

## ORIGINAL ARTICLE OPEN ACCESS

# Mother-Newborn Couplet Care in Denmark: A National Cross-Sectional Survey of Clinical Practices and Challenges

Joan Neergaard Larsen<sup>1</sup>  | Helena Hansson<sup>2,3</sup> | Porntiva Poorisrisak<sup>1</sup>  | Laura Emdal Navne<sup>4</sup> | Stina Klemming<sup>5</sup> | Jette Led Sørensen<sup>3,6</sup> | Ragnhild Maastrup<sup>1</sup> 

<sup>1</sup>Department of Neonatology, Copenhagen University Hospital – Rigshospitalet, Copenhagen, Denmark | <sup>2</sup>Department of Pediatrics and Adolescent Medicine, Copenhagen University Hospital – Rigshospitalet, Copenhagen, Denmark | <sup>3</sup>Department of Clinical Medicine, Faculty of Health and Medicine Sciences, University of Copenhagen, Copenhagen, Denmark | <sup>4</sup>The Danish Centre for Social Science Research, Copenhagen, Denmark | <sup>5</sup>Lund-Malmö NIDCAP Training and Research Center, Lund, Skaane, Sweden | <sup>6</sup>Mary Elizabeths Hospital and Juliane Marie Centre, Copenhagen University Hospital – Rigshospitalet, Copenhagen, Denmark

**Correspondence:** Joan Neergaard Larsen ([joan.neergaard.larsen.01@regionh.dk](mailto:joan.neergaard.larsen.01@regionh.dk))

**Received:** 22 August 2025 | **Revised:** 24 September 2025 | **Accepted:** 30 September 2025

**Funding:** Copenhagen University Hospital—Rigshospitalet, Denmark, supported this work and grants from Novo Nordisk Foundation (file no. NNF22OC0079732).

**Keywords:** infant- and family-centered developmental care | interprofessional collaboration | mother-newborn couplet care | skin-to-skin contact | zero separation

## ABSTRACT

**Aim:** Although evidence supporting mother-newborn couplet care continues to grow, its clinical integration remains inconsistent due to ongoing barriers. This study aimed to describe current practices of mother-newborn couplet care in Danish obstetric and neonatal departments.

**Methods:** A national cross-sectional survey was conducted in all Danish neonatal and obstetric departments. An online questionnaire identified organisational structures, collaboration between departments, and interprofessional education. Quantitative data were analysed descriptively, while qualitative responses were evaluated using content analysis.

**Results:** The response rate was 91% ( $n = 31/34$ ). Maternal treatment and care provided in neonatal departments were reported as “always” by 33% of respondents, “often” by 44%, and “sometimes” by 17%. Neonatal treatment and care provided in obstetric departments were reported as “always” by 22% of respondents, “often” by 33%, and “sometimes” by 28%. The clinical integration of couplet care depended on the level of medical needs for both. Key barriers included organisational and structural challenges and a lack of formalised interprofessional education.

**Conclusion:** The findings highlight the current situation of reducing mother–newborn separation through couplet care. Most Danish departments report that mothers and newborns can often be cared for together. However, organisational and structural barriers still prevent the integration of mother–newborn couplet care.

## 1 | Introduction

The traditional model of maternal and neonatal care often involves the separation of mothers and newborns when one or

both require specialised medical treatment and care after birth [1]. While this approach ensures targeted medical care, it poses significant challenges to early biological processes, including emotional connection, regulation of physiology and behaviour,

**Abbreviations:** CPAP, continuous positive airway pressure; NICU, Neonatal Intensive Care Unit; SFR, single-family rooms; SSC, skin-to-skin contact; WHO, World Health Organization.

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2025 The Author(s). *Acta Paediatrica* published by John Wiley & Sons Ltd on behalf of Foundation Acta Paediatrica.

## Summary

- The integration of couplet care depends on the medical needs of both the mother and the newborn.
- Key challenges to clinical integration of mother-newborn couplet care include inadequate organisational structures and a lack of formalised interprofessional education between obstetric and neonatal departments.
- Future efforts should focus on viewing mothers and newborns as one, strengthening interprofessional collaborations, and enhancing education between obstetric and neonatal departments to support integration into clinical practice.

as well as breastfeeding [1, 2]. Separation from the parent, without buffering protection from the parent, is associated with stress in newborns [1]. In contrast, maintaining physical closeness by keeping the newborn in a safe environment close to the parent promotes resilience, well-being, and health [1, 3].

Research highlights the benefits of minimising mother-newborn separation, indicating that immediate skin-to-skin contact with a parent after birth contributes to improved neonatal outcomes, including reduced mortality, enhanced thermoregulation, decreased risk of infection, and improved cardiorespiratory stability [4–10]. For mothers, increased proximity to their infant generally fosters breastfeeding success and reduces stress and anxiety [11, 12]. Since 2022, the World Health Organization (WHO) has recommended that all newborns should be provided with skin-to-skin contact (SSC) as early and as much as possible [13].

Accordingly, the past two decades have witnessed a growing shift in the standard of care toward zero separation, emphasizing the importance of keeping mothers and newborns together [1, 8, 14, 15]. A model to avoid separation is mother-newborn couplet care, which involves caring for both the mother and the newborn together. In this approach, both remain in close proximity, even when either or both require specialized care, with care provided in the unit best equipped to manage the most complex medical needs [16]. In 2023, various organizational models for mother-newborn couplet care were described across Nordic countries, demonstrating how this approach can be adapted to fit local healthcare contexts [16]. A key consideration in mother-newborn couplet care is where the care takes place and who provides it. One model was keeping the newborn and mother in the neonatal intensive care unit (NICU), typically when the newborn requires highly specialized care, where neonatal staff care for the newborn, while the mother receives care from midwives, obstetric nurses, and obstetricians [16–24]. Alternative models include integrated care teams, with midwives embedded in the neonatal unit [25] and arrangements where newborns with mild and transient medical needs remain in the maternity ward. There is also a novel organizational model based on the principle of keeping mothers and newborns together as an inseparable unit, with both obstetric and neonatal care provided within a unified perinatal department [14, 16]. Mother-newborn couplet care requires a new collaborative approach, with interprofessional

education between departments crucial in facilitating its integration into clinical practice, regardless of level of care [26]. Despite the increasing evidence supporting zero separation and the vision of mothers and newborns remaining physically close to each other irrespective of their medical needs, a gap may persist between evidence-based knowledge and current practices in postpartum care for ill mothers and newborns [27].

This study aimed to describe and discuss current mother-newborn couplet care practices in Danish obstetric and neonatal departments, identifying organisational structures and collaboration between departments, and exploring the reported advantages and disadvantages of existing practices as well as future plans. The findings can contribute to quality improvement initiatives and inform future strategies for optimising couplet care models.

## 2 | Methods

### 2.1 | Design

This study was a national cross-sectional survey, and data were obtained through an online questionnaire.

### 2.2 | Setting and Participants

In Denmark, there are 18 hospitals with both obstetric and neonatal services. Two of these hospitals have integrated maternal and newborn care in perinatal units. All obstetric, neonatal, and perinatal departments ( $n=34$ ) at the 18 hospitals were invited to participate. There were no exclusion criteria. The Neonatal Intensive Care Units (NICUs) have different levels [28]: Level 2 ( $n=2$ ), Level 3A ( $n=12$ ), Level 3B ( $n=3$ ), and Level 3C ( $n=1$ ). Level 1=Basic care of stable infants born at 35 to less than 37 weeks of gestation. Level 2=Specialty care of infants born at least 32 weeks of gestation or 1500g, with the possibility of brief mechanical ventilation or CPAP. Level 3A=Subspecialty intensive care of infants born at least 28 weeks of gestation or 1000g, with the possibility of mechanical ventilation. Level 3B=Subspecialty intensive care of infants born at less than 28 weeks of gestation or 1000g, with the possibility of advanced respiratory support and access to paediatric surgical specialists. Level 3C=As level 3B but including extracorporeal membrane oxygenation and surgical repair of complex congenital cardiac malformations.

### 2.3 | Questionnaire

The questionnaire included questions about the characteristics of the department and the respondent, the organization of maternal care in the NICU, neonatal care in the obstetric department, routines for initiation and continuation of SSC and mother-newborn couplet care, and collaborations between departments. The response options varied and were mostly dichotomous or on a five-point Likert scale. In every question, the option “do not know” was possible. There were four open-ended questions concerning the advantages and disadvantages of the existing practice and future plans related to couplet care. The

author group developed the questionnaire collaboratively, and the questionnaire was discussed and revised through pilot testing by five healthcare professionals (two obstetricians, one neonatal nurse, one midwife, and one academic staff member). The questionnaire is available upon request from the first author.

## 2.4 | Data Collection

The data were collected from October to December 2024. The questionnaire was distributed by email to the heads of the departments representing obstetricians, neonatologists, obstetric and neonatal nurses, and midwives, respectively. Reminders were sent after 3 and 5 weeks. We invited them to either answer themselves or refer to another relevant healthcare professional in their department. We asked for a minimum of one returned questionnaire per department. Still, we encouraged them to answer from different professions, which could result in multiple responses from each department.

## 2.5 | Data Analysis

Descriptive statistics were applied to analyze the quantitative data [29]. We calculated responses from the obstetric and neonatal departments, respectively. From departments with multiple responses, the most favorable response was selected, reflecting a perceived opportunity likely to occur. In questions where the response options could not be aggregated into a most favorable assessment measure, for example, “Who is responsible for maternal care in the NICU?”, the results were reported solely at the departmental level. Discrepancies in responses that could not be aggregated were found between the obstetric and neonatal departments, rather than within the individual departments. In addition, the responsibility of care was analyzed within professional groups to identify potential patterns. One hospital with a perinatal department submitted only a single response, and this response was applied to both the obstetric and neonatal departments in the analysis. The other hospital with a perinatal department submitted answers from both an obstetrician and a neonatal nurse.

For the results of the open-ended questions, we employed a subjective interpretation using conventional content analysis, which involved a process of coding and identifying themes or patterns [30–33]. JNL began the analysis with (1) sorting the text into content areas, (2) reading the open-ended questions multiple times to grasp the overall meaning, (3) combining the text into one document, which served as the unit of analysis, (4) dividing the text into meaning units, abstracting and labeling them with codes, (5) comparing the codes based on similarities and differences, and sorting them into subcategories and categories, (6) discussing the tentative categories among all authors and revising them, and finally (7) developing a theme based on the underlying meaning or latent content of the categories.

## 2.6 | Ethics Approval and Consent to Participate

The study was conducted in accordance with the Declaration of Helsinki. Participants were healthcare professionals, and

the study involved no patients or data based on patient information. Approval from the Danish Data Protection Agency was obtained (Journal number P-2022-199). Participation was voluntary. Hospitals were anonymized in data management and publications. This study did not involve human material or alter patients' medical treatment, rendering approval by the Danish National Committee on Health Research Ethics unnecessary (file no. 22029700) following Danish regulations.

## 3 | Results

Of the 34 departments, 31 participated in the study (91%), and seven of these departments submitted more than one questionnaire, resulting in a total of 40 returned questionnaires that covered all 18 hospitals. The tables are presented with 33 departments, since the two perinatal departments are presented with responses from the obstetric and neonatal departments, respectively, as described in the analysis section.

### 3.1 | Characteristics of the Departments and Respondents

Respondents were nearly evenly distributed among the professions of obstetricians, neonatologists, obstetric and neonatal nurses, and midwives. All neonatal departments and almost all obstetric departments responded (Table 1). About half (53%) of the obstetric departments reported having single-family rooms (SFRs), while 72% of neonatal departments had a mix of shared rooms and SFRs (Table 1).

### 3.2 | Organization of Maternal Care and Medical Needs of Mothers in the NICU

In most hospitals, mothers were reported to be able to receive postnatal care in the NICU, with 78% doing so “always” or “often” (Table 2). In more than two-thirds of hospitals, mothers could receive treatment and care in the NICU directly from the delivery room, after a caesarean section, or following anaesthesia for treatment of postpartum bleeding (Table 2). More than 94% of hospitals could provide treatment and care in the NICU for mothers who required blood tests, medication, blood pressure monitoring, psychological support, or assistance with mobilisation. However, only 17% provided treatment and care for mothers needing intravenous magnesium sulfate therapy (Table 2). In 61% of hospitals, the availability of treatment and care for mothers in the NICU was influenced by the workload situation and the staff available. There were inconsistencies in who was responsible for maternal care in the NICU, with NICU respondents often citing obstetric nurses, while obstetric respondents cited shared responsibilities (Table 2).

### 3.3 | Organization of Neonatal Care and Medical Needs of the Newborn in the Obstetric Department

In many hospitals, newborns with mild conditions were reported to be able to receive treatment and care in the obstetric department, with 55% reporting this “always” or “often”

**TABLE 1** | Characteristics of respondents and among Danish Obstetrics and Neonatology departments.

<b>Characteristics of respondents among Danish Obstetrics and Neonatology departments</b>	<b><i>n</i> = 40 (%)</b>	<b>Hospital, <i>n</i> = 18 (%)</b>	<b>Obstetric, <i>n</i> = 15</b>	<b>Neonatal, <i>n</i> = 18</b>
<b>Profession</b>				
Physician (neonatal and obstetric)	12 (30)			
Nurse (neonatal and obstetric)	17 (42.5)			
Midwife	11 (27.5)			
<b>Department</b>				
Obstetric	19 (47.5)			
Neonatal	21 (52.5)			
<b>Rooms</b>				
Single-family rooms (SFR)			8	5
Shared rooms			0	0
Combination of SFR/shared rooms			7	13
<b>Distance neonatal/obstetric</b>				
Next to each other		9 (50.0)		
Not on the same floor of the hospital		11 (61.1)		
In different areas of the hospital ( <i>missing</i> = 1)		2 (11.1)		
Multiple options, so the total exceeds the number of departments responding				

(Table 3). More than 94% of hospitals could provide care in the obstetric department for newborns with mild hypoglycemia, those needing supplementary feeding, and those requiring blood tests (Table 3). However, only 34% reported treating newborns with neonatal jaundice in need of intensive phototherapy. Obstetric nurses were reported to be responsible for the care of these newborns (47%), sometimes shared with neonatal nurses (27%) (Table 3).

### 3.4 | Initiation and Continuation of Mother-Newborn Couplet Care and SSC

Respondents in 61% of the hospitals reported that SSC could be initiated immediately after elective caesarean sections, and 22% immediately after emergency caesarean sections (Table 4). Obstetric departments responded more positively to initiating SSC after elective and emergency caesarean sections than NICUs (Table 4). Respondents in 89% of the hospitals reported being able to initiate and continue SSC and couplet care in the delivery room, operating room (67%), and recovery room (33%), including newborns requiring continuous positive airway pressure (CPAP) (Table 4). Respondents in 61% of the hospitals reported providing in-house transfer of the mother and newborn in continuous SSC, but fewer (22%) reported keeping mothers and newborns together during inter-hospital transfers (Table 4).

### 3.5 | Collaboration Between Departments

The most frequently reported activities across obstetric and neonatal departments were joint meetings and conferences (94%) and joint education (72%). Joint staff rooms were reported in the two perinatal departments (11%) (Table 5). Strategies to improve communication included managerial collaboration, shared inter-professional monthly meetings discussing vulnerable mothers and late-preterm newborns, daily briefings, mutual participation in staff meetings, onboarding new colleagues, and shared office spaces. Shared education included, for example, inter-professional simulations, joint resuscitation courses, and equipment training.

### 3.6 | Advantages and Disadvantages of the Existing Practice and Future Plans Related to Couplet Care

We identified the following themes based on analysis of the open-ended questions: (1) Closeness and Separation; (2) Professionalism, Competencies, and Collaboration; and (3) Organisational and physical structures.

#### 3.6.1 | Closeness and Separation

Respondents commented on the importance of physical closeness between mother, newborn, and co-parent as a key benefit

**TABLE 2** | Treatment and care for mothers in the Danish Departments of Neonatology.

<b>Treatment and care for mothers in the Danish Departments of Neonatology</b>	<b>Hospital, n = 18 (%)</b>	<b>Obstetric, n = 15</b>	<b>Neonatal, n = 18</b>
Possible for mothers to receive treatment and care in the NICU			
Always	6 (33.3)	6	3
Often	8 (44.4)	3	9
Some times	3 (16.7)	5	5
Seldom	1 (5.6)	1	1
Never	0 (0)	0	0
Mothers can receive treatment and care in the NICU			
Directly from the delivery room	17 (94.4)	12	15
After a caesarean section	15 (83.3)	13	12
Had an epidural or spinal	16 (88.9)	13	9
Need for a blood test	18 (100)	15	16
Medication other than oral analgesics ( <i>missing = 1</i> )	17 (94.4)	11	17
Preeclampsia	14 (77.8)	8	12
Blood pressure measurement	17 (94.4)	13	17
IV-magnesium	3 (16.7)	3	2
Diabetes, including gestational diabetes	16 (88.9)	11	14
Psychologically vulnerable/psychiatric diagnosis	17 (94.4)	10	17
Postpartum bleeding > 1000 mL	15 (83.3)	11	12
Needing help with mobilisation	17 (94.4)	8	15
Depending on the staff situation ( <i>missing = 1</i> )	11 (61.1)	6	11
Multiple options, so the total exceeds the number of departments responding			
		<b>Obstetric, n = 15 (%)</b>	<b>Neonatal, n = 18 (%)</b>
Responsible for the mother's obstetric care in the NICU			
Neonatal nurse		1 (6.7)	4 (22.2)
Obstetric nurse		4 (26.7)	10 (55.6)
Midwife		2 (13.3)	1 (5.6)
Combination of neonatal nurse/obstetric nurse/midwife		4 (26.7)	3 (16.7)
Depending on the mother's condition		1 (6.7)	0 (0)
Others		3 (20)	0 (0)

of couplet care. Spatial and resource limitations were reported often leading to unintended separation, particularly in complex obstetric and neonatal medical cases. Isolation in single rooms and disruptions of couplet care due to maternal or neonatal complications were noted. Efforts to reduce separation and facilitate immediate/early and continuous SSC were reported as central. Physical and organisational integration of the obstetric and neonatal departments was reported as vital for the continuity of care. The co-parent was also recognised as essential: “The father is an essential piece in the family constellation and makes it possible for the newborn to be

cared for skin-to-skin during the hours when the mother is unavailable” (respondent 17).

### 3.6.2 | Professionalism, Competencies, and Collaboration

Maintaining high standards in both obstetric and neonatal treatment and care was viewed as essential. Interprofessional collaboration and clearly defined roles were reported to support integration of mother–newborn couplet care, but different

**TABLE 3** | Treatment and care for infants in the Danish departments of Obstetrics.

<b>Treatment and care for infants in the Danish departments of Obstetrics</b>	<b>Hospital, n = 18 (%)</b>	<b>Obstetric, n = 15</b>	<b>Neonatal, n = 18</b>
Possible for infants to receive treatment and care in the obstetric department			
Always	4 (22.2)	3	3
Often	6 (33.3)	5	5
Some times	5 (27.8)	2	7
Seldom	2 (11.1)	4	1
Never	1 (5.6)	1	2
Do not know	0 (0)	0	0
Infants can receive treatment and care in the obstetric department			
Mild hypoglycaemia	17 (94.4)	14	15
Phototherapy jaundice	16 (88.9)	14	16
Phototherapy jaundice (intensive)	6 (33.3)	5	3
Bottle- or cupfeeding	18 (100)	15	18
Need for a blood test	18 (100)	15	18
Need for monitoring respiration, pulse, and temperature	10 (55.6)	8	8
Heating mattress	10 (55.6)	9	6
Feeding tube ( <i>missing = 1</i> )	13 (72.2)	10	12
Antibiotic treatment	8 (44.4)	4	8
Weightlimit	18 (100)	15	16
Gestational age limit	18 (100)	15	17
Multiple options, so the total exceeds the number of departments responding			
		<b>Obstetric, n = 15 (%)</b>	<b>Neonatal, n = 18 (%)</b>
Responsible for the neonatal care of infants in the obstetric department			
Neonatal nurse		0 (0)	3 (16.7)
Obstetric nurse		7 (46.7)	9 (50.0)
Midwife		2 (13.3)	0
Combination of neonatal nurse/obstetric nurse/midwife		4 (26.7)	5 (27.8)
Depending on the infant's condition		1 (6.7)	0 (0)
Others		1 (6.7)	0 (0)
Do not know		0 (0)	1 (5.6)

professional cultures and separate training were seen as barriers to this. Obstetric care was sometimes deprioritized in neonatal departments, since neonatal nurses' focus was primarily on the newborn. One respondent stated:

It is our perception that it is essential to retain highly skilled nurses... Therefore, we adhere to the principle of having two specialised nurses—one for the mother and the healthy newborn, and one for the sick or possibly premature newborn.

(respondent 11)

### 3.6.3 | Organisational and Physical Structures

Organisational and physical structures were reported to have a strong influence on the integration of mother-newborn couplet care. This included financial divisions, policy rigidity, and physical limitations. In some cases, family rooms and couplet care facilities were planned but ultimately failed to function as intended due to structural constraints such as limited staff, lack of competencies, or unclear perceptions of responsibility. Some highlighted organisational issues: (*Barriers to couplet care are*) "That we have separate structures and economies... and that the staff in the obstetric department are

**TABLE 4** | Initiation and continuation of skin-to-skin contact (SSC) and mother-newborn couplet care among departments of Obstetrics and Neonatology in Denmark.

<b>Initiation and continuation of skin-to-skin contact (SSC) and mother-newborn couplet care among departments of Obstetrics and Neonatology in Denmark</b>	<b>Hospital, n = 18 (%)</b>	<b>Obstetric, n = 15</b>	<b>Neonatal, n = 18</b>
Possible for the mother/infant to begin early SSC after elective caesarean section			
Always	11 (61.1)	10	3
Often	6 (33.3)	5	11
Some times	1 (5.6)	0	2
Seldom	0 (0)	0	1
Never	0 (0)	0	0
Unknown	0 (0)	0	1
Possible for the mother/infant to begin early SSC after emergency caesarean section			
Always	4 (22.2)	4	1
Often	11 (61.1)	9	6
Some times	2 (11.1)	2	5
Seldom	1 (5.6)	0	2
Never	0 (0)	0	1
Unknown	0 (0)	0	3
Possible for mother/infant to start and continue SSC/couplet care			
In the delivery room	16 (88.9)	13	14
In the operating room after a caesarean section	12 (66.7)	9	7
In the recovery room	6 (33.3)	4	7
We cannot offer SSC/couplet care in the delivery/operating/recovery room	5 (27.8)	2	3
None of the above	3 (16.7)	0	3
Multiple options, so the total exceeds the number of departments responding			
Possible for mother/infant to continue SSC/couplet care during transportation			
Infant and mother SSC in bed the neonatal ward	11 (61.1)	8	9
Infant and mother SSC in a wheelchair to the neonatal ward	7 (38.9)	5	6
Infant and mother SSC from hospital to hospital	4 (22.2)	1	3
We cannot offer couplet care during transportation	9 (50.0)	5	8
None of the above	3 (16.7)	1	2
Do not know	3 (16.7)	3	0
Multiple options, so the total exceeds the number of departments responding			

under pressure and understaffed” (respondent 2). Concerns were also raised about new hospitals under construction, if the new construction does not provide for the optimal setting for couplet care, resulting in further increasing mother-newborn separation.

#### 4 | Discussion

This study shows that mother-newborn couplet care is to some extent integrated into clinical practice at many hospitals in

**TABLE 5** | Collaboration between the Danish Departments of Obstetrics and Neonatology.

Participants, <i>n</i> = 40	Hospital, <i>n</i> = 18 (%)	Obstetric, <i>n</i> = 15	Neonatal, <i>n</i> = 18
Activities across the neonatal and obstetric ward			
Joint education	13 (72.2)	6	12
Joint meetings/ conferences	17 (94.4)	11	14
Social activities	3 (16.7)	2	3
Joint staff room	2 (11.1)	2	2
Joint ward rounds neonatal/ obstetric	4 (22.2)	4	1
Others	6 (33.3)	4	3
No activities across departments	4 (22.2)	2	3
Multiple options, so the total exceeds the number of departments responding			

Denmark, typically organised with mothers accommodated in the NICU rather than newborns being cared for in the maternity department. SSC is generally initiated early within an interprofessional context and maintained during transfers, likely due to its status as a national quality indicator. However, there are opportunities to improve further SSC initiation and continuation, which is crucial for all newborns, regardless of medical condition or gestational age, and mother-newborn couplet care is one tool to make this possible [13]. Formalised interprofessional education between departments and collaborative activities remain limited. The results indicate an evolving process toward more extensive collaborations. Our results indicate a trend toward decreasing separation between mother and newborn in Denmark compared to data from an international study based on data from 2018, which found that maternal-newborn separation remains the norm if one or both require specialised medical care [34].

In this study, we selected the most favourable response regarding mother-newborn couplet care, which reflects a perceived opportunity, implying that some hospitals and departments seem to be more prepared to adopt this model of care. Our study found that mother-newborn couplet care was reported to be integrated to some extent in most Danish hospitals; however, not for all mother-newborn pairs, as the degree of medical needs influences its feasibility. These data can be

compared to reports from 2023, which indicate that approximately half of Swedish hospitals and two-thirds of Finnish hospitals had implemented mother-newborn couplet care to some extent [16].

In our study, barriers and facilitators to couplet care were linked to organisational and physical structures, professional roles and responsibilities, competencies, and interprofessional collaboration. These findings are consistent with those of Veenendaal et al., who identified culture, collaboration, capacities, and coaching as key themes influencing the implementation of couplet care [34]. Mother-newborn couplet care is a complex intervention requiring interprofessional collaboration, new competencies, and cultural changes across clinical settings. Implementation studies generally find that successful implementation depends on an organization's readiness for cultural and structural change, a process that develops over time and must be carefully accounted for during planning [35]. The planning process should include a NICU design that fully facilitates couplet care.

We identified differences between responses from obstetric departments and NICUs in the same hospital concerning the primary responsibility for maternal and neonatal care and treatment. While the study cannot determine the underlying reasons for the observed differences, the findings raise concerns that unclear delineation of responsibility may contribute to misunderstandings and miscommunication in the care of both mothers and newborns. Collaboration on national and regional guidelines is necessary to support patient safety and workflow when implementing couplet care [26].

Our study found that the likelihood of offering couplet care was closely linked to the complexity of the medical needs. Mothers requiring less intensive treatment and care were reported to be likely to receive couplet care in the NICU with their newborns. Newborns needing less specialised treatment and care were reported to be able to remain in the obstetric department with their mothers. Most studies about couplet care have excluded the medically complex mothers or newborns. For instance, an American Level 4 NICU described its experiences in implementing couplet care, limited to newborns and mothers with less complex medical needs [24]. Some hospitals, however, succeed in implementing mother-newborn couplet care despite the medical complexity, as described in Itoshima's 2024 study, which evaluated the effect of couplet care in a level III NICU [36]. The study found earlier initiation of SSC, parents being more active in care, and more often being close to their newborn during nighttime. Key initiatives included prioritising minimal separation, staff rotation between obstetrical and neonatal units, and interprofessional education.

Respondents in our study reported that maternal care was often deprioritized in NICUs, leading to concerns about compromised maternal care quality. Similar concerns were reported in Curley et al.'s integrative review from Australia, which identified a lack of confidence, competence, and worries about maternal and newborn safety as barriers to couplet care [37]. These findings align with the conclusions of a Danish study that identified key concerns for couplet care, including patient safety and the quality of treatment and care [26].

## 4.1 | Strengths and Limitations of the Study

A high response rate of 91% among all departments, combined with participation from every hospital with at least one response, strengthened the validity of the findings and reduced potential selection bias. The leadership of the included department in Denmark helped ensure a high participation rate. They provided management support when answering themselves or pointing out another relevant healthcare professional to answer, but this might also put pressure on the appointed participants to respond. Our quantitative data was explained and contextualised by our qualitative findings, reducing the risk of misinterpreting numbers without context. However, it is challenging in a survey to fully capture and describe how care is provided and varies across departments. The interprofessional author group contributed their clinical and theoretical knowledge to planning the study and interpreting the results. Investigator triangulation increased the study's credibility, and our description of the participants and context increased transferability. In addition, participant quotes improved dependability, and our description of the sampling, data collection, and analysis increased the study's confirmability [38].

A limitation of the study is that responses may reflect primarily a leadership perspective, which could differ from those of frontline clinicians, as practical, day-to-day challenges may not always align with leadership intentions or policies. Selecting the most favourable assessment among divergent responses from the same department may reflect a perceived opportunity, but could also result in an overly positive portrayal not corresponding with reality. The study did not include anaesthesia departments, which could have provided more insights into barriers and facilitators to early SSC and mother-newborn closeness in the operating theatre and recovery room, since separations are reported to be common when maternal care is needed in these locations [16]. This survey captures data at a single point in time. As mother-newborn couplet care continues to develop, the current status of its integration in clinical practice may shift significantly within a short timeframe. Although the questionnaire items were carefully designed, the variation in responses to specific questions suggested that they may have been subject to differing interpretations, such as those related to responsibility for care. Limiting this study questionnaire to include responses about mother-newborn closeness and separation was deliberate, as we sought specific information about mother-newborn couplet care. However, including questions of co-parents in the study could have broadened our understanding of how and when co-parents are involved in the care, since co-parents/fathers often take a more active role when the physical surroundings support their presence [39].

## 5 | Conclusions

This national survey is the first national description of mother-newborn couplet care practices in obstetric and neonatal departments. Given the complexity of integrating mother-newborn couplet care, this survey contributes valuable knowledge to the field. While most hospitals reported offering couplet care for less complicated mothers and newborns, challenges like structural barriers and gaps in interprofessional collaboration persist.

Mothers and newborns who require less intensive care are more likely to remain together. Mother-newborn couplet care is a tool to initiate and continue skin-to-skin contact (SSC). The reported high level of intention for early initiation of SSC in this study might reflect the low level of separation made possible through the integration of mother-newborn couplet care in many of the Danish hospitals. Many hospitals had common education for staff; however, more structured interprofessional educational programs could further support the concept of mother-newborn couplet care and SSC. This study demonstrated that mother-newborn couplet care is highly integrated into clinical practice in Denmark. To strengthen future initiatives, greater emphasis on collaboration, coordinated care, and education is needed to support consistent couplet care integration. A Nordic survey focusing on facilitators would be interesting.

### Author Contributions

J.N.L., J.L.S., and R.M. designed the study, and H.H., P.P., L.E.N., and S.K. contributed to the questionnaire. J.N.L. collected the data. J.N.L. analyzed the data, and H.H., P.P., J.L.S., H.H., L.E.N., S.K., and R.M. contributed to interpreting the data. J.N.L. drafted the manuscript; all authors critically revised it and approved the final version for publication.

### Acknowledgements

The authors thank all leadership and healthcare professionals in Danish neonatal and obstetric departments who participated in the study.

### Consent

The authors have nothing to report.

### Conflicts of Interest

The authors declare no conflicts of interest.

### Data Availability Statement

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

### References

1. N. J. Bergman, "Birth Practices: Maternal-Neonate Separation as a Source of Toxic Stress," *Birth Defects Research* 111, no. 15 (2019): 1087–1109.
2. S. Brink, *The Fourth Trimester Understanding, Protecting and Nurturing an Infant Through the First Three Months* (University of California Press, 2013), 1–49.
3. N. J. Bergman, "New Policies on Skin-to-Skin Contact Warrant an Oxytocin-Based Perspective on Perinatal Health Care," *Frontiers in Psychology* 15 (2024): 1385320.
4. C. Sahlén Helmer, U. Birberg Thornberg, A. Frostell, A. Örtenstrand, and E. Mörelus, "A Randomized Trial of Continuous Versus Intermittent Skin-to-Skin Contact After Premature Birth and the Effects on Mother–Infant Interaction," *Advances in Neonatal Care* 20, no. 3 (2020): E48–E56.
5. A. Linnér, K. Lode Kolz, S. Klemming, et al., "Immediate Skin-to-Skin Contact May Have Beneficial Effects on the Cardiorespiratory Stabilisation in Very Preterm Infants," *Acta Paediatrica* 111, no. 8 (2022): 1507–1514.

6. A. Conde-Agudelo, J. L. Díaz-Rossello, and A. Conde-Agudelo, "Kangaroo Mother Care to Reduce Morbidity and Mortality in Low Birth-weight Infants," *Cochrane Database of Systematic Reviews* 2017, no. 2 (2016): CD002771.
7. S. Arya, H. Naburi, K. Kawaza, et al., "Immediate "Kangaroo Mother Care" and Survival of Infants With Low Birth Weight," *New England Journal of Medicine* 384, no. 21 (2021): 2028–2038.
8. N. J. Bergman, "The Neuroscience of Birth—and the Case for Zero Separation," *Curatationis (Pretoria)* 37, no. 2 (2014): e1–e4.
9. S. Lillieskold, K. Lode-Kolz, S. Rettedal, et al., "Skin-to-Skin Contact at Birth for Very Preterm Infants and Mother-Infant Interaction Quality at 4 Months," *JAMA Network Open* 6, no. 11 (2023): e2344469.
10. K. Lode-Kolz, C. Hermansson, A. Linnér, et al., "Immediate Skin-to-Skin Contact After Birth Ensures Stable Thermoregulation in Very Preterm Infants in High-Resource Settings," *Acta Paediatrica* 112, no. 5 (2023): 934–941.
11. N. R. van Veenendaal, A. A. M. W. van Kempen, B. F. P. Broekman, et al., "Association of a Zero-Separation Neonatal Care Model With Stress in Mothers of Preterm Infants," *JAMA Network Open* 5, no. 3 (2022): e224514.
12. D. Sharma, N. Farahbakhsh, S. Sharma, P. Sharma, and A. Sharma, "Role of Kangaroo Mother Care in Growth and Breast Feeding Rates in Very Low Birth Weight (VLBW) Neonates: A Systematic Review," *Journal of Maternal-Fetal & Neonatal Medicine* 32, no. 1 (2019): 129–142.
13. O. World Health, *WHO Recommendations for Care of the Preterm or Low-Birth-Weight Infant: Web Supplement. Evidence Base* (World Health Organization, 2022).
14. WHO, *Global Position Paper. Kangaroo Mother Care. A Transformative Innovation in Health Care 2023* (WHO, 2023).
15. WHO, *Kangaroo Mother Care – Implementation Strategy for Scale-Up Adaptable to Different Country Contexts* (WHO, 2023).
16. S. Klemming, S. Lilliesköld, S. Arwehed, W. Jonas, L. Lehtonen, and B. Westrup, "Mother-Newborn Couplet Care: Nordic Country Experiences of Organization, Models and Practice," *Journal of Perinatology* 43, no. 1 (2023): 17–25.
17. L. R. Spradlin, "Implementation of a Couplet Care Program for Families After a Cesarean Birth," *AORN Journal* 89, no. 3 (2009): 553–562.
18. M. Stelwagen, A. van Kempen, A. Westmaas, E. Vet, and F. Scheele, "Parents' Experiences With a Model of Integrated Maternity and Neonatal Care Designed to Empower Parents," *Journal of Obstetric, Gynecologic, and Neonatal Nursing* 50, no. 2 (2021): 181–192.
19. C. S. Baker and S. T. Naumann, "Transitioning to Couplet Care," *Journal of Obstetric, Gynecologic, & Neonatal Nursing* 44, no. s1 (2015): S27–S28.
20. V. Brockman, "Implementing the Mother-Baby Model of Nursing Care Using Models and Quality Improvement Tools," *Nursing for Women's Health* 19, no. 6 (2015): 490–503.
21. M. P. Duggan, "Keeping Compromised Neonates and Mothers Together in Integrated Neonatal Intensive Care," *Journal of Obstetric, Gynecologic, and Neonatal Nursing* 46, no. 3 (2017): S4–S5.
22. L. Grubbs and B. H. Cottrell, "Nurses' Attitudes and Concerns About Couplet Care," *Nursing Management* 27, no. 1 (1996): 54–56.
23. S. Klemming, S. Lilliesköld, and B. Westrup, "Mother-Newborn Couplet Care From Theory to Practice to Ensure Zero Separation for All Newborns," *Acta Paediatrica* 110 (2021): 2951–2957.
24. B. Redmond, T. Gambardella, and C. J. Bruno, "Reimagination Through Renovation: Incorporating Couplet Care in a Level 4 Academic NICU," *Journal of Perinatology* 43, no. Suppl 1 (2023): 26–29.
25. J. Salaberry, V. Hait, K. Thornton, et al., "Journey to Mother Baby Care: Implementation of a Combined Care/Couplet Model in a Level 2 Neonatal Intensive Care Unit," *Birth Defects Research* 111, no. 15 (2019): 1060–1072.
26. J. N. Larsen, L. E. Navne, H. Hansson, et al., "Mother–Newborn Couplet Care and the Expectations, Concerns and Educational Needs of Healthcare Professionals: A Qualitative Study," *BMJ Open* 14, no. 12 (2024): e086572.
27. K. Patriksson and L. Selin, "Parents and Newborn 'Togetherness' After Birth," *International Journal of Qualitative Studies on Health and Well-Being* 17, no. 1 (2022): 2026281.
28. A. R. Stark, "Levels of Neonatal Care," *Pediatrics* 114, no. 5 (2004): 1341–1347.
29. D. A. Story and A. R. Tait, "Survey Research," *Anesthesiology* 130, no. 2 (2019): 192–202.
30. H.-F. Hsieh and S. E. Shannon, "Three Approaches to Qualitative Content Analysis," *Qualitative Health Research* 15, no. 9 (2005): 1277–1288.
31. L. Bardin, *Content Analysis*, vol. 70 (Edições, 2011), 279.
32. K. Malterud, "Systematic Text Condensation: A Strategy for Qualitative Analysis," *Scandinavian Journal of Public Health* 40, no. 8 (2012): 795–805.
33. U. H. Graneheim and B. Lundman, "Qualitative Content Analysis in Nursing Research: Concepts, Procedures and Measures to Achieve Trustworthiness," *Nurse Education Today* 24, no. 2 (2004): 105–112.
34. N. R. Veenendaal, N. H. M. Labrie, S. Mader, A. A. M. W. van Kempen, S. R. D. van der Schoor, and J. B. van Goudoever, "An International Study on Implementation and Facilitators and Barriers for Parent-Infant Closeness in Neonatal Units," *Pediatric Investigation* 6, no. 3 (2022): 179–188.
35. K. Skivington, L. Matthews, S. A. Simpson, et al., "A New Framework for Developing and Evaluating Complex Interventions: Update of Medical Research Council Guidance," *BMJ (Clinical Research Ed.)* 374 (2021): n2061.
36. R. Itoshima, K. Korhonen, A. Axelin, S. Ahlqvist-Björkroth, A. Hovi, and L. Lehtonen, "Effect of Couplet Care on Early Parent-Infant Closeness Among Preterm Infants," *Acta Paediatrica* 114, no. 5 (2025): 903–912.
37. A. Curley, L. K. Jones, and L. Staff, "Barriers to Couplet Care of the Infant Requiring Additional Care: Integrative Review," *Healthcare (Basel)* 11, no. 5 (2023): 737.
38. A. K. Shenton, "Strategies for Ensuring Trustworthiness in Qualitative Research Projects," *Education for Information* 22, no. 2 (2004): 63–75.
39. J. N. Larsen, H. Hansson, S. A. Beck, and V. Zoffmann, "Single-Family Rooms in Neonatal Intensive Care: A Qualitative Analysis of Fathers', Mothers' and Nurses' Experiences," *Journal of Neonatal Nursing* 30, no. 6 (2024): 725–730.