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"A word that describes it well is 'lonely'" – Experiencing preterm birth during the first COVID-19 lockdown in Germany: A qualitative study

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ABSTRACT

Background: During the first pandemic lockdown restrictive regulations were implemented in hospitals. Parents of preterm babies were particularly affected due to a long hospital stay. The aim of this study is to investigate how pandemic regulations during the first lockdown impacted the birth and perinatal experiences of parents of preterm babies.
Methods: For this qualitative study, we interviewed ten parents who had a preterm baby (28 to 32 gestational weeks) during the first lockdown in Germany. The interviews were analysed using reflexive thematic analysis.
Results: Five themes were identified 1) "Loneliness of pregnant mothers at risk at the maternity ward", highlights the lack of physical and emotional support, intensified by a tense atmosphere at the hospitals 2) "Losing out on meaningful moments" describes the feeling of being cheated of a 'real' birth experience and missing out on the 'normal life at home' with a newborn 3) "Fear as a constant companion" refers to the fear of a COVID-19 infection during the hospital stay and ambivalent feelings upon arriving home 4) "Medical care of preterm infants during the pandemic" emphasizes the gaps in medical care of preterm infants but also underscores what went well despite pandemic restrictions and 5) "Mothers taking action to change hospital regulations" portrays their agency.
Conclusion: It is crucial to include scientific, pediatric expertise in future pandemic response planning to rapidly visualize and prevent negative consequences of mitigations measures, such as those described in this study. Protecting elements of family-centered and integrated care should be a priority.

1. Introduction

During the first lockdown, restrictive regulations regarding hospital stays and visitations were implemented in Germany [1]. Since expectant mothers and preterm babies stay in the hospital for several weeks, parents and their babies were among those most affected by these restrictions [2]. At that time, there was still no COVID-19 vaccination available and testing capacities were limited [3,4]. The implementation of regulations during the first lockdown varied not only between different German federal states but also among hospitals within the same state and region and even across different wards within the same hospital [5]. For families experiencing birth in Germany, varying hospital policies made it difficult for fathers to be present during birth and to visit the mother and child after birth [5,6]. Visits from friends or relatives at the hospitals were prohibited [7]. At some perinatal wards the "kangaroo-care-time" (skin-to-skin contact) was reduced [7].

It is known that the peri-and postnatal phases are crucial periods that play a pivotal role in bonding between parents and their newborn and for early childhood development [8,9]. The father's participation during birth is associated with a stronger bond to the newborn [10]. Studies reported higher stress and insecurity of parents in the first weeks after birth during the COVID-19 pandemic [11]. Qualitative studies showed

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that parents often felt isolated and left alone with their questions and worries [12,13]. A survey conducted in the UK and the USA revealed that the strict COVID-19 policies impacted negatively on bonding time, the ability to participate in care and on breastfeeding [14]. Moreover, a brief report about parents of newborns in a neonatal intensive care unit (NICU) in Italy during COVID-19 showed that they suffered from being separated from their baby but also from the partner [15]. A study with parents of NICU babies in Turkey, who were allowed to see their babies at birth and then only once a week virtually during the pandemic, underscored that the parents experienced severe adverse psychological consequences including anxiety, stress and loneliness [16]. Similarly, a Norwegian study highlighted that parents of NICU babies struggled to become a family when the father was not allowed to visit; fathers had difficulties to learn how to care for their infant and stated that this might have led to a delayed attachment [17].

This study is of international interest because it examines the long-term effects of COVID-19 mitigation measures, which were particularly restrictive for children (including newborns and preterms) in Germany. During and immediately after the first waves of the pandemic, health policies and measures focused on infection, mortality, hospitalization and recovery statistics. However, to gain a more comprehensive understanding of the secondary effects of the pandemic, it is important to see the person and their stories behind these numbers. Parents with preterm babies are of special interest because they experienced restrictions at the hospital for an extended period, and the effects of pandemic regulations might have been particularly pronounced in this group.

The aim of this study is to gain a deeper understanding of how parents of preterm babies during the first lockdown in Germany experienced the birth and the perinatal period (including the time of the mother at the gynaecological ward, parent-infant attachment, breastfeeding and arriving at home after the hospital stay) and how their experiences were affected by the pandemic restrictions.

2. Methods

2.1. Sampling

Participants of this qualitative study were recruited through purposeful sampling, based on the cohort of the PRIMAL (Priming Immunity At the beginning of Life) study, a study examining the effects of probiotic interventions on the microbiome of preterm babies. Details of the PRIMAL-cohort have been described previously [18,19].

Parents were eligible if their preterm baby had a gestational age of 28 to 32 weeks, and was born at a German hospital during the first COVID-19-lockdown (from March 22nd to May 6th of 2020); being able to express themselves in German was also an inclusion criterion. We contacted nine families from the PRIMAL-trial who had previously agreed to be reached for further research, via telephone or email. All nine families agreed to participate with either the mother, the father or both.

2.2. Ethical considerations

The study received approval from the Ethics Committee of the University of Cologne (23-1239). Written voluntary informed consent was given by all participants prior to the interview.

2.3. Data collection

Nine interviews with ten participants (in one interview both parents participated), lasting between 42 and 80 min, were conducted between July and October 2023. The interviews were conducted by the second - (SD, $n = 7$) and the first author (SBG, $n = 2$).

Data saturation was not determined in advance of the study [20]. As this study sample is highly specific, 10 interviews were considered as suitable to reach information power during data collection [21]. For this explorative study, a semi-structured interview guide was developed based on iterative discussion within the study team (see Supplementary file A). The interview guide consisted of questions regarding parents' experience of a preterm birth, bonding, the extended hospital stay and the time at home during COVID-19 restrictions. Questions were tested in advance in a pilot interview. The interviews were conducted via video conference or by telephone and audio recordings were made. The recordings were pseudonymised and transcribed by a professional transcription-bureau. Participants received no incentive for participating.

2.4. Data analysis

Data from the interviews were analysed using reflexive thematic analysis, a method developed by Braun and Clarke [22–25]. The analysis was guided by the six steps proposed by Braun and Clarke [26]. Familiarity with the data was achieved by conducting interviews, listening to the audio recordings and reading the transcripts several times. Throughout this phase, field notes were taken to capture initial thoughts and ideas across the dataset and those were summarized in a thematic mind-map. The transcripts were then coded by the first author identifying semantic as well as latent codes. After coding all interviews, a second thematic mind-map, including all codes, was constructed and the codes were refined at this stage. Based on the second mind-map, subthemes and overarching themes were created by identifying common patterns across the codes. Potential themes were reviewed for quality and limitations and some were removed to arrive at the final five themes. The overarching themes were critically discussed between the authors and the wording and definitions were refined. Multiple data extracts were allocated to each theme and exemplary quotes were selected to illustrate the themes. German quotes were translated into English using Artificial intelligence (Chat GPT, version 3.5). Translated quotes were reviewed and edited by the authors for accuracy. Data organizing and coding were facilitated by using MAXQDA (version 22.7) software. We adhered to the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines [27].

2.5. Reflexivity and positionality

The first author is a pediatric resident, in her early thirties, who was working at a NICU during the first lockdown and is mother of one child herself. The second author is a psychologist at a NICU, which may have helped to establish contact with the parents online as she is experienced in assisting them with their feelings and worries. None of the interviewed parents had a preterm infant hospitalized in the hospitals where the first and second author were working. Our background and experience enabled us to build rapport quickly and to listen to participants' stories with empathy and curiosity. As all interviews were conducted online and with parents in different parts of Germany, positionality in terms of being medical personnel did not seem an issue.

3. Results

Socio-demographic information of the participants is presented in Table 1. Maternal age ranged from 18 to 39 years and paternal age from 18 to 48 years. All parents were born in Germany. Three mothers delivered vaginally and six via Caesarean section (C-Section).

The overarching themes and subthemes identified in our analysis are presented in Table 2.

3.1. Loneliness of pregnant mothers at risk at the maternity ward

This theme illustrates the feeling of abandonment of mothers at risk for preterm birth (e.g. with a preterm premature rupture of membrane or pre-eclampsia) during their stay at the maternity ward, which could be several weeks. The theme is characterized by the physical isolation

Table 1
Participants' socio-demographics.

Pseudonym	Age	Ethnicity	Singleton or twin pregnancy	Type of delivery	Gestational age	Time at neo, weeks	Siblings	Education
Lisa	38	WE[a]	Singleton	Emergency-C-Section	29 + 4	11	Yes	University
Peter	48	WE[a]	Singleton	Emergency-C-Section	29 + 4	11	Yes	University
Emma	37	WE[a]	Twins	C-Section	32 + 5	5	Yes	University
Jasmin	34	WE[a]	Twins	C-Section	31 + 2	4	No	Vocational Training[b]
Paula	18	WE[a]	Singleton	Emergency-C-Section	30 + 4	8	No	Vocational Training[b]
Maria	31	WE[a]	Singleton	Spontaneous	32 + 0	3	No	University
Anna	39	WE[a]	Singleton	Spontaneous	32 + 2	4	Yes	Vocational Training[b]
Sarah	31	WE[a]	Twins	C-Section	32 + 4	5 & 11	Yes	University
Nicole	32	WE[a]	Singleton	Spontaneous	31 + 4	6	No	University
Lukas	37	WE[a]	Twins	Emergency-C-section	32 + 5	5 & 10	Yes	University

[a] WE: Western-European.
[b] Vocational training in Germany refers to a practical training and education for a specific profession, which can be pursued with a certificate of higher or lower secondary education.

Table 2
Themes and subthemes derived from thematic analysis.

Themes	Subthemes
Loneliness of pregnant mothers at risk at the maternity ward	1. Physical isolation due to visitation restrictions 2. Missing emotional support for difficult decisions 3. Tense atmosphere at the hospital
Losing out on meaningful moments	1. Feeling cheated of a 'real' birth experience 2. Missing out on the 'normal life at home' with a newborn
Fear as a constant companion	1. Fear of a COVID-19 infection during the hospital stay 2. Ambivalent feelings when arriving home
Medical care of preterm infants during the pandemic	1. Gaps in medical care of preterm infants during the pandemic 2. What went well despite pandemic restrictions
Mothers taking action to change hospital regulations	

due to visitation restrictions, missing emotional support for difficult decisions and a tense atmosphere at the hospitals.

3.1.1. Physical isolation due to visitation restrictions

A prominent issue was the absence of the partner and the family in an extreme medical situation. Participants described this as very difficult and emotionally draining.

> "[…] *and then I was admitted. One day later, the first lockdown actually happened, and it went like this: My husband was just there* […] *to check on me because it was all a shock for us, and he was then… well, not to exaggerate, he was thrown out. A nurse came and said, 'Everyone must leave now, and under current circumstances, you probably won't be able to see your wives again for a while,' and of course, that was pretty tough timing-wise because the night before, you're being informed about a possible premature C-section ten weeks early, and you're told, 'You'll stay here until birth,' and then the next day, it's 'Now you're staying alone here'* […]."
>
> (Interview 8 Nicole)

The intensity of the feeling to have no one familiar by one's side, became evident during the interview with Emma, who began to cry while talking about the time in the maternity ward:

> "[…] *it was also really awful that my parents weren't allowed to come, because everyone was, of course, suffering and worrying along with us, and I was also feeling very, very bad at the time because the preeclampsia kept progressing. And, yes, my mom always said, 'I would love to. Can't I just come and wave to you?' (sounds very emotional), and then I always said/(crying, unable to speak for a few seconds). But in the end, we always talked on the phone, and it was okay. And there it goes, I actually thought (laughs) I was over it.*"
>
> (Interview 2 Emma)

In two cases, women explained that the loneliness was the reason they chose to discharge themselves early (Interview 1 Lisa) or against medical advice. In Paula's case, the loneliness became unbearable, leading her to leave against medical advice, even though she was still at risk for preterm delivery because of a high probability of developing preeclampsia "[…] *and mine was apparently extremely high. Nevertheless, I discharged myself because I felt so/I was so lonely and everything was somehow too much* […]" (Interview 4 Paula).

The aspect of feeling alone and isolated was also present during birth. Combined with the feeling of not being in control of the situation, helplessness and the dependence on the mercy of others, it led to traumatic birth experiences.

> "*Actually, a word that describes it well is 'lonely' (laughs lightly), and coupled with that, I think situations arose that also led to a rather unpleasant course of childbirth. So, in principle, one felt to have no control indeed, and that was not a nice experience. Personally, I didn't have any birth complications medically speaking, but psychologically, yes, a lot.*"
>
> (Interview 8 Nicole)

The lack of physical contact with the partner such as the inability to "[…] *hug each other* […]" (Interview 1 Lisa) in an extreme situation was sorely missed. A woman described it as "[…] *I had to stay alone in this room and really needed someone to just hold me in between* […]" (Interview 5 Maria).

In addition, the restriction of not being allowed to leave the hospital room at all, intensified the feeling of abandonment for many women. There were also feelings of guilt towards older children who were suddenly left without the mother (Peter Interview 1).

3.1.2. Missing emotional support for difficult decisions

Participants not only had to cope with physical isolation, but also missed emotional support when having to make difficult decisions in an extreme medical condition (experiencing contractions) and had to carry the burden of the decision alone.

> "[…] *if I choose the safer route with the Caesarean, I mean, you know, it's all very planned and not hectic and the contractions stop* […] *but then I also ensure that my child definitely comes today. And if I try spontaneously, also with the risk of a brain haemorrhage and all that could happen, then it could also be that he stays longer* […]. *And that was probably, from a psychological perspective, the reason why I couldn't make a decision in the end, because I just couldn't/because it was a bit like choosing between the plague and cholera, so how am I supposed to decide? And, exactly, being alone with this situation, that was extreme for*

me and during the contractions I/I was really very overwhelmed by the situation and also by being alone […].”

(Interview 8 Nicole)

The need to have trusted people around, especially when there is an unexpected situation during birth, was emphasized by a woman, who compared a birth after the pandemic to the one during the pandemic*:* “[…] *it wasn't all easy, but my husband was allowed to come, my children could come, my mum was there and that helped, and that's something where I say, yes, in a difficult situation or in life in general, you simply need people around you who support and help you, and that was just given.*” (Interview 2 Emma).

3.1.3. Tense atmosphere at the hospital

In addition, many women described a tense atmosphere at the hospital, exacerbated by stressed hospital staff and the feelings that the staff had no time due to shortages and that they were overwhelmed by the pandemic situation*:* “[…] *and you also noticed the clinic staff were quite tense somehow, so everyone was somehow afraid and didn't really know what was happening, and it was just 'No, no, no'* […]” (Interview 4 Paula).

3.2. Losing out on meaningful moments

Female participants described the feeling of having missed something. This feeling was described especially in two situations: the birth and the time at home with a newborn.

3.2.1. Feeling cheated of a 'real' birth experience

Some women expressed not being able to experience a 'real' birth as they were unable to see or hold their newborns after birth. This condition was partly due to the prematurity of the newborns but worsened by restrictive COVID-19 measures: “[…] *most parents have a picture of themselves with their newborn in their arms. I don't have that. There are so many things I haven't experienced* (*sounds emotional*).” (Interview 3 Jasmin).

In addition, extensive hygiene precautions during labour affected the birth experience “[…] *I had to wear the mask the entire time during labour. That was definitely odd.* […] *And sometimes, when the mask slipped down, they would say,* “*Oh, hm, mask up, mask up.*” *So, they were all a bit nervous about it, even the nurses and everyone.*” (Interview 6 Anna).

The feeling of being cheated of a 'real' birth experience was also marked by the concern of not having the partner present at birth. In five of nine interviews the father either missed the birth or was not allowed to be present due to COVID-19 restrictions. One father explained that he had to wait in the parking lot during the C-section of his preterm twins and described how he missed out on this special moment in their family life:

> “*Yes, so I actually wasn't able to directly experience it, and that was due to COVID-19. At that time, I wasn't allowed to enter the delivery room. Both children were delivered by caesarean section in the 32nd week plus* […] *I wasn't allowed to be there. I wasn't even allowed to go into the hospital; that was also forbidden to me. So, I was basically standing in the parking lot in front, and it was only after I called the ward again at some point and was told that they were there that I was allowed to go in and up, and I saw the children for the first time when they were already in these incubators* […].”
>
> (Interview 9 Lukas)

In many hospitals the father could be present at the birth for the “expulsion stage” but timing was very difficult. In some cases, the birth happened unplanned and suddenly (e.g. emergency-C-section), leaving no time to inform the father or having him arrive in time.

> “*So, he left, and during the time he was on his way home, things progressed rapidly, and they said, 'No, we have to do it now,' and he was contacted again. By the time he arrived, it was already done* (*laughs*). *The children were already born. If it weren't for the COVID-19 pandemic, he would have been able to stay.*”
>
> (Interview 3 Jasmin)

The regret of not having the person closest to them at a unique experience – the birth of their child – was mentioned by a number of participants. In one case, a mother reported her big relief when her husband managed to join last minute:

> “*He was standing outside the hospital and wasn't allowed in, and I was being prepared for the surgery upstairs* […] *there was this overwhelming panic that he would miss it, or I would miss getting him, or that something would go wrong. It was really terrible for us; we found it very, very distressing.* […] *and then finally, they wheeled me into the delivery room, and he was finally allowed to come up, and we finally saw each other, and it was such a relief* (*laughs slightly*). *That was the first step, he was there with me, exactly.*”
>
> (Interview 2 Emma)

Towards the end of the lockdown phase a mother with preterm twins, reported that having the father stay with her throughout the entire day helped her to cope with the situation better (Interview 7 Sarah).

3.2.2. Missing out on the 'normal life at home' with a newborn

This subtheme is characterized by the feeling of not sharing special moments after birth with the newborn due to COVID-19 restrictions. This was partly due to the cancellation of classes which are considered to be part of the 'normal life at home' with a newborn such as baby-play courses, baby swimming or postnatal gymnastics. The first lockdown was a time when all postpartum courses were cancelled but online courses were not yet established, so there was a gap in care.

> “*Yes, in principle, we would have liked to have celebrated a big baby shower, attended a baby swimming class, all the things you normally do, like baby playgroups. All of that was missing. Postnatal exercises, whatever,* (*laughs*) *nothing was happening. It's just missing, it's missing. And you can't make it up later.*”
>
> (Interview 1 Lisa)

In one case, a mother developed a postpartum depression and explained that the social isolation at home after birth might have contributed to this (Interview 4 Paula).

3.3. Fear as a constant companion

Fear as a constant companion was a theme which was present from the pre- to the postnatal experience. Two subthemes could be distinguished 1) Fear of a COVID-19 infection during the hospital stay 2) Ambivalent feelings when arriving home.

3.3.1. Fear of a COVID-19 infection during the hospital stay

Despite the concerns about prematurity itself, fear related to the pandemic was a constant companion for the parents. Parents mentioned the fear to be responsible of infecting their preterm baby with COVID-19. This led many parents to reduce their social contacts to a minimum. One woman explained that what she remembered most about the time of the birth is: “*Oh, I think, that fear is the first thing that comes to mind. It was a constant companion, this fear of COVID-19 and the fear of not being able to have my partner with me, not being able to see the children, always this fear that something beyond our control would interfere. That was really, yes, that was what weighed heavily on us. It was of course the fear for the children, but especially in connection with COVID-19, the fear that we would get infected and something would happen.*” (Interview 2 Emma).

The fear to get infected with COVID-19 themselves and not being able to visit the newborn at the preterm ward was a heavy burden for the parents.

> "*And then every day, of course, with entry restrictions, COVID tests, and temperature checks. Each time it was a nerve-wracking experience: does the thermometer show the right temperature, will they let me through?*"
>
> (Interview 1 Lisa)

3.3.2. Ambivalent feelings when arriving home

Many parents wanted their loved ones to meet the newborn while also wanting to protect the baby. Therefore, the social isolation continued for many families upon arriving at home. However, many parents highlighted the feeling of finally being together as a family as something positive.

"*I would say it was the moment when we finally got home* (*laughs*). *You know? The relief of leaving the hospital behind and being able to hold your child without a mask* (*sounds emotional*)" and the father added "[…] *that he sees you all of a sudden (laughs lightly) with a full face or something, because he didn't know anything else for ten weeks, always seeing people with masks on. And, yes, really, being able to be together as a family at home.*" (Interview 1 Lisa and Peter). But this was accompanied by ambivalent feelings about showing the newborn to family and friends: "*So, we naturally visited family; somehow you have to do that* (*laughs lightly*), *so there's also this pressure from the family's side. But especially the father of our child was really particular; no one could hold our child, no one could even give a kiss anywhere, not at all. We were really, really, very anxious that he might catch anything or something might happen.*" (Interview 4 Paula). Most of the families were extra careful and took additional measures at home to protect the newborn from being infected with COVID-19. A mother described it as "*I believe that concern was still like a sword of Damocles hanging over us*" (Interview 2 Emma). However, Home-office (for the fathers) was repeatedly perceived as positive, as it allowed the family to spend more time together at home.

> "*We had a lot of family time because, as I mentioned, I was working mostly from home. I could also take breaks and support my wife in between. Yes, that was the only advantage of the COVID-19 period* […]."
>
> (Interview 1 Peter)

3.4. Medical care of preterm infants during the pandemic

This theme is divided into the subthemes 1) Gaps in medical care of preterm infants during the pandemic and 2) What went well despite pandemic restrictions.

3.4.1. Gaps in medical care of preterm infants during the pandemic

Several parents struggled with strict visiting hours in the NICU, and arranging visiting slots with other parents in the same room (Interview 4 Paula*)*. Particularly, in the case of having a child with severe medical complications as described by a mother, who had one twin baby transferred to a specialized neonatal ward because of an oesophageal atresia: "[…] *and in* [*name of city*] *there were visiting hours on the intensive care unit: one hour in the morning and one hour in the afternoon.*[…] *so that's actually what I'm still struggling with the most, the fact that with* [*Max*], *our little problem child, where everything was already intense anyway, one of us was there for only two hours a day and for 22 hours no one was there.*" (Interview 7 Sarah).

Parents complained about inconsistent rules and regulations as regulations changed rapidly and there was a lack of communication between hospital staff but also between hospital staff and parents: "*So that was one thing, because every/every 24 hours there were new rules, and it was a bit* (*sighs lightly*) *okay, so you couldn't really keep up with it anymore, and also by the time it got around to the team/So often you had the situation where someone came with a statement, and the next person said 'NO,'* […]" (Interview 8 Nicole).

One major inconsistency that several participants complained about was allowing only one parent to visit the preterm baby at the NICU, yet parents spent time together at home and could potentially infect each other. Additionally, there was a lack of communication regarding the rationale behind the regulations, aggravating the feelings of frustration, as regulations seemed to have been put in place arbitrarily (Interview 5 Maria).

Preterm wards tried to enable "Kangaroo-care" during the pandemic, however some parents mentioned extensive hygiene measures, which affected the quality: "[*Kangaroo-care*]*, was really with full protective gear. So, you had to wear a proper cap, gown, and something over your shoes. And accordingly, there was no skin-to-skin contact.*" (Interview 7 Sarah).

The majority of parents described their involvement in the (medical) care of their baby, like measuring temperature, bathing and feeding. However, in two cases, the mothers were upset about missing the first bath of their newborns: "[*Karl*] *was bathed without us, although our deepest wish was to be there for his first bath.*[…] *I really cried because I wasn't allowed to bathe him for the first time.*" (Interview 4 Paula). Moreover, meetings such as "parents of premature baby meet-ups", which were normally offered in some hospitals, did not take place. One father noted that an exchange with other preterm parents would have been helpful, as they shared similar experiences and concerns (Interview 1 Peter).

Gaps in follow up-care for preterm babies arose and might have been intensified by the pandemic. A dramatic case in the present study is that of a preterm baby with a severe brain haemorrhage, for whom the follow-up care after discharge was not organized by the hospital. The child developed leg paralysis and the parents felt left alone and overwhelmed by the task of recognizing the condition, organizing proper treatment and handling administrative aspects, such as applying for a disability-ranking with the health-insurance. The situation was worsened by the fact that counselling such as that from health insurances was only available via telephone (Interview 3 Jasmin).

3.4.2. What went well despite pandemic restrictions

However, there were aspects in medical care, which were not affected by the pandemic. The majority of the participants described that the pandemic did not impact on breastfeeding, and medical staff did not articulate any concerns about the transmission of COVID-19 through breastmilk (Interview 2 Emma). Most mothers reported that lactation counselling remained available. Also, midwifes' visits at home were still possible. According to the participants of this study, pandemic restrictions had some advantages such as limiting visitors in hospitals, which led to a quieter and more peaceful environement: "*It was very quiet in the neonatal unit* […] *It's such an incredibly stressful situation for parents to have a premature baby, and I was so grateful that not everyone could come and look and give unwanted advice.* […] *I was glad there wasn't a flood of visitors, and the midwives also mentioned that it was much, much quieter. The babies were much calmer too because there wasn't so much foot traffic.* […] *And above all, you didn't have to say 'No, I don't want you to come', which you're not really allowed to say* (*laughs lightly*). *Instead, you could just say 'Well, the hospital won't let you in.'*" (Interview 2 Emma).

The parents also expressed their wishes for improvements. They suggested more regular evaluations to determine whether the mitigation-measures were effective and more involvement of parents in deciding on measures.

> "*If they had perhaps given parents more opportunity to express how they perceived the pandemic regulations, how they would evaluate them, effective yes or no? Of course, parents might assess this on a completely different basis than medical professionals or those with expertise about infectious diseases* […]. *But it would have been valuable to subjectively capture parents' feelings to see where, as a medical professional, you might think, 'Well, that's an okay rule, let's do it this way,' but then realize the psychological impact it has on the parents, and just weight what is more important in that moment* […]."
>
> (Interview 7 Sarah)

Other women expressed the wish for more psychological support for mothers of preterm babies*:* "[…] *there are hospital psychologists or*

chaplains, and it would have been good to assess where the sensitive areas are. I would cautiously argue that a fracture isn't as critical as a premature birth or oncology or palliative care. It would have been beneficial to pay more attention to those areas and identify who needs additional support." (Interview 8 Nicole).

3.5. Mothers taking action to change hospital regulations

Participants expressed gratitude for person-centred care. The flexibility of nurses in finding individual solutions was mentioned as a factor that facilitated the situations (Interview 5 Maria). Nevertheless, active effort from the women was required to change the regulations. One woman and her bed-neighbour wrote a letter to the hospital-management, explaining why they needed their husbands to visit them: "*The* [*bed neighbour*] […] *is a journalist by profession, and we then thought about how we could manage to get an exception, since we were long-term patients and didn't know how long this would go on. So, we eventually (laughs lightly) wrote a letter and sent it to the chief physician, asking for an exception. We included scientific evidence that all this stress and the psychological aspect are not exactly helpful for the child staying for a long time and so on, and he agreed to it. But of course, it was a procedure, as it is in hospitals, until it was processed, etc., and then we* […] *had the exception that men were allowed to visit once a week for 30 minutes.*" (Interview 8 Nicole).

In another case, a mother with preterm twins, one of whom had to stay longer at the hospital due to a medical complication was not allowed to bring the other twin to the hospital, while she was still breastfeeding both. She had to negotiate with the hospital management to change the rules: "[…] *we wanted to bring him* [*our other child*] *to the clinic as well, especially considering that I was breastfeeding* […]. *However, it was said that 'No, siblings are not allowed.' And that was something I could hardly accept, because I thought* […] *it's okay to have visiting rules and restrict it to parents and not allow siblings* […] *but we're talking about the twin brother who is being breastfed by the mother. I thought, this can't be. So, I spoke with the chief physicians and they said 'No, that wouldn't be possible,' but I didn't accept that. I escalated it up to the hospital management and pushed for it, and in the end, they decided in our favour and said, 'Well, okay, it's understandable, and we can do that.'*" (Interview 7 Sarah).

4. Discussion

In the early stages of the COVID-19 pandemic, pragmatic decisions regarding hospital regulations were made. In retrospect and emphasized by the results of this study, it is questionable whether these decisions, particularly the restrictive visiting hours around the perinatal period, were justifiable. While the elderly dying alone and in isolation during the pandemic has been critiqued [28–30], this study shifts the focus to the beginning of life, highlighting how mothers experienced the lack of accompaniment during birth. The majority of women at risk for preterm birth in this study experienced being "left alone", without being able to receive any visits or being allowed to leave the room, having to make difficult decisions alone, partly in extreme physical states, such as during contractions or with preeclampsia.

Becoming a mother during the COVID-19 pandemic was particularly challenging due to the added fears of viral infection for both the mother and the newborn, combined with reduced social support [11]. As underscored by this study, psychological support of mothers during this time was disregarded and led to an undue burden on expectant mothers from today's perspective. Evidence suggests that having a companion during birth improves maternal well-being and contributes to a positive birth experience [31,32]. Moreover, a qualitative study of mothers with COVID-19 during birth experienced the separation from their newborn as traumatic [33].

Our findings provide nuances and insights to quantitative studies such as a multinational online-survey that reported that 57 % of the respondents were not permitted to have another person present during birth. However, there were country specific differences, in México and Poland 87 % and 90 % of mothers giving birth alone, whereas in Australia, New Zealand and Sweden over 90 % were permitted to have another person present [34]. Similar country specific differences were noted regarding parental presence in the NICU. In China, 87 % and in Turkey 34 % of respondents were not allowed to see their newborn at all [34].

Our study highlights that the COVID-19 pandemic not only aggravated pre-existing sensitive and conflictual situations in neonatal units, such as the moment following the birth of a preterm infant, but also led to reduced transparency regarding medical decisions and COVID-19 restrictions. Additionally, the pandemic resulted in reduced involvement of parents in the (medical) care of the child, shifting their role from being part of the care team to be more of a spectator. Besides the pandemic restrictions might have contributed to preterm infants missing essential follow-up care, as illustrated by a case of a preterm with brain haemorrhage who developed leg paralysis.

The importance of skin-to-skin contact in the neuro-development of preterms is widely recognized, therefore kangaroo-care has been established in most modern preterm wards [35–37]. Current research indicates, that delivery-room skin-to-skin contact promotes mother-and child interaction and reduces the risk of maternal depression in mothers with preterm babies [38]. In light of this, some COVID-19 regulations at preterm wards such as extensive hygiene precautions during kangaroo-care or allowing only one parent at a time largely affect other important priorities of individualized neurodevelopmental care of preterm infants. The decisions of policy makers and health care professionals at that time were a balancing act and were complicated by the novelty of the virus, the lack of established guidelines and rapidly changing regulations [39]. Similar to other studies, our findings show that decisions at the NICUs regarding mitigation measures were primarily driven by infection control and that concepts of family-centred care took a back-seat [40,41].

4.1. Strengths and limitations

A limitation of this study is, that most of the participants had an academic background and that there were no migrant families, so some themes e.g. "mothers taking action to change the hospital regulations" may represent "positive" but rare cases. The time interval between the first lockdown and performing the interviews might have led to difficulties in recollection of emotions. However, we perceived this was not the case as the birth of a preterm baby was a very impactful life event and the parents seemed to remember the time very clearly. There might be the argument that conducting in depth-interviews online might have influenced the interview situation. However, we considered it as an advantage as we were able to interview parents living in different German cities and to our impression we could establish a trustful atmosphere. One of the main strengths is the qualitative design, which allows for the exploration of personal values and experiences in context-sensitives circumstances and the inclusion of new aspects identified by the participants. To directly interview parents is a strength as they have other perspectives on the effects of the hospital regulations than health care professionals or policy makers. There is an importance to have a close look at vulnerable groups (preterms and their parents) in early stages of a pandemic.

5. Conclusion

It is crucial to include scientific, pediatric expertise in pandemic response planning to rapidly visualize and prevent the negative consequences of mitigation measures such as those described in this study for children and their families. In sensitive areas of medical care such as birth (especially preterm birth) and the perinatal period, support of mothers during hospital stay and birth as well as the presence of both parents in the preterm ward are essential for parent-child bonding and early childhood development.

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Author contribution

All authors attest they meet the ICMJE criteria for authorship.

CRediT authorship contribution statement

Simone Teresa Böhm-González: Conceptualization, Data curation, Formal analysis, Investigation, Resources, Visualization, Writing – original draft. **Sarah Detemple:** Conceptualization, Data curation, Investigation. **Jasmin Gruß:** Conceptualization, Writing – review & editing. **Angela Kribs:** Writing – review & editing. **Astrid Berner-Rodoreda:** Formal analysis, Methodology, Writing – review & editing. **Christoph Härtel:** Investigation, Writing – review & editing. **Jörg Dötsch:** Resources, Writing – review & editing. **Annic Weyersberg:** Conceptualization, Funding acquisition, Methodology, Project administration, Supervision, Writing – review & editing.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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