694 | 2.09 | 0.89 | 1 | 5 |
| Parental separation anxiety[bc] | 640 | 2.24 | 0.44 | 1 | 3.75 |
| Parental perception of child care quality[b] | | | | | |
| Caregiver's warmth and interest in the child and caregiver's skill (child)[c] | 619 | 4.41 | 0.46 | 2.34 | 5 |
| Supportive parent-caregiver relationship (parent)[c] | 619 | 4.24 | 0.59 | 2.16 | 5 |

*Descriptive statistics for complete cases.*
*[a]Answering scale ranged from 1 to 7 [composite mean score of infant behavior questionnaire-revised (IBQ-R), early childhood behavior questionnaire (ECBQ), and children's behavior questionnaire (CBQ)].*
*[b]Answering scale ranged from 1 to 5.*
*[c]Winsorized.*

outcome variables with correlations based on 1,000 bootstrap samples. No differences were found, showing the correlations to be robust. As one can see in **Table 2**, higher levels of child and parental distress were related to a lower number of months in child care before closure, lower stability of the professional caregivers and single-parent families. Furthermore, a higher level of child distress was related to a higher parental educational level and mothers scored higher on parental distress than fathers. These variables were therefore included in the analysis as covariates.

## Hierarchical Multiple Linear Regression Analysis: Child Distress After Reopening

The regression analysis for child distress was performed in three steps. All three models were significant ($p < 0.001$) and the third model was significantly better than the first and second model ($p < 0.001$). The final model (**Table 3**; Model 3) had an explained variance of 34.4% and showed that younger children ($\beta = -0.29$, $p < 0.001$) and children with parents scoring higher on separation anxiety ($\beta = 0.29$, $p < 0.001$) experienced more distress after the reopening. Furthermore, children with parents who reported more distress after reopening ($\beta = 0.17$, $p < 0.001$), children who spent less hours at the child care center after reopening ($\beta = -0.13$, $p < 0.001$), children who experienced less stress during closure according to their parent ($\beta = -0.13$, $p < 0.001$), and children from one-parent families ($\beta = -0.09$, $p = 0.012$) were more distressed upon return. The regression coefficients for parental fear of COVID-19 ($\beta = -0.13$, $p < 0.001$) and parental stress during closure ($\beta = 0.14$, $p < 0.001$) also reached significance, but these coefficients were not in line with the non-significant bivariate correlations ($r = 0.07$ and $r = 0.03$, respectively), indicating negative suppression (Tabachnick and Fidell, 2013). Therefore, these predictors seemed to add to the model, but could not be considered sound predictors in itself.

## Hierarchical Multiple Linear Regression Analysis: Parental Distress After Reopening

The regression analysis for parental distress was also performed in three steps, and again, all three models were significant ($p < 0.001$). The final model (**Table 4**; Model 3), significantly better than the first and second model ($p < .001$), explained 47.6% of the variance and showed that parents scoring higher on general separation anxiety ($\beta = 0.36$, $p < 0.001$) and fear of COVID-19 ($\beta = 0.33$, $p < 0.001$) experienced more distress after reopening. Moreover, parents experiencing less stress during closure ($\beta = -0.18$, $p \leq 0.001$), parents of children experiencing more stress after reopening ($\beta = 0.14$, $p \leq 0.001$) as well as less during closure ($\beta = -0.07$, $p = 0.022$), and mothers ($\beta = 0.08$, $p = 0.017$) also experienced more distress. Again, one predictor reached significance ($p = 0.021$), but did not match the negative bivariate correlation, which could be attributed to a negative suppressor effect (Tabachnick and Fidell, 2013). This predictor was the parental perception of child care quality toward the parent ($\beta = 0.10$ vs. $r = -0.09$).

## Sensitivity Analysis

Compared to the pooled results, the outcomes of the analyses with complete cases only ($N = 543$) showed some differences (see **Supplementary Tables S1**, **S2**). The final model for child distress after reopening indicated that negative affectivity was a significant predictor ($\beta = 0.12$, $p = 0.009$), while this was not the case for the analysis that included cases with imputed data. For parental distress after reopening two differences were found, the first of which concerned parental perception of child care quality toward the child, which significantly contributed to the model for the complete cases ($\beta = -0.13$, $p = 0.015$), but not for the analysis making use of imputations. Furthermore, the level of child stress during closure ($\beta = -0.06$, $p = 0.116$) was not a significant predictor in the model for the complete cases, while it was for the model including the imputed data. These differences indicate that multiple imputation was justified, as the outcomes were slightly different for some of the predictors.

# DISCUSSION

In the current paper we studied what factors contributed to variance in child and parental distress during the reopening of child care centers after a 2-month lockdown because COVID-19. Results indicated that about one-third of the children (29.1%) and parents (31.6%) experienced distress upon the

**TABLE 2 |** Bivariate correlations among the predictors, outcome variables, and covariates.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Child age | – | 0.302** | −351** | −0.054 | 0.126** | −0.141** | −0.076 | −0.101* | 0.017 | −0.026 | −0.246** | −0.084* | 0.005 | 0.036 | 0.768** | −0.039 | −0.042 | −0.03 | 0.198** | −0.102* | −0.066 | 0.236** |
| 2. Negative affectivity | 0.295** | – | −0.385** | 0.006 | 0.117** | 0.196** | −0.149** | −0.101* | 0.088* | 0.112** | 0.068 | 0.095* | 0.099* | 0.045 | 0.159** | −0.052 | −0.003 | −0.02 | 0.098* | −0.104* | 0.006 | 0.109* |
| 3. Surgency/ extraversion[a] | −0.321** | −0.359** | – | 0.005 | 0.162** | −0.061 | 0.195** | 0.166** | 0.037 | −0.068 | −0.061 | −0.117** | −0.078 | 0.021 | −0.230** | 0.135** | 0.057 | 0.014 | −0.154** | −0.038 | −0.002 | −0.205** |
| 4. Child hours in child care | −0.058 | 0.025 | −0.013 | – | 0.135** | −0.127** | −0.014 | −0.006 | 0.289** | −0.099** | −0.101** | −0.129** | −0.024 | −0.039 | 0.108** | −0.024 | −0.039 | −0.180** | −0.047 | 0.144** | −0.081 | 0.173** |
| 5. Child stress during closure | 0.129** | 0.111** | 0.148** | 0.135** | – | −0.115** | 0.119** | 0.089* | 0.326** | 0.009 | −0.223** | −0.209** | 0.044 | 0.083 | 0.112** | 0.063 | 0.045 | −0.044 | −0.114** | −0.168** | 0.058 | −0.127** |
| 6. Parental separation anxiety | −0.135** | . 199** | −0.058 | −0.116** | −0.112** | – | −0.359** | −0.237** | −0.076 | 0.297** | 0.468** | 0.553** | 0.043 | 0.084* | −0.161** | −0.079* | −0.089* | −0.08 | −0.051 | −0.064 | 0.109* | −0.094* |
| 7. Parental perception of child care quality—child | −0.073 | −0.151** | 0.189** | −0.016 | 0.116** | −0.351** | – | 0.743** | −0.043 | −0.082* | −0.270** | −0.217** | −0.009 | −0.013 | −0.055 | 0.099* | 0.087* | 0.015 | −0.026 | −0.01 | 0.049 | −0.126** |
| 8. Parental perception of child care quality—parent | −0.101* | −0.099* | 0.157** | −0.005 | 0.088* | −0.232** | 0.740** | – | −0.099* | −0.071 | −0.206** | −0.101* | −0.028 | 0.012 | −0.095* | 0.078 | 0.106* | 0.007 | −0.077 | −0.054 | 0.056 | −0.135** |
| 9. Parental stress during closure | 0.013 | 0.082 | 0.02 | 0.292** | 0.331** | −0.064 | −0.041 | −0.095* | – | −0.045 | 0.027 | −0.234** | −0.058 | 0.103* | 0.114** | −0.104** | −0.019 | −0.03 | 0.063 | 0.105* | 0.035 | 0.186** |
| 10. Parental fear of coronavirus | −0.026 | 0.102* | −0.052 | −0.105** | 0.008 | 0.297** | −0.079* | −0.07 | −0.043 | – | 0.071 | 0.458** | −0.04 | 0.054 | −0.066 | −0.07 | −0.118** | −0.056 | −0.008 | −0.021 | 0.098* | −0.02 |
| 11. Child distress after reopening | −0.246** | 0.073 | −0.07 | −0.098* | −0.221** | 0.456** | −0.261** | −0.203** | 0.027 | 0.071 | – | 0.347** | −0.058 | 0.034 | −0.182** | −0.01 | −0.115** | −0.107* | −0.016 | 0.095* | 0.090* | −0.023 |
| 12. Parental distress after reopening | −0.084* | 0.085* | −0.107* | −0.132** | −0.206** | 0.547** | −0.209** | −0.094* | −0.235** | 0.458** | 0.347** | – | −0.015 | 0.076 | −0.096* | −0.065 | −0.129** | −0.089* | 0.003 | 0.031 | 0.153** | −0.043 |
| 13. Child gender[b] | 0.005 | 0.087* | −0.067 | −0.019 | 0.045 | 0.042 | −0.015 | −0.032 | −0.056 | −0.04 | −0.058 | −0.015 | – | −0.036 | 0.008 | 0.035 | 0.029 | −0.003 | −0.009 | −0.031 | −0.012 | −0.001 |
| 14. Child general health[c] | 0.031 | 0.038 | 0.012 | −0.037 | 0.072 | 0.078 | −0.013 | 0.01 | 0.094* | 0.058 | 0.032 | 0.076 | −0.038 | – | −0.003 | 0.036 | −0.064 | −0.018 | 0.001 | −0.056 | 0.023 | −0.120* |
| 15. Number of months in child care before closure | 0.766** | 0.146** | −0.213** | 0.100** | 0.114** | −0.164** | −0.053 | −0.094* | 0.110** | −0.062 | −0.186** | −0.099* | 0.009 | −0.005 | – | −0.073 | −0.061 | 0.01 | 0.167** | 0.033 | −0.055 | 0.248** |
| 16. Use of other forms of child care during closure | −0.039 | −0.048 | 0.139** | −0.02 | 0.062 | −0.086* | 0.095* | 0.072 | −0.107** | −0.07 | −0.01 | −0.065 | 0.035 | 0.033 | −0.068 | – | −0.018 | −0.034 | −0.116** | −0.214** | 0.119** | −0.204** |
| 17. Stability of professional caregivers[d] | −0.042 | −0.005 | −0.05 | −0.039 | 0.043 | −0.083* | 0.080* | 0.101* | −0.026 | −0.118** | −0.115** | −0.129** | 0.029 | −0.07 | −0.06 | −0.018 | – | 0.087* | 0.047 | −0.044 | 0.004 | −0.019 |

*(Continued)*

**TABLE 2 |** (Continued)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18. Family composition[e] | −0.037 | −0.02 | 0.025 | −0.198** | −0.027 | −0.093* | 0.026 | 0.011 | −0.024 | −0.055 | −0.094* | −0.086* | −0.004 | −0.018 | 0.001 | −0.024 | 0.095* | – | 0.153** | 0.102* | −0.061 | 0.043 |
| 19. Number of children[f] | 0.191** | 0.088* | −0.144** | −0.049 | −0.106* | −0.06 | −0.012 | −0.064 | 0.057 | −0.013 | −0.017 | 0.003 | −0.017 | 0.001 | 0.147** | −0.114** | 0.059 | 0.144** | – | 0.064 | −0.067 | 0.307** |
| 20. Parental education[g] | −0.096* | −0.104* | −0.059 | 0.140** | −0.149** | −0.064 | −0.006 | −0.043 | 0.104* | −0.012 | 0.084* | 0.035 | −0.032 | −0.049 | 0.037 | −0.204** | −0.043 | 0.098* | 0.059 | – | −0.032 | 0.189** |
| 21. Parental gender[b] | −0.06 | 0.003 | −0.002 | −0.08 | 0.057 | 0.090* | 0.056 | 0.061 | 0.035 | 0.094* | 0.07 | 0.141** | −0.017 | 0.018 | −0.05 | 0.108** | 0.004 | −0.048 | −0.063 | −0.023 | – | −0.209** |
| 22. Parental age | 0.229** | 0.101* | −0.192** | 0.174** | −0.124** | −0.087* | −0.112** | −0.117** | 0.178** | −0.022 | −0.011 | −0.041 | −0.004 | −0.105* | 0.233** | −0.200** | −0.016 | 0.029 | 0.297** | 0.177** | −0.200** | – |

*Correlations under the diagonal were pooled for all 50 imputed datasets (N = 694). Correlations above the diagonal were calculated for complete cases only.*

**p < 0.05, **p < 0.01 (two-tailed).*

[a]*Composite mean score for infant behavior questionnaire-revised (IBQ-R), early childhood behavior questionnaire (ECBQ), and Children's Behavior Questionnaire (CBQ).*

[b]*0 = boy/male, 1 = girl/female.*

[c]*0 = good, 1 = health issues.*

[d]*0 = no, 1 = yes.*

[e]*1 = one-parent family, 2 = two-parent family.*

[f]*1 = one child, 2 = more than one child.*

[g]*1 = low/middle, 2 = high.*

child's return to the child care center, as reported by the parent. An explanation for the apparent discrepancy between the percentage for child distress after reopening and the percentage regarding the children that displayed different behavior after the reopening (52%), is that for the subscale on child distress, parents needed to report on average at least some distress (2.5 or higher), while the single question about behavior also applied to minor changes regarding one specific behavior (e.g., crying). Moreover, 25.6% of the parents reported that they were (somewhat) afraid of COVID-19 around the reopening. During closure, 73.7% of the children and 71.2% of the parents experienced at least some stress, as perceived by the parent. Thus, parents and children were more distressed during the closure than after the reopening of child care centers, at least according to parental (self-)report. The disadvantages of closed facilities might have weighed heavier than the difficulties around the reopening for most children and parents. The strongest predictors of child distress upon return were child age and parental separation anxiety, with younger children and children with parents experiencing more separation anxiety showing more distress after the reopening. Furthermore, concurrent parental distress was positively associated with child distress, and child hours spent in child care and child distress during closure were significant negative predictors. Finally, children from one-parent families experienced more distress upon return than children from two-parent families. In parents, parental separation anxiety and parental fear of COVID-19 explained most of the variance in their distress, with parents scoring higher on separation anxiety and fear of COVID-19 experiencing more distress when their child re-entered the child care center. Moreover, we found that mothers experienced more distress, as well as parents with lower stress levels during the closure and parents with more distressed children upon return.

## Explaining Differences in Child Distress After Reopening

Child distress after reopening was significantly associated with several child, parental and COVID-19 related factors. First, the results of the current study showed younger children to experience more distress when returning to the child care center than older children, as reported by the parent. Younger children have less self-regulatory capacities and were found to be more susceptible to stressors (Gunnar and Donzella, 2002), and therefore might experience more distress around transitions. It should be noted though that most children in the younger age range in the current sample were around 12 months of age and none of the children were younger than 6 months. Therefore, the negative relation between child age and distress upon return might be partly explained by the occurrence of separation anxiety in children as part of a healthy development between 6 and 18 months, when children's attachment bonds with their primary caregivers are being consolidated (Schaffer and Emerson, 1964). Other important predictors of child distress upon return were parental separation anxiety and parental distress after reopening. This positive link between parental emotional reactions and child functioning has been described as a cross-over effect, in which the

**TABLE 3 |** Results of the hierarchical multiple linear regression analysis predicting child distress after reopening ($N$ = 694).

| | Step 1 | | | | Step 2 | | | | Step 3 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***B*** | ***SE*** | β | ***t*** | ***B*** | ***SE*** | β | ***t*** | ***B*** | ***SE*** | β | ***t*** |
| (Intercept) | 3.15 | 0.39 | | 8.00** | 3.51 | 0.61 | | 5.79** | 3.22 | 0.61 | | 5.29** |
| Number of months in child care before closure | −0.02 | 0.00 | −0.20 | −5.30** | 0.01 | 0.00 | 0.08 | 1.45 | 0.01 | 0.00 | 0.07 | 1.32 |
| Stability of professional caregivers[a] | −0.29 | 0.10 | −0.11 | −3.07** | −0.19 | 0.08 | −0.07 | −2.24* | −0.16 | 0.08 | −0.06 | −1.99 |
| Family composition[b] | −0.41 | 0.19 | −0.09 | −2.13* | −0.44 | 0.16 | −0.10 | −2.69** | −0.41 | 0.16 | −0.09 | −2.50* |
| Parental educational level[c] | 0.19 | 0.08 | 0.10 | 2.36* | 0.13 | 0.07 | 0.07 | 1.90 | 0.11 | 0.07 | 0.06 | 1.59 |
| Child age | | | | | −0.02 | 0.00 | −0.30 | −5.16** | −0.02 | 0.00 | −0.29 | −5.10** |
| Negative affectivity | | | | | 0.06 | 0.04 | 0.06 | 1.53 | 0.07 | 0.04 | 0.07 | 1.62 |
| Surgency/extraversion | | | | | −0.07 | 0.05 | −0.06 | −1.39 | −0.06 | 0.05 | −0.05 | −1.20 |
| Child hours in child care | | | | | −0.01 | 0.00 | −0.14 | −3.79** | −0.01 | 0.00 | −0.13 | −3.74** |
| Child stress during closure | | | | | −0.14 | 0.04 | −0.14 | −3.82** | −0.13 | 0.04 | −0.13 | −3.49** |
| Parental separation anxiety | | | | | 0.69 | 0.07 | 0.36 | 9.48** | 0.56 | 0.08 | 0.29 | 6.91** |
| Parental perception of child care quality—child | | | | | −0.15 | 0.10 | −0.08 | −1.54 | −0.12 | 0.10 | −0.06 | −1.23 |
| Parental perception of child care quality—parent | | | | | −0.05 | 0.07 | −0.04 | −0.74 | −0.08 | 0.07 | −0.06 | −1.10 |
| Parental stress during closure | | | | | 0.12 | 0.04 | 0.11 | 2.92** | 0.13 | 0.04 | 0.14 | 3.67** |
| Parental fear of coronavirus | | | | | −0.08 | 0.03 | −0.08 | −2.37** | −0.13 | 0.03 | −0.13 | −3.72** |
| Parental distress after reopening | | | | | | | | | 0.20 | 0.05 | 0.17 | 3.95** |
| $R^2$ | 0.07** | | | | 0.33** | | | | 0.34** | | | |
| $F_{(df1,df2)}$ | $F_{(4,649)}$ = 10.75** | | | | $F_{(14,668)}$ = 21.07** | | | | $F_{(15,669)}$ = 21.22** | | | |

*Regression coefficients were pooled for all 50 imputed datasets.*
*B, regression coefficient; SE, standard error; β, beta coefficient or standardized regression coefficient; t, t-value; $R^2$, coefficient of determination; $F_{(df1,df2)}$, F-value and degrees of freedom.*
**p < 0.05, **p < 0.01.*
[a] *0 = no, 1 = yes.*
[b] *1 = one-parent family, 2 = two-parent family.*
[c] *1 = low/middle, 2 = high.*

emotional reactions of one person within a subsystem influence the emotional reactions of another person (Nelson et al., 2009). The underlying mechanism that has been proposed for explaining this relation is parenting behavior (Deater-Deckard, 1998), although some studies only found a direct effect of parenting stress on child functioning (e.g., Crnic et al., 2005). In the current study, anxious or overprotective parenting could be an explanatory mechanism, although this is a speculation. The hours spent in child care per week were negatively associated with child distress after reopening. Spending more hours at the child care center after an interruption may be beneficial for the adjustment process, because this may help children to get used more easily to the child care setting. It should be noted that in the current study, most children (around 80%) spent 1–4 days at the child care center, which is common in the Netherlands, where full-time child care is an exception. Another predictor was child stress during the closure of child centers: children who missed the child care center to a larger extent during closure, showed less distress upon return. It appears that children who missed the child care center were more excited to return after the reopening and therefore might have experienced less distress, according to their parent. Finally, children from one-parent families experienced more distress when they returned to the child care center. Although family composition was not a predictor of parental distress, children in one-parent families might experience more distress upon return because in general, single parents experience more parenting stress than parents with a partner (Copeland and Harbaugh, 2005), and this parental stress might have crossed over to the child.

Contrary to our expectations, child temperament and child care quality as perceived by the parent were no significant predictors of child distress. We, however, did find negative affectivity to be a significant predictor for the complete cases, with a small difference in the beta weight compared to the pooled data. Since parents who partially filled out the questionnaire reported more parental distress upon return, speculatively, child factors such as negative affect might be only a significant predictor when parental factors such as parental distress are less dominant. When parents experience distress above a certain threshold, the effect of child negative affectivity on child distress may vanish, as parental distress might have a larger impact. Regarding temperament, this variable may act as a moderator, as was for example found in the study by Albers et al. (2016). This study showed higher afternoon cortisol levels during the first weeks at child care for infants who

**TABLE 4 |** Results of the hierarchical multiple linear regression analysis predicting parental distress after reopening ($N$ = 694).

| | Step 1 | | | | Step 2 | | | | Step 3 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***B*** | ***SE*** | **β** | ***t*** | ***B*** | ***SE*** | **β** | ***t*** | ***B*** | ***SE*** | **β** | ***t*** |
| (Intercept) | 2.76 | 0.34 | | 8.18** | 1.56 | 0.49 | | 3.208** | 1.12 | 0.50 | | 2.238* |
| Number of months in child care before closure | −0.01 | 0.00 | −0.10 | −2.64** | 0.00 | 0.00 | 0.06 | 1.19 | 0.00 | 0.00 | 0.05 | 0.95 |
| Stability of professional caregivers[a] | −0.29 | 0.08 | −0.13 | −3.468** | −0.12 | 0.06 | −0.05 | -1.87 | −0.10 | 0.06 | −0.04 | −1.53 |
| Family composition[b] | −0.26 | 0.16 | −0.07 | −1.59 | −0.11 | 0.14 | −0.03 | −0.79 | −0.06 | 0.14 | −0.02 | −0.44 |
| Parental gender[c] | 0.34 | 0.10 | 0.13 | 3.22** | 0.213 | 0.09 | 0.08 | 2.51* | 0.20 | 0.09 | 0.08 | 2.39* |
| Child age | | | | | −0.00 | 0.00 | −0.06 | −1.11 | −0.00 | 0.00 | −0.02 | −0.29 |
| Negative affectivity | | | | | −0.02 | 0.03 | −0.02 | −0.56 | −0.03 | 0.03 | −0.03 | −0.78 |
| Surgency/extraversion | | | | | −0.05 | 0.04 | −0.06 | −1.38 | −0.05 | 0.04 | −0.05 | −1.17 |
| Child hours in child care | | | | | 0.00 | 0.00 | 0.00 | −0.04 | 0.00 | 0.00 | 0.02 | 0.49 |
| Child stress during closure | | | | | −0.09 | 0.03 | −0.10 | −2.96** | −0.07 | 0.03 | −0.07 | −2.29* |
| Parental separation anxiety | | | | | 0.67 | 0.06 | 0.41 | −11.72** | 0.58 | 0.06 | 0.36 | 9.78** |
| Parental perception of child care quality—child | | | | | −0.16 | 0.07 | −0.10 | −2.20* | −0.14 | 0.07 | −0.09 | −1.98 |
| Parental perception of child care quality—parent | | | | | 0.12 | 0.06 | 0.10 | 2.15* | 0.13 | 0.05 | 0.10 | 2.31* |
| Parental stress during closure | | | | | −0.14 | 0.03 | −0.17 | −5.15** | −0.15 | 0.03 | −0.18 | −5.67** |
| Parental fear of coronavirus | | | | | 0.25 | 0.02 | 0.31 | 10.36** | 0.26 | 0.02 | 0.33 | 10.81** |
| Child distress after reopening | | | | | | | | | 0.12 | 0.03 | 0.14 | 4.04** |
| $R^2$ | 0.05** | | | | 0.46** | | | | 0.48** | | | |
| $F_{(df1,df2)}$ | $F_{(4,652)}$ = 8.18** | | | | $F_{(14,661)}$ = 35.45** | | | | $F_{(15,662)}$ = 35.13** | | | |

*Regression coefficients were pooled for all 50 imputed datasets.*
*B, regression coefficient; SE, standard error; β, beta coefficient or standardized regression coefficient; t, t-value; $R^2$, coefficient of determination; $F_{(df1,df2)}$, F-value and degrees of freedom.*
*$^*p < 0.05$, $^{**}p < 0.01$.*
*[a]0 = no, 1 = yes.*
*[b]1 = one-parent family, 2 = two-parent family.*
*[c]0 = male, 1 = female.*

received higher quality of maternal care, but only if infants also scored higher on negative emotionality.

## Explaining Differences in Parental Distress After Reopening

Parental factors contributed more to the explained variance in parental distress after reopening than child factors. This is in line with the conclusion by Cobham et al. (2016), who found child functioning to predict parental outcomes only in a minority of studies. As expected, parental separation anxiety and parental fear of COVID-19 were positively associated with parental distress. Comparable results were found in other recent studies into stress and parenting during the COVID-19 pandemic. For example, Brown et al. (2020) found COVID-19 related stressors, and high anxiety and depressive symptoms to correlate with higher parental stress. We additionally found evidence for a negative relation between parental stress during closure and parental distress after reopening, which might be explained by the relieve that parents who experienced more stress during closure might have felt when they were able to bring their child to the child care center after 2 months. In the current study, mothers experienced more distress than fathers, which corresponds with the general finding that women suffer more from anxiety and depressive symptoms than men (Faravelli et al., 2013), and which was also found in a recent study on lockdown-related traumatic stress in parents (Chartier et al., 2021). We also found that child distress was a significant predictor of parental distress. More research is needed to further explore the (bi)directionality of the relation between child and parental distress. Finally, results showed that child care quality as perceived by the parent did not predict parental distress, which contradicted our expectation. The absence of this effect might be explained by the limited variation in child care quality overall, as parents rated the child care quality of the child care setting rather positive.

## Limitations and Implications

The current study showed that about one-third of the parents and children experienced distress when the child returned to the child care center after the lockdown (as perceived by the parent). When discussing these results it is, however, important to note that after the reopening, child care centers took several measures to minimize the spread of COVID-19, such as keeping 1.5 m distance between all adults and a quicker drop-off and collection at the door. As we described in a previous report (Vrijhof et al., 2020), these measures

were mainly perceived as negative by parents, both for their children and themselves, and therefore it is likely that these measures have had an impact on experienced parental and child distress after reopening. The effect of the interruption of care and the effect of the measures after reopening are difficult to disentangle, but unfortunately inherent to the situation. Further, as our preliminary analyses showed, parents who filled out the questionnaire partially, scored higher on distress upon return to the child care center than parents who completed the entire questionnaire. Therefore, it could be that the most stressed parents did not fill out the questionnaire at all, leading to an underestimation of the levels of distress upon return. However, the relatively low levels of distress could also reflect reality, as other studies also found that only a minority responded negatively to the reopening of schools and work places after a lockdown during the COVID-19 pandemic (Gilbert et al., 2020; Tan et al., 2020). Another limitation concerns the possibility that some questions in the current study could have elicited socially desirable answers, especially with regard to the CiToC questionnaire. Parents might have not wanted to report extremely low or high distress, as the first may be seen as indifference and the second as conflicting with bringing their child to the child care center.

In addition, the retrospective and one-informant design of the study has some drawbacks. First, parents reported about both their own and their child's distress, which could have resulted in parents with distress over-reporting their child's distress, as was found in other studies (Briggs-Gowan et al., 1996). However, the relatively low bivariate correlation between and different results for the two outcome variables give confidence in the independent rating of constructs. Secondly, parents filled out the questionnaire several months after the actual reopening of child care centers and their memories may have faded somewhat or decreased in intensity. However, because of the extraordinary nature of events, it was not possible to distribute the questionnaire earlier and we expected parents to remember the details rather accurately because of this. Moreover, it was mentioned that participants could discuss the CiToC questionnaire with their partner to increase validity. Finally, all variables were measured simultaneously, and conclusions regarding causality can therefore not be drawn. Future studies should ideally implement a multi-informant (including both parents and professional caregivers), multi-method design (including both questionnaires and observations) and follow children and parents prospectively over time as they (re)transition into a (new) child care setting, and further explore the proposed underlying mechanisms of the association. Additionally, such a design could help to answer questions about how long children and parents need to (re)adjust and what factors account for variation in the length of this process. Related factors such as family socio-economic status and social support should be included as well, as these can (partly) influence other factors, such as the number of hours that the child spends at the child care center (which was found to be related to child distress).

As widespread closures of child care centers might happen again, not only because of the COVID-19 pandemic, the outcomes of the current paper can give direction to policy makers and professionals in comparable future situations. The interruption of care can be related to large-scale disasters, but also to individual circumstances, such as hospitalization of the child. After such an interruption, extra attention should be directed to younger children, children spending less hours at child care (children of) parents with higher levels of parental separation anxiety, and parents with higher levels of situation-specific anxieties (in this case: more fear of COVID-19). Considering the strength of the association between parental separation anxiety and both outcome measures, it would be interesting to investigate what parents and professional caregivers think about the feasibility of the MSA subscale (Hock et al., 1989) as a screening instrument. The questionnaire might then help professionals to identify children and parents that may be in need of some extra support. However, this idea raises some ethical questions that should be discussed first, for example who would get access to this personal information. Furthermore, research into useful cut-off scores would be needed then. In the meantime, child care organizations could think of encouraging professional caregivers to communicate with parents before the return and ask them about their feelings and potential worries regarding the interruption of care and the return of the child to the child care center. Another implication is that few hours in child care per week might be less beneficial for the adjustment process of children. Whether certain thresholds exist regarding the amount of hours that is necessary for a smooth (re)transition should be studied in future research. A final avenue for prospective research concerns studying the types of support that help children and parents best with making a smooth (re)transition into the child care setting.

## CONCLUSION

The current study demonstrated that child age, child hours in child care, child and parental stress during closure, parental separation anxiety, parental fear of COVID-19, parental gender, and family composition are predictors of child and parental distress when the child returned to the child care center after a 2-month national lockdown. Especially younger children, children spending less hours at child care and (children of) anxious parents could benefit from some extra support when they return after an interruption. Communicating with parents about potential worries regarding the return of children is crucial to be able to identify these families. Future research should use prospective designs in which the observations of multiple informants are included and the underlying mechanisms, such as parenting practices, of the observed associations are studied.

## DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because if we receive a request to share our data the lead

investigator HV, possibly in consultation with the other members of the research team, will decide whether or not to agree with this request. We support the notion that other researchers must be able to verify results and that it can be worthwhile to reuse data for future research. Requests to access the datasets should be directed to HV, vermeer@fsw.leidenuniv.nl.

## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Ethics Committee of the Institute of Education and Child Studies of Leiden University. The participants provided their written informed consent to participate in this study.

## AUTHOR CONTRIBUTIONS

SMV, CV, and JP coordinated the data collection. SMV and CV organized the database. SMV wrote the initial draft and conducted the statistical analyses. All authors contributed to the conception and design of the study, manuscript revision, read, and approved the submitted version.

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## SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.718898/full#supplementary-material

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# Early Intervention Services During the COVID-19 Pandemic in Spain: Toward a Model of Family-Centered Practices

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Early intervention services (EIS) worked hard to continue serving children and their families during the COVID-19 lockdown, using online applications. This study aimed to determine families' and professionals' perceptions of the functioning of the early intervention (EI) model in Spain during the pandemic. The study sample comprised two subsamples: 81 families of children attended at an EIS (72 mothers and 9 fathers) and 213 professionals recruited from EIS. The survey was conducted online several weeks after the end of the strict lockdown in Spain. Descriptive statistics of the questionnaire answered by families and professionals were compiled, comparisons were made between the families' and the professionals' responses, and the relationships with several sociodemographic variables were analyzed. The results indicated that parents who cared for their children and were fully responsible for housework, parents who had used telematic tools before the lockdown, and younger professionals had a more positive perception of the EI model and the incorporation of family-centered practices (FCP) during the pandemic. The results also showed statistically significant differences in some items between parents and professionals: for example, professionals perceived more advantages than families during the lockdown, quoting the greater participation of families in the intervention and a greater focus on families' needs. The data obtained from professionals suggested a more positive attitude toward FCP: however, the results show that they continued to adopt a directive role in the intervention, a position that is at odds with the tenets of FCP. There is a clear need for more training if a paradigm shift to FCP is to be achieved. Families' and caregivers' perceptions of telerehabilitation, and their adherence to telerehabilitation programs, are discussed. The implications of this study with regard to guiding future telematic interventions and family support are also considered.

**Keywords: early intervention services, COVID-19, pandemic, family-centered practices, families, professionals, telematic intervention**

## INTRODUCTION

Over fifty years have passed since the introduction of the first early intervention services (EIS) in Spain. Today there is a wide network of universal, public, and free-of-charge EIS throughout the country, organized by the autonomous communities and run by interdisciplinary teams of professionals in the fields of health, psychology, education, speech therapy, physiotherapy, and social work. According to data provided by the *Grupo de Atención Temprana* (GAT; Early Intervention Group), there are currently over 700 EIS in Spain employing more than 4,500 professionals (Grupo de Atención Temprana, 2018).

Internationally, early intervention (EI) has come a long way in recent years, focusing less on biology and more on environmental questions, and evolving toward the integration of the biological, the psychological and the social. This is manifested mainly in the interaction of individuals with their contexts, and all these factors must be included in in each therapeutic action. In Spain, EIS have become consolidated over the years, but have also undergone major changes (some of them driven by the evolution in approaches to disability, which are no longer deficit-based but prioritize rehabilitation) and have shifted from a child-centered to a family-centered focus (Espe-Sherwindt, 2008). The scientific evidence emerging from the systemic, ecological, and transactional development model (Bronfenbrenner, 1979, 1987; Sameroff, 1983) to explain child development has also influenced their activity.

The development of EI in Spain has reflected this change in focus (García-Sánchez et al., 2014; Escorcia-Mora et al., 2016; Domeniconi and Gràcia, 2018; García-Grau et al., 2019; Gràcia et al., 2019), in response to the need for improvements in interventions (García-Sánchez, 2002; Vilaseca et al., 2004; Giné et al., 2006; Gutíez, 2010; García-Sánchez et al., 2014; Vilaseca et al., 2019a) laid down in the *Libro Blanco de la Atención Temprana* (White Book on Early Intervention; Grupo de Atención Temprana, 2005a). The *Libro Blanco* (Grupo de Atención Temprana, 2000, 2005a) and the manual of technical recommendations (Grupo de Atención Temprana, 2005b) highlight the importance of the family in the intervention. The book defines EI as "a set of interventions for children aged 0–6 years, the family, and the environment, which aim to respond as promptly as possible to the temporary or permanent needs of children with developmental disorders or those who are at risk. These interventions must be holistic and must be planned by an interdisciplinary or transdisciplinary team of professionals" (Grupo de Atención Temprana, 2000, p. 12).

Clearly, this definition highlights the need to intervene with the child, with the family, and with the community. However, theoretical models differ widely on the question of how to work with families, including those with a child with disabilities or at risk (Dalmau et al., 2017; Mas et al., 2018; García-Grau et al., 2020). Furthermore, despite the fact that international organizations such as the World Health Organization (2012), the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2015), the Division for Early Childhood of the Council for Exceptional Children (Division for Early Childhood, 2014) and specialized professional associations such as the European Association on Early Childhood Intervention and the International Society on Early Intervention have all called for the incorporation of evidence-based and family-centered practices in EI, not all EIS in Spain apply a family-centered model.

In fact, most EIS in Spain still apply a child-centered approach, in which professionals intervene with the child outside his/her natural context (Dalmau et al., 2017; Vilaseca et al., 2020). According to Vilaseca et al. (2004), EI professionals spend 1% to 5% of their time working with families and 70% to 80% of their time working with the child. A more recent study (Grupo de Atención Temprana, 2011) reported a slight change in the proportions, with 14.7% of their time being devoted to families and 75% to children. Although the time spent working with families has increased, it nevertheless falls short of the international recommendations. According to Dunst and Trivette (1987, 1996, 2009), Leal (1999), Bruder (2000), Dunst et al. (2008), Espe-Sherwindt (2008) and McWilliam (2010a,b, 2011), family-centered practices (FCP) should (a) adopt an ecological and systemic approach, (b) stress the importance of the families' natural context to promote family choices and control over desired resources, (c) empower families by placing the emphasis on their strengths, and d) develop a collaborative relationship with families – in stark contrast to the expert model, in which professionals decide how to proceed with families and what objectives to establish in their intervention programs (Serrano et al., 2017). This proposal for a change of perspective has met resistance from both families and professionals (Gràcia et al., 2019; Vilaseca et al., 2019a). For professionals, it implies a change in the way they interact with families and a shift to a model that many international authors have called family capacity-building practices (Dunst et al., 2019) – described in the early childhood intervention literature as enabling practices (Summers and Jenkins, 2001), participatory practices (Dunst and Espe-Sherwindt, 2016), engaging practices (Buckingham et al., 2016), collaborative practices (Espe-Sherwindt, 2008) and empowering practices (Dunst et al., 1988. In short, this type of intervention includes and emphasizes the support that professionals provide to parents of young children and other caregivers to promote the child's learning and development in a model of equality and collaboration, inside contexts of everyday activities and settings (Kemp and Turnbull, 2014; Dunst et al., 2019; García-Grau et al., 2019; Vilaseca et al., 2019a, 2020). For families, this change represents a challenge as they now play an active role in decision-making rather than a passive one, and now see professionals as their partners (Turnbull et al., 2011). A literature search carried out prior to this study highlighted the barriers that EI professionals face when they shift practices from one model to another (Friedman et al., 2012; Gràcia et al., 2019; Vilaseca et al., 2019a). Coaching with parents can be challenging for professionals, as the process can easily revert to the expert-based model (García-Grau et al., 2019).

On 11 March 2020, the World Health Organization (WHO) officially declared the COVID-19 pandemic. In Spain, as in other countries, the emergency radically changed the care given to families with children attended at EIS. During the lockdown, many EIS had to suspend visits and care for families, and this undoubtedly increased the burden on parents of children with

disabilities or children at risk. Behavioral regulation problems and levels of parental stress rose notably (Montirosso et al., 2021). In this new context, families had to provide 24-h care, without face-to-face access to the EIS. The most frequent concern of parents of children with disabilities was the lack of rehabilitation during the lockdown (Cacioppo et al., 2021). It is clear that social distancing seriously affects rehabilitation interventions, especially when children require physical interaction with their therapists (Provenzi et al., 2021). In Spain, in an attempt to ensure continuity of care, many of the EIS worked online, connecting with families through Skype, Zoom and other online platforms and were thus able to enter the families' natural contexts, even if only virtually. In this way, the situation of COVID-19 provided early intervention professionals with an opportunity to implement telerehabilitation strategies inside families' everyday contexts.

Telehealth technology has been reported to be a very useful tool in these situations, especially for rehabilitation purposes (Camden et al., 2020; Fazzi and Galli, 2020). Telehealth includes telerehabilitation, telecare, and teleconsultation. Previous research has shown that remote consultations can help to maintain closeness with therapists and help parents address concerns about their children's development or their own psychological distress (Vismara et al., 2018). Studies of computer-mediated interventions have also shown good results with parents of children with developmental disorders or with neurodevelopmental disabilities (Kennedy et al., 2017; Balldin et al., 2018; Provenzi et al., 2020). The use of telehealth technology also facilitates access to care for families who live far away, allows the participation of the whole family by making service hours more flexible, and saves them time and money by removing the need for travel. Some assessments of teleintervention have reported fewer cancelations and greater commitment from primary caregivers (Behl et al., 2017). Indeed many studies report high levels of satisfaction among families, thus supporting the hypothesis that remote rehabilitation services can be a good alternative to direct face-to-face in-center care (Beani et al., 2020; Roggman et al., 2020; Traube et al., 2020).

During the pandemic, several tele-rehabilitation projects were set in motion in different countries for families with a child with neurodevelopmental disorders. Nevertheless, as Shorey et al. (2021) report in a review, only two studies systematically evaluated families' responses to teleintervention during the pandemic. The first was conducted as part of the Engaging with Families in Online Rehabilitation of Children during the Epidemic (EnFORCE) telehealth program in Italy (Provenzi et al., 2021), and the second at the COVID-19 Neurodevelopmental Disorders Clinic (Summers et al., 2021) in Canada. The Italian program provided families with uninterrupted care and rehabilitation during the COVID-19 lockdown, and comprised parental support and child rehabilitation sessions conducted by the same therapists and psychologists as before the confinement, in a situation very similar to that of EIS professionals in Spain. The results of that study were spectacular: more than 80% of the parents perceived an improvement in the development of their children and, in addition, 40% reported that this type of telematic intervention had been more effective than face-to-face practice at the centers. The Canadian study (Summers et al., 2021) was a home-based consultation program implemented by a multidisciplinary team. Virtual assessments focused on problematic behaviors and lasted 60–90 min. Both these teleintervention programs were well received by most of the families. The problems identified were related to the poor quality of the internet connection, the lack of familiarity with telematic tools, interruptions, and difficulties following the instructions (Shorey et al., 2021).

In Spain, for researchers into early intervention practices, the COVID-19 pandemic brought an opportunity to move toward a family-centered model, despite all the difficulties and challenges that the situation posed. Some professionals in early intervention already had training and experience in teleintervention before the pandemic, while for others it was an entirely new experience. We should highlight certain support initiatives, such as the guide prepared by Plena Inclusión (2020). This situation made us reflect on whether, despite the terrible consequences of the COVID-19 pandemic, it might have given professionals and families the impetus to adopt the principles of family-centered practices – a change of perspective which had been proposed for so long in Spain (Tamarit, 2015; Dalmau et al., 2017; Mas et al., 2018; Gràcia et al., 2019; Vilaseca et al., 2019a).

Therefore, the general aim of this study was to identify the changes in the intervention methodology used with families receiving EIS in Spain in the new scenario created by the COVID-19 pandemic. More specific aims were: (a) to analyze the families' and professionals' perceptions of the intervention model received and implemented during the pandemic lockdown; (b) to explore the relation of certain sociodemographic variables and the families' and professionals' perceptions of the intervention model; (c) to identify any differences between families' and professionals' perceptions of the intervention model in this exceptional context.

# MATERIALS AND METHODS

## Participants

Convenience sampling – a type of non-probabilistic sampling-was used to select participants who were recruited from several EIS in Spain. Two inclusion criteria were applied: families had to have a child attended by an EIS at the time of receiving the survey, and professionals had to have been working in the EIS for at least one year prior to the lockdown. The participants were volunteers who met the inclusion criteria and responded to a request to take part (see section "Procedure").

The study sample comprised two subsamples: 81 families and 213 professionals (see **Tables 1**, **2**). The subsample of families (parents) was composed of 72 mothers (88.9%) and 9 fathers (11.1%). The mothers had a mean age of 38.1 years (*SD = 6.9*) and the fathers of 39.9 years (*SD = 14.9*). Most parents were married or living with a partner (90.1%). Half of them had completed high school (46.9%) or had a university degree (39.5%). They were either employed full-time (42%), employed part-time (22.2%) or cared for their children and were fully responsible for housework (19.8%). The majority were

**TABLE 1 |** Demographic characteristics of the family members who answered the survey and the child attended at an EIS ($n$ = 81).

| Characteristics of the person who answers | *n* (%) | Characteristics of child attended at an EIS | *n* (%) | Characteristics of attention in EIS before COVID-19 | *n* (%) |
|---|---|---|---|---|---|
| Sex | | Sex | | Frequency of sessions | |
| Female | 72 (88.9) | Female | 19 (23.5) | Twice-weekly | 4 (4.9) |
| Male | 9 (11.1) | Male | 62 (76.5) | Weekly | 30 (37.0) |
| Age (years) | | Age (months) | | Every two weeks | 20 (24.7) |
| < 29 | 6 (6.2) | < 24 | 17 (21.7) | Monthly | 15 (18.5) |
| 30–39 | 37 (45.4) | 25–48 | 34 (43.1) | Others | 3 (3.6) |
| 40–49 | 36 (43.1) | 49–59 | 18 (22.9) | They had not started | 9 (11.1) |
| > 50 | 4 (4.8) | > 60 | 11 (14.1) | Session length (minutes) | |
| *Employment status* | | Degree of disability | | 60 | 44 (54.2) |
| Employed full-time | 34 (42.0) | Mild | 52 (64.2) | 45–50 | 28 (34.6) |
| Employed part-time | 18 (22.2) | Moderate | 21 (25.9) | < 40 | 9 (11.1) |
| Homemaker | 16 (19.8) | Severe | 8 (9.9) | Session mode | |
| Others | 13 (16.0) | Therapy received at the EIS | | Professional and child | 40 (49.4) |
| Level of education completed | | Speech therapy | 33 (41.3) | Professional talks with the family at the end of the session | 11 (13.6) |
| Primary or no studies | 11 (13.6) | Psychology | 24 (30.0) | Professional involves the family | 19 (23.5) |
| Secondary | 38 (46.9) | Physiotherapy | 16 (20.0) | Professional goes to child's home | 1 (1.2) |
| University degree | 32 (39.5) | Others | 7 (8.8) | Others | 10 (12.3) |

**TABLE 2 |** Demographic characteristics of professionals ($n$ = 213).

| Characteristics | n (%) | Characteristics | n (%) |
|---|---|---|---|
| Sex | | Discipline | |
| Female | 204 (95.8) | Physiotherapy | 58 (27.2) |
| Male | 9 (4.2) | Psychology | 75 (35.1) |
| Age (years) | | Speech therapy | 45 (21.2) |
| < 29 | 23 (10.7) | Psychomotor skills | 13 (6.2) |
| 30–39 | 74 (34.8) | Social work | 6 (2.8) |
| 40–49 | 69 (32.4) | Pedagogy/ psychopedagogy | 6 (2.8) |
| 50–59 | 29 (13.5) | Others (neuropediatrics, occupational therapy...) | 10 (4.7) |
| > 60 | 16 (7.5) | Number of people in team | |
| Missing | 2 (1.0) | < 5 | 37 (17.3) |
| Years of experience | | 6–10 | 55 (25.9) |
| < 2 | 30 (14.1) | 11–15 | 42 (19.8) |
| 2 - 5 | 39 (18.3) | 16–20 | 33 (15.4) |
| 6 - 10 | 25 (11.7) | 21–25 | 34 (16.0) |
| > 10 | 119 (55.9) | >26 | 12 (5.6) |

from Catalonia (79%), 18.5% were from Castilla La Mancha and 2.5% from Andalusia.

Among the children, 76.5% were male and 23.5% were female, with an age range from 7 to 68 months ($M$ = *40.5, SD = 16.4*). The degree of intellectual disability (ID) was mild (33 – 64%) in 64.2%, moderate (−65 – 74%) in 25.9% and severe (> 75%) in 9.9%. In Spain, assessment of the percentage of disability is a standardized process carried out by a government agency, the Valuation and Guidance Services for People with Disabilities. ID is graded as mild, moderate or severe. A total of 41.3% of children received speech therapy, 30% psychological support and 20% physiotherapy. More than half (54.2%) received 60-min sessions at the EIS, either once a week (37%) or every other week (24.7%) before the pandemic. Regarding the format of the pre-pandemic sessions, almost half of the family subsample stated that the professional attended exclusively to the child (49.4%), 23.5% stated that s/he involved the family and only 1.2% reported that s/he came to their home. Before the onset of the pandemic, it tended to be the mother who took the child to the EIS (49.4% alone or 29.6% together with the father). Most families (64.2%) had no online contact before COVID-19.

The subsample of professionals comprised 204 women (95.8%) and 9 men (4.2%), with a mean age of 41 years (*SD = 10.9*). With regard to their specializations, 27.2% were physiotherapists, 35.1% psychologists and 21.2% speech therapists. Most had over five years of experience working at an EIS (67.6%). Most (63%) worked in a team with a maximum of 15 members. Most of the participating EIS were based in Catalonia (58.7%), with 23% in Castilla La Mancha, 15% in Andalusia, and 11% in Valencia.

## Instruments

Once the family or professional received the document via e-mail and clicked on the link, they were given information about the nature and purpose of the survey on the first page.

Subsequently, if they agreed to participate, they were taken to the sociodemographic questionnaire on the following page. The second part of the survey asked about their perceptions of how the intervention methodology at the EIS had changed as a result of COVID-19.

The family version of the *Brief sociodemographic questionnaire* compiled data on marital status, educational attainment, employment status, number of people living in the home, gender and age of their child, degree of disability, and frequency of attention in EIS before lockdown. The version for professionals compiled data on their field, number of EIS professionals at their center, years of work experience, and so on.

The *Questionnaire on EIS interventions in times of COVID-19 for families (Intervención en los CDIATs en tiempos de COVID-19 para familias)* was developed *ad hoc* for this study. The main objective was to evaluate families' perceptions of the changes in the way professionals intervened with their children since the pandemic.

The *Questionnaire on EIS interventions in times of COVID-19 for professionals (Intervención en los CDIATs en tiempos de COVID-19 para profesionales)* also developed *ad hoc* for this study, assessed professionals' perceptions of changes in the methodology of intervention with families and children since the pandemic.

Both surveys were translated into Catalan for people from Catalonia and Valencia. Initially, the measures consisted of 14 items. In the version for families, the items measured aspects related to the use of telematic means (video calls, videos, e-mails, etc.) with the EIS professional as a result of the lockdown. For example, some questions explored whether interventions carried out through a video call allowed family members to talk in more detail about daily routines or about the child's functioning at home (item 1) or participate more in the intervention (item 2), or whether the professional continued to decide what to work on with the child at home (item 3).

In the version for professionals, these items measured, for example, whether the use of telematic means allowed them to learn more about the child's natural context (item 1) and to focus on the needs of the entire family and not just the child (item 5), or asked about the need for further training to intervene in the natural context (item 14). **Table 3** (families) and **Table 4** (professionals) display all the items for both instruments.

Families and professionals were asked to state how far they agreed with each of the items on a Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). The Cronbach's alpha coefficient of the final questionnaire for families, composed of 12 items, was 0.915, and the final questionnaire for professionals, with 13 items, was 0.906, indicating acceptable internal consistency (Taber, 2018).

## Procedure

During the pandemic, the safest way to collect data was through an online survey. We conducted a nationwide cross-sectional study through an electronic survey in Google Forms (Google LLC, Mountain View, CA, United States). We prepared two surveys: one for families and the other for professionals. This study was approved by the Network of Ethics Committees in Universities and Public Research Centers in Spain in accordance with the International Ethical Guidelines for Health-related Research Involving Humans and written informed consent was obtained from parents and professionals prior to data collection.

First of all, we contacted two organizations that manage EIS in Spain and Catalonia, the Spanish Association for Early Childhood Intervention (AEIPI) and the Catalan Association of Early Intervention (ACAP). We sent them a document via e-mail with a brief explanation of the project, the objectives and methodology, and a link to a fuller explanation of the project, the informed consent form, a brief sociodemographic questionnaire and the survey. The associations sent the information to all affiliated members. Participation in the study was voluntary and anonymous, and participants did not receive any financial compensation.

Parents or professionals who agreed to participate, answered the online survey, which was available for approximately three weeks (from 11 June to 7 July 2020). The survey took approximately 15 min to answer. At the end of the survey both families and professionals had the possibility to add observations or comments and to contact the researchers if they had questions.

## Data Analysis

An exploratory factor analysis was conducted to identify the underlying dimensions of each of the two versions of the *Questionnaire on EIS interventions in times of COVID-19*. Data for each questionnaire underwent Principal Component Analysis (PCA) with Varimax rotations.

Cronbach's alpha coefficients were computed for each scale to provide an indicator of internal consistency of the measures. For item analysis, we calculated Cronbach's alpha if an item was deleted, and also discrimination indexes, obtained as the corrected correlation of the item score with that of the corresponding scale. Total scores were obtained by calculating the mean for the items on each scale.

Descriptive statistics (mean and standard deviation) were computed for each of the questions answered by professionals and families. Each item was scored on a four-point Likert-type scale (1: Strongly disagree, 2: Disagree, 3: Agree, 4: Strongly agree). A one sample *t*-test was used to determine whether the mean score of each item was different from 2.5 (the midpoint of the scale). In addition, differences between professionals and families were analyzed by comparing the mean scores of the items with similar content for both groups, via an independent sample *t*-test.

To study the relationship between each of the demographic variables and the total scores on the questionnaires, a bivariate analysis was conducted. For categorical demographic variables, total scores were compared via an independent sample *t*-test (to compare two means) or One-Way ANOVA (for more than two means), followed by *post hoc* pairwise comparisons. Relationships between continuous demographic variables and total scores were examined via Pearson product-moment correlation coefficients (or Spearman's correlation coefficients for ordinal demographic

**TABLE 3 |** Exploratory factor analysis and descriptive statistics for the questionnaire answered by the families ($n$ = 81).

| | Factor loading | *M* | *SD* | $t_{(80)}$ |
|---|---|---|---|---|
| 1. Connecting by video call with the EIS professional has allowed us to talk more than before about our daily routines, the child's functioning at home, our daily organization, etc. | 0.566 | 2.70 | 0.99 | 1.84 |
| 2. During the follow-up via video call, we were able to participate more and contribute our opinions on what to work on with our child, and on the difficulties encountered on a day-to-day basis, etc. | 0.737 | 2.69 | 0.97 | 1.77 |
| 3. The EIS professional has continued to propose and decide which aspects we can work on or strengthen with our child at home. | 0.853 | 3.24 | 0.88 | 7.57*** |
| 4. The EIS professional has guided us to find new ways to use the material we have at home. | 0.864 | 3.17 | 0.93 | 6.49*** |
| 5. We feel that the EIS professional has taken our emotional needs as a family more into account during lockdown than before lockdown. | 0.581 | 2.61 | 1.01 | 1.03 |
| 6. In addition to caring for the child, we have been able to discuss other situations that affect us as a family (e.g., symptoms of anxiety or depression as a result of COVID-19, concerns about the current economic and employment situation, etc.). | 0.727 | 2.91 | 1.07 | 3.46** |
| 7. In the video call sessions, all members of the family (mother, father and/or siblings) have participated, whereas before we were not able to do this. | 0.569 | 2.37 | 1.05 | −1.10 |
| 8. The EIS professional has given us guidelines on what we can do as parents to promote our child's development at home. | 0.861 | 3.22 | 0.93 | 6.94*** |
| 9. The sessions lasted as long as before lockdown. | 0.652 | 2.98 | 0.99 | 4.41*** |
| 10. Unlike before, the professional has added our opinions to the work plan with our child. | 0.677 | 2.54 | 1.00 | 0.39 |
| 11. The online sessions have continued to be led by the professional. | 0.732 | 3.08 | 0.96 | 5.47*** |
| 12. We are satisfied with the care we have received from EIS during lockdown. | 0.839 | 3.23 | 0.95 | 6.94*** |
| Total score | 0.566 | 2.90 | 0.91 | 5.09*** |

*$^{**}p < 0.01$ $^{***}p < 0.001$ One sample t-test (mean value = 2.5).*

**TABLE 4 |** Exploratory factor analysis and descriptive statistics for the questionnaire answered by the professionals ($n$ = 213).

| | Factor loading | *M* | *SD* | $t_{(212)}$ |
|---|---|---|---|---|
| 1. Connecting by video call with families or through videos has allowed me to increase my knowledge about specific aspects of family dynamics in the child's natural context, daily routines, how the child functions at home, etc. | 0.755 | 3.15 | 0.76 | 12.34*** |
| 2. In the intervention sessions with families and children at home, families have been more participative (they have contributed their opinions on aspects to work on, difficulties encountered, etc.). | 0.733 | 2.99 | 0.72 | 9.99*** |
| 3. I have been able to propose, with input from the parents, functional objectives concerning what the child and family do at home. | 0.710 | 3.08 | 0.76 | 11.22*** |
| 4. I have guided families to identify new ways to use the material they already have or the routines they already do to support their child's development. | 0.754 | 3.26 | 0.69 | 15.95*** |
| 5. I have been able to work with the families during this period of lockdown, based on their needs. | 0.761 | 3.33 | 0.71 | 17.09*** |
| 6. In addition to caring for the child, I have been able to think of specific goals for the caregivers (e.g., related to the presence of symptoms of anxiety or depression as a result of COVID-19, concerns regarding their current economic and employment situation, etc.). | 0.655 | 3.00 | 0.79 | 9.35*** |
| 7. I have had the opportunity to see the entire family unit and involve all the members, since the mother, father and/or siblings were present in the sessions we held through video calls. | 0.649 | 2.68 | 0.87 | 3.07*** |
| 8. I have been able to promote parent-child interactions that enhanced the child's development at home. | 0.716 | 3.03 | 0.71 | 11.00*** |
| 9. I have had the opportunity to give positive feedback to parents about their interactions with their child and enhance their strengths. | 0.836 | 3.35 | 0.74 | 16.84*** |
| 10. If siblings were present in the video call sessions, I was able to observe the relationship between siblings. | 0.637 | 2.76 | 0.94 | 4.08*** |
| 11. From now on, I want to continue using tools to work with families and children in the natural context. | 0.714 | 3.14 | 0.81 | 11.43*** |
| 12. The experience of lockdown has made me rethink the way I work with families and children. | 0.569 | 2.87 | 0.89 | 6.05*** |
| 13. The experience of lockdown has made me realize that I need more training on how to intervene with families and children in their natural context. | 0.512 | 2.88 | 0.87 | 6.48*** |
| Total score | | 3.04 | 0.54 | 14.54*** |

*$^{**}p < 0.01$ $^{***}p < 0.001$ One sample t-test (mean value = 2.5).*

variables). For the bivariate analysis, effect size was calculated by Cohen's $d$, Eta squared ($\eta^2$), or $R$ squared.

Finally, variables whose effect was found to be statistically significant in the previous bivariate analyses were included in a linear regression model to predict total score on the questionnaires. IBM SPSS Statistics (version 26.0 for Windows) was used for all statistical analyses. Missing data were handled by pairwise deletion.

For all analyses, statistical significance was defined as $p < 0.05$.

# RESULTS

## Factor Analysis and Reliability of the Questionnaire for Families

Principal Component Analysis (PCA) was used to explore the dimensionality of the Questionnaire on EIS interventions in times of COVID-19 for families. According to the Unidimensionality Index, $UI = (\lambda_1 - \lambda_2) \big/ (\lambda_2 - \lambda_3) = 19.45$, the items clearly satisfied unidimensionality (Slocum-Gori and Zumbo, 2011). All item loadings were greater than 0.50, except items 12 ("We like to use our own material rather than that of the EIS, because we can use it every day and it helps our child") and 13 ("Our child has received less attention than before lockdown") with loadings lower than 0.30. Also, Cronbach's alpha coefficient increased if items 12 and 13 were deleted. For these reasons, these two items were removed from the questionnaire and items were renumbered accordingly.

The final questionnaire (comprising 12 items) underwent PCA again. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.87, and Bartlett's test of sphericity was highly significant ($p < 0.001$), indicating that the data were suitable for the analysis. The one-factor solution accounted for 53.2% of the total variance. All item loadings were greater than 0.50 (see **Table 3**).

Cronbach's alpha coefficient was computed to assess the questionnaire's internal consistency. For item analysis, we calculated Cronbach's alpha if an item was deleted, and homogeneity indexes, obtained as the corrected correlation of the item score with the total score. In this sample, Cronbach's alpha was 0.915, and it decreased if any of the items were deleted. Homogeneity indices were greater than 0.50 for all items. Thus, the final questionnaire seemed to show a unidimensional structure with a high internal consistency.

## Descriptive Statistics of the Questionnaire for Families

A total score was obtained by calculating the mean score of the 12 items included in the questionnaire. Therefore, total scores (like the item scores) ranged from 1 to 4. **Table 3** shows descriptive statistics (mean and standard deviation) of the total scores, and each of the items answered by families ($n = 81$). In eight items, the difference between the mean item score and the midpoint of the scale (2.5) was statistically significant ($p < 0.01$). This result indicates that, on average, families agreed with the statement made in the questions. In particular, the content of those items was related to professional guidelines promoted to foster the child's development at home (item 8), proposing what to work on (item 3) and using the material they had available in the home (item 4). In addition, families agreed that they could discuss other situations affecting them at family level (e.g., symptoms of anxiety or depression because of COVID-19) (item 6). They also reported that the virtual sessions continued to be led by the professional (item 11) and lasted as long as they had done before lockdown (item 9). In general terms, they were satisfied with the care they received from the EIS during lockdown (item 12).

In contrast, the mean score for six of the items was not significantly different ($p > 0.05$) from the midpoint of the item scale (2.5). This means that families did not clearly agree or disagree with the content of the items. Specifically, they did not report that virtual sessions via a video call allowed them to talk more than before about their daily routines, the child's functioning at home, etc. (item 1), or that they could participate more and contribute their opinions on aspects to work on with their child (item 2). Nor did they particularly agree that their emotional needs as a family were taken into account more than before the lockdown (item 5), that all members of the family participated whereas previously they had not been able to (item 7) or, that their opinions were now added to the work plan (item 10). Therefore, in certain aspects such as the duration of the sessions, the participation of all family members, and the involvement of professionals in other areas (as well as the emotional needs of families), families did not perceive a significant change compared with the pre-lockdown period.

In any case, the total score differed significantly ($p < 0.001$) from the midpoint (2.5), indicating that (on average) families agreed with the items on the questionnaire, since the mean total score ($M = 2.90$) was approximately equal to the third point of the Likert-type scale (3: "Agree").

## Sociodemographic Factors and Total Score on the Questionnaire for Families

The relationship between sociodemographic factors and the total score on the family questionnaire was analyzed. Specifically, the following sociodemographic factors were included in the study: parent's age and gender, marital status, educational level, employment status, number of people living at home, age and gender of their child, degree of intellectual disability, and frequency of visits to the EIS before lockdown. Parents were also asked whether they had online contact with the EIS before lockdown, and whether they used telematic tools.

The results showed a statistically significant effect of employment status on the total score on the family questionnaire (Welch's $F(2, 38.4) = 4.79$; $p < 0.014$; $\eta^2 = 0.125$). The highest mean total score for the family questionnaire was found in parents who cared for their children and were fully responsible for housework ($M = 3.32$; $SD = 0.57$), followed by those who were employed part-time ($M = 2.97$; $SD = 0.42$), and those employed full-time ($M = 2.68$; $SD = 0.84$). Pairwise comparisons (via the Games-Howell test) showed higher total scores in parents fully responsible for housework than in those employed full-time ($p < 0.05$); no differences were found between the other categories of the variable. Using Cohen's (1988) benchmarks for interpreting effect sizes, the effect of employment status on total questionnaire score can be considered as medium ($0.06 < \eta^2 < 0.25$).

The results also showed a relationship between the use of telematic tools prior to lockdown and the total questionnaire score for families (Welch's $t(11.52) = 4.22$; $p = 0.001$; Cohen's $d = 1.54$). Parents who used telematic tools prior to the pandemic

had a higher mean questionnaire score ($M$ = 3.04; $SD$ = 0.56) than those who had not used them ($M$ = 1.96; $SD$ = 0.82). In accordance with Cohen (1988), the effect of the use of telematic tools on the total questionnaire score of the families can be considered as large ($d > 0.50$).

The other demographic variables (parents' age and gender, marital status, educational level, number of people living at home, age and gender of their child, degree of intellectual disability, and frequency of visits to the EIS before lockdown) did not show significant effects ($p > 0.05$) on the total score of the questionnaire answered by the families.

Sociodemographic factors whose effect was found to be statistically significant in the previous bivariate analyses ($p < 0.05$) were included in a multiple linear regression model to predict the total score on the family questionnaire. Two potential factors were taken into account: (1) parent's employment status, and (2) use of telematic tools prior to the pandemic. The results (**Table 5**) indicate that total scores on the family questionnaire could be predicted by a linear combination of the parent's employment status and previous use of telematic tools. In particular, high total scores on the questionnaire corresponded to parents who cared for their children and were fully responsible for housework (versus those in full-time employment), and who had used telematic tools before the pandemic. The regression model accounted for 35.7% of the variance of the total questionnaire scores (adjusted $R^2 = 0.357$).

## Factor Analysis and Reliability of the Questionnaire for Professionals

Dimensionality of the Questionnaire on EIS interventions in times of COVID-19 for professionals was explored by PCA. According to the Unidimensionality Index, $UI = (\lambda_1 - \lambda_2) \,/\, (\lambda_2 - \lambda_3) = 25.7$, the items clearly satisfied unidimensionality (Slocum-Gori and Zumbo, 2011). All item loadings were greater than 0.50, except item 11 ("Before the opportunity to do this follow-up with families and children at home, it was difficult for me to see the importance of an intervention in the natural, family-centered context") with a loading lower than 0.30. Also, Cronbach's alpha coefficient increased if item 11 was deleted. For these reasons, this item was excluded from the questionnaire, and items were renumbered accordingly.

Principal component analysis was again conducted on the final questionnaire, which comprised 13 items. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.904, and Bartlett's test of sphericity was highly significant ($p < 0.001$), indicating that the data were suitable for the analysis. The one-factor solution accounted for 48.6% of the total variance. All item loadings were greater than 0.50 (see **Table 4**).

With respect to the internal consistency of the questionnaire for professionals, Cronbach's alpha was 0.906, and it decreased if any of the items were deleted. Homogeneity indices were greater than 0.40 for all items. Therefore, the final questionnaire showed a unidimensional structure with a high internal consistency.

**TABLE 5 |** Linear regression model on total scores of the questionnaire for families.

| Predictor | Estimate | *SE* | *t* | *p* |
|---|---|---|---|---|
| Intercept | 0.524 | 0.426 | 1.23 | 0.224 |
| **Employment_status:** | | | | |
| Employed part-time – Employed full-time | 0.214 | 0.172 | 1.24 | 0.220 |
| Homemaker – Employed full-time | 0.428 | 0.183 | 2.34 | 0.023 |
| **Use of telematic tools:** | | | | |
| Yes – No | 1.183 | 0.227 | −5.21 | < 0.001 |

## Descriptive Statistics of the Questionnaire for Professionals

A total score was obtained by calculating the mean score of the 13 items included in the questionnaire. Total scores ranged from 1 to 4. **Table 4** shows descriptive statistics for the total score and each question answered by professionals working at an EIS ($n$ = 213). In all the items and the total score, the mean score was statistically different ($p < 0.001$) from the midpoint of the item scale (2.5). Therefore, on average, professionals agreed with the statements contained in all the questions. This indicates that connecting by videoconference with the families and children had positive consequences for the professionals, such as being able to identify specific aspects of the family dynamics, daily routines or the functioning of the child in his/her own home, etc. (items 1 to 10). This new way of connecting with families, caused by the lockdown situation, has led EIS professionals to rethink their way of working and has encouraged them to intervene with families and children in their natural context (items 11 to 13).

## Sociodemographic Factors and Total Score on the Questionnaire for Professionals

Several sociodemographic factors were included in the study: professionals' gender and age, years of experience working at an EIS, professional field, and number of members in the team. A statistically significant Pearson's correlation coefficient was found between cognitive professionals' age and total scores on the professionals' questionnaire ($r = -0.144$; $p = 0.036$). This indicates that younger professionals showed higher scores on the questionnaire than their older peers. The other demographic variables included in this study had no statistically significant effect on the total scores on the professionals' questionnaire.

Professionals' age was included in a linear regression model to predict total scores on the professionals' questionnaire. Results (**Table 6**) indicate that total scores could be predicted by professionals' age, although the regression model accounted for only 1.6% of the variance of the total questionnaire scores (adjusted $R^2 = 0.016$). Indeed, the regression line (represented in **Figure 1**) shows a slight downward trend, indicating that older professionals had lower total scores on the questionnaire, although the effect size can be considered as low.

## Comparison Between Professionals and Families

Six questions on the professionals' and families' questionnaires were almost identical (items 1, 2, 3, 4, 6, and 8). For each

**TABLE 6 |** Linear regression model on total scores of the questionnaire for professionals.

| Predictor | Estimate | *SE* | *t* | *p* |
|---|---|---|---|---|
| Intercept | 0.524 | 0.426 | 1.23 | 0.224 |
| Professionals' age | 1.183 | 0.227 | −5.21 | < 0.001 |

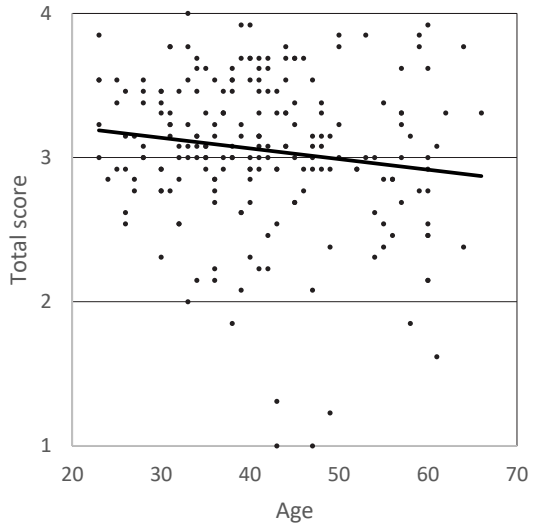


**FIGURE 1 |** Relationship between professionals' age and total score on the questionnaire.

of the questions, the difference in means between the two groups was analyzed. The data analysis was conducted via independent samples *t*-test. The results showed statistically significant differences for two items: the first ($t_{(118.2)} = 3.65$; $p < 0.001$) and the second ($t_{(115,4)} = 2.56$; $p = 0.012$). On these two questions, the professionals had higher average scores than the families. In fact, among the professionals (see **Table 4**), the mean score on these questions was significantly higher than 2.5 ($p < 0.001$), which means that most of them agreed with the statements in these items. In the case of family members (see **Table 3**), the mean for the same questions was not significantly higher than 2.5 ($p > 0.05$). Thus, the professionals, but not the family members, did perceive certain advantages during the lockdown: for example, they learnt about specific aspects of the family dynamics in the child's natural context (item 1) and felt that families participated more actively and could give their opinions on aspects to be worked on, difficulties encountered, etc. (item 2).

In the four other remaining questions, no statistically significant differences were found between the groups ($p > 0.05$); that is, both professionals and family members generally agreed with the content of the issues raised. Both groups agreed that the professional was able to suggest what the child and family could work on at home (item 3), guide families to find new ways to use the material (item 4), attend to other situations affecting the family (such as symptoms of anxiety or depression as a result of COVID-19, worries about money and employment etc.) (item 6), and promote parental interactions that enhanced the child's development in their own home (item 8).

## DISCUSSION

The two surveys in this study recorded information on families' and professionals' perceptions of the EI methodology used during the COVID-19 pandemic in Spain. Our aims were to analyze and compare these perceptions and to explore the relation between them and certain sociodemographic variables.

Our general hypothesis was that videoconferencing would promote the use of family-centered practices (FCP), by bringing professionals closer to the family context. We expected both families and professionals to perceive an increased use of FCP in the intervention model, However, the results of the study did not clearly indicate this; rather, they lend support to the idea proposed both in the United States and in Europe (Bezdek et al., 2010; Tomasello et al., 2010; Serrano et al., 2017) that the family-centered approach (FCA) is not easy to apply. With respect to the influence of sociodemographic variables on these perceptions, our study was exploratory.

In relation to the families, most respondents were mothers (almost 90%). Although the participation of the father at EIS is increasingly recommended to promote children's early development (Tamis-LeMonda et al., 2004; Cabrera et al., 2011) and although systemic and ecological theories of development emphasize the dynamic and interdependent nature of the family unit (Bronfenbrenner, 1979, 1987; Sameroff, 1983), it still tends to be mothers who organize and orchestrate the needs of children with a disability (McWilliam and Er, 2003; Rantala et al., 2009; Vilaseca et al., 2020). If the aim is to move toward new, more systemic and ecological models of intervention, the figure of the father or other caregivers such as grandparents, uncles/aunts and older siblings must be incorporated in EIS (Davys et al., 2017; Crnic et al., 2019; Vilaseca et al., 2019b).

Furthermore, the data obtained from the families suggest that in almost 50% of cases the professional is the person who works with the child. Professionals go to family homes only 1% of the time and only involve the family into their intervention model in 2% of cases. These results are consistent with other studies in Spain (Vilaseca et al., 2004; Grupo de Atención Temprana, 2011; Escorcia-Mora et al., 2018; Mas et al., 2018; García-Grau et al., 2019) but are clearly at odds with most model home visiting programs carried out in the United States, which focus on working in the family's home (Sama-Miller et al., 2017).

Of the 12 items evaluated by the families, the difference between the mean item score and the midpoint of the scale was statistically significant in seven. Families were satisfied with the professional attention received during the lockdown (item 12), and the duration of the sessions did not change (item 9). They felt that professionals offered guidance to use the home materials in innovative ways to improve the child's development (item 4) and they had the opportunity to talk with the professional about aspects of family life other than attending to the child, such as the emotional impact of COVID-19 or economic and employment problems (item 6). Our findings are consistent with

previous studies using a telehealth family-centered rehabilitation program for children with disabilities during the COVID-19 lockdown (Provenzi et al., 2021). In that study, more than 86% of parents reported increased feelings of engagement, self-relevance, perceived support, and recognition of their role in childcare and development. Other studies carried out in families with children with neurodisabilities also reported a high level of satisfaction in relation to the use of telerehabilitation (Beani et al., 2020; Fazzi and Galli, 2020). Likewise, in studies carried out with young children with autism, cerebral palsy, and other neurodevelopmental disorders, parents also reported qualitative benefits of teleintervention, such as greater parental self-efficacy and empowerment to interact with their children in their natural context (Little et al., 2018; Wallisch et al., 2019). For us, these results support the use of telerehabilitation to implement best practices for children with disabilities in order to promote their learning and development in their habitual contexts.

Finally, and not at all surprisingly, parents showed significant agreement regarding other items that reflect an expert-focused EI model. They felt that professionals continued to play a directive role in the identification of developmental outcomes to promote at home (item 3) and that they continued to lead the virtual sessions (item 11). Parents felt that the professional provided concrete guidelines for promoting the child's development at home (item 8), which reflects a child-centered EI model. These results indicate that families continue to lack control over the EI practices that their child receives. We agree with García-Grau et al. (2019) that the Libro Blanco (Grupo de Atención Temprana, 2005a) and the Technical Recommendations for Early Intervention in Spain (Grupo de Atención Temprana, 2005b) do not contain enough practical recommendations to aid the transition from a child-centered approach to a family-centered approach. The families' responses suggest that the specific actions carried out by the professionals had little in common with the participatory practices recommended in family-centered services, despite the opportunities that the use of remote technology could offer them.

In other items that referred directly to videoconferencing and to relevant characteristics of FCP, parents did not express clear agreement or disagreement. They did not report that videoconferencing allowed them to speak more specifically than before about daily routines, about the functioning of the child at home or about the family's daily organization (item 1). Videoconferencing did not increase their participation in the definition of intervention aims or daily difficulties in attaining these aims (items 2 and 10), attention to the emotional needs of the family (item 5) or the participation of all family members (item 7). These results indicate that although the introduction of remote technologies may have been useful during the pandemic for daily clinical practice and for the treatment of children with neurodisabilities, in Spain, professionals still require training in their application. The potential of telerehabilitation is increasing exponentially, both in European and further afield (Montirosso et al., 2020; Traube et al., 2020; Provenzi et al., 2021; Summers et al., 2021).

On the other hand, the results of our study indicate that total scores on the families' questionnaire can be predicted by a linear combination of parents' employment status and their previous use of telematic tools. Parents who answered the questionnaire (mothers in almost all cases) and who cared for their children and did the housework had a more positive perception of the intervention during the lockdown. This interesting finding can probably be attributed to the role that is assigned to mothers within families with children with developmental delays. According to Elam et al. (2017), mothers tend to assume greater responsibility in the management of family tasks, such as organizing daycare and following the indications of the EI professional. This in no way implies that mothers should be advised not to do paid work: it merely indicates that they may be more aware of the characteristics of the intervention being carried out. Today in Spain, mothers still spend more time with their children than fathers. In the case of children with disabilities, they accompany them to the EIs, the pediatrician, and school meetings (Vilaseca et al., 2020). Indeed, in most western countries, women are still the primary caregivers, especially in the case of families with a child with a disability (Bianchi et al., 2012). It is important to encourage mothers with children with developmental delays to work outside the home, since this activity can reduce emotional distress in families with children with disabilities (Vilaseca et al., 2014), and it does not in any way conflict with the FCP guidelines.

Not surprisingly, parents accustomed to using computer resources before the COVID-19 pandemic had a more positive perception of the online intervention during the lockdown. Those results are consistent with previous studies assessing factors that either promote or hamper the use of telehealth. Difficulty in accessing technical resources is one of the main reasons for rejecting teleintervention (Kraljević et al., 2020).

Most EI professionals who responded were women, almost 96%; most were aged between 30 and 49 years old and over half had more than ten years of experience working in EI. Most teams comprised six to 10 professionals from different fields.

The survey results showed that the professionals (unlike families) expressed agreement with all items, and the results were all statistically significant. It seems that the pandemic and the use of video calls or videoconferences brought them closer to the families and helped them to understand their needs and adjust to them (items 1, 5 and 6). Likewise, they felt that families were more participative than before (item 2); they were able to propose functional objectives adapted to families' routines involving all family members, including siblings (items 3, 7, and 10) and could guide them to identify new uses for the materials they already had (item 4). Professionals based their practice on parenting, promoting positive interactions between mothers, fathers, and children to promote child development (item 8), and on giving feedback to enhance family strengths (item 9). These results conflict with the findings of a study of 250 EI professionals carried out in the pre-COVID era by García-Grau et al. (2019), who found the most difficult practices carried out with families to be the identification of family support, addressing families' needs with routines, and scheduling family visits in a way that adapted to the needs of all members. Studies continue to show that there is a huge difference between family-centered best practices and what professionals do on a day-to-day basis (Espe-Sherwindt and Serrano, 2016). Although it seems that the pandemic has made

EI professionals in Spain pay more attention to the principles of FCA, their peers in countries such as the United States or elsewhere in Europe are facing the same challenges. Even when EI professionals think they are fully implementing an FCA, their perceptions are often incorrect (Dunst et al., 2014). Home visiting programs in the United States also strongly recommend the active engagement of parents with their children during home visits (Roggman et al., 2008). Unfortunately, however, this is the case in fewer than 50% of home visits (Peterson et al., 2018).

Interestingly, in this study the professionals agreed that they would continue to use tools that allow them to promote the interaction of parents and children at home (item 11). In addition, it seems that the pandemic situation made them rethink the way they work and collaborate with families (item 12) and they realized that they needed more training in order to continue to work with families applying this more ecological approach (item 13). This is an important point, because the adoption of FCA requires the mastery of new skills and lack of training is one of the main barriers to a change of paradigm (Tomasello et al., 2010; McWilliam and García, 2016). In Spain, for some time now there have been calls for more training (Tamarit, 2015; Pereira and Oliveira, 2019; Vilaseca et al., 2019a).

As regards sociodemographic factors, the results showed that total scores on the professionals' questionnaire could be predicted by age. Older professionals had lower total scores on the questionnaire, although the effect size can be considered as low. These findings are consistent with a study carried in Finland by Heiskanen et al. (2021) of rehabilitation professionals during the COVID-19 pandemic, in which those with the longest work experience were found to be the least likely to use telerehabilitation after the pandemic. However, our results could also be attributed to the context of the implementation of the FCA model in Spain, already discussed in the introduction section. FCP were introduced only recently and are applied inconsistently among early intervention professionals and teams. Older professionals continue to prefer child-focused models; so FCA training is a necessity if we want to achieve a change of perspective among all EI professionals.

The comparison of families' and professionals' perceptions of care during the pandemic present a certain amount of agreement but statistically significant differences were found in two items (items 1 and 2), on which professionals had higher average scores. As we have mentioned, parents did not clearly agree or disagree with the content of those two items, while professionals expressed full agreement. One of the issues that has important consequences for early intervention practices is the professionals' vision of how to work with families. One of the key principles of the FCA is collaboration between parents and professionals (Dunst et al., 2000; Carlhed et al., 2003; Turnbull et al., 2004) and an insistence that parents should not be mere recipients of information, but also providers; they should participate actively and their role should not be limited to following instructions. In many European countries, including Spain, it is a priority for professionals to include parents in their intervention programs, to train them to make their own decisions and to take their perspectives much more into account (European Agency for Development in Special Needs Education, 2010). Our results are consistent with a study carried out in Spain before the pandemic with over 180 professionals and 500 families, in which professionals scored higher than families on most FCA dimensions (Escorcia-Mora et al., 2018). According to Escorcia-Mora et al. (2018), these results can be attributed to an overvaluation by professionals of their own practices and the intrinsic need to project a positive image of their work, and to a lack of training that prevents them from reflecting on other ways of intervening with families (in accordance with previous studies carried out in Spain: García-Sánchez et al., 2014; Mas et al., 2019; Vilaseca et al., 2019a). It is evident that these perceptions may vary depending on the professional's specialization. Interestingly, several studies carried out during the pandemic found the use of telerehabilitation varied according to whether the professional was a speech and language therapist (Kraljević et al., 2020), an occupational therapist (Dahl-Popolizio et al., 2020) or another specialization.

## CONCLUSION AND FINAL REMARKS

The aim of this study was to assess the work that EI professionals carried out with families and children seen in EIS in Spain during the COVID-19 pandemic, and to establish whether this situation might promote a change in their practices. More specifically, we compared families' and professionals' perceptions of the intervention methodology used and explored the relation between these perceptions and certain sociodemographic variables.

Our main findings were that, contrary to expectations, it is not clear that the online intervention carried out during the pandemic presented significant changes in terms of the incorporation of FCP. Professionals considered that the intervention followed the defining trends of FCP, but the impression of the families was less clear-cut; although they perceived some changes with regard to the use of FCP, they noted that the intervention maintained many of the characteristics of the traditional child-centered model. The families were satisfied with the care received during the pandemic. but overall, the study shows that the professionals were not perceived as applying the standards of FCP. For professionals, the pandemic situation has highlighted the importance of the family and the involvement of all its members, and the need to promote positive parenting at home to optimize the child's development. Although this new awareness is clearly positive, more training is still needed and policy makers in Spain should focus on ways of promoting effective change that can be extended to all EIS.

Some interesting findings were also obtained regarding the role of sociodemographic variables in the perception of the intervention model. Mothers with previous use of computer resources and who dedicated themselves entirely to caring for their children and housework were more satisfied with the intervention and observed a more widespread adoption of FCP. On the other hand, younger EI professionals perceived the online intervention as being more in line with FCP. This may indicate that, even though the objective of extending and generalizing FCP is far from being established, a change is taking place in

the attitudes toward EI among younger professionals in Spain, probably due to training and to a lower adherence to more traditional models.

This study has several limitations. First, our aim of comparing the perceptions of families and professionals in relation to the intervention model during the pandemic was hindered by the fact that only six of the questions were the same for both groups because we adjusted the formulation of the items to the previous knowledge and to the characteristics of each group. The discrepancy between the items is a drawback and is an issue that needs attention in future work.

Another limitation is the sampling procedure and the sample size. Perhaps the families and the professionals who agreed to participate were particularly interested or concerned about the pandemic or had already generated discussions on the items in their professional teams. We would have liked to have been able to reach more professionals and families, but potential participants received numerous online questionnaires during the pandemic and many may have been reluctant to respond. All in all, the results are not representative of all EIS in Spain, because we know that many of them have started the transformation toward new, more systemic and ecological intervention models. This study should now be replicated with a larger number of families and professionals with a representative sample of all the regions of Spain.

Third, the study was based on self-reports and perceptions; there was no direct observation of EI professional practices. Therefore, the results should be interpreted with caution. Finally, the study's cross-sectional design means that we cannot establish causality. We also need to qualify the term *predictor*, as used in the regression analysis. In this context, to *predict* means just to estimate total questionnaire scores based on the predictor variable scores (such as employment status, use of telematic tools, or professionals' age), and does not necessarily imply direct causality.

In spite of these limitations, our study has several strengths. First, although the possibilities for comparison are limited, we have provided relevant data on a new topic: families' and professionals' perceptions of the early intervention services received and provided during the COVID-19 pandemic lockdown. The questionnaires used in this study showed both a unidimensional structure and a high internal consistency, which allows us to use them in future studies of the topic. Another strength, undoubtedly, is the focus on the impact of a critical event in spite of the obstacles that it created; the sample size is small, but it is very difficult to engage families and professionals in times of crisis. Our results show that the obligation to use the internet for the intervention led professionals to rethink some of their previous practices, raised their awareness of the interest and value of adjusting to the families' needs, strengths, resources and aims, and increased the participation of the families inside a less directive and a more collaborative model – all of them characteristics of FCP. Although our results do not indicate a clear shift toward the use of FCP at EI services, they do suggest that the professionals' greater focus on the family context because of the lockdown caused them to question some of their preconceptions. In this way, then, our study may help to increase the spread of FCP.

In addition, our study has implications for future early intervention programs with families. Telematic intervention during the pandemic was positively valued by parents, and managed to bring the intervention closer to the family context. Professionals saw telematic intervention as an opportunity to move toward intervention models that encourage families' participation, their involvement in decision-making, and the deployment of strategies focused on daily routines. Professionals feel that they have made progress in this direction during the pandemic. However, as mentioned above, families have not perceived such significant changes. Several consequences follow from this. First, the use of telematic interventions does not in itself guarantee a change in the intervention model. Second, we must continue making efforts to approximate the families' needs and professional visions, which do not always coincide. The application of innovative and remote rehabilitation interventions during the pandemic may have interesting repercussions in the post-COVID-19 scenario. Their use in daily clinical practice and in the treatment of children with neurodisabilities in their everyday environment has real potential, as long as they are family-centered and take into account the needs of the child and those of their caregivers. The use of telerehabilitation can facilitate the use of best practices, focusing on empowering families to promote the development and learning of their children with disabilities.

Research in Spain and in other countries should now continue with case studies including observation of parenting in a natural context and the provision of coaching, monitoring and feedback during in-service and online sessions. This should help to broaden our understanding of the strengths and weaknesses of online intervention in family-centered parenting practices. The benefits and limits of telerehabilitation should continue to be explored, in order to make decisions regarding its use either as a primary via of intervention or as a complementary one.

## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author/s.

## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by University of Barcelona's Bioethics Commission. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

## AUTHOR CONTRIBUTIONS

RV, FF, MR, and RB made substantial contributions to conception and design, acquisition of data, analysis and interpretation of data, participated in drafting the article or revising it critically

for important intellectual content, and gave final approval of the version to be submitted. All authors contributed to the article and approved the submitted version.

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## SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.738463/full#supplementary-material

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# Engagement of Families Attending Early Childhood Services During 5-Month School Closure Due to COVID-19: An Italian Experience

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During the COVID-19 outbreak, we experienced the suspension of both work-related and spare activities, with the closure of shops, companies, services, as well as schools. Children probably are the ones who have suffered the most from this situation, due to the limited socialization with peers and boredom experienced at home. In this context, schools and childhood services tried to relieve the negative effects brought by the pandemic through actions aimed at actively engaging students and their parents in promoting child development and wellbeing. Therefore, several worldwide actions have been implemented to guarantee educational continuity. However, most of these actions targeted 3–18 years old children/adolescents, while the subgroup 0–3 was rarely included. *Cooperativa Sociale Aeris*, a social enterprise based in northern Italy that deals with socio-educational and welfare services, took several measures to overcome problems resulting from the closure of its services dedicated to 0–3 aged children. In this manuscript, we depict how Aeris kept engaged children and their parents, reporting families' evaluation on the actions taken. For assessing their proposed activities, Aeris promptly distributed an on-line survey to the families in May 2020. The answers showed that the organized activities had a positive impact on both children and parents, diminishing the sense of loneliness and boredom for the former, and acting as an important support for the latter. Therefore, this manuscript could work as a reference for policy-makers and managers of educational services in implementing activities and initiatives during home schooling.

**Keywords: COVID-19, school closure, childhood services, family engagement, child development, child well-being, children, parents**

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## INTRODUCTION

Early childhood education holds a key place in the wellbeing of families and their local communities. These services give opportunities for children's development and socialization and for enabling families to engage fully in the labor market, each of which is important in contributing to stronger families (Baxter, 2015). Early Childhood Education and Care (ECEC) policies and practices vary among different countries and communities (Rutanen et al., 2014),

but they are all based on the universal ideals of the "best interest of the child" (Convention on the Rights of the Child, 1989). The experiences of the first 3 years of life are recognized as highly important with respect to child well-being and development: therefore, from the basic care of younger children under age 3 while parents work, the role of Early Childhood Services has been shifted toward socialization, development, and cognitive stimulation (Kamerman, 2000). This role may be made difficult by events that require school closure and children confinement.

The COVID-19 pandemic has drastically changed our lives, leading to the suspension of many activities that were part of our routine. Children are probably the ones who suffered the most from this situation due to the limited social connection, reduced physical activity, loneliness, and boredom that experienced during the COVID-19 outbreak. This could result in long-term negative effects, since the mental and physical health, as well as productivity in adult life, are deeply rooted in the childhood years (Pedrosa et al., 2020).

In this situation, childhood services and schools had to bridge the gap between need for children to learn and socialize and their isolation due to the pandemic, through actions aimed at actively engaging families in promoting child development and wellbeing. For this reason, following the COVID-19 outbreak, schools all over the world reorganized and activated new services to support families and guarantee children educational continuity (see for example, Bubb and Jones, 2020; Caffo et al., 2020; Dong et al., 2020; Dube, 2020; Ferraro et al., 2020; Parmigiani et al., 2020; Putri et al., 2020; Rasmitadila et al., 2020; Zhao et al., 2020; Harper et al., 2021). However, these studies mainly included children and adolescents from 3 years old up to 18 years old, and only few studies included children younger than 3 years and their families (Listyaningrum et al., 2020; Szente, 2020; Lee et al., 2021; Meoded Karabanov et al., 2021).

Being one of the first countries that had to deal with the COVID-19 pandemic, Italy promptly forced a lockdown with the closure of all services among which the schools. The partial school closure is registered the 24th of February 2020, while the total closure the 10th of March 2020, placing Italy as the first European country and the third country in the world after China and Mongolia to close schools (UNESCO Website, 2021). Therefore, Italy above every other European country had to timely respond to the sanitary emergency, organizing actions aimed at facing problems arising from the closure of childhood services and schools that lasted till the end of August 2020. Each school activated custom solutions to be in contact with families, including e-learning and online meetings (Lucisano, 2020; Thorell et al., 2021). The Italian Educational Research Society (SIRD) distributed all over Italy an online survey to investigate the experience of Italian teachers during the COVID-19 outbreak (Lucisano, 2020). SIRD found that different means were used for maintaining contacts with families (e.g., social media, online platforms, websites, blogs, emails, apps etc.) and several didactic strategies were implemented (e.g., online lessons, registered lessons, presentations from students etc.). However, the survey was distributed to teachers from preschools, elementary schools, and secondary schools, excluding the nurseries from this evaluation. To our knowledge, there is a lack of Italian studies specifically dedicated to 0–3 aged children, which is consistent with worldwide findings previously mentioned. In Italy, this is probably due to the lower nursery attendance with respect to schools for 3–18 aged children/adolescents. Indeed, in 2019 only 7% of children under the year attended the nursery, rising to 51% if considering children of 24–36 months. On the other side, more than 90% of 3–5 aged children attended the pre-school and the totality of children/adolescents the Italian compulsory school (6–16 years; ISTAT, 2020). Moreover, we have to consider the difficulties in organizing online activities for children less than 3 years old, since their attention to a screen is easily lost, especially if considering the youngest (<1 year old) (Szente, 2020).

In this context, *Cooperativa Sociale Aeris* (hereinafter referred to "Aeris"), a social enterprise based in northern Italy that deals with socio-educational and welfare services, took several measures to overcome problems resulting from the closure of its Early Childhood Services dedicated to 0–3 aged children. Since the beginning of the pandemic, Aeris team found new ways of caring for children and elaborated a specific plan to maintain contact with families, in order to cultivate relationships, oversee situations of greater fragility, and offer support to families.

Therefore, the aim of this manuscript is to depict how AERIS kept engaged children and their families attending Early Childhood Services, and how families evaluated the actions done to involve them and to support child development and wellbeing.

# MATERIALS AND METHODS

## The Aeris Cooperative: Offered Services and Their Participants

Aeris is a social enterprise that provides educational and social assistance services, aimed at families with their infants, toddlers and children, youngsters, people with disability, adults in situations of fragility, asylum seekers, and refugees. One of their activities deals with the management of the following Early Childhood Services located in the Northern Italy (precisely in Agrate, Cambiago, Robbiate, Vaprio, and Trezzo, as shown in **Figure 1**), which are dedicated to 0–3 aged children:

- Four nurseries located in Agrate, Cambiago, Robbiate, and Vaprio, i.e., educational and social services that, in collaboration with families, favors the harmonious development of the child's personality, promoting his/her independence and socialization. Before the pandemic, most of the time spent at the nursery was dedicated to the "care" of the child (i.e., feeding, washing, changing, putting the child to sleep, cuddling, and consoling).
- Four *"Spazi Gioco"* (SG hereafter) located in Agrate, Cambiago, Trezzo, and Vaprio, i.e., places where the child and his/her caregiver interact within these social spaces. For children who do not attend the nursery, the SG is an opportunity to meet other children, offering stimuli and opportunities for experimentation. In addition, a pedagogist is present to accompany the caregivers in comparisons and reflections on


**FIGURE 1** | Location in Northern Italy of the Early Childhood Services located in Agrate, Cambiago, Vaprio, Trezzo, and Robbiate.

issues relating to their children's growth. Finally, formative/informative meetings dedicated to families are organized and conducted by different professional figures (i.e., pediatricians, pedagogists, and psychologists).

- "*Merenda in Gioco*" (MG hereafter) in Agrate, a service that gives children the possibility to have a snack and play with educators two mornings a week. MG offers children a space to meet and socialize, with interesting and varied experiential activities aimed at developing expressive, social, communicative, motor, and cognitive skills.
- "*Servizio Ponte*" (SP hereafter) in Agrate, an integration service between nursery (0–3 years) and preschool (3–6 years), which offers a bridge class co-managed by nursery educators and teachers. Here children meet and socialize, with interesting and varied experiential activities aimed at developing expressive, social, communicative, motor, and cognitive skills, as well as experiencing distance from their parents.

These services have been attended in the academic year 2019–2020 by 228 families distributed as follows: 60 at the Agrate nursery, 24 at Cambiago nursery, 32 at Robbiate nursery, 40 at Vaprio nursery, 30 at Agrate SG, eight at Vaprio SG, 18 at Trezzo SG, and 16 at Cambiago SG. Families enrolled at MG and SP were the same attending the Agrate SG.

However, due to the social distancing imposed during the COVID-19 pandemic, a reorganization of these activities through remote actions became mandatory. This reorganization involved the development of several activities that could be enjoyed by means of technological devices as described in the following section.

## Aeris Proposed Activities During the COVID-19 Outbreak

After the school closure occurred the 24th of February 2020, the Aeris team started to contact families giving information about the re-organization of their services. From the 10th of March, systematic online activities were organized to keep contacts with families, due to the new restrictions following the Decree of the 9th of March 2020 released by the Italian Ministry of Health. The online educational activities lasted until the end of June 2020, while in July, the face-to-face activities restarted in the form of summer camps. During the

closure period, the Aeris team had to develop several remote activities, using the guidelines given by the Italian government about the distance educational connections (*Legami Educativi A Distanza*, LEAD; MIUR, 2020). The Smart-Edu website[1] was created, whose objective was to guarantee and maintain relational and educational continuity with children and families posting stories, videos, tutorials, and chores. It was freely accessible by means of computers, tablets, and smartphones and continuously updated 2/3 times per week to keep contacts with families despite the distance.

In addition to the Smart-Edu website, Aeris' members used different media to maintain and maximize contacts with families, sharing materials, and information through:

- WhatsApp groups/broadcasts: families received communications *via* WhatsApp approximately three times a week.
- Facebook pages (where posts were published 3/4 times per week):
  - o *Aeris 0–3 insieme a piccoli passi*:[2] the page specifically dedicated to the nurseries;
  - o *Spaziogioco papaveriepapere:*[3] the page specifically dedicated to the SG;
  - o *Smart-Edu*:[4] the page associated with the Smart-Edu Website and activated from 4 March 2020.
- YouTube channel: www.youtube.com/c/AerisCooperativa Sociale
- Emails;
- Video calls (*Via* Google Meet or Zoom).

Finally, Aeris concretely moved in two directions to support parents and children:

- It engaged parents with several activities, allowing them to actively intervene in supporting child development during the COVID-19 outbreak, and it provided support especially to the most fragile realities. These activities are presented in detail in the section "Actions to support the parents."
- It organized activities specifically dedicated to children in order to mitigate the hardship caused by the social distancing imposed during the lockdown. These activities are presented in detail in the section "Actions to support the children."

## Actions to Support the Parents

Interaction between families and childhood services is at the basis of a correct child development, independently from the educational setting. During the COVID-19 pandemic, the communication was intensified to monitor and support families, especially those more fragile, with the intent not to leave anyone alone. Therefore, Aeris offered the following possibilities:

- Being included in WhatsApp groups or broadcasts to have faster and immediate communication.
- Attending calls and video calls with the educators, having the possibility to attend both group and "one-to-one" calls. Group meetings allowed parents to compare and share difficulties with other families and the Aeris team; one-to-one calls were dedicated to support families in facing specific situations and needs.
- Attending pedagogical consulting by calls or video calls.
- Writing and discussing by email with the educational team. Moreover, Aeris sent bi-weekly emails to update families about the closure/suspension of the services and implemented measures to contain the contagion.

WhatsApp groups/broadcast, emails, the Smart-Edu website, and social pages were used to share with parents written documents and videos dealing with children's growth, but also documents and videos on current pedagogical topics of interest that could help families in facing this difficult period.

## Actions to Support the Children

During the closure of the Early Childhood Services, the educational teams shared materials and contents every other day. The activities were prepared considering children developmental areas (e.g., gross- and fine-motor development, language, and autonomy) as described in the pedagogical guidelines defined by the Italian Ministry of Education, which are inspired by developmentally appropriate practices (MIUR, 2020). This material was focused on:

- Videos with Italian and English songs and nursery-rhymes accompanied by gestures and musical instruments.
- Videos with stories and readings proposed as at the nursery.
- Video tutorials that explained to parents how to realize simple activities that could be done at home with easily available materials.
- Videos providing ideas and suggestions to parents for engaging children in daily life, such as participating in household chores and taking care of themselves.
- Tutorials that explained to parents how to realize manipulative and graphic workshops, science experiments, sensory explorations, hand-eye coordination activities, and motor games.

In addition, calls and video calls that involved both children and parents replicating the typical routine moments of the nursery were organized once or twice a week, dividing families in small groups (i.e., maximum 15 children).

## Evaluation of the Proposed Activities

With the aim of assessing if the adopted organization and proposed activities had positive feedback on families; a survey was developed by means of Google forms. It was distributed in May 2020 to the 228 families attending the Early Childhood Services. A five-point Likert scale ranging from 1 (strongly disagree/not at all satisfied) to 5 (strongly agree/extremely satisfied) was used to evaluate families' engagement and

[1]https://sites.google.com/coopaeris.it/smart-edu
[2]https://www.facebook.com/aerisinfanzia
[3]https://www.facebook.com/Spaziogioco.Papaveriepapere
[4]https://www.facebook.com/smartedu.aeris

satisfaction. Some open-ended questions were also included, allowing families to express their personal feelings and experiences related to the proposed activities. The survey template is presented in the **Supplementary Material**.

## Statistical Analysis

Median values were computed for each answer given to questions scored with the five-point Likert scale. They are reported as median values (IQR), where IQR is the interquartile range (i.e., the difference between the 3rd and 1st quartiles). A chi-square test was carried out on the results to verify if frequencies of categorical data were uniformly distributed. Finally, *post hoc* power analysis was performed. The statistical significance was established at $p < 0.05$.

# RESULTS

Two hundred and twenty-eight families had access to the survey and 119 actively responded (81% were Italian). The majority of them were aged 31–40 years (58.5%) and 41–50 years (30.7%), few were aged 20–30 years (9.4%), and very few were older than 51 years (1.4%). The children (aged 0–3 years, precisely 26.4 ± 8.1 months) were distributed among the Early Childhood Services as follows: 33.6% attended the Agrate nursery, 12.6% Cambiago nursery, 12.6% Robbiate nursery, 12.6% Vaprio nursery, 10.9% Agrate SG, 7.6% Trezzo SG, 6.7% Vaprio SG, 2.5% Cambiago SG, 4.2% Agrate MG, and 6.7% Agrate SP. Among them, 3.4% attended more than one Early Childhood Service but they answered once.

The survey showed that all families have a device with internet connection. Most of them used smartphones (80.7%), but also computers (55.5%), tablets (26.8%), and smart TVs (3.3%). However, not all families have an unlimited internet connection, and 21.8% of them cannot use the service without limits. Moreover, 52.1% of the families have more than one child (aged 0–15 years), and 31.1% have at least two children who use devices for online activities.

Most of the families (89.1%) participated to the activities suggested and the 62.2% considered useful to receive feedbacks on other families and educators' activities by means of WhatsApp (44.6%), email (16.2%), video call (9.5%), Facebook (5.4%), YouTube (4.1%), and Smart-Edu website (4.1%). In particular, the success of social media in sharing the material during the lockdown is demonstrated by the increased number of followers and likes of the Facebook pages, as reported in **Table 1**.

**Table 2** shows the proposed means to maintain the connection between the Early Childhood Services and families, reporting also the percentage of families who effectively used these means, their satisfaction indexes (SI, expressed as the median score of the five-point Likert scale) with the IQR and the results of the chi-square test.

As shown in **Table 2**, most of the families used the proposed means to maintain contacts and appreciated them, as demonstrated by the high satisfaction indexes ($SI \geq 4$). Only the calls with the pedagogist did not engage the families as expected (family engagement <50%), even if those who participated appreciated them ($SI \geq 4$). Results of the chi-square test (chi$^2$ ranging between 13.2 and 117.1, $p \leq 0.01$) show that SI distributions in **Table 2** are non-uniformly distributed in a statistically significant way, i.e., the satisfaction level is strongly unbalanced toward high scores.

**Figure 2** analyzes children (as reported by parents) and parents' interest in the proposed activities, reporting the median score of the five-point scale and its IQR; blue bars refer to the children's involvement, while orange ones refer to the parents'.

Both parents and children positively welcomed the proposed activities, judging them interesting as demonstrated by the

**TABLE 1** | Statistic numbers of the Facebook pages managed by Aeris.

| Facebook page | Followers' number in March 2020 | Followers' number in June 2021 | Number of likes in March 2020 | Number of likes in June 2021 |
|---|---|---|---|---|
| *Aeris 0–3 insieme a piccoli passi* | 240 | 946 | 233 | 899 |
| *Spaziogioco papaveriepapere* | 251 | 558 | 245 | 538 |
| *Smart-Edu* | 0 | 1,170 | 0 | 1,131 |

*The initial null number of followers and likes referred to the Smart-Edu page is related to the fact that the page was appositely created during the COVID-19, while the other pages were already active.*

**TABLE 2** | Proposed means to maintain contacts between the Early Childhood Services and families.

| Proposed means to maintain families/ services connection | Families engagement | SI (IQR) | Chi$^2$ | *p* |
|---|---|---|---|---|
| WhatsApp groups and broadcasts to shear materials and information | 89.9% | 4 (1) | 90.7 | <0.0001 |
| Written documents dealing with children growth | 71.4% | 4 (1) | 93.6 | <0.0001 |
| Calls and video calls between the educators and parents (one-to-one) | 61.3% | 5 (1) | 117.1 | <0.0001 |
| Smart-Edu website | 58.8% | 4 (1) | 60.6 | <0.0001 |
| Video calls among families and educators (group calls) | 57.1% | 5 (1) | 79.5 | <0.0001 |
| Videos dealing with children growth | 54.6% | 4 (1) | 75.3 | <0.0001 |
| Calls and video calls between the pedagogists and parents (one-to-one) | 13.4% | 4 (2) | 13.2 | 0.01 |

*SI, satisfaction indexes; IQR, interquartile range; and Chi$^2$, chi-square test. The table also shows the percentage of engaged families, the SI with the IQR (interquartile range), and the results of the chi-square test ($p < 0.05$).*

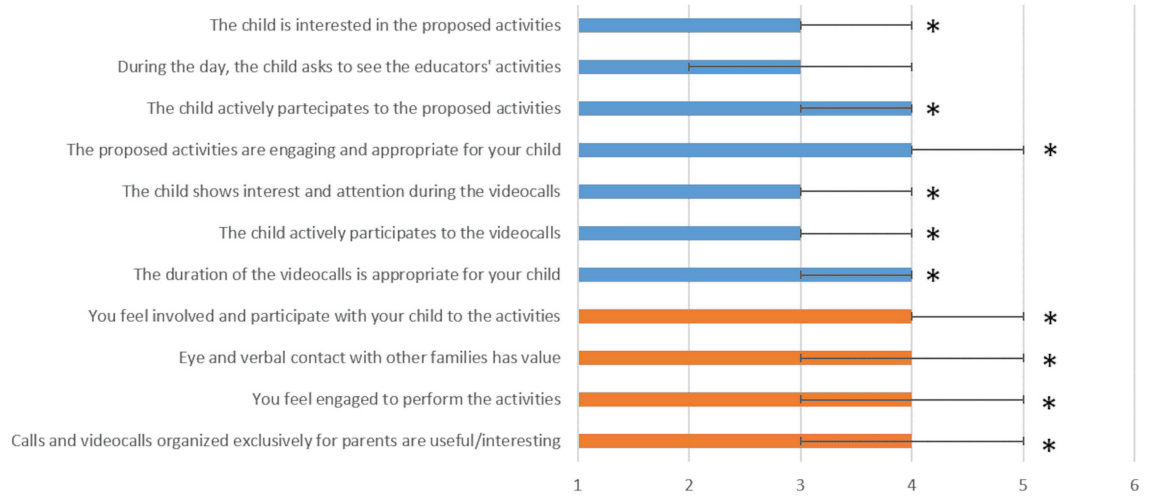


**FIGURE 2 |** Interests in children (as reported by parents) and parents regarding the proposed activities. Blue bars refer to the children's involvement, orange bars to the parents. *Chi-square test, $p < 0.0001$.

median score always ≥3. Also in this case, comparisons of score distributions with an equidistributed matrix reached statistical significance for all five-level variables (chi$^2$ ranging between 25.7 and 101.7, $p < 0.0001$); the only exception regards the item "During the day, the child asks to see the educators' activities," whereby no statistical significance was found ($\chi^2 = 5.7$, $p = 0.23$). This could be anticipated due to the age of the children (32% of them were ≤24 months old). However, among children older than 24 months, 73% of them asked to see the educators' activities (median score ≥3). To validate these findings, we performed a *post hoc* power analysis on 119 families considering the two main outcomes: children and parents' engagement. For both the cases, the power of results reached 99.9%.

In addition to these considerations, from the open-ended questions it emerged to send more rhythmic and musical games, dances, and psychomotor activities, and to continue to send readings and song videos (preferably with educators' voices and faces to maintain the contact), as well as crafts to be done with materials that can be easily found at home. With specific attention to the group video calls, families found them useful, but sometimes chaotic and dispersive. Therefore, they suggested limiting the number of participants, the free discussion, and slowing down the pace during the video calls, also organizing more than one meeting per week.

## DISCUSSION

Due to the COVID-19 outbreak and the suspension of the educational activities, February and March 2020 were accompanied by a general unpreparedness and uncertainty, and the need for everyone (both the educational teams and families) to adapt in a few days to a situation that no one had ever experienced before. To deal with this new destabilizing reality, Aeris activated an early intervention and developed some activities aimed at maintaining contact with families and children, supporting the most critical realities. Aeris moved from the beginning of the pandemic to minimize children's detachment from their routine, allowing them to experience the lockdown as an active process. With this purpose, the Smart-Edu website was developed; here families and children found chores, stories, videos, e-learning activities, and several resources to decrease the sense of isolation and facilitate long-distance relationships. Aeris also enhanced social channels such as YouTube and Facebook, and created WhatsApp groups/broadcasts with the aim of having contacts with families despite the distance. In particular, sharing material *via* social channels allowed reaching families not enrolled in the Aeris services, as demonstrated by the increased number of followers during the pandemic, leading to the spread of these support initiatives. Lot of importance was given to the video calls, which allowed children to keep having a visual contact with the educators, and parents to share experiences, opinions, and ideas with the educators, pedagogues, and other families.

The activities proposed by Aeris were defined considering the children developmental areas described in the pedagogical guidelines defined by the Italian Ministry of Education, which are inspired by developmentally appropriate practices. These guidelines suggest to foster the following areas of development: gross-motor development, fine-motor development, language, physical wellbeing and autonomy, development of the creative expression, attention and cognitive development, social-emotional development, exploration and play, problem solving, development of the mathematical and scientific thinking, and development of the learning approaches (MIUR, 2020). For each of these areas, the child has to achieve specific skills, and the activities were designed in order to stimulate or acquire these skills. For example, songs and nursery-rhymes accompanied by gestures helped in the development of the language and gross-motor

functions, while manipulative and graphic workshops in the development of the fine-motor functions.

In parallel to these actions aimed at guaranteeing the appropriate child's development, other interventions are necessary to support caregivers in their interaction with children, both for in presence or virtual learning. Specifically, individualized and targeted meetings between families and institutional caregivers are necessary to define the pedagogic intervention on the child and help the educators to define the child's profile and share it with the parents. A continuous exchange between families and educators is another key-point: the mutual support between families and institutional caregivers facilitates a correct interaction with children and, therefore, the development of their skills. The activities proposed by AERIS to families during school closure aimed also to reinforce the relationship between families and Early Childhood Services thus facilitating the interaction with children.

With the aim of assessing the proposed activities, an on-line survey was distributed to the families in May 2020. The results showed that these initiatives had a positive impact on children and parents, diminishing the sense of loneliness and boredom for the former, and acting as an important support for the latter. Readings, songs, dances, and rhythmic activities were evaluated as the most engaging. The videos proposed by Aeris were so successful that some families decided to propose their own videos and share them with other families. This allowed the families both to fill the void left by this pandemic and to be a support for other families too. Because of these actions, a deeper connection has been created with both other families and the Aeris team: if before the pandemic meetings were organized in more formal contexts, during these months everyone "entered" into others' homes, both symbolically giving a support, but also more practically through the video calls that allowed seeing others in their home context. Video calls were judged an important tool to reduce social distancing and were widely used, but sometimes they resulted chaotic and dispersive, due to the fast pace and large number of participants. In addition, it was not always easy to maintain the children's attention, especially with the younger (<1 year). Therefore, families proposed a reorganization of the video calls, decreasing the number of participants, slowing down the pace and reducing the free discussion in favor of activities with children as active learners. Following these suggestions, the Aeris team decided to diminish the number of children per call: from the 15 initial participants, some sub-groups were formed with approximately 10 children. This resulted in less chaotic meetings and gave the possibility to all children of interacting during the calls. These findings are in line with what reported by Szente (2020), who shared reflections on over 50 live Zoom instructional lessons with toddlers. In accordance with Aeris' experience, children responded well to songs, engaging stories, dances, and rhythmic activities. However, when the online lessons lasted more than 20 min, they seemed to be losing their interest. Finally, also Szente (2020) noticed that video calls tended to be chaotic if the participating children were more than 10–15.

In general, families found the activities proposed by the Aeris team engaging, well organized and useful for child development. Moreover, the Aeris team noticed an increased participation in the meetings during the pandemic than before. Indeed, the remote mode also allowed the more committed parents to attend the meetings, and this is the reason why the Aeris team decided to keep this participation option also after the COVID-19 outbreak. The same positive feeling was perceived in other worldwide realities, in which homeschool was well received by pupils and parents (Bubb and Jones, 2020; Garbe et al., 2020; Szente, 2020), or at least it was perceived as acceptable (Hafidz et al., 2020; Zhao et al., 2020). Despite these positive experiences, worldwide there is the common feeling that the e-learning needs to be improved (Fauzi and Sastra Khusuma, 2020; Putri et al., 2020; Rasmitadila et al., 2020), technology implemented (Dube, 2020; Fauzi and Sastra Khusuma, 2020; Rasmitadila et al., 2020), teachers more trained (Dias et al., 2020; Putri et al., 2020; Szente, 2020), and integrated grade-specific approaches are needed (Zhao et al., 2020). In general, teachers found a lower learning quality with respect to traditional lessons (Lucisano, 2020), and families had negative beliefs about the values and benefits of online learning, retaining that the family-school partnerships has not yielded compelling results and preferring traditional methods (Dong et al., 2020; Firmanto et al., 2020; Harper et al., 2021; Lee et al., 2021; Thorell et al., 2021). These findings differ from the Aeris reality, but we must point out that the initiatives described in this manuscript are specifically thought for 0–3 aged children, therefore dealing with simple activities that use materials easily available at home. When considering the previously mentioned studies the situation differs, since they deal with school age children (>3 years old) who need more structured activities for their development, therefore more demanding to implement.

When it comes to children, either toddlers or school aged, what emerges is that the active participation of families is fundamental for obtaining convincing results during distance educational activities. Without the mutual collaboration between educators and families, it is impossible to hope for child cognitive and behavioral development. Several studies reported a high family engagement, demonstrating the intent of the caregivers to act as proactive actors in child development (Bubb and Jones, 2020; Hafidz et al., 2020; Kim, 2020; Novianti and Garzia, 2020; Rasmitadila et al., 2020; Sari and Maningtyas, 2020; Panaoura, 2021). This was found also in the Aeris reality, in which most of the families actively participated in the proposed activities. In contrast, teachers in other contexts had problems in collaborating with parents (Fauzi and Sastra Khusuma, 2020; Lucisano, 2020; Pek and Mee, 2020), while parents encountered problems with the e-learning due to their lack of time, professional knowledge in supporting children's online learning (Dong et al., 2020; Garbe et al., 2020; Listyaningrum et al., 2020), and/or insufficient support from schools (Thorell et al., 2021). It is interesting to notice that studies in which parents were not sufficiently involved coincide with those previously mentioned for the unsuccess of the e-learning with respect the traditional methods, highlighting the importance of mutual collaboration between educational services and families (Phillips and Lowenstein, 2011; Bianco and Lecce, 2016). Despite the Aeris team was able to engage most of the families; the cooperative perceived that the pandemic had emphasized social differences among people. Indeed, not all of them participated in the distance initiatives, and the "left out-families" were usually

those with fewer technical, cultural, and cognitive tools. However, Aeris lessened this phenomenon increasing communication especially with the most fragile and less responsive families, which usually were the foreign ones. Therefore, the emails were written in English, French, and Arabic, and some of the proposed videos were also in English other than Italian (i.e., the songs and nursery-rhymes). An improvement to reach more effectively these families might consist in proposing all the initiatives at least in double language (i.e., English and Italian). In addition, some families encountered organizational issues. Indeed, some of the parents had to assist more than one child during distance educational activities, while others never stopped working and, therefore, they were not able to connect to the online activities. Finally, some of the caregivers were grandparents who had no technological skills. A useful improvement in these situations may consist in making all the contents available in the cloud, to give the family the possibility of making them up when they have time.

To conclude, the role of parents is crucial in maintaining children's well-being and education, especially during critical situations like this lockdown. It is essential to individuate parents' needs and support them in addressing their educational role. However, this does not always happen, and the pandemic highlighted the need of mentoring families in parenting their children during learning from home (Listyaningrum et al., 2020; Meoded Karabanov et al., 2021). This pilot study could be a reference for policy-makers and managers of educational services in implementing activities and initiatives aimed at filling the gap between families and schools. Indeed, it contains suggestions for other Early Childhood Services in Italy or abroad, and it could be a useful tool for future organization of other services, since we are still facing short local school closure (UNESCO Website, 2021). Even if the results may be dependent on the social context and national environment, a similar model could be implemented after its adaptation to the local habits and behaviors.

Although this work can be a useful guide for future organization of educational services during homeschooling, it has some limitations. Firstly, it lacks of an assessment of children and parents' wellbeing through validated instruments, and the measured variables are only parent-reported; indeed, the proposed survey evaluates families' satisfaction about the organized activities, but not the effects of these initiatives on children development and parents' stress levels. Moreover, due to the unpreparedness that characterized the beginning of the pandemic, the study lacks of a baseline evaluation of family wellbeing and needs (e.g., specific needs linked to the lockdown) before the starting of online activities. Finally, a comparison with early childhood services that acted in different ways is missing, which could be useful for identifying and implementing the best strategies in engaging families. Therefore, we will dedicate future works to the assessment of child development and children and parents' wellbeing after the school closure using validated instruments, and to the evaluation of other actions/ways that other early childhood services implemented to generalize these findings.

## DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article are openly available in Zenodo at DOI 10.5281/zenodo.5149218 (link: https://zenodo.org/record/5149219#.YYUD-LVKhPY, accessed on 30 July 2021).

## ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

## AUTHOR CONTRIBUTIONS

RN: research design, data analysis and interpretation, drafting and revision of the article, and final approval of the version to be submitted. EB: research conception and design, data interpretation, revision of the article, and final approval of the version to be submitted. GC: research conception and design, instrument development, data collection, revision of the manuscript, and final approval of the version to be submitted. GG: research conception and design, instrument development, and data collection. LS: website development, data collection, revision of manuscript, and final approval of the version to be submitted. GR and CC: final approval of the version to be submitted. All authors contributed to the article and approved the submitted version.

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## SUPPLEMENTARY MATERIAL

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# Parenting With a Kind Mind: Exploring Kindness as a Potentiator for Enhanced Brain Health

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A growing body of research has suggested that high levels of family functioning—often measured as positive parent–child communication and low levels of parental stress—are associated with stronger cognitive development, higher levels of school engagement, and more successful peer relations as youth age. The COVID-19 pandemic has brought tremendous disruption to various aspects of daily life, especially for parents of young children, ages 3–5, who face isolation, disconnection, and unprecedented changes to how they engage and socialize. Fortunately, both youth and parent brains are plastic and receptive to change. Resilience research shows that factors such as engaging in acts of kindness, developing trusting relationships, and responding compassionately to the feelings of others can help lay new neural pathways and improve quality of life. Yet, little research has investigated the effects of brain healthy parental practices of kindness with pre-school aged children. The current study examines whether an interactive, parent–child kindness curriculum can serve as a potentiator for brain health as measured by resilience and child empathy levels. During a peak of the pandemic, mother participants between the ages of 26–46 ($n = 38$, completion rate 75%) completed questionnaires on parental resilience levels and parent-reported child empathic pro-social behaviors before and after engaging in a 4 weeks online, self-paced, kindness curriculum. Half of the group received additional brain health education explaining the principles of neuroplasticity, empathy, perspective taking, and resiliency. Mothers in both groups showed increased resilience ($p < 0.001$) and reported higher levels of empathic behavior in their child ($p < 0.001$) after completing the curriculum. There was no significant difference between groups. Comparison of mean resilience levels during COVID-19 to pre-pandemic general means indicated that mothers are reporting significantly lower levels of resilience as well as decreased empathetic behaviors in their children. These results support the notion that kindness is a powerful brain health booster that can increase resilience and empathy. This research study was timely and relevant for parents in light of the myriad of stresses brought about by the ongoing COVID-19 pandemic. There are broader public health implications for equipping individuals with tools to take a proactive and preventative approach to their brain health.

**Keywords: kindness, preschool, parenting, training, online, resilience, pro-social**

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## BACKGROUND/INTRODUCTION

The COVID-19 pandemic permeates family functioning and wellbeing, potentially leading to a significant negative impact on parents and their young children. Parents are facing imminent threats to their relationships, social support networks, and educational access for their children, leading to overwhelming feelings of worry, stress, and anxiety (Prime et al., 2020). Specifically, the parent–child relationship is of utmost concern. Recent studies suggest that parents experiencing pandemic-related fears may have difficulty managing negative emotions, which in turn, affects daily life, family discord, and ultimately, the parent–child relationship (Daks et al., 2020; Di Crosta et al., 2020; Prikhidko et al., 2020; Saladino et al., 2020). As such, parenting young children can be challenging in and of itself, and now parents must combat additional stressors (i.e., financial, childcare, and health) due to the pandemic.

Studies indicate that, during crises, resilience (i.e., an individual's ability to positively adapt in the face of adversity; Herrman et al., 2011) reported by women with children is considerably lower than during non-crises times and that stress levels are reported to be exacerbated (Avery et al., 2021; Taylor et al., 2021). A recent study investigating the relationship of social stressors and parent–child engagement during the COVID-19 pandemic, found that mothers and fathers who reported more social stressors were less engaged with their children and their children exhibited more behavior problems compared to before the pandemic (He et al., 2021). Fortunately, it has been shown that when parents maintain positive, responsive styles of caregiving, they can prevent and even reverse toxic levels of stress in the home caused by adversity (Blair and Raver, 2016). Stern and Cassidy (2018) found that the parent–child bond can be strengthened through an acknowledgment of empathic pro-social behaviors such as care and concern for others, which involves the capacity to comprehend the minds of others, to feel emotions outside one's own, and to respond with kindness to others' suffering.

Furthermore, resilience research indicates that factors such as engaging in acts of kindness, developing trusting relationships, and responding compassionately to the feelings of others can help lay new neural pathways and improve quality of life (Haslip et al., 2019). Kindness, defined as actions intended to benefit others (Curry et al., 2018) and considered as a pro-social relational construct, supports an intra and interpersonal focus on how one treats others, takes care of oneself, and interacts with the world around them. As such, parent-driven kindness interventions may prove fruitful in promoting resilience, as parents have the influence and opportunity to become the first teachers and models for acts of kindness with their children.

The global pandemic has put a spotlight on brain health and the great need for resources, education, and training. Brain health is defined as a state of performing at your personal best and thriving in your life context—not simply the absence of disease. The term brain health as described by Chapman et al. (2021) holistically encompasses the brain's functions which includes aspects of cognition (ex: problem solving, innovation, processing speed, and memory), daily life (ex: responsibilities, sleep, nutrition, and exercise), wellbeing (ex: resilience, quality of life, and mood), social interaction (ex: empathy, kindness, and social support), and neural components (ex: brain blood flow and connectivity). In contrast, mental health is a term that more narrowly focuses on psychological and emotional wellbeing. Recent work has highlighted how the different components of brain health influence each other and by strengthening skills in one area, may also compensate for areas of weakness. A case study showed that after completing an online cognitive intervention, some of the outcomes were that the participant felt more satisfied with her social networks and saw improvement in measures of wellbeing, which included increased resilience and decreased stress (Chapman et al., 2021). Following this line of thinking, the current study seeks to understand how a kindness intervention may improve resilience.

With social distancing and stay-at-home mandates in effect, digital tools that are easily accessible and cost effective offer a solution to help families navigate the stresses of the COVID-19 pandemic. Studies have demonstrated the value of digital interventions in allowing various populations, including families, to access evidence-based guidance on demand and through a modality (web-based) that they are already comfortable using to seek mental, behavioral, and brain health guidance (Lund et al., 2018; Caulfield and George, 2020; O'Dell et al., 2021). Supplementary to intervention, other tools such as self-paced, at-home brain science education, could offer additional insight for parents seeking to better understand their own brain health. Yet, currently, there is limited data on the effects of brain science education on the resilience levels of parents with young children amid a pandemic. This study seeks to understand if an online kindness training may increase resilience in parents with preschool-aged children, promote empathic pro-social behavior in their children, and parents find the kindness activities relevant.

## AIMS AND HYPOTHESIS

Given the timely need for at-home parenting programs that support the social, emotional, and relational emergence of developing young minds, collaborators from the University of Texas at Dallas Center for BrainHealth, alongside the Children's Kindness Network, based in TN, had a specific interest in the impact of Kind Minds with Moozie, an online kindness training for parents of preschoolers. The aim of this study is to understand if practicing the pro-social skills of kindness may (1) affect resilience in parents and (2) affect empathic pro-social behavior in preschool-aged children.

The hypothesis for this study was that (1) parents who engage with Kind Minds with Moozie will increase resilience and observe increased empathic pro-social behaviors in their child, (2) additional brain science education for the parents would contribute to greater gains in resilience, and (3) parents would find kindness activities relevant during interactions with their preschool-aged children.

# MATERIALS AND METHODS

## Procedure and Study Design

Participants were randomized into either the Kindness Only condition, or the Kindness with Brain Science condition *via* a simple random sample process. All individuals provided written informed consent to participate, and all procedures were approved by and carried out in accordance with the University of Texas at Dallas Institutional Review Boards, number 21-104. The study was conducted entirely online from April to July 2021. Recruitment was open to both mothers and fathers; however, most participants who enrolled in the study were mothers. One father enrolled in the study but did not complete the online modules and was considered loss to follow-up and was not included in the analysis.

## Participants

Participants were recruited for the study through professional networks and social media posts, primarily in online groups for parents. Parents with children (three to 5 years of age) were screened to determine if they qualified for the study. Participants who met all inclusion and failed to meet exclusion criteria were enrolled in the study. Inclusion criteria consisted of: the parent being 18 years of age or older, having access to the Internet (including access to a computer/smartphone/tablet), identifying as the primary caregiver/parent within the target child age range, and being a proficient English speaker. If the parent agreed, they were provided with an electronic consent form explaining the procedures for the study and provided written consent. Thirty-eight mothers with children between the ages of 3 years, 0 month, and 5 years, 11 months ($M = 3.97$ years; male = 61%, female = 39%) participated in the study. The study included mothers between the ages of 26 and 46 ($M = 36.35$ years) who were relatively highly educated (25% up to Bachelor's, 55% Master's, and 15% Doctorate). See **Table 1** for a breakdown of ethnicity and gender for the parent participants and their children.

**TABLE 1** | Demographic data.

| Parent Ethnicity | Frequency | Percentage |
|---|---|---|
| White | 28 | 73.7 |
| Hispanic/Latino | 3 | 7.9 |
| Asian/Pacific Islander | 4 | 10.5 |
| Other | 2 | 5.3 |
| Not reported | 1 | 2.6 |
| **Parent gender** | | |
| Female | 37 | 97.4 |
| Male | 0 | 0 |
| Not reported | 1 | 2.6 |
| **Child ethnicity** | | |
| White | 27 | 71.0 |
| Hispanic/Latino | 3 | 7.9 |
| Asian/Pacific Islander | 2 | 5.3 |
| **Other** | 5 | 13.2 |
| Not reported | 1 | 2.6 |
| Child gender | | |
| Female | 14 | 36.8 |
| Male | 22 | 57.9 |
| Prefer not to say | 1 | 2.6 |
| Not reported | 1 | 2.6 |

*Parent and child ethnicity and gender (N = 38).*

# MOOZIE TEACHES KINDNESS CURRICULUM

The *Moozie Teaches Kindness* curriculum for preschool-aged children, developed by the Children's Kindness Network, includes do-at-home kindness activities that utilize music, art, and creativity to move methodically from the center of the child's circle, him/herself, to the ever-widening rings of awareness of others, animals, the environment, and nature (Children's Kindness Network, 2013). Moozie, an ambassador of kindness, is presented as a lovable, gentle, digital cow to whom children can easily relate and from whom they learn valuable, lifelong lessons. The instructional design of the *Moozie Teaches Kindness* curriculum was developed to meet National Association for the Education of Young Children (NAEYC) standards for Social–Emotional and Cognitive Development with the target age group being 3 to 7 (NAEYC, 2019).

Researchers selected and adapted the *Moozie Teaches Kindness* curriculum for this study based on its applicability to parents of preschool-aged children and focus on pro-social behaviors using the four kindness pillars that are paramount to brain health: Kindness to Others, Kindness to Self, Kindness to Animals, and Kindness to Earth. Each kindness pillar teaches parents how they can contribute to the development of empathic pro-social behavior of their child through parent-led activities which promote recognizing and naming feelings of self and others, sharing, taking turns, helping others, saying kind words, interacting with pets and/or outdoor animals, and being kind to nature in positive (recycling and conserving) and negative ways (littering and wasting).

## Kind Minds With Moozie Protocol

Kind Minds with Moozie was a randomized, pilot intervention trial designed to examine benefits of an online kindness training protocol for parents and their preschoolers. Accessed *via* parent's electronic device (laptop, phone, tablet, and desktop computer) parent participants completed five online kindness modules, each designed to take less than 10 min to complete. Parents were asked to click through a series of written and pictorial step-by-step kindness activities to be later implemented when interacting with their children (**Tables 2**, **3**). Participants in the study were randomly assigned to one of two conditions and subsequently completed pre-test measures, online modules with kindness content and post-module surveys, and then post-test measures within 1 week of completion of the last online kindness module.

## Kindness Only Condition

The first kindness only condition ($n = 17$) included an overview module introducing Moozie as the ambassador of kindness and

**TABLE 2** | Kind minds modules based on the four pillars of kindness.

| Kind minds online modules | Kindness only content | Kindness with brain science content |
|---|---|---|
| Overview | Introduction to Moozie | Introduction to Moozie |
| Kindness to others | Cultivating Kindness | Cultivating Kindness and Empathy and Mirror Neurons |
| Kindness to self | Practicing Kindness | Practicing Kindness and Self-Compassion and Parasympathetic Nervous System |
| Kindness to animals | Modeling Kindness | Modeling Kindness and Resilience and The Frontal Lobe |
| Kindness to nature | Spreading Kindness | Spreading Kindness and Neuroplasticity and Flexibility |

*The kind minds online modules provided education on the four pillars of kindness with additional brain science for one condition.*

setting a learn, do, and reflect pedagogy. This pedagogy introduced parents to the pillars of kindness (learn), described steps to and importance of including kindness in daily parenting activities (do), and prompted parents to consider the likelihood of integrating a kindness focus into their parenting style (reflect). Each of the modules provided graphics, clickables, and simple activities to engage parents. On average, it took parents 29.25 min to complete all five modules over a period of 4 weeks.

## Kindness With Brain Science Condition

The second kindness with brain science condition ($n = 21$) included the same overview and online kindness modules as the first condition, as well as a brief brain science component during the learning stage. Each brain science learning component consisted of 2–3 additional paragraphs of reading material describing empathy, resilience, neuroplasticity, and flexibility. This additional brain science was provided to explain the importance, "the why" of each concept to overall parental brain health. Participants in this condition were not informed that they would be receiving this additional content. On average, it took parents 33.14 min to complete all five modules over a period of 4 weeks.

## Measures

Resilience was measured using the self-report 25-item Connor-Davidson Resilience Scale (CD-RISC; Connor and Davidson, 2003). The scale has been developed and tested as a measure of the degree of resilience and has promise as a method to screen people for high, intermediate, or low resilience. The total score can range from 0 to 100 and the higher the score obtained, the greater the participants resilience. Each parent rated their own stress coping ability on a 5-point scale (0–4), with higher scores reflecting greater resilience in areas such as an individual's ability to adapt when changes occur, staying focused and thinking clearly when under pressure, and bouncing back after injury, illness, or hardship. The CD-RISC measure of resilience normative data indicates that the US general population median score is 82, with the first quartile (Q1: 0–73) describing the score range for the lowest group (lowest 25% of the population), i.e., the least resilient, the second (Q2: 74–82) and third (Q3: 83–90) the intermediate scores, and the fourth (Q4: 91–100) describing the highest or most resilient, i.e., above 75% of the population. This measure is found to have a very good internal consistency as measured by Cronbach's α ($\alpha = 0.93$).

Empathic pro-social behavior was measured using a National Institute of Health (NIH) Toolbox Empathic Behaviors Survey CAT Ages 3–13 v2.0 (EBS), a parent-report measure for children ages 3 through 12 that assesses parent perceptions of children's pro-social behaviors using a 10-item fixed length form. The EBS is a specific test within the NIH Toolbox—Emotion—Social Relationships—Positive Social Development (Salsman et al., 2013). This parental proxy scale was developed to assess early behavioral indicators of positive social development (i.e., empathic pro-social behaviors). Each item administered has a 5-point scale with options ranging from never to always. An example of a parent's perception of the child's empathic pro-social behavior would be "In the past month, please decide: How often your child offers to help other children who are having difficulty." Higher scores are indicative of more parent reported child pro-social behaviors, with a normative mean T-score of 50. This measure is found to have a very good internal consistency as measured by Cronbach's α ($\alpha = 0.90$).

Relevancy of the program was measured using a 5-point Likert scale (1 = strongly disagree and 5 = strongly agree) that parents completed after each of the online kindness modules. These five, three-question surveys asked parents to reflect and rate their experience in terms of content comprehension, relevance to parenting style, and likelihood of implementing the kindness practice into daily life (**Table 4**). This relevancy survey was developed by the Kind Minds researchers to examine the saliency of this training for parents. Examples of the relevance questions include "I understand how being kind to others plays a role in having a kind mind" (comprehension), "I find the concept of compassion relevant to my parenting style" (relevance), and "I will practice modeling and expressing empathy with my child" (likelihood).

# RESULTS

To test the hypotheses that parents who engage with Kind Minds with Moozie would increase resilience and observe increased empathic pro-social behaviors in their child, a paired sample t-test was conducted. Secondly, a two-sample t-test was conducted to determine the effects of additional brain science education on resilience levels. Lastly, to test the hypothesis that parents would find kindness activities relevant during interactions with their preschool-aged children, post-training participant ratings were collected and averaged. All statistics were done in SPSS (IBM Corp., 2019).

Toward completion of the study activities, researchers recommended parents complete one online kindness module

**TABLE 3** | Online kindness activities.

| Kind minds online modules | Prompt from Moozie | Kindness activity 1 | Kindness activity 2 | Kindness activity 3 |
|---|---|---|---|---|
| Kindness to others | "What can you do today to be kind to our family and neighbors?" | Remind your child that being kind is important to our own well-being and to that of others. | Play "Catch a Smile" with your child. How many times can you catch each other smiling? Write down this number each day and throughout your week. Then, see if you can make it grow! | Play a game of charades with your child. Take turns acting out the different ways you showed kindness this week. Try to guess each other's kind acts. |
| Kindness to self | "Good morning!" to yourself with kindness and a smile. | Encourage your child to start off the day best by saying this to themselves in front of a mirror. Remind them that taking care of their hair, teeth, and body, is being kind to themselves, too! | Play "Moozie Munchies" with your child. How many times can you make healthy food choices this week? Each day, draw a picture of all the fruits and veggies you ate, then watch your picture garden grow! | Take a walk with your child. Use all of your senses to talk about what you see, hear, feel, smell, and touch. Remind your child that physical activity is a very important part of being kind to yourself. |
| Kindness to animals | "I am sleepy. Moo. Please wish me and all my animal friends a sweet and dream-filled rest." | Share with your child that animals are kind to us, too, and we can be kind to them. Point out that our day always starts with birds singing in the morning. What is your favorite song? | Guide your child in placing a bowl(s) of water outside for our animal friends (on a fire escape, in the park, or in the yard). Try to remember to refill the bowl each day, then see what animal friends come to visit! | Parents describe how when we love a family member, we often give them hugs. We like to hug, pet, and play with our pets, too! Choose a stuffed animal (or your pet!) and practice kindness by giving and receiving lots of love. |
| Kindness to nature | "Let us walk through a park or a backyard and find gifts from nature like a flower, a cloud, a blade of grass, or a unique rock." | Play "Picture Perfect" with your child. Grab a camera or a sketchbook and look out the window sometime during the morning. Draw or take a picture of the world around you. Have your child tell a story about their picture. | Remind your child that nature is a gift. Invite your child to go on a "Trash or Treasure Hunt" with you and find all the special gifts outdoors that can easily be overlooked. Shift your perspective to see the magic happening all around you. Be kind to the earth by removing any real trash during your explorations. | Have your child interact with the digital garden. Be sure to remind your child that plants and flowers have special powers – they help take care of you, each other, animals, and our planet! Moo! |

*The parent-led activities to be completed with their preschoolers.*

per week and activated a 5-day time lapse between the completion of one module and access to the next, thereby allowing sufficient time for practice of the kindness activities with their children and subsequent completion of the relevancy surveys. On average, participants took 34.7 days to complete the study from pre-test date to post-test date.

## Resilience

At baseline (T1), both conditions rated low levels of resilience, with both groups falling within the first quartile (Q1: 0–73). Post-training (T2), mothers in both conditions increased their mean scores to an intermediate level of resilience, falling within the second quartile (Q2: 74–82); the kindness with brain science condition reported slightly higher levels of resilience than the kindness only condition (**Table 5**). A paired sample t-test showed a whole group significant increase in resilience ($p < 0.001$) after completing the online kindness modules (**Table 6**).

## Empathic Pro-Social Behavior

Prior to the training (T1), mothers reported child empathic pro-social behaviors levels below expected norms ($T < 50$). Upon post-test (T2), mothers in both groups rated their perception of their child's empathic pro-social behaviors as significantly increased, with the kindness only condition outperforming the kindness with brain science condition (**Table 5**). A paired *t*-test revealed mothers in both groups reported observing higher levels of empathic pro-social behavior in their child ($p < 0.001$) after completing the online kindness modules (**Table 6**).

## Brain Science

A two-sample t-test found no significant differences in CD-RISC between the kindness only and kindness with brain science conditions (**Table 7**).

## Relevancy

The mean relevancy scores in both groups revealed that mothers reported overall high relevancy after completing each of the online kindness modules (**Table 8**). Responses ranged from 4.69 to 4.91 out of a 5-point Likert scale (1 = strongly disagree and 5 = strongly agree).

# DISCUSSION

The Kind Minds with Moozie research study sought to understand if an online kindness curriculum could be a

**TABLE 4** | Relevancy survey questions.

| Relevancy survey questions | | |
|---|---|---|
| **Comprehension of concept** | **Relevancy of concept** | **Practice the concept with my child** |
| **Kindness only condition** | | |
| I understand that this study aims to equip and empower me to be a kind, parenting mind. | I find the concept of kindness relevant to my parenting style. | I will practice Moozie moments and kindness with my child. |
| I understand how being kind to each other plays a role in having a kind, parenting mind. | I find the concept of modeling kindness relevant to my parenting style. | I will practice showing kindness to my child. |
| I understand how being kind to myself plays a role in having a kind, parenting mind. | I find the concept of practicing self-care relevant to my parenting style. | I will practice self-care with my child. |
| I understand how being kind to earth plays a role in having a kind, parenting mind. | I find the concept of being kind to earth relevant to my parenting style. | I will practice being kind in nature with my child. |
| I understand how being kind to animals plays a role in having a kind, parenting mind. | I find the concept of practicing kindness to animals relevant to my parenting style. | I will practice kindness towards animals with my child. |
| **Kindness with Brain Science Condition** | | |
| I understand that this study aims to equip and empower me to be a kind, parenting mind. | I find the concept of kindness relevant to my parenting style. | I will practice Moozie moments and kindness with my child. |
| I understand how empathy plays a role in having a kind, parenting mind. | I find the concept of empathy relevant to my parenting style. | I will practice modeling and expressing empathy with my child. |
| I understand how compassion plays a role in having a kind, parenting mind. | I find the concept of compassion relevant to my parenting style. | I will practice self-compassion and calming exercises with my child. |
| I understand how neuroplasticity plays a role in having a kind, parenting mind. | I find the concept of flexibility relevant to my parenting style. | I will practice being flexible with my child. |
| I understand how resilience plays a role in having a kind, parenting mind. | I find the concept of resilience relevant to my parenting style. | I will practice resiliency with my child. |

*The participants were asked to rate their comprehension, the relevancy, and the likelihood of practicing the concept at the end of each online kindness module.*

**TABLE 5** | Connor-Davidson resilience scale and NIH toolbox empathic behaviors survey means.

| | M | SE | n |
|---|---|---|---|
| CD-Risc Kindness Only T1 | 69.59 | 11.34 | 17 |
| CD-Risc Kindness Only T2 | 75.24 | 11.52 | 17 |
| CD-Risc Kindness with Brain Science T1 | 69.67 | 8.00 | 21 |
| CD-Risc Kindness with Brain Science T2 | 76.57 | 10.86 | 21 |
| EBS Kindness Only T1 | 43.44 | 8.56 | 17 |
| EBS Kindness Only T2 | 49.82 | 8.57 | 17 |
| EBS Kindness with Brain Science T1 | 42.45 | 10.13 | 21 |
| EBS Kindness with Brain Science T2 | 47.06 | 12.88 | 21 |

*A table of descriptive statistics displays the averages of participant scores in both conditions, kindness only and kindness with brain science, at T1 and T2.*

potentiator for resilience and empathic pro-social behavior during times of stress brought about by the COVID-19 pandemic. One aim of this study was to integrate easy-to-follow brain science education with kindness activities delivered digitally. We hypothesized that parents who engaged with the online kindness activities with their preschool-aged children would boost parental levels of resilience and parent reported child empathic pro-social behavior levels. Results showed a whole group increase in resilience levels of mothers and mother-reported empathic pro-social behaviors in their children. This study supports the notion that practicing kindness can be a useful tool to help mothers become more resilient. The ability to overcome difficulties and cope with stress is critical, especially during a global pandemic. As such, changes in resilience, a personality trait aimed at complying with environmental changes and stress, may be a beneficial factor to consider (Block and Block, 1980). There is a need for additional research and salient early interventions for parents, including both mothers and fathers, as resilience can be a potentiator for improved mental, physical, and brain health.

Given that the baseline resilience levels of mothers in this study fell within the bottom 25% of the population ($m = 69$), there was opportunity for growth and intervention. One possible explanation is that the pandemic contributed to feelings of worry and fear, which may then affect mothers' resilience levels. Similar to the findings of our study, Mariani Wigley et al. (2020) used the same measure of resilience and investigated the support role of parents during the COVID-19 emergency. Results showed that parents were also found to have a low parental resilience score ($m = 63.78$) when their children were on average 8 years of age. Compared to the mothers of preschoolers in this study, who reported higher resilience levels before and after the kindness training ($m = 69$, $m = 75.9$), our results suggest that maternal resilience levels may fluctuate not only due to environmental stressors, but also depending on child age. Therefore, implementing a kindness training during the earlier years of childhood may serve as a buffer against declining parental ability to adapt and bounce back in the face of stressful situations.

Prior to receiving this online kindness training, mothers in both the kindness only and kindness with brain science conditions reported child empathic pro-social behaviors at levels lower than expected norms ($T < 50$). Upon completion of the online kindness modules, a significant increase in whole group child empathic pro-social behaviors was reported ($m = 48.30$), although the scores increased, they were still slightly below

**TABLE 6 |** Paired sample *t*-test for Connor-Davidson resilience scale and NIH toolbox empathic behaviors survey.

| | M | SE | t | df | p |
|---|---|---|---|---|---|
| CD-Risc T1-T2 Whole Group | −6.34 | 8.89 | −4.39 | 37 | 0.000** |
| CD-Risc T1-T2 Kindness Only | −5.64 | 2.11 | −2.66 | 16 | 0.017* |
| CD-Risc T1-T2 Kindness with Brain Science | −6.90 | 2.00 | −3.44 | 20 | 0.003* |
| EBT1-T2 Whole Group | −5.40 | 5.16 | 0.83 | 37 | 0.000** |
| EBT1-T2 Kindness Only | −6.38 | 1.23 | −5.18 | 16 | 0.000** |
| EBT1-T2 Kindness with Brain Science | −4.60 | 1.14 | 4.03 | 20 | 0.001** |

*Paired sample t-tests revealed significant differences in reported means from T1 to T2 in both the kindness only and the kindness with brain science conditions. *p < 0.05. **p < 0.001.*

**TABLE 7 |** Two-sample t-test comparing kindness with brain science to the kindness only condition.

| | M(T1-T2) | SE(T1-T2) | t | df | p |
|---|---|---|---|---|---|
| CD-Risc Kindness with Brain Science-Kindness only | 1.25 | 2.93 | 0.429 | 36 | 0.671 |

*The two-sample t-test demonstrated that there was no significant difference in the change reported from T1 to T2 in the kindness only and kindness with brain science conditions on the CD-Risc.*

**TABLE 8 |** Relevancy survey questions.

| | Relevancy survey means | | |
|---|---|---|---|
| **Online kindness modules** | **Understand the concept** | **Find the concept relevant** | **Practice the concept with my child** |
| Kindness overview (*n* = 33) | 4.91 | 4.85 | 4.73 |
| Kindness to others and Empathy (*n* = 32) | 4.84 | 4.88 | 4.81 |
| Kindness to self and self-compassion (*n* = 33) | 4.88 | 4.85 | 4.73 |
| Kindness to animals and resilience (*n* = 35) | 4.75 | 4.78 | 4.74 |
| Kindness to nature and neuroplasticity (*n* = 32) | 4.78 | 4.69 | 4.88 |

*The participants were asked to rate their comprehension, the relevancy, and the likelihood of practicing the concept at the end of each online kindness module.*

the norm. One potential factor for consideration is that these low scores may be due to the isolating nature of the COVID-19 pandemic as children might be restricted from engaging in social–emotional learning activities outside of the home or have limited social engagement with peers in order for natural development of pro-social behavior through activities involving same-aged play, peer modeling, and social communication.

Regarding differences between the kindness only and the kindness with brain science conditions, the authors hypothesized that both groups would demonstrate gains in resilience and parent reported empathic pro-social behavior and that the participants in the kindness with brain science condition would show greater increases in parental resilience. Analysis revealed both groups did increase in resilience and parent reported empathic pro-social behavior in their children; however, there was no significant difference between groups. One potential reason for this finding may be that the measures were not well suited to capture the impact of the brain education provided. We did not include application questions for the brain science information provided. Research has shown that synthesis (gist reasoning) is an important process to abstract meaning from complex information and that gist reasoning can predict performance in daily function (Vas et al., 2015). Providing information alone may not have been enough to create measurable changes in resilience. Future studies should investigate the possibility of making the brain science educational aspect more thorough, with specific and direct applications. Mothers reported high relevancy upon completion of the online kindness modules. Study participants reported they found Kind Minds with Moozie to be comprehensible, relevant, and practical. Additionally, on average, parents in the kindness only condition spent 29.25 min and parents in the kindness with brain science condition took slightly longer at 33.14 min to complete the entire course over the course of 4 weeks. Given that the additional brain science education should have only resulted in a brief increase in the amount of time taken to complete each module, this small difference is expected. Nonetheless, with the time-consuming demands placed on parents during the pandemic, it is promising that this brief, online kindness training can be completed in less than 1 h. Furthermore, the results of this study suggest that mothers value practicing and instilling pro-social skills such as being kind to others, yourself, animals, and nature in their children and that kindness activities, which foster parent–child interaction, are well received.

## Limitations and Future Directions

This research study has several strengths and limitations related to the study design. Due to the limitations of the study, the results must be interpreted with caution. The two conditions of the study allowed for examination of the added benefits

of brain science to online kindness activities; however, the study could benefit from a third condition including parents who would not receive the brain science. While a control group which would receive materials after the post-intervention measurement of resilience and empathic pro-social behaviors could have provided additional insights into the effectiveness of the online kindness training, the research team prioritized delivering the training in a timely manner due to the pandemic. This online kindness training was relevant for mothers considering the myriad of stresses and demands brought about by the ongoing COVID-19 pandemic. The digital design of the study was an efficient method for researchers to provide study activities to participants during a period of physical and social distancing, although participant feedback on the accessibility and ease of use of the technology was not collected. Additionally, the participant feedback surveys gathered insight regarding the comprehension, relevancy, and practicality of the kindness activities in daily life; however, the feedback did not address parent engagement levels or frequency of practicing the kindness activities with their children. These aspects could be assessed in future studies to gain additional information which would be useful for the implementation of the program and the evaluation of its feasibility. In regard to the participants, it was a homogeneous group, as more female participants enrolled in the study, and many came from similar educational and socioeconomic levels; therefore, the data collected were limited in representation to mothers of preschool-aged children. The study design could be strengthened by adding a follow-up time point to assess maintenance effects of gains in parent resilience and child pro-social behavior. Further exploration of how a more structured cognitive training combined with daily habits may affect greater change in parent resilience levels may be of interest in a larger-scale investigation. Continued effort to expand and enroll a third control group would lend itself to a more robust analysis of the impact and effects of brain science education on resilience, empathy, and cognition. Future recruitment processes should include a more focused diversification so that multiple demographics and both maternal and paternal figures are represented. Overall, study findings serve as a model for leveraging a neuroscience-based online kindness curriculum to empower parents with strategies to combat stress exacerbated by these unique times. There are broader public health implications for equipping individuals with tools to take a proactive and preventative approach to brain health, thereby influencing the social, academic, and neural development of the family unit (Feldman, 2015). The chronic and cumulative effects of stress on the brain can contribute to adverse childhood experiences and have been linked to parental resilience as a mediator. Borja et al. (2019) suggest that the resilience of some parents can prevent the heightened exposure of their children to adversities.

Continued studies should further investigate specific methods and protocols utilizing kindness and resilience building activities that promote parent–child interaction and relational development as a foundation to creating happier and more brain healthy families.

## CONCLUSION

Identifying effective ways to reduce stress and increase resilience has become a mandate for people from a myriad of life, age, professional, and socioeconomic backgrounds, and especially among parents and their young children. Kindness is a familiar construct that goes beyond educational, psycho-social, and cultural boundaries; however, many current practices do not involve a curriculum devised specifically for the implementation by parents of preschool-aged children. The developing mind is instrumental in instilling strong, neural pathways that promote resilience and empathic pro-social behavior. Kind Minds with Moozie resulted in a valuable tool to provide structured support and didactic instruction to assist parents in supporting and promoting child empathic pro-social behavior and proved to be useful in support interventions for families exposed to adverse events as well as public health crises. Specifically, Kind Minds with Moozie could be used to plan intervention for caregivers (e.g., teachers and parents) aimed at improving resources to cope with life stressors. Thus, the present results highlight the significance of designing digital therapeutic tools and kindness training designed to improve both parental and child wellbeing.

## DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by University of Texas at Dallas. The patients/participants provided their written informed consent to participate in this study.

## AUTHOR CONTRIBUTIONS

MJ co-designed the study, conducted recruitment, created the online modules, enrolled and managed participants, scored and interpreted data, and wrote the manuscript. JF co-designed the study, assisted with recruitment, and manuscript preparation and edits. KT assisted with data interpretation and manuscript preparation and edits. AM assisted with participant screening and recruitment, and manuscript edits. All authors contributed to the article and approved the submitted version.

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**Conflict of Interest:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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