

## RESEARCH ARTICLE

# Adaptation of infant mental health services to preterm infants and their families receiving neonatal intensive care unit services during the COVID-19 pandemic

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## Abstract

Multiple changes and stressors at the family, hospital, and societal levels have resulted from the COVID-19 pandemic that impact the early social environment of infants in Neonatal Intensive Care Unit (NICU) settings. This manuscript reviews these pandemic-related adversities, including hospital-wide visitor restrictions, mask requirements that interfere with caregiver facial expressions, parental anxiety about virus transmission, and reduced support services. We will further describe adaptations to mental health service delivery and approaches to care in the NICU to mitigate increased risk associated with pandemic-related adversities. Adaptations include integration of technology, staff education and support, and delivery of activity kits to encourage parent–infant bonding. Data was collected as part of routine program evaluation of infant mental health services from one 50-bed NICU setting and describes family concerns, barriers to visitation, and utilization of mental health services during the pandemic. Concerns related to COVID-19 rarely emerged as the primary presenting issue by the families referred for infant mental health services from April through December of 2020. However, a number of families indicated that infection concerns and visitation restrictions posed significant challenges to their parenting and/or coping. There were significant discrepancies noted between the visitation patterns of families with public and private insurance. Several adaptations were developed in response to the multiple challenges and threats to infant mental health present during the COVID-19 pandemic.

## KEYWORDS

COVID-19, mental health, NICU, preterm infant

## 1 | INTRODUCTION

The COVID-19 pandemic has posed increased challenges to infant mental health for infants born preterm—a medically-vulnerable population who are already at increased risk for developmental delays, behavioral regu-

lation difficulties, and reduced infant–parent bonding and attachment. Confirmed COVID-19 infections are very rare among infants being treated in Neonatal Intensive Care Units (NICUs), ranging from .03% to .44% (Ahmad et al., 2021). However, the indirect effects resulting from risk mitigation strategies related to the COVID-19 pandemic have,

and will likely continue to have, a large impact. Multiple systemic changes and stressors at the family, hospital, and societal levels have resulted from the pandemic and these especially impact the early social environment of infants in Neonatal Intensive Care Unit (NICU) settings. Among preterm infants treated in NICUs during the COVID-19 pandemic, the largest current and future impact may indeed be on the mental health of the infants and families.

This manuscript will review multiple pandemic-related adversities, including hospital restrictions to family member visitation, mask requirements that interfere with an infant's ability to see and respond to caregiver facial expressions, parental anxiety about transmitting the virus to the infant, and reduced support services for infants and family members during the NICU stay. We will then present practices and program evaluation data from a single NICU to illustrate challenges that were experienced, including barriers to visitation, parenting concerns, and utilization of integrated behavioral health services in one NICU. Finally, we conclude with a discussion of the implications for infant mental health care for infants and families treated in NICUs during the pandemic and for systemic considerations for NICUs moving forward.

## 2 | INFANT MENTAL HEALTH AND THE NICU

Infants born prematurely or with other medical complexities and their families typically require care across multiple domains in the NICU, including medical, developmental, and psychosocial. Psychologists working in NICU settings are able to address each of these areas when working with families through an infant mental health lens. Infant mental health is conceptualized as “the young child's capacity to experience, regulate, and express emotions, form close and secure relationships, and explore the environment and learn” (Zeanah & Zeanah, 2018, p. 6). Most importantly, these capacities are developed and strengthened in the context of the child's relationships and environment.

The NICU environment impacts infant mental health in several important ways by disrupting opportunities for parent–infant interactions and engagement in activities that promote bonding and attachment. Parents often experience limited ability to hold and/or interact with their infants due to the medical fragility of the infant (e.g., need for little to no stimulation, ventilation support that requires little to no infant movement). Additionally, many infants are not developmentally or medically ready for oral feeding at birth and for several weeks to months after and so parents are not able to engage in feeding through breast or bottle. Finally, families may not be able to consistently be at

### Statement of relevance to infant mental health

Preterm and medically complex infants in Neonatal Intensive Care Units and their families face many stressors throughout the hospital admission. The COVID-19 pandemic created additional challenges in the areas of parental mental health, family engagement, and parent–infant bonding. Each of these focus areas impact the well-being of the family unit and the young child's early social-emotional environment. This paper details how one NICU adapted psychosocial supports to mitigate increased risk associated with pandemic-related adversities.

### Key Findings/Practitioner Points

- Families had additional challenges/stressors that affected quality and quantity of infant–parent interactions during the COVID-19 pandemic.
- On-site access to infant mental health services in the NICU allowed many families to access services during this time.
- NICU providers need to consider ways to meet the mental health needs of infants and families, especially those with challenges to visitation.

bedside on a regular basis due to other family responsibilities, work, and/or mental health symptoms (e.g., trauma, depression, anxiety) that result in avoidance of visitation. Thus, parents and infants may have reduced frequency of interactions and opportunities to engage with one another. Altogether, this can challenge the parent's perception of his/her role in the infant's care and result in reduced perceptions of self-efficacy in the parenting role.

The role of healthy parents in NICU care is critical. A big movement now is the push for family-centered care and promotion of family engagement in NICUs. Family engagement is a broad term without a consistently agreed upon definition; it generally refers to behaviors by families and providers, as well as organizational policies and procedures, that promote engagement of families as part of the infant's care team (Maurer et al., 2012). Family presence and engagement is critical for language exposure, behavioral and state regulation, and readiness for discharge. Additionally, separation from infant (as well as

other factors) increase risk for parent mental health concerns. Providers from multiple disciplines seek to promote both quality and frequency of infant–parent interactions by assisting families with engaging in kangaroo care and making psychosocial support services available to families (Hynan et al., 2015).

### 3 | COVID-19 AND THE NICU ENVIRONMENT

When the COVID-19 pandemic affected hospital systems in the United States and across the world in early 2020, multiple changes were implemented in NICU settings that further challenged the ability for parents to be engaged in care of their infants. These policy changes and their potential impact on infant mental health are described below.

#### 3.1 | Reduced visitation

Family presence at bedside is vital for family engagement, parent–infant attachment, shared decision-making/family-team communication, and medical care and discharge readiness for the infant. Many families with infants in NICUs already experience barriers to regular visitation, especially during prolonged hospital stays due to transportation challenges (financial and logistical), need to care for other siblings, work, and mental health challenges that can cause avoidance of the team and/or NICU setting. During COVID-19, these challenges were exacerbated with an increase in financial difficulties, schools and childcare settings closing for in-person services, and reduced availability of resources (e.g., ability for parents and siblings to stay in Ronald McDonald house). Practitioners from one US hospital reported that in comparison to the same period a year before, during March through May 2020, families visited less frequently (47% of days in comparison to 97% the year before) and infants received less frequent developmental care activities and for a shorter duration from both families and staff (Scala et al., 2021). Furthermore, as disparities in ability to be present at bedside have existed even prior to the pandemic, they have become more pronounced and exacerbated during the pandemic (Pang et al., 2021).

In addition to an increase in logistical barriers that interfere with parental presence at bedside, visitation restrictions were widespread in many hospitals during the COVID-19 pandemic. Mahoney et al. (2020) surveyed 277 NICUs across the globe to describe variations in NICU visitation policies and ancillary staff availability during the COVID-19 pandemic. Prior to the pandemic, 83% allowed

parents to be at bedside 24 h per day, 7 days per week; during the pandemic this declined to 53% of responding NICUs. Degree of parental presences permitted also varied, with some NICUs not allowing parents to visit at all (5%), some only allowing one designated parent to be present throughout the NICU stay (25%) and others only allowing one parent to be present at a time (85%). Notably, this varied according to NICU layout/design; NICUs with single rooms for families had less restrictions than those with open baby layouts or hybrid designs.

Although such changes in visitation policies may have been necessary to curb spread of the virus among providers/staff, patients, and visitors, there were likely unintended, yet deleterious effects on infant mental health. Muniraman et al. (2020) sought to learn about parental perceptions of the impact of visitation policies during COVID-19 on care for infants by surveying NICU parents from 6 tertiary NICU settings in the US and UK conducted in May through August 2020. Of the 231 respondents, 41% indicated that they were not able to bond adequately with their infants as much as desired due to these visitation restrictions and 36% of mothers indicated that COVID-19 related restrictions impacted their ability to breastfeed. Similarly, in a smaller study conducted with parents in Libya with infants in NICU, 34% of parents with an infant in NICU indicated that they were not able to breastfeed with the frequency that they would prefer and an additional 24% indicated that visitation restrictions severely affected ability to breastfeed (Ashini et al., 2021).

#### 3.2 | Personal protective equipment and social interaction

Although critical to reduce transmission of the coronavirus, use of personal protective equipment, such as masks and facial shields, may have resulted in diminished quality and frequency of infant-caregiver communication (both verbal and nonverbal). Infant's visual acuity at birth is designed for focus on faces and facial recognition and is a significant and vital (though not sufficient) aspect of social development. Indeed, preterm infants use facial gaze, coupled with affectionate talk, for vital bidirectional communication with mothers and fathers within the first weeks of life (Stefana et al., 2020). Masking during infant–parent interactions prohibits an infant's ability to view full faces. For infants with prolonged hospital stays during COVID-19, masks prohibited exposure to full facial expressions with both staff (who were also often wearing protective eye gear) and parents during a critical time period for developing social responsiveness (Nagy, 2008). In the parent survey conducted by Muniraman et al. (2020) survey described in the previous section, 34% of parents reported

that wearing a mask affected their ability to bond with their infant.

### 3.3 | Social distancing and parental isolation

A primary aim of most infant mental health practitioners working in integrated NICU settings is to promote the parental sense of self as an important member of the baby's team with unique role and expertise. That is, mental health clinicians focus on encouraging the parent to own their role in the infant's care and to engage in typical parenting activities, despite the multiple challenges that arise when parenting in a NICU. Some activities we often encourage are doing "typical" parenting activities that can be done given an infant's unique medical status, such as dressing the infant (even if only a sock or a hat), bringing in a blanket to cover the isolette, or decorating the infant's space with items from home (e.g., posters/pictures of family members, unique items of significance to the family). Due to infection control restrictions, some NICUs prohibited the introduction of these items into the infant's care space. Furthermore, items that parents may have previously had access to (e.g., board books, child life toys) to enhance and encourage the parenting experience were often unavailable to parents during the pandemic. Furthermore, due to travel restrictions, social distancing and lockdowns, and visitation policies, families of NICU infants were not able to engage in the self-care activities, including accessing social support and accepting help of individuals, that were previously available to them.

### 3.4 | Reduced access to psychosocial support for families

Parental support and community among other NICU parents has long been recognized as an important aspect of NICU design and programming (Hall et al., 2015; Hynan et al., 2015). Opportunities for families to connect with one another are often created through formal and informal programs (e.g., support groups) and shared family spaces (e.g., family lounges). Due to need for social distancing, common spaces were often closed down and in-person opportunities for families to gather and connect with one another were prohibited. Thus, families had less opportunities for in-person connection and community building, which posed a further challenge to a parent's ability to cope with the stress of having an infant in the NICU.

In many hospitals, ancillary services to support families were also reduced or placed on hold. For example, volunteers could not be present to hold babies when parents

were not at bedside. In the Mahoney et al. (2020) study, 43% of NICUs reported reductions in developmental therapy services, lactation services (including receipt/use of donor milk), and/or social work services, all which serve to improve the mental health (and developmental care) of infants and families in NICU settings.

## 4 | A CASE EXAMPLE OF ONE NICU

To illustrate how the COVID-19 pandemic affected the experience of NICU parents, we provide a description of the challenges reported by families in one NICU setting. Patient and family data for this case example were collected as part of routine program evaluation. The program evaluation and associated data collected have been reviewed by the internal review board at our institution and designated as non-human subject research. Because this is program evaluation data, we acknowledge that these data are not generalizable to other settings.

### 4.1 | Setting

All services were provided at a 50-bed Level III NICU at a regional hospital serving both inborn and outborn infants, primarily those born preterm. The NICU consists of private pods, which are three walled rooms that open to a general nursing area in clusters of five–six beds. A curtain partition which can be closed is present between the pod and nursing area. Payer mix is approximately 50% public payer (e.g., Medicaid). Families come to the unit from the surrounding urban and suburban regions, as well as the rural and frontier regions from across the state and some surrounding states.

During the COVID-19 pandemic, visitation restrictions were tightened to allow only two parents/caregivers at bedside during the hospital stay. Notably, multiple changes in visitation policy occurred over the course of the pandemic as community spread waxed and waned, with occasional changes in policy related to the number of visitors allowed at a time, the ability to change designated visitors, and the ability to leave and come back in a 24-h period.

Social work and psychology services were deemed essential by program leadership and providers continued to come to the hospital to deliver critical individualized behavioral health services to patients and families. However, other services, such as volunteers to hold babies, a March of Dimes representative, and community organizations that hosted parent gatherings and activities were restricted from coming on site. Masking and social distancing policies were also enacted and families with suspected COVID-19 exposures were not allowed to come

to the hospital for designated periods of time and until COVID-19 tests came back negative, consistent with state and national health guidelines.

## 4.2 | Mental health services in the NICU

Psychosocial services for infants and families in the NICU are provided by social work and psychology. Psychological services, also referred to as the Connections Program for High-Risk Infants and Families, were new to this NICU, with psychologists coming on site starting in February 2020. The psychology team initially received consults for babies under 30 weeks gestational age and in June 2020 expanded the criteria to infants under 32 weeks gestation.

After families were identified as eligible for psychology services (based on gestational age and/or provider concerns), the psychology team member completed a health behavior intake. Standard questions documented in the intake included (a) primary concern of family at time of intake; (b) additional worries/concerns; (c) visitation frequency (hours per visit, days per week); (d) family-reported barriers to visitation; and (e) additional factors affecting infant and family mental health/wellness. The intake sessions were typically conducted around 14 days of life. From March 2020 through December 2020 the psychologists (who specialize in infant mental health services) provided services to 76 infants admitted to the NICU and their families. There were five sets of twins/multiples in this sample and overall, 71 families received services.

After the intake, families were typically followed on a weekly or biweekly basis, based on treatment plan agreed upon by psychology team, family, and NICU team. At each intervention session, the following are documented: (a) new and ongoing concerns; (b) visitation frequency (hours per visit, days per week); (c) family-reported barriers to visitation. The average number of intervention sessions was 3.77 (2.78) and 21% of families participated in at least one of these sessions using telehealth when they could not be present at bedside.

## 4.3 | Program evaluation data

As part of routine program evaluation, the team keeps data on family concerns, barriers to visitation, assessment and interventions service utilization, and other variables that can be analyzed to inform care. To determine how patterns of concerns, visitation, and barriers to visitation changed after intake, we examined data collected from the 71 families who received an intake assessment from the psychology team between March and December 2020. In the case of twins/multiples (five families), only data from Baby A

**TABLE 1** Demographic characteristics ( $N = 71$ )

	<b>M<sup>a</sup></b>	<b>SD<sup>a</sup></b>
Gestational age at birth (weeks)	28.5	2.7
Birthweight (g)	1229.9	508.3
Length of stay (days)	65.9	33.7
Birth type		
Singleton	91.5%	
Twins	7.0%	
Multiple (3)	1.4%	
Gender (% male)		
Insurance (% Medicaid)	46.5%	
Race (%)		
Asian	4.2%	
Black	14.1%	
Other	15.5%	
White	66.2%	
Ethnicity (%)		
Hispanic or Latino	26.8%	
Not Hispanic or Latino	73.2%	
Language (%)		
English	93.0%	
Spanish	2.8%	
Other	4.2%	
Siblings (%)	46.5%	

<sup>a</sup>Unless indicated otherwise.

were included so as not to overrepresent any family in our data. Characteristics of the infants included in the sample are reported in Table 1.

Included in this summary of the program evaluation data include information gathered during the intake, as well as information gathered during an intervention session that took place approximately 4 weeks after the intake. Of the 71 infants in the sample with intake data, 40 had intervention data 4 weeks later. The other 31 did not have data due to discharge, transfer, or infant demise (77.4%), parents declining services (9.7%), or inability of the psychology team to reach the family to provide services (12.9%).

### 4.3.1 | Family concerns

The primary concern report by families at the time of intake was primarily related to the baby's medical condition (40%), followed by parental coping (28.2%), and transportation logistics (9.9%). COVID-19 visitation restrictions (1.4%) or infection concerns (1.4%) were rarely indicated as the primary concern of the parent, but were more frequently endorsed as presenting challenges to parenting



**TABLE 2** Proportion of caregivers reporting concerns

	<b>Intake (<i>N</i> = 71) (%)</b>	<b>Four week follow-up (<i>N</i> = 40) (%)</b>
COVID-19 (infection concern)	5.6	2.5
COVID-19 (visitation restrictions)	2.8	.0
Medical condition	49.3	17.5
Work	4.2	7.5
Parental coping	33.8	42.5
Maternal recovery	4.2	.0
Feeding	.0	5.0
Logistics (e.g., transportation, distance)	11.3	2.5
Extended family	1.4	.0
Siblings	11.3	2.5
Financial	4.2	5.0
Other	16.9	5.0

and/or coping. Specifically, 9.9% of parents endorsed infection concerns as such a challenge and 14.1% endorsed visitation restrictions.

In addition to COVID-19 related issues, families endorsed a range of other concerns (in addition to their primary concerns), which included fears about infant feeding, care for siblings and extended family members, finances, work, and parent medical condition/recovery following delivery. Table 2 presents the proportion of parents who indicated concerns about each of these variables at both intake and 4 weeks after the intake session. Notably, parental endorsement of concerns for all categories declined from intake to 4-week follow-up, with the exception of parental coping—more parents endorsed concerns about parental coping at 4-week follow-up in comparison to intake.

#### 4.3.2 | Visitation frequency and barriers to visitation

Parents indicated regular visitation in the NICU, despite the COVID-19 pandemic and the hours per visit and days per week of visits did not change over time. In general, parents indicated that at least one parent visited 5–6 days per week for approximately 5 h per day. Despite the high level of visitation reported, 62% of families at intake and 70% at 4-weeks post intake reported one or more barriers to visitation. Table 3 presents the proportion of families identifying specific barriers to visitation at both these time points. The most common barriers to visitation at intake were work, caregiving responsibilities to siblings

and extended family members, non-COVID parent medical condition (e.g., delivery complications/recovery), and distance from home to hospital. One month later, work was identified as a barrier for more families and non-COVID parent medical condition (e.g., delivery complications/recovery) were reported by less families. Other reported variables remained relatively stable.

Disparities in visitation were observed between patients with commercial and public insurance in terms of hours spent at bedside per visit ( $t(48) = 3.5, p = .001$ ). Specifically, patients with commercial insurance reported spending significantly more hours at bedside per visit ( $M = 5.7, SD = 2.4$ ), compared to patients with public insurance ( $M = 3.5, SD = 1.9$ ). The same pattern was observed at the intervention session 4 weeks later visit ( $t(23) = 2.9, p = .009$ ); parents of patients with primary commercial insurance again reporting spending significantly more time at bedside per day ( $M = 6.0, SD = 2.0$ ) than the families of patients with primary public insurance ( $M = 3.5, SD = 2.2$ ).

Regarding disparities in number of days a caregiver was present at bedside per week, a significant difference was found at intake ( $t(63) = 2.3, p = .027$ ) with patients with commercial insurance ( $M = 6.3, SD = 1.6$ ) spending an average of one more day per week in the NICU than patients with public insurance ( $M = 5.3, SD = 2.2$ ). No significant differences were found at follow-up although patient with commercial insurance ( $M = 6.0, SD = 4.6$ ) spending an average of one more day per week in the NICU than patients with public insurance ( $M = 4.9, SD = 2.0$ ).

#### 4.4 | Adaptations to typical psychosocial services

In response to COVID-19 related changes to operations in the NICU such as the visitation restrictions and enforcement of prolonged quarantine for infected parents described above, the psychology team and other psychosocial support team members made several adaptations to programs and services offered in the NICU. Adaptations include using telehealth technologies to encourage infant–parent interactions and peer-to-peer interactions for NICU families, staff education and support, and delivery of materials/kits of activities to encourage parent–infant bonding.

##### 4.4.1 | Virtual services

Using tablet devices with audiovisual capabilities, psychology providers were able to connect with families who could not be at bedside to their infants in the hospital.

TABLE 3 Visitation and barriers to visitation

	Intake (N = 71)		Four week follow-up (N = 40)	
	M <sup>a</sup>	SD <sup>a</sup>	M <sup>a</sup>	SD <sup>a</sup>
<u>Parent reported visitation</u>				
Hours of visitation/Day	4.7	2.4	5.1	2.3
Days of visitation/week	5.9	1.9	5.6	1.8
<u>Reported barriers to visitation</u>				
Transportation	5.6%		7.5%	
Distance from hospital	12.7%		10.0%	
Work	21.1%		30.0%	
COVID-related illness or quarantine	2.8%		.0%	
Non-COVID medical reasons	15.5%		2.5%	
Parental coping/distress at bedside	1.4%		5.0%	
Other caregiving responsibilities (e.g., siblings, extended family members)	18.3%		17.5%	
Visitation restrictions	2.8%		.0%	
Other	4.2%		5.0%	
None	38.0%		30.0%	

<sup>a</sup>Unless indicated otherwise.

A higher percentage of patients with public (32%) rather than private (13.5%) insurance had at least one intervention session delivered via telehealth, though these were not statistically significant ( $\chi^2(1, N = 62) = 3.08, p = .079$ ). Although preliminary, it does appear that telehealth may be capable to increase access to care for parents with public insurance as they were generally able to be at bedside less in the NICU making them less available for in-person services. On multiple occasions, we were also able to use the tablets to connect parents quarantined due to COVID-19 exposure with their infants virtually and to facilitate virtual, face-to-face communication with the team.

Because in-person support and educational group offerings were unable to be held due to social distancing restrictions, virtual groups were offered instead. These groups were offered virtually three times per week to allow access for parents that were not able to be physically present in the NICU during the times the meetings were offered. Additionally, tablet devices were available to loan families at bedside to allow easier access to these groups. The purpose of these groups was to encourage peer-to-peer interactions for NICU families, deliver support and education, and ultimately promote family engagement in the NICU. The support group programming was offered from March to May and was ultimately discontinued due to lack of engagement, with only one person ever attending a session. The psychoeducational group hosted by the March of Dimes to orient parents to the NICU and a parent-organization hosted support group continued to be offered.

#### 4.4.2 | Educational interventions to promote infant–parent interactions

To promote parent–infant attachment and healthy family coping, the psychology created and distributed “kits” for families of infants born less than 32 weeks (and thus with anticipated prolonged stays). These kits were distributed to the families of 50 infant–parent dyads in the NICU during 2020. Kits contained single-use items (i.e., the family was able to keep rather than borrow the items) and instructions for their use to facilitate infant–parent interactions. The items included were footprint art kits, a board book, scent cloths, and a journal for parents. To ensure the utility of the wellness kits, each kit contained instructions for completing an anonymous survey regarding the acceptability and usefulness of the materials. Feedback from families completing this survey provided strong support for the kits: 100% of respondents endorsed strong appreciation for receiving the kit and recommended continuing to deliver the kits to other families in the NICU. Furthermore, 75% agreed or strongly agreed that using the kit had made it easier to cope with being a parent of a child requiring NICU services.

## 5 | DISCUSSION

The COVID-19 pandemic has highlighted the critical importance of site-based mental health care for infants and their families (Hynan, 2020). There are multiple challenges

to optimal infant mental health and development in NICU settings that were exacerbated by the COVID-19 pandemic. Hospital policies adopted to curb the spread of the pandemic, including visitation policies, use of personal protection equipment, and social distancing posed new and significant challenges to the social development and family wellness of this already at-risk group and perpetuate disparities in care.

In the case example presented, the large majority of families during the pandemic experienced barriers to visitation, due to both logistical challenges (e.g., work and family care responsibilities) and visitation policies. Although there is strong evidence to support the concept that reduced visitation policies have been detrimental to infant–parent bonding, breastfeeding, and parental access to services to support their mental health, it is important to acknowledge that they are implemented to protect patients and staff and the general public. Venkatesh Murthy and Karthik Nagesh (2021) point out that lack of visitation restrictions also pose serious threat to infants, families, and staff due to a number of factors, including overcrowding (not allowing for social distancing), more opportunities for breaches in policies related to masks, and increased likelihood of asymptomatic individuals being present for longer periods of time and exposing infants, staff, and other visitor to the coronavirus. However, NICUs with architectural designs that allowed for more distancing between patients with individual rooms or pods required less visitation restrictions than those with open designs, which has implications for architectural design of NICUs in the future.

## 6 | IMPLICATIONS

Erdei and Liu (2020) also detail three main strategies for supporting family well-being in the light of the current pandemic and its long-term effects. This includes (a) promoting shared decision making, (b) increasing mental health support, and (c) providing mental health support to providers. These are also mimicked in the recommendations of multiple others (Cena et al., 2021; Choi et al., 2020). We break these down in greater detail as recommendations for infant mental health practices of NICU infants during the pandemic and following to mitigate its long-term effects on infant mental health. As there have always been barriers to parental visitation, NICUs may consider adopting and implementing these strategies going forward to reduce health disparities and access to care for those who cannot regularly be at bedside.

## 7 | STRATEGIES TO ENHANCE CONNECTION

Starting in March 2020 members of the National Network of NICU Psychologists (NNNP) participated in weekly calls to share and develop strategies for better supporting infants, families, staff, and one another during the pandemic. NICU psychologists typically consider the infant–parent dyad and relationship as the primary focus of their work and interventions usually seek to enhance these important relationships (Saxton et al., 2020). Thus, discussion largely focused on ways to address parental mental health, infant–parent attachment, developmental care, and staff support (Hynan, 2020). The NNNP also created publicly available handouts for parents (National Network of NICU Psychologists, 2020a) and providers (National Network of NICU Psychologists, 2020b) in NICUs to promote parent–infant engagement that described several strategies. Many of these are discussed below.

### 7.1 | Family-team connection

To improve family engagement, interventions must address both *opportunities for* and *quality of* parent-team communication. In the case example discussed in this manuscript 60%–70% of families reported at least one experienced barrier to visitation. Although they visited most days per week, they were limited in the number of hours per day they were able to be present and thus many were unable to attend team rounds in the mornings due to a myriad of reasons (visitation restrictions, work, childcare demands). Thus, provider teams must consider virtual options for engaging with families (both during the pandemic and beyond) to enhance exchange of information with families and allow for shared decision-making. Psychologists and other mental health providers in the NICU can connect families with virtual services by scheduling virtual assessment/intervention sessions and/or hosting virtual “office” hours to connect with the psychology or other mental health professionals.

### 7.2 | Infant–parent connection

The parent–provider relationship is not the only important aspect of communication, however. The infant–parent relationship is also of vital importance. Psychologists and other mental health specialists can implement strategies for parents at bedside and those away to also address opportunities for and quality of interactions. For parents who



cannot be at bedside, providing virtual opportunities to connect with their infants is recommended. In the parent survey study conducted by Muniraman et al. (2020), only 17% of respondents indicated that video/audio recordings or streaming were unhelpful. Thus, adoption of technological approaches to connecting families with infants through picture-sharing platforms and/or video streaming platforms may enhance parent feelings of connectedness to their babies. Although these are examples of one-way communication, technology that allows for bidirectional communication between parent and baby are also encouraged. In the NICU described in the case example, psychology and social work providers used tablet devices to connect families to their infants during sessions to promote bonding and bidirectional communication.

Additionally, as noted in the introduction, personal protective equipment, particularly masking, may interfere with nonverbal communication between the infant and parent, even when the parent is at bedside. Burns et al. (2020) made several recommendations for enhancing opportunities for visual social development, including using special PPE (face shields and/or clear face masks) during more developmentally intensive infant interactions, using high-resolution color photographs of caregiver faces within the infant's visual field (or possibly videos, as well), and psychoeducation about importance of face-to-face interactions, especially as parents prepare for discharge.

### 7.3 | Connection among NICU families

Although many psychosocial providers in NICUs during the COVID-19 pandemic transitioned their support groups to virtual platforms, attendance at these has been a challenge. In the NICU in the case example, although we offered a series of virtual groups as a psychology team and in collaboration with the March of Dimes representative, the groups were seldom attended and were ultimately reduced in frequency and variety. Conversations during the NNNP calls revealed similar challenges to connecting families to one another through virtual support groups, as low attendance seemed to be ubiquitous. Future directions in this area may include development and implementation of asynchronous ways for parents to connect with one another rather than through virtual support groups.

## 8 | STRATEGIES TO ADDRESS PARENT MENTAL HEALTH IN THE NICU

Families of NICU infants were at an already increased risk for postpartum anxiety, depression, and posttrau-

matic stress and this has increased during the COVID-19 pandemic—one small study of 41 parents in a NICU indicated that 85% had positive depression screening scores and nearly 10% indicated suicidal ideation (Ashini et al., 2021). The association among parent mental health and infant development and care is well established and has been shown to affect parent–infant interactions, parental readiness to care for infants after NICU discharge, and mental health of the infant in early childhood and beyond. In light of the ongoing challenges to parent mental health among families of infants in the NICU, it is more important than ever for NICUs to consider psychosocial support an essential service and increase its presence in the NICU setting (Hynan, 2020). Erdei et al. (2021) delineate the following guidelines for systems needed to improve monitoring of parental mental health screening and mental health care access in NICUs: (a) implementing the guidelines for psychosocial care proposed by the National Perinatal Association (Hynan et al., 2015); and (b) developing and implementing programming specific to each unit that allows for transdisciplinary care, including psychologists and psychiatrists with expertise in infant and parent mental health and provided in a stepped-care approach to mental health service provision.

Choi et al. (2020) further elaborated on recommendations for mental health care in NICU, particularly during the COVID-19 pandemic with additional suggestions for specific activities, including (a) monitoring for postpartum depression, anxiety, and traumatic stress symptoms following and infant's birth, using virtual means, if necessary; (b) connecting parents with resources in the community that provide virtual and/or socially-distanced supportive and mental health services (if not available on site in the NICU); (c) creating collaborative networks with community-based organizations to facilitate care; and (d) advocating for mental health services for staff in NICUs as well.

In the case example, we found that despite many COVID-19 related challenges, families were able to access the individualized infant mental health services offered by the psychology team. For NICUs that do not have onsite mental health care from qualified providers, there is still a strong need for monitoring for parent mental health symptoms and facilitating referrals to specialists who work with NICU families and can understand the unique challenges and risks to mental health in the family systems.

## 9 | CONCLUSION

The COVID-19 pandemic significantly impacted the physical and social environment of preterm and medically complicated infants in Neonatal Intensive Care Units. While

parents in this case study rarely named the pandemic as a primary concern during their infants' admission, the stressors that families described were frequently exacerbated by COVID-19, such as childcare limitations, visitation restrictions, and challenges with parent–infant bonding due to the need for personal protective equipment. Onsite mental health services that focus on infant mental health are essential for supporting the attachment of the parent–infant dyad, addressing parental anxiety, depression, trauma and other psychological concerns, and enhancing parental engagement.

The COVID-19 pandemic provided an opportunity for increased collaboration amongst psychologists in NICU settings to address disparities exacerbated by the pandemic, as well as an impetus for creatively redesigning intervention services. Telehealth was a successful adaptation that allowed for more families to engage with their infant despite increased barriers and will have significant impacts on infant development throughout and after the pandemic.

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## CONFLICT OF INTEREST

The authors have no conflicts of interest to disclose.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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