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In-person versus virtual neonatal intensive care unit visitation: A family perspective

Kadi Abdulrahman Alhumaidi*, Salman Ghanem Alghanim, Abdulrahman Obaid Alharbi

ABSTRACT

Background: Parents whose infants are admitted to the neonatal intensive care unit (NICU) express feeling stressed and anxious. The purpose of this study was to assess parents' satisfaction with virtual versus in-person NICU visits, as well as their preferences, perceived barriers, visitation costs, and breastfeeding support and practices. *Methods*: A cross-sectional study was carried out among the parents of infants who were admitted to the NICU at Maternity and Children Hospital in Buraydah from August 2025 to July 2026. The parents who visited the hospital in person completed a structured questionnaire, whereas those who attended virtually were interviewed either in a virtual clinic or by telephone. *Results*: About 71.7% of the participants attended the visits in person, while 9.4% attended them virtually and 18.9% attended both in person and virtually. When it came to discussing the baby's condition, 83.0% of the participants preferred face-to-face communication. There was no significant difference in satisfaction according to the mode of attendance (ANOVA, p = 0.168), even though those who attended virtually gave slightly higher satisfaction scores. The main reason for attending regularly was to follow the infant's health and to stay updated (75.3%), followed by breastfeeding or giving breast milk (24.7%). The major obstacles were work commitments (46.5%), childcare (31.3%), and distance from the hospital (27.3%). The most common difficulties that mothers experienced with breastfeeding were an insufficient milk supply (48%) and the baby's medical condition (22%). *Conclusion*: Our study demonstrates a strong preference for parents to be physically present at the bedside, but also the value of virtual access when in-person visits are challenging.

Keywords: Neonatal intensive care unit (NICU), parental satisfaction, virtual visitation, telemedicine

1. INTRODUCTION

Admission of a newborn to the Neonatal Intensive Care Unit (NICU) can have emotional effects on parents (Hames et al., 2021). Visiting their infant at the bedside in the NICU is more than just a visit. It allows parents to stay connected and informed about their baby's condition. They are also able to communicate with their baby's healthcare providers and be involved in their plan of care. Newborns who are critically ill often require extended hospitalization (Rosenthal et al., 2021). As a

result, parents of critically ill newborns are not always able to be at their side. In addition to the physical distance from the hospital, many caregivers have financial constraints that limit their ability to be present at their infant's bedside in the NICU (Ray et al., 2012; Safran, 2003).

In addition to the earlier mentioned worries and stress feelings of parents whose infant is admitted to the NICU, there are also a lot of psychological disorders such as anxiety, depression, and post-traumatic stress disorder (Greene et al., 2015a; Alkozei et al., 2014). Restricting parents' access to their infant increases the risk of parental depression (Greene et al., 2015b).

Parents were restricted from visiting their newborns in the NICU during the SARS-CoV-2 (COVID-19) pandemic. Families were therefore unable to see their newborns, hold them, speak with health care staff, and participate in planning and learning about their baby's plan of care. Parents' mental health and well-being were affected by the restrictions placed on their entry into care, education, and transition back home (Campbell-Yeo et al., 2021).

However, NICU parental presence policies can vary widely between hospitals. Many hospitals permit both parents to be present with their baby at the bedside. In contrast, some hospitals allow only one parent, most often the mother, to be present with her baby in the NICU as part of infection prevention and control policies. In this context, virtual access may help parents stay involved in their infant's care while reducing anxiety and the number of days parents need to spend away from home and healthcare costs (Mosquera et al., 2021).

Virtual care is not new, but has evolved substantially and is used in a variety of ways across various healthcare settings (Smith et al., 2020). It is unknown whether virtual access will meet the needs of parents and provide the same level of satisfaction, emotional support, and breastfeeding education, particularly for aspects of care that require physical presence and direct interaction. Kangaroo mother care (KMC), bedside breastfeeding education, and support by a lactation consultant have been shown to improve breastfeeding outcomes for preterm and low birth weight infants (Boundy et al., 2022). Accordingly, breastfeeding is addressed as one component of this study, with a focus on feeding practices, perceived support, and challenges reported by mothers during the NICU stay.

Our study also aims to address gaps in the literature by evaluating parental experiences, satisfaction, preferences, access barriers, and breastfeeding support related to virtual and in-person NICU visits, with an additional exploration of attendance-related costs and preferences across different parental subgroups, including those with a history of infertility.

2. MATERIALS & METHODS

The observational cross-sectional study was carried out at the Neonatal Intensive Care Unit (NICU) of Maternity and Children Hospital in Buraydah, in the Qassim Region, from August 2025 to July 2026, and it covered the parents of all neonates who were admitted to the NICU during that period.

The sampling technique was non-probability sampling, with inclusion criteria being parents of neonates <3 months of age who had attended the NICU either in person or virtually, while exclusion criteria were parents of neonates aged ≥3 months, parents whose infants were not admitted to the NICU during the study period, parents who had not attended the NICU either in person or virtually, or parents who declined participation. For multiple births, only the parents of the first-born neonate were included, and for readmissions, only the first NICU admission was considered.

A structured, self-administered questionnaire was developed by the study authors for data collection and was completed by parents attending the NICU in person, whereas parents who participated virtually were interviewed by telephone or through the virtual clinic. The questionnaire consists of five sections; the first section collected participants' sociodemographic characteristics, including age, relationship to the infant, educational level, nationality, employment status, monthly family income, place of residence, distance from the hospital, and infertility history. The second section assessed NICU attendance patterns and accessibility, including the type of visit attended (in-person, virtual, or both), approximate cost of attending one NICU visit, the preferred method of visiting, the frequency of attendance, and the reasons for frequent attendance. In the third section, parents' experiences and level of satisfaction were assessed through a series of questions on a five-point Likert scale going from 'strongly disagree' to 'strongly agree'. The questions covered such areas as communication with the healthcare team, understanding of the infant's condition, participation in making decisions, and receiving emotional support. The fourth section looked at the obstacles preventing parents from attending the NICU, such as problems with transportation, work obligations, childcare duties, financial difficulties, the distance from the hospital, and other factors that limited parent attendance. The last section assessed breastfeeding practices, including the infant's current feeding method, breastfeeding support from NICU staff, and breastfeeding challenges during the NICU stay.

A pilot study was conducted on 15% of the participants as a pre-test of our research instrument to identify any issues and barriers in participant recruitment. The results from the pilot study were not incorporated into the main study. The statistical analysis was carried out with IBM SPSS Statistics, version 27.0 (IBM Corp., Armonk, NY, USA). For categorical variables, frequencies and percentages were given, and for continuous variables, the means and standard deviations were provided. To examine the association between categorical variables, the chi-square (χ^2) test was used, and one-way ANOVA was carried out to compare the quantitative variables among more than two groups. A P value less than 0.05 was regarded as statistically significant.

The study received approval from the Regional Ethical Committee of Qassim Region, Kingdom of Saudi Arabia (H-04-Q001). All parents involved were given a brief verbal explanation of the study aims. The participants provided their informed consent either in person or by telephone before the questionnaire was administered. Parents were additionally informed they could withdraw from the study at any time without affecting the care provided to their infant.

3. RESULTS

The study included 106 parents. Participants were 50.9% mothers and 49.1% fathers. The age distribution showed that the 30 to 39-year age group had the highest prevalence (48.1%). Most of the participants held a bachelor's degree (59.4%) and were from Saudi Arabia (86.8%). About two-thirds (63.2%) resided within 30 km of the hospital, and 47.2% said their monthly family income was more than 10,000 SAR. Eighty-point-two per cent of the participants had no previous history of infertility (Table 1).

Table 1. Sociodemographic and Other Parameters of Parents

Variable	Category	Frequency (n=106)	Percent
Relationship to infant	Mother	54	50.9
	Father	52	49.1
Age	<20 years	1	0.9
	20–29 years	17	16.0
	30–39 years	51	48.1
	40–49 years	33	31.1
	50–59 years	4	3.8
Education	Less than secondary school	5	4.7
	Secondary	29	27.4
	Bachelor's	63	59.4
	Higher education	9	8.5
Nationality	Non-Saudi	14	13.2
	Saudi	92	86.8
Residence	<30 km	67	63.2
	30–100 km	29	27.4
	>100 km	10	9.4
Family income (monthly)	<5,000 SAR	19	17.9
	5,000–10,000 SAR	37	34.9
	>10,000 SAR	50	47.2
History of infertility	No	85	80.2
	Natural conception after a history of infertility	14	13.2
	Conception after fertility treatment (IVF/other)	7	6.6

Most participants had in-person visits (71.7%), while 9.4% had virtual visits and 18.9% had both in-person and virtual visits. Most parents (83.0%) preferred to discuss their infant's condition face-to-face. As for the frequency of attendance, (45.3%) of the participants attended daily, (44.3%) attended a few times per week, (3.8%) attended rarely, and (6.6%) attended mostly via virtual clinic/telephone.

In terms of attendance costs, (46.2%) of participants reported spending less than 50 SAR per NICU visit, while only (6.6%) reported spending more than 200 SAR (Table 2).

Table 2. Attendance, Parental Preferences, and Attendance Cost

Variable	Category	Frequency(n=106)	Percent
Type of NICU attendance	In-person	76	71.7
	Virtual	10	9.4
	Both	20	18.9
Preferred method for discussing infant's condition	In-person	88	83.0
	Virtual	18	17.0
Frequency of attendance	Daily	48	45.3
	Few times per week	47	44.3
	Rarely	4	3.8
	Mostly via virtual clinic/telephone	7	6.6
Approximate cost per NICU visit (SAR)	<50	49	46.2
	50–100	42	39.6
	100–200	8	7.5
	>200	7	6.6

Parents attending NICU virtually had a mean overall satisfaction score of 3.60 ± 1.20, compared with 2.81 ± 1.60 among those using both virtual and in-person visits and 2.64 ± 1.52 among those attending in person only. Overall parental satisfaction did not differ significantly among the three groups (one-way ANOVA, p = 0.168) (Table 3).

Table 3. Overall Parental Satisfaction According to the Type of NICU Visit

Type of NICU visit	N	Mean ± SD	P value
In-person	76	2.64 ± 1.52	0.168
Virtual	10	3.60 ± 1.20	
Both	20	2.81 ± 1.60	

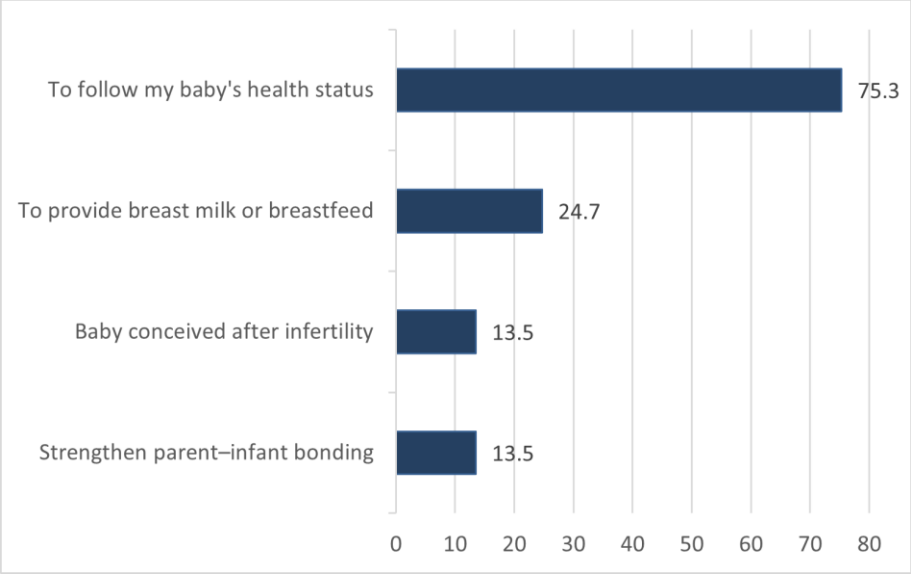


Figure 1. Reasons for Frequent NICU Visits Among Parents Who Attended Frequently (N =89). (Multiple responses were allowed).

Among the 89 parents who reported frequent NICU attendance, the most common reason given was to follow their baby's health and stay updated (75.3%). This was followed by providing breast milk or breastfeeding (24.7%). Additionally, 13.5% of parents reported attending frequently because their baby was born after infertility, and an equal proportion reported attending to strengthen bonding and connection with their baby (Figure 1).

Figure 2 shows the barriers to NICU visits among parents who reported at least one barrier (N = 99). The most reported barrier was work schedule (46.5%), followed by caring for other children (31.3%) and living far from the hospital (27.3%). Financial issues (13.1%) and transportation difficulties (12.1%) were less commonly reported. Other barriers, such as tiredness, hospitalization, and personal circumstances, were reported by a small proportion of participants (3.0%) (Figure 2).

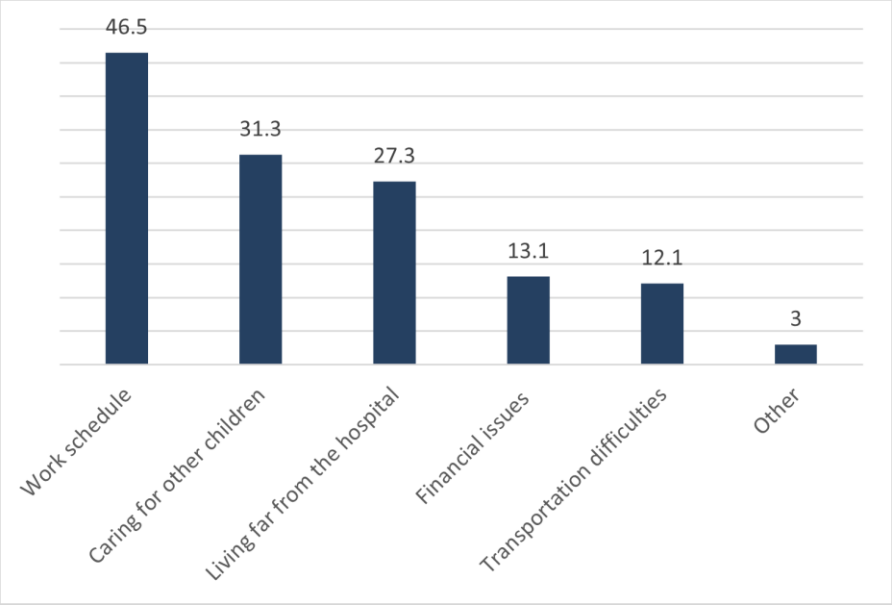


Figure 2. Barriers to NICU Attendance Among Participants Who Reported At least One Barrier (N = 99). (Multiple responses were allowed).

Figure 3 shows parents' preferred method for discussing their infant's condition. Most participants preferred in-person (bedside) discussions (83.0%), whereas 17.0% preferred virtual (phone) discussions (Figure 3).

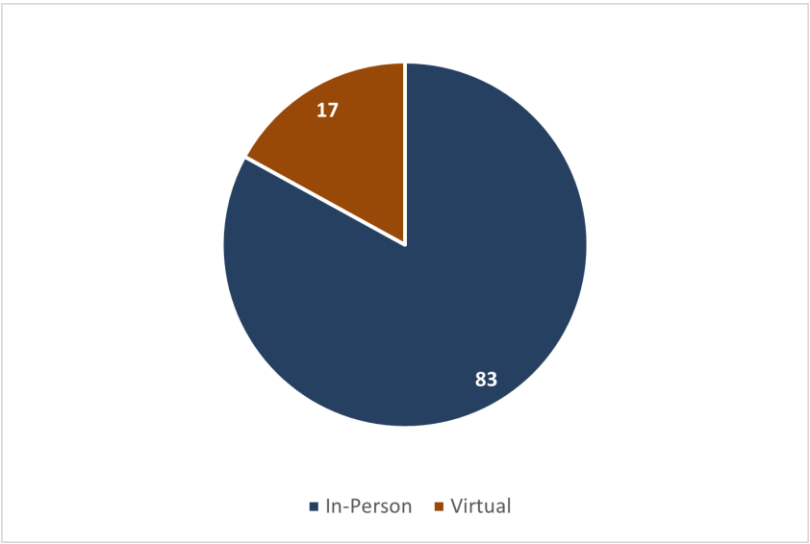


Figure 3. Parents' Preferred Visit Method for Discussing Their Baby's Condition.

Figure 4 presents the reported barriers to breastfeeding during the NICU stay. The most frequently reported barrier was low breast milk supply (48%), followed by the baby's medical condition (22%). Less frequently reported barriers were lack of health education (9%) and lack of emotional support/psychological factors (5%) (Figure 4).

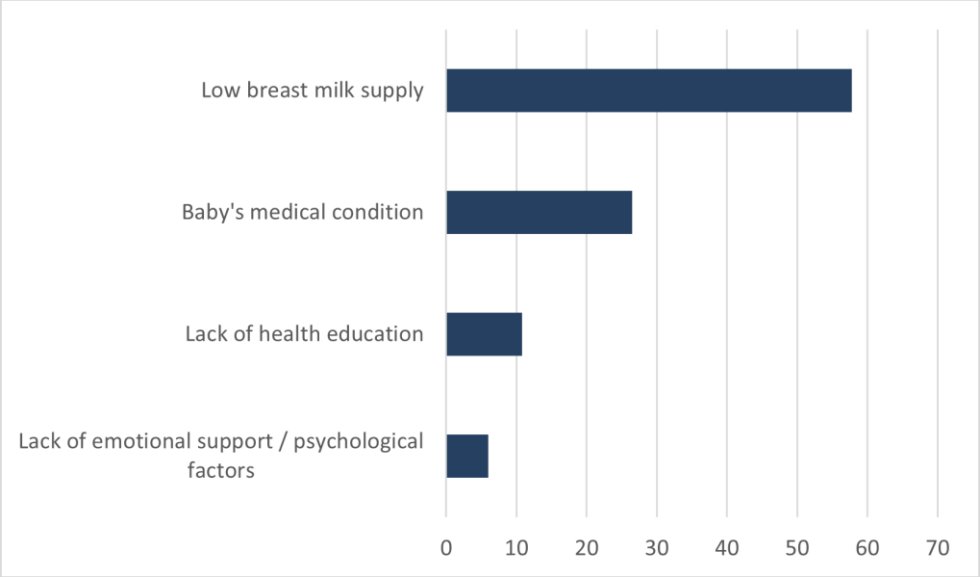


Figure 4. Challenges to Breastfeeding During NICU Stay Among Participants Reporting At least One Barrier (N = 83). (Multiple responses are allowed).

4. DISCUSSION

In our study, we found differences in parents' attendance, satisfaction, and barriers to attending the NICU. Four in five parents said they would prefer to go in person and have face-to-face communication. Technology may help parents remain connected and reassured, but virtual access may not be the same as being at the bedside (Kubicka et al., 2021; Mause et al., 2025). Web camera virtual visits have been associated with less parental anxiety and increased parental connection with their newborn (Legge et al., 2023; Kilcullen et al., 2022).

The virtual-only group reported the highest median satisfaction score, followed by parents who participated in both virtual and in-person sessions and those who attended only in-person visits. However, there were no statistically significant differences in overall parental satisfaction between the groups of parents. The small number of parents in the virtual-only group may have affected the study's power to detect true differences. Thus, results for this group should be viewed with some caution.

The most commonly reported reasons for NICU attendance were to follow the baby's health status and provide breast milk or direct breastfeeding. A smaller but notable proportion of parents reported bonding and connection, or conception following infertility, as reasons for frequent attendance. This is consistent with evidence showing that parental presence, holding, and skin-to-skin contact are key to establishing and reinforcing the parent–infant bond at a time when the normal bonding process is disrupted by separation and the technological environment of the NICU (Soni and Tscherning, 2021).

Previous studies have shown that parents who have suffered from infertility or who have undergone assisted reproductive treatment display greater emotional involvement and a higher degree of parental commitment (Schmid and Ehlert, 2025). For this reason, they take a more active role in caring for their newborn and make more trips to the NICU.

Work schedules, taking care of children, and the distance from the hospital were the top barriers to NICU attendance in our study. Parents who live far from the hospital where their baby is being treated often find it harder to visit regularly. This distance becomes a challenge when trying to be present in the NICU (Bourque et al., 2023).

A small number of parents said they spent more than 200 SAR per visit. This shows that some families faced higher costs than others when visiting their infant. In addition, 13.1% of parents said they could not afford the visit costs, which stopped them from going to the NICU. These findings match a study conducted across a U.S. State, which found that the extra costs of NICU visits can go over $6,500 during a typical 14-day hospital stay. The biggest part of these costs came from wages (Gourevitch et al., 2025). Even if each

visit in our study did not seem expensive, the costs can add up quickly. This is especially true when parents need to visit the NICU and when the hospital is far from their home.

Once mothers of infants in the NICU decide to initiate lactation for their newborns, specialized lactation care is needed to address the associated lactation challenges. The most common reported challenges to breastfeeding among our participants were low breast milk supply and the infant's medical condition, followed by limited health education and inadequate emotional or psychological support. The breastfeeding challenges identified in our study are consistent with those reported in previous NICU literature. Breast pumps are frequently used by mothers because of prolonged separation from their infants and the clinical conditions of the infants that may complicate the establishment and maintenance of milk production (Parker et al., 2021). Maternal stress associated with preterm birth or neonatal illness, along with extended separation from the infant, may also contribute to challenges in successful milk expression and breastfeeding during the NICU admission (Rossman et al., 2018; Gianni et al., 2018).

Our study has limitations that warrant acknowledgment. The cross-sectional research design may limit the ability to establish causality or capture changes over time. Furthermore, because we included only one NICU center in a specific geographic region in Saudi Arabia, our findings may not generalize to families in other regions. A small number of parents used only virtual visits, making it difficult to determine differences in satisfaction between the different groups of parents. Additional studies with more NICUs and more parents would help us to understand better how parents are involved, what gets in the way of visiting the NICU, and how virtual visits can help families.

5. CONCLUSION

Parents of infants admitted to the NICU preferred in-person attendance and face-to-face communication. Overall satisfaction did not vary by attendance method. The most common reason for frequent attendance was to follow the infant's health and provide breast milk or direct breastfeeding. The main barriers to attendance in the NICU were work schedule, childcare responsibilities, distance from the hospital, and financial issues. At the same time, low milk supply and the infant's medical condition were the most common breastfeeding challenges. The results indicate that flexible visitation policies may increase parental access, breastfeeding support, communication, and financial strain. If these barriers are overcome and good communication is achieved, parental involvement and the overall experience during their infant's NICU stay can be positively impacted.

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Authors' Contributions

Kadi Abdulrahman Alhumaidi: Contributed to the study design, collected the data, performed the statistical analysis, interpreted the results, and drafted the manuscript.

Salman Ghanem Alghanim: Contributed to data collection, literature review, data interpretation, and manuscript revision.

Abdulrhman Obaid Alharbi: Conceived and supervised the study, contributed to the study design, interpreted the findings, and critically revised the manuscript.

Informed consent

Written & Oral informed consent was obtained from participant's parent.

Ethical approval

Not applicable. This article does not contain any studies with human participants or animals performed by any of the authors.

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Conflict of interest

The authors declare that they have no conflicts of interest, competing financial interest or personal relationship that could have influenced the work reported in this paper.

Data and materials availability

All data associated with this study will be available based on the reasonable request to the corresponding author.

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