Breastfeeding and room-sharing during COVID-19 in the Netherlands: The impact of perinatal healthcare support

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ABSTRACT

Aim: The recommendations of 6 months of exclusive breastfeeding (EBF) and parent-infant room-sharing (RS) are often not followed. As these early caregiving practices may have been affected by the COVID-19-related restrictions, we documented BF and RS practices in the Netherlands (2020–2021) and the effects of perceived perinatal healthcare support.

Methods: Pregnant women and mothers of an infant younger than 6 months (N = 784) completed online questionnaires (e.g., demographic information, the impact of COVID-19 on their lives aspects, infant childcare practices) twice: at the beginning of the pandemic and when the infant reached 6 months of age.

Results: The pandemic EBF practices mirrored pre-pandemic Dutch reports (17.8 %; M duration = 3.4 months), while RS rates and duration seemingly doubled (30.6 %; M duration = 3.98 months). Higher maternal education (r = 0.18) and multiparity (r = 0.08) were significantly associated with longer EBF, and similarly for education (r = 0.17) and multiparity (r = 0.11) with RS durations. Higher perceived perinatal healthcare support predicted shorter RS duration [β = 0.509, t(5,596) = 2.27, p = .023].

Conclusion: While the COVID-19 pandemic did not impact EBF, it may have promoted RS. The negative association between perinatal healthcare support and RS may suggest that parents who need more support from their providers also experience more challenges adhering to RS recommendations, yet this hypothesis remains to be corroborated.

1. Introduction

Current recommendations of the World Health Organization (WHO) encourage exclusive breastfeeding (EBF) and parent–infant room-sharing (RS) for the first 6 months of life [1]. WHO defines EBF as feeding infants only breast milk, without any additional liquids or solids, except for drops or syrups necessary as vitamin integrators or medication [2], which we also adopt in this paper. RS is defined as parent-infant sharing the room, irrespective of the specific infant sleeping surface. These recommendations are grounded on the well-documented positive health outcomes of EBF for the infant and the mother and the lower risk of sleep-related infant death associated with RS [3]. However, these guidelines are not always followed, potentially due to several factors such as cultural beliefs and challenges faced when combining BF and RS practices with returning to work. Reports indicate that only 37 % of infants worldwide and 19 % in The Netherlands are exclusively breastfed for the first 6 months of life [4–7]. Research on RS is scarcer, but evidence shows that 52 % of the infants in Israel [8], 33 % in the United States [9,10], and only 17 % in The Netherlands [11] share a room with their parent(s) at 6 months of age. As early caregiving practices may have been affected by the COVID-19 pandemic and associated lockdowns [12], our first aim was to document breastfeeding (BF) practices and RS rates in 6-month-old infants born during the COVID-19 pandemic in The Netherlands. Furthermore, perinatal healthcare providers play a crucial role in facilitating and promoting BF [5], but access to such healthcare services may have changed during...
COVID-19 lockdowns. Therefore, our second aim was to investigate how perceived perinatal healthcare support was associated with EBF and RS durations during the COVID-19 pandemic. Notably, while studies documenting BF and RS practices report prevalence rates per month, the average duration of these practices at a group level is often unreported. In this study, we focus on documenting the prevalence rates of all BF practices and RS (Aim 1) and investigating predictors of EBF and RS durations (Aim 2).

The COVID-19 pandemic resulted in substantial changes and stress in daily life, including in families with young infants [12–14]. COVID-19 led to the closure of childcare centers and a shift to remote work or unemployment, with approximately 50 % of European employees working from home partly or exclusively during the first COVID-19 lockdown [15]. These changes may have also provided opportunities for parents, such as flexible work schedules, less commuting, and more time with the infant. Since an early return to work and long working hours have been identified as factors that hinder EBF and RS [16–18], the COVID-19 regulations may have favored EBF and RS. Indeed, in a large Dutch study, pregnant mothers reported that perinatal healthcare support new

The COVID-19 pandemic resulted in changes in daily life that may have influenced EBF and RS practices. The pandemic presents an opportunity to study the factors that promote or hinder these important caregiving practices to inform future interventions and policies to increase EBF and RS. Our study aimed to document BF and RS practices in 6-month-old infants born during the pandemic in The Netherlands and to test a perceived perinatal healthcare support and EBF and RS durations. Additionally, we evaluated education level and parity as potential moderators, as the impact of the pandemic and the COVID-19 pandemic impacted EBF for the worse, leading to shorter durations.

Regarding RS, research has shown that the disruption of parental sleep was reported as a contributing factor by 34 % of parents choosing not to room-share with their infants [10]. Yet, during lockdowns, the necessity to allocate space for home-based offices may have led to a scarcity of available space, potentially contributing to an increase in RS practices. This observation aligns with a report documenting an increase in the number of children (3 years) in the US sharing rooms with their parents or other family members during the pandemic [24]. However, evidence regarding the impact of COVID-19 on RS duration in the first months of life is lacking.

The WHO pinpointed midwives and nurses as crucial in facilitating and promoting BF [5]. However, access to perinatal healthcare services changed dramatically during the COVID-19 lockdown, with fewer in-person appointments, all when needs were at an all-time high [25]. Indeed, in a large Dutch study, pregnant mothers reported that perinatal healthcare support decreased, compared to pre-pandemic [26]. Moreover, lower perinatal healthcare support, compared to lower partner and social support, was the best predictor of COVID-19-related worries and mental health symptoms. Hence, support from perinatal healthcare professionals during the COVID-19 pandemic may have played a relevant role in parental decisions concerning EBF and RS.

The COVID-19 pandemic resulted in changes in daily life that may have influenced EBF and RS practices. The pandemic presents an opportunity to study the factors that promote or hinder these important caregiving practices to inform future interventions and policies to increase EBF and RS. Our study aimed to document BF and RS practices in 6-month-old infants born during the pandemic in The Netherlands and to test a perceived perinatal healthcare support and EBF and RS durations. Additionally, we evaluated education level and parity as potential moderators, as the impact of the pandemic and changes in perinatal healthcare support may vary based on these factors. We expected that EBF and RS rates and durations would increase as a result of longer time spent at home of mothers (and partners) after the birth of the baby, due to the ongoing lockdowns and possible transitions to a period without working or remote home-based working. Moreover, we hypothesized that better perinatal healthcare support would predict

2. Methods

2.1. Study design

The COPE (COVID-19 and Perinatal Experiences) study is a part of the international research alliance COVGEN, investigating the perinatal experiences of (future) parents and their infants during the COVID-19 pandemic. The survey materials are publicly available at https://osf.io/uqhec/. The Dutch COPE is a longitudinal study with 4 assessments [12,26,27]. For the current paper only data from the 1st (during 1st Dutch COVID-19 lockdown, April–May 2020) and 4th (infants' age 6 months; July 2020–December 2021) assessments are used.

2.2. Participants

A total of 2409 mothers and fathers that were either expecting or had an infant younger than 6 months participated in the first assessment of the COPE study. From these, 1048 parents completed a follow-up online questionnaire when their infant reached the age of 6 months. We only included the mothers (n = 946) in the analyses because mothers and fathers may have reported data on the same infant. From this group, we excluded babies older than 12 months (n = 5), younger than 5 months (n = 4), no age information (n = 1) and twins (n = 14). Additionally, we excluded 140 babies born before the 13th of March 2020, the date when the WHO declared BF safe [28], with the idea that doubts concerning the safety of BF may have negatively impacted mothers' BF decisions. Parents that answered the questionnaire when their infant was older than 6 months (n = 127) were included, with a cut-off at 12 months, since BF practices can be reliably reported retrospectively at least until 12 months of age [29]. The final sample consisted of 782 infants and their mothers.

2.3. Measurements

Breastfeeding (BF) prevalence rates were reported by mothers with one item during the 6-months' assessment: “Has the baby received exclusive breastfeeding in the first 6 months?” (1 = never breastfed; 2 = No, stopped and/or formula and -or solids have been added besides breast milk; 3 = Yes, in the first 6 months my baby was exclusively breastfed). Exclusive breastfeeding is defined as feeding infants only breast milk, without any additional liquids or solids, except for drops or syrups necessary as vitamin integrators or medication.

Exclusive Breastfeeding (EBF) duration was assessed during the 6-months' assessment with the following question: “At what age (in months) did you start giving: powdered milk, rice flour, fruits, and vegetables”. The duration of EBF was determined by the first introduction of anything other than breast milk in the infant's diet and ranged from 0 to 6 months.

Room-sharing (RS) rates were reported by mothers in a monthly diary-like format from the first to the sixth month. RS practices were defined as sleeping in the mother's/parents' room or bed, whereas any other sleeping arrangement was considered as non-RS.

Room-sharing (RS) duration was assessed during the 6-months' assessment with one item: “Where did your baby normally sleep at night for each of the first 6 months of life?”. Parents answered this question for each month. The sum of months that the infant slept in the parent's room/bed constituted the duration of RS and ranged from 0 to 6 months.

Perceived perinatal healthcare support was assessed during the 6-months' assessment concerning the main perinatal healthcare providers in the Netherlands: maternity home nurses, midwives, labor assistants, general practitioners, practice assistant general practitioners, obstetricians, nurses, and well-baby clinic. Maternity home nurses support new mothers for the first week around birth, including after home deliveries, in caring for the newborn. Midwives care for mothers and newborns
during pregnancy and birth, while obstetricians only care for women with pregnancy complications. The labor assistant is an optional pregnancy or birthing coach that provides practical and emotional support for the family during pregnancy, birth and postnatally. The well-baby clinic provides immunizations, home visits during the first 2 weeks of the infant’s life and health check-ups until 18 years of age. First, mothers selected their main perinatal healthcare providers from a list. They answered the following question for each one: “How well were you supported by the _ in the first 6 months after delivery?” (1 = very well supported, 2 = somewhat supported, 3 = not so well supported). The answers were reverse-coded, with higher scores indicating more perceived support. After that, a mean score of total support was computed from all the perinatal healthcare providers.

**Maternal education** was assessed during the first assessment with 1 item: “What is your highest education level?” with the following answers: no schooling, elementary school, secondary education, applied vocational education, professional higher education, university to doctorate level. We defined with a 1 low-medium education level: no schooling to professional higher education; 2 high = university education and higher. A binary classification was used in the analyses, due to the relatively low number of low educated women. As a result, we grouped low and medium educated mothers under one category to prevent skewness.

**Parity** was assessed during the first assessment via one item “How many children do you have, including the one in this study?”. One child was given 1 (primiparous) and >1 child a 2 (multiparous).

### 2.4. Statistical analyses

We conducted a descriptive analysis to characterize the sample and frequency analysis to show changes in exclusive breastfeeding (EBF) and room-sharing (RS) rates (% of women providing exclusive breastfeeding and sharing a room with their infant) and durations (0–6 months) during the first two years of the pandemic (Aim 1). Two multiple regression analyses were performed only with EBF and RS durations (0–6 months) as dependent variables and education, parity, and perceived perinatal healthcare support as independent variables (Aim 2), excluding mothers who never initiated breastfeeding (n = 124) and who never shared a room with their infant (n = 81), respectively. We z-scored the perinatal healthcare support variable before computing interaction terms. Finally, we performed sensitivity analyses for each perinatal healthcare professional that was chosen by at least 100 women. This analysis aimed to examine whether support provided by the most frequently approached healthcare professionals explained significant variance in EBF and RS durations, rather than the combined effect of support from all available professionals. For the sensitivity analyses, we corrected the obtained p-values with Bonferroni for multiple testing (p < .01). The analyses were done using SPSS, and illustrations were created in R. Posthoc power analyses were conducted with G*Power software and showed that the study had sufficient power to detect even a small effect with a sample of ≥100 and five predictors.

### 3. Results

#### 3.1. Descriptive and preliminary analyses

Descriptive statistics are shown in Table 1. Pearson bivariate correlation analyses (Table 2) showed that higher maternal education and multiparity were associated with longer EBF and RS durations. Having more than one child was also associated with higher perceived perinatal healthcare support. Furthermore, EBF and RS durations were significantly and positively associated. In Table 3, we present the mean of perceived support for the main perinatal healthcare providers, ranked from left to right in order of the number of mothers who indicated receiving support from these professionals. Five were selected by a minimum of 100 mothers: maternity home nurses, midwives, general practitioners, well-baby clinics, and obstetricians.

#### 3.2. Breastfeeding and room-sharing practices during COVID-19

##### 3.2.1. Breastfeeding

Prevalence rates of EBF were 17.8 % at 6 months of infant age. Fig. 1A illustrates the EBF duration for each month of the study. Fig. 2A and B illustrate EBF duration by parity and education, respectively. We present these plots for 2020 and 2021 separately for descriptive purposes, although EBF duration did not differ significantly between these years.
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4. Discussion

The findings of this study revealed that the mean duration of exclusive breastfeeding (EBF) was 3.4 months, while that of room-sharing (RS) was 4 months during the COVID-19 pandemic (2020–2021) in The Netherlands. Higher education and multiparity significantly predicted longer EBF and RS durations, while higher perceived perinatal healthcare support was linked to shorter RS duration.

4.1. Exclusive breastfeeding

Our finding that the mean duration of EBF lies around 3 and a half months is consistent with data from previous Dutch non-COVID-19 samples [11,29]. Around 18 % of mothers provided EBF to their infant during the first 6 months, whereas approximately 60 % provided mixed BF, consistent with previous findings [4,6,30]. Perceived perinatal healthcare support was not associated with EBF duration during the COVID-19 pandemic, contrary to our expectations. A UK-based study showed that women with low education reported more BF-related struggles and earlier cessation, with 70 % attributing it to lack of face-to-face support from health professionals during COVID-19 [19]. However, in our study, maternal education did not moderate associations between perceived support and EBF, indicating that the potential effects of perceived support on EBF did not differ by education level. This result could be due to our unbalanced number of low-medium and high-educated groups. It is also possible that mothers did not perceive healthcare support as being low during the pandemic. This seemed to have been particularly the case for multiparous women, as denoted by the significant positive association with higher perceived perinatal support. This may suggest that women with previous prenatal experiences were better able to obtain the professional support they needed than first-time mothers. Still, despite this significant associations, parity was not a significant moderator for the relation between perinatal support and parity. It is also possible that mothers did not perceive perinatal healthcare support as being low during the pandemic. This seemed to have been particularly the case for multiparous women, as denoted by the significant positive association with higher perceived perinatal support. This may suggest that women with previous prenatal experiences were better able to obtain the professional support they needed than first-time mothers. Still, despite this significant associations, parity was not a significant moderator for the relation between perinatal support and parity. It is also possible that mothers did not perceive

Table 3
Perceived perinatal healthcare support in the first 6 months after birth as reported by mothers.

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<tbody>
<tr>
<td>Total perceived support mean (SD)</td>
<td>2.70 (0.52)</td>
<td>2.65 (0.55)</td>
<td>2.48 (0.64)</td>
<td>2.38 (0.61)</td>
<td>2.40 (0.65)</td>
<td>2.56 (0.62)</td>
<td>2.66 (0.57)</td>
</tr>
<tr>
<td>Very well supported %</td>
<td>73.3 %</td>
<td>69.6 %</td>
<td>56.5 %</td>
<td>45.9 %</td>
<td>49.5 %</td>
<td>63.2 %</td>
<td>71.4 %</td>
</tr>
<tr>
<td>Not very well supported %</td>
<td>3.2 %</td>
<td>4 %</td>
<td>8.1 %</td>
<td>7 %</td>
<td>8.9 %</td>
<td>7 %</td>
<td>4.8 %</td>
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Notes. Total N for mean support was 784. SD = standard deviation, N = number of mothers that selected the specific care provider. Note that mothers could select more than one provider. Total perceived support mean is the score computed with all perinatal healthcare providers that supported them (1 = not so well supported, 2 = somewhat supported, 3 = very well supported), with higher scores indicating more perceived support. Percentages (%) of mothers reporting to have felt very well or not well at all supported was calculated based on the number of respondents for each selected healthcare provider.
Fig. 1. Exclusive breastfeeding (1A, EBF) and room-sharing (1B, RS) duration in months across the study months of 2020–2021.

Notes: The dots represent the data points for each participant, with different colors used for each study period. The black dot represents the mean and the whiskers the standard error of the mean. The min-max on the y-axis equals 0–6 months, yet some randomness (e.g., “jitter”) was added for better illustration of the points which would otherwise be largely overlapping.
Fig. 2. Exclusive breastfeeding duration (EBF) in months for multiparous and primiparous groups (2A) and for lower and higher education groups (2B), divided by pandemic year (2020 and 2021).

Notes: The dots represent the data points for each participant, with different colors used for each study period. The black dot represents the mean with the whiskers representing the standard error of the mean. The min-max on the y-axis equals 0–6 months, yet some randomness (e.g., “jitter”) was added for better illustration of the points which would otherwise be largely overlapping.
Fig. 3. Room-sharing duration (RS) in months for multiparous and primiparous groups (3A) and for lower and higher education groups (3B), divided by pandemic year (2020 and 2021).

Notes. The dots represent the data points for each participant, with different colors used for each study period. The black dot represents the mean with the whiskers representing the standard error of the mean. The min-max on the y-axis equals 0–6 months, yet some randomness (e.g., “jitter”) was added for better illustration of the points which would otherwise be largely overlapping.
to breastfeeding or inefficient. A more likely explanation is that Dutch mothers have been recently advised to introduce solids in their infant's diet between 4 and 6 months to familiarize infants with new textures and to prevent iron deficiencies and allergies [31]. This advice is in stark contrast with recommendations of the WHO of exclusive breastfeeding for the first 6 months of an infant's life [1], but may at least partly explain why our results do not show that healthcare support is associated with longer EBF. Moreover, as reported in a comprehensive review of the European Union-funded Integrated Approaches to Food Allergy and Allergen Management (iFAAM) study [32], the association between early introduction of complementary food in the infant's diet and allergy prevention remains anecdotal and observational at best. This conclusion is also supported by the European Academy of Allergy and Clinical Immunology (EAACI) [33], the American Academy of Pediatrics (AAP) [34] and the Australasian Society of Clinical Immunology and Allergy (ASCIA) [35], stating that the current status of empirical evidence does not justify any recommendation to promote or withhold exclusive breastfeeding for a specific length.

Altogether, our pandemic rates of EBF mimic Dutch pre-pandemic rates [17], which is remarkable given the many challenges experienced by parents due to the COVID-19 pandemic. A possible explanation for this positive finding is that we investigated EBF rates in children born after breastfeeding was declared safe by the WHO and that Dutch women continued to receive the help of maternity home nurses in the first week after birth throughout the pandemic years. However, the current rates still do not meet the WHO criteria. Accordingly, it remains essential to improve and continue efforts to facilitate and promote EBF.

### 4.2. Room-sharing

Concerning RS, parents reported sharing a room with their infants for approximately 4 months, which is higher than the previously reported RS duration of approximately 11 weeks in the Netherlands [11]. Moreover, 32 % of parents shared the room with their infant for 6 months, doubling the rates reported earlier in the Netherlands (16.9 %) [11]. Although these data suggest that RS rates and duration doubled during the pandemic, we have to note that the earlier is, to our knowledge, the only report on RS practices in The Netherlands with data stemming from children born in 2006–2007. Our findings of 32 % of RS at 6 months postpartum match reports from other Western samples (33 % in the US) [10]. Hence, these are rates of RS that reflect the rates of individualistic societies and are in contrast to the higher rates of RS in more collectivistic societies (52 % in Israel) [8]. Nonetheless, the current scarcity of research on RS practices makes it difficult to contextualize the results and further reflect on their meaning. Our findings concerning RS suggest an increase in RS duration of around one month in The Netherlands. While this is a remarkable achievement, the WHO recommendations for 6 months of RS are still unmet. Moreover, this rise has been observed in the last decade, so we cannot verify if this rise is due to the COVID-19 pandemic. The COVID-19 pandemic created opportunities for longer RS duration by giving rise to working from home, which is related to fewer commuting hassles, more flexible work-life schedules, and more rest at self-chosen moments. However, it could also be the case that this rise in RS duration already took place before 2020. Therefore, it is essential to investigate RS duration again, post-pandemic, both in The Netherlands and other countries.

An unexpected finding was that increased perceived support from perinatal healthcare providers was associated with a shorter duration of RS. This result might be explained by mothers who experienced complications or other problems during the perinatal period needing more perinatal healthcare support while simultaneously being less physically or emotionally well to choose to engage in (months of) room-sharing. An important future direction for research is to investigate if specific subgroups of mothers, who experienced complications or problems during the perinatal period, need support to engage in room-sharing. Given our current scarce knowledge of RS practices and their importance for infant health, more efforts must be channeled towards studying RS.

### 4.3. Strengths and limitations

Strengths of this study include the timely recruitment of a large sample of young mothers and infants during the first COVID-19 lockdown and a longitudinal design covering the first two years of the pandemic. The study was sufficiently powered, and despite pandemic-related challenges, nearly 50 % of the original sample was retained until 6 months of infant age. Limitations include a highly educated sample (76 %) and a lack of information on reasons for stopping prematurely or previous experience with EBF and RS. Nevertheless, the EBF rates reported in this highly educated sample mirror those from a more heterogeneously educated Dutch sample [17], indicating the generalizability of our findings to the broader Dutch society. Finally, retrospective self-reports such as those used in the current study may be subject to memory bias. Although previous studies have shown that BF practices can be reliably reported up to at least 12 months of infant's age [29,36], future studies should consider repeated ecological momentary assessments of infant BF and RS practices.

### 5. Conclusion

Our study found unchanged exclusive breastfeeding rates during the COVID-19 pandemic and a two-fold increase in parent-infant room-sharing compared to prior years. Mothers with higher education and more children tended to breastfeed and room-share for longer durations exclusively. As more perceived perinatal healthcare support was linked to shorter RS duration, we urge to further investigate relevant facilitators and barriers for RS, including maternal health.

### CRediT authorship contribution statement

Stefania V. Vacaru performed research, analyses, interpreted the data, wrote the manuscript, Sofia Weidle Scatolin performed research, interpreted the data, wrote the manuscript, Marion van den Heuvel designed and performed research, provided feedback on the manuscript. Roseriet Beijers designed and performed research, interpreted the data, wrote the manuscript.

Carolina de Weerth designed and performed research, interpreted the data, wrote the manuscript. All authors contributed and approved the final manuscript as submitted.

### Declaration of competing interest

We have no known conflict of interest to disclose.

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