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Original research article

SPECIFICS OF NURSING CARE FOR A HEALTHY NEWBORN AFTER A CAESAREN SECTION

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Abstract

Goals: This study aims to describe and compare nursing care for healthy newborns after caesaren sections, focusing on how the mode of delivery influences maternal involvement, the initiation of breastfeeding, and the overall hospital stay.

Methods: The research is based on a qualitative analysis of semi-structured interviews with ten nurses working in neonatal units at two hospitals in the South Bohemian Region of the Czech Republic. Data were analysed using open coding and the categorisation of recurring themes.

Results: The findings indicate that newborns delivered via caesaren section generally require more nursing support, as mothers are often fatigued and less able to provide immediate infant care. Breastfeeding tends to begin later, and maternal education on newborn care may be delayed. Early bonding between mother and child can encounter more challenges. Additionally, fathers frequently assume a more active role in newborn care during this time.

Conclusion: This study highlights the importance of an empathetic and flexible nursing approach to ensure a successful start to motherhood, regardless of the delivery method.

Keywords: *Childbirth; Caesaren section; Newborn; Nursing care; Pediatric nurse*

INTRODUCTION

A caesaren section is a surgical method of delivery where the baby is removed through incisions made in the mother's abdomen and uterus (Cunningham et al., 2022). In this study, the focus was on caesarean sections performed under spinal anesthesia, although the procedure can also be done under general anesthesia. Caesaren sections are classified as planned, urgent, or emergency, depending on the situation (Procházka et al., 2020). After birth, the newborn undergoes essential adaptation processes to transition from the womb to the outside world, including lung aeration, the onset of spontaneous breathing, and circulatory changes (Hooper et al., 2019). During the first few days after birth, several natural physiological processes take place, including the passage of meconium and the first urination. Healthy term neonates typically pass meconium within 24 to 48 hours after birth, which is considered a key indicator of normal gastrointestinal function (Skelly et al., 2023). Newborn health and adaptation are typically assessed using the Apgar score, which evaluates heart rate, respiration, muscle tone, reflexes, and skin color at 1, 5, and 10 minutes after birth, with each parameter scored on a scale of 0–2 points (Simon et al., 2024). Bonding refers to early and uninterrupted contact between mother and baby, its most important form being skin-to-skin contact, which is very important for initiating breastfeeding and increases the rate of exclusive breastfeeding (Martínez-Hortelano et al., 2025). After caesaren section, the baby is dried and covered with a warm sterile cloth to prevent heat loss (Procházka et al., 2020). If the mother is stable, the baby may be placed

on her chest in the operating room, enabling early skin-to-skin contact, which is crucial for successful breastfeeding initiation and increases the chance of exclusive breastfeeding during hospitalisation (Martínez-Hortelano et al., 2025).

A doctor is always there during a caesaren section to ensure both the surgery and the baby are safe. Immediately after birth, the baby is usually handed to a neonatal nurse or doctor who takes care of the baby and helps them adjust to life outside the womb. This care encompasses promoting bonding, clamping the umbilical cord, collecting cord blood, minimising heat loss, ensuring airway patency, identification, and preventing neonatal conjunctivitis and bleeding disorders (Fendrychová, 2021).

On the first day following surgery, the nursing staff typically looks after the newborn and brings the baby to the mother at regular intervals. Supporting breastfeeding and involving the mother in newborn care is crucial (Procházka et al., 2020). Once the mother's condition allows, rooming-in begins, allowing the baby to remain with the mother at all times. Although most newborn care is consistent regardless of delivery type, mothers after caesaren section often need more support (Fendrychová, 2021).

MATERIALS AND METHODS

This qualitative study employed semi-structured interviews with nurses from delivery rooms and neonatal units for healthy newborns in two hospitals located in the South Bohemian Region. Ten nurses participated, each with experience in caring for newborns after caesaren sections. In the first hospital, where the delivery rooms and newborn wards are connected, three nurses described the entire care process from birth to discharge. In the second hospital, where these units are staffed separately, seven nurses participated, three from the delivery rooms and four from the healthy newborn ward.

The semi-structured interviews lasted between 17 and 30 minutes and were conducted in a quiet setting to ensure privacy. The interview guide included open-ended questions focusing on the specifics of newborn care after caesarean delivery, maternal involvement, breastfeeding initiation, and differences in daily nursing practice compared to spontaneous birth. All nurses were encouraged to elaborate on their answers freely.

Data analysis

The data were analysed using a qualitative analysis based on open coding, performed manually. Each interview transcript was read several times to achieve familiarisation with the content. Key phrases and meaningful segments were highlighted and assigned initial codes that represented the essence of the nurses' statements. The coding was carried out using the traditional "pen and paper" technique, which allowed close interaction with the data and the identification of recurring ideas.

Similar codes were subsequently grouped into subcategories, which were refined through repeated comparison and discussion. Areas where the nurses' responses most frequently converged were used to form the final analytical categories. These categories were then arranged in a logical order corresponding to the continuum of nursing care; from the delivery room to the healthy newborn ward.

To ensure credibility, the coding and categorisation process was reviewed and discussed with a second researcher. All interviews were conducted in Czech and later translated into English for publication, with careful attention paid to preserving the original meaning and nuance of the participants' statements.

Two main categories emerged: Differences in newborn care by delivery type in delivery rooms (Table 1), and Differences in newborn care by delivery type in the healthy newborn ward (Table 2).

Table 1 – Differences in newborn care by type of delivery in the delivery room (Category 1)

Spontaneous birth	Caesaren section
Immediate skin-to-skin contact, bonding for two hours with parents	Bonding in the operating room with the mother is shorter, often replaced by contact with the father, and delayed bonding
Early attachment to the breast	The application is typically postponed to the postoperative room, rarely in the operating room
A child is with the mother immediately	Child with mother for a short time, followed by separation
The doctor is not present at the birth unless complications occur	The doctor is always present
Initial and final treatment based on the parents' wishes	The final treatment has a specific timing
Transporting a newborn simultaneously with the mother	Transporting a newborn separately from the mother

Table 2 – Differences in newborn care by type of delivery in the healthy newborn ward (Category 2)

Spontaneous birth	Caesaren section
Reduced reliance on the assistance of nurses	Increased reliance on nursing assistance
Faster mobilisation of the mother	Extended mobilisation time
Early interaction with the child	Separation of a newborn from its mother
Comprehensive education should be provided as soon as possible, depending on the mother's condition	Basic education in the postoperative room; complete education was delayed
Father's role in newborn care	The father can take over the basic care of the newborn from the mother
More rapid onset of lactation	Delayed lactation
Reduced hospitalisation	Extended hospitalisation

RESULTS

Bonding and first breastfeeding

One of the main questions asked during the interviews was: *"When is the newborn first put to the breast? How does bonding between the mother and newborn take place? Does the timing and procedure differ between spontaneous vaginal birth and caesaren section?"*

All nurses interviewed (S1–S6) reported that after a spontaneous vaginal birth, immediate skin-to-skin contact with the mother takes place, typically lasting up to two hours if both mother and newborn are clinically stable. After a caesarean section, bonding is also encouraged, but full contact in the operating room is often not possible due to the mother's condition and the layout of the operating theatre (S1–S3). In such cases, a so-called "rapid bonding" period of around five minutes is usually performed. Nurse S5 noted: *"If the mother feels up to it and is okay, and of course the baby is too, bonding in the room can easily last for 20 minutes. A lot depends on the child's adaptation and the mother's feelings."*

After a spontaneous birth, nursing staff prioritise the early initiation of breastfeeding, ideally within the first hour of life. In cases of caesaren delivery, the first breastfeeding session is typically postponed until the postoperative recovery phase, often after the mother has been transferred to the recovery area or post-anesthesia care unit or following a brief observation period for the newborn.

First newborn care

During the interviews, nurses were asked: *"Describe in detail your actions and inter-*

ventions during spontaneous birth and during caesarean section. How is the care of the newborn from birth to transport to the healthy newborn ward in both cases?"

All nurses (S1–S6) reported that the main differences in initial newborn care between spontaneous vaginal birth and caesarean section lie in the timing and location of interventions. After a spontaneous vaginal delivery, the newborn is placed immediately on the mother's chest for skin-to-skin contact and dried with a warm cloth. Delayed umbilical cord clamping is performed, followed by clamping or securing the cord. Cord blood collection is carried out similarly in both delivery types. The initial assessment is conducted by neonatal nurse, and if the newborn is stable, a full examination by the doctor is performed shortly afterward.

Following a caesarean section, initial care occurs primarily on the operating theatre, after a brief bonding period with the mother. Key procedures (drying, identification with an ID bracelet, checking rectal patency, umbilical stump care) are the same in both delivery types but differ in timing and location. Bonding and further care may then continue with either the mother or the father, depending on the situation and parental preferences, including temporary replacement of the mother by the father for skin-to-skin contact (S1–S6).

Final care, performed either after the initial bonding period or according to parental wishes, includes cleaning, dressing, umbilical care, conjunctival sac disinfection, and vitamin K administration (S1–S6). As Nurse S3 emphasized: *"We have given procedures, but we also have to follow the wishes of the parents, some of whom, for example, do not want to put eye drops in their child's eyes."*

Transport of the newborn and mother to the postnatal ward for healthy newborns

The nurses were asked to describe *"When and under what conditions a newborn is transported to the healthy newborn ward?"* All nurses (S1–S6) agreed that after a vaginal birth, transport to the newborn unit depends on the mother's condition: some mothers walk while carrying the baby, others are moved in a wheelchair while holding the baby, or the baby is transported separately in a cot. Following caesaren section, transportation largely depends on the mother's health status. The newborn is typically placed in an observation incubator for monitoring before being transferred to the ward.

Care of the mother and newborn

During the interviews, nurses were asked: *"What specific interventions do you perform on newborns after their arrival at the healthy newborn station? How is newborn care ensured if the mother is unable to care for the baby immediately after birth?"*

Upon admission to the ward, the identification bracelets of both the mother and newborn are checked to prevent any mix-up. The newborn's overall condition is assessed, including skin appearance, signs of adaptation, and vital parameters. Some units conduct pulse oximetry screening between 6 and 12 hours of life (S2, S8, S9, and S10).

After vaginal birth, the newborn is usually placed in the mother's room right away, where thorough education on newborn care (including diapering, umbilical stump care, thermal comfort, breastfeeding, ward orientation, and call system usage) is provided.

After caesaren section, bonding is typically delayed until the newborn is transferred to the ward. Basic education is offered during the mother's postoperative period. The newborn often stays in an observation box initially, allowing the mother to rest. Active maternal involvement in care usually begins on the second postoperative day.

Father involvement in newborn care is possible regardless of the type of delivery. After a caesaren section, fathers can take a more active role, particularly if the mother is unable to fully care for the baby initially. Fathers are guided in basic newborn care and may temporarily assume the mother's caregiving responsibilities. Nurse S8 noted: *"If the father wants, we will take him through the entire education, except for breastfeeding, of course. And the extent of the care provided then depends on him."*

Lactation and feeding methods

We also asked the nurses: *"What differences do you observe in lactation support in mothers after spontaneous birth and after caesaren section? What factors influence the success of lactation in these cases and what do you consider to be key to its success?"*

Feeding methods before full lactation differs among units and may include donated breast milk and formula provided through finger or tube feeding, with bottle feeding being uncommon. Lactation onset may be slightly delayed following caesaren section due to temporary mother-infant separation, although the difference is generally minimal. While according to nurse S1, there is no significant difference in the onset of lactation between spontaneous birth and caesaren section today, thanks to early contact between mother and child. On the contrary, nurses S2, S3, and S8 still note a slight delay in women after caesaren section.

Support for breastfeeding includes frequent feeding attempts and the implementation of rooming-in practices. Choosing a comfortable breastfeeding position is essential; after a caesaren section, pain may hinder this, so supportive aids such as breastfeeding pillows are advised. For the first day after birth, nurses S1 and S2 recommend a sitting or semi-sitting position with the legs propped up, while nurses S7, S8, S9, and S10 prefer a side-lying position. The so-called side football position also appeared in the responses, which is particularly suitable for women after a caesaren section but can also be used by women after a spontaneous birth.

Length of hospital stay

The last questions of the interview were: *"What is the usual length of hospitalisation for a newborn? How does the type of birth affect the length of hospitalisation?"* All the nurses' answers were clear: after a vaginal birth, the hospital stay typically lasts 3 to 4 days, with the possibility of earlier discharge depending on agreement and clinical condition. In contrast, after a caesaren section, the hospital stay is usually longer, averaging around five days due to maternal recovery and potential delayed lactation. However, discharge on the fourth day is possible if the conditions are favourable.

DISCUSSION

The first category examines differences in newborn care according to delivery method in a delivery room setting – specifically bonding, initial breastfeeding, newborn care, and transportation. All nurses surveyed in this study reported that skin-to-skin contact is common after spontaneous deliveries and typically lasts about two hours, provided both the mother and child are in suitable condition. This practice aligns with WHO recommendations, which regard bonding as essential for the newborn's adaptation and promoting breastfeeding (Ministry of Health of the Czech Republic, 2020).

After a caesaren section, conditions for full bonding are often limited. Smaller hospitals, in particular, may lack the space or staff in operating rooms to allow for extended contact, resulting in brief or "rapid bonding" of just a few minutes. Even short interactions can be beneficial, though they fall short of recommended standards. Nurses reported making efforts to ensure at least eye contact or brief physical closeness when full bonding is not possible.

These findings are consistent with those of Xu et al. (2024), who demonstrated in a randomised controlled trial that initiating uninterrupted skin-to-skin contact within 10 minutes after caesaren delivery and maintaining it for at least 90 minutes led to significantly improved breastfeeding outcomes and reduced neonatal complications. While such implementation may be challenging in practice, especially under staff constraints, it offers clear clinical benefits and aligns with the observed interest among Czech nurses in enhancing post-caesaren bonding practices.

Nurses also emphasised that the involvement of fathers and the start of breastfeeding are closely tied to the delivery type. After a spontaneous vaginal birth, mothers typically have the opportunity to provide their newborn with skin-to-skin contact immediately and to initiate breastfeeding within the first hour of life. This early interaction supports maternal-infant bonding, and contributes to a more positive birth experience and earlier lactation (Belešová et al., 2025). Midwives and nurses are in a unique position to assess attachment and to promote attachment behaviours (Mazúchová et al., 2021).

In the case of caesaren section, however, first contact is usually delayed until the mother reaches the recovery room. Nurses described how fathers frequently assume a more active caregiving role during this time. This matches the observations of Belešová

et al. (2025), who noted that fathers often step in when the mother is temporarily unavailable, engaging in skin-to-skin contact, holding, or speaking to the newborn – actions that can meaningfully contribute to early bonding. A study by Mortensen et al. (2025) showed that the father played a central role, especially when mothers were immobile following caesarean section. These results emphasise the importance of attending to fathers mental health in the situation.

Consistent with Procházka et al. (2020), nurses reported that the so-called "golden hour" is not always fully utilised following a caesaren birth. When maternal and neonatal conditions permit, some facilities are beginning to place the baby on the mother's chest in the operating room. Still, nurses acknowledged that such practices remain inconsistent and often depend on staffing, room layout, and surgical workflow.

According to the nurses interviewed, newborn care procedures in the first minutes of life do not differ significantly between delivery types in terms of content. Drying, identification, checking rectal patency, weighing, and sometimes length measurement are performed in both cases. However, the timing and location of these procedures vary. For example, one hospital routinely measures newborn length, unless it is a breech birth or the parents request otherwise. This aligns with Dort's et al. (2018) recommendation to postpone this step until discharge, although such guidance has not yet been widely implemented in clinical practice.

Final treatment includes disinfecting the conjunctival sac, administering vitamin K, and dressing the newborn. After spontaneous delivery, these procedures are typically performed within two hours, while after a caesaren section, their timing depends on when bonding concludes. According to Jullien (2021), vitamin K should be given after birth, ideally within the first hour. The standard and most reliable method is a single dose of 1mg, while oral regimens can be used if injection is declined, but they require multiple doses and strict adherence.

The transport of the newborn to the healthy newborn ward varies based on the type of delivery. As reported by Dokoupilová and Gregora (2021), after a spontaneous delivery, the woman and her baby stay in the delivery room for about 1–2 hours for bonding. After a caesaren section, the newborn is initially placed in an observation box, where the father may also be present. After two hours, the baby is moved to the postpartum ward. In the case of a caesaren section, the mother is typically transferred before the baby, leading to a temporary separation.

The second category, Differences in newborn care according to type of delivery in the healthy newborn ward, focuses on the specifics of nursing care for newborns after caesaren sections. All nurses surveyed confirmed that care primarily depends on the health of the mother and child. Upon admission, identification bracelets are always checked to ensure that the child is clearly linked to the mother (Fendrychová, 2021). This is followed by a visual assessment of the newborn's condition, including an evaluation of the skin, adaptation, and physiological functions. One of the nurses pointed out: "It is necessary to monitor the adaptation processes in newborns, especially those after a caesarean section. They have not gone through the physiological process of birth, which helps to expel amniotic fluid from the lungs, so some problems may arise." In some workplaces, POX testing is performed as part of the screening – measuring oxygen saturation and perfusion index with a pulse oximeter on the right upper and one lower limb between 6 and 12 hours of life. This parameter is important for assessing the newborn's circulatory system (Institute of Health Information and Statistics of the Czech Republic (2021).

After a spontaneous delivery, the baby can be in the room with the mother immediately after transport, provided her condition is stable. Nurses then provide education that includes handling the newborn, caring for the umbilical stump, changing diapers, thermoregulation, and breastfeeding, as reported by Kachlová et al. (2022). As nurse S8 pointed out: "Education is a prerequisite for the mother to have her baby with her. No information can be postponed; the mother simply has to know how to change, dress, and feed the baby."

Following a caesaren section, full bonding is typically only achievable after the baby has been transferred to the ward. The duration of the mother's stay in the post-operative room depends on her condition. In this case, edu-

cation focuses solely on safely holding the newborn, ensuring clear airways, and proper latching onto the breast. The baby remains in the observation box for the first 24 hours but contact with the mother is permitted based on current circumstances, always in the presence of a nurse (Dokoupilová and Gregora, 2021).

On the second day after a caesaren section, the mother is transferred to a standard room, where she becomes more actively involved in the care of her newborn and receives comprehensive education. This rooming-in model has been shown to produce more effective outcomes.

Education continues even after spontaneous delivery, particularly when the newborn is bathed for the first time on the second day, necessitating further education for the mother. As Kachlová et al. (2022) state, it is recommended to postpone the first bath for at least 24 hours to preserve the vernix. The interviews confirm that, in practice, bathing typically occurs on the second day of life. While the mother is immediately involved after a spontaneous delivery, she usually does not actively participate until the third day after a caesaren section.

The father can also take part in caring for the newborn, which is especially beneficial when the mother has booked a premium room after a caesaren section. Nurses confirmed that the father can receive comprehensive education and assume most of the care responsibilities if he expresses interest. The only exception is breastfeeding in the post-operative room under the supervision of a nurse. According to the nurses interviewed, educated and confident fathers often step in to support the newborn during the mother's initial recovery, especially when the mother is unable to provide full care due to postoperative limitations. This active involvement of the father not only benefits the newborn but also contributes to a more positive overall birth experience. These findings are supported by Ratislavová et al. (2023), who identified the presence of a close person during childbirth as a statistically significant factor influencing women's satisfaction with birth. Their study showed that women accompanied by a partner or another trusted person during delivery reported higher levels of satisfaction, particularly in terms of emotional support and perceived quality of care. Providing fathers with adequate guidance and involving them actively in early care thus plays an important psychosocial role, especially in the context of caesaren section.

The onset of lactation is a highly individual process influenced by various factors, including the type of delivery. According to nurses, lactation typically begins on the third day after birth, which is also confirmed by Roztočil et al. (2020). Frequent breastfeeding plays a crucial role in its development. Until milk production stabilises, it is essential to ensure an appropriate method of supplementary feeding (S7). Both donated breast milk and formula are utilised.

In one of the departments, the preferred method of supplementary feeding involves using a syringe on the finger, which, according to Karabayir et al. (2022), is only suitable for cases of temporary interruption of breastfeeding or when the baby is currently unable to suckle. In the other department, the favoured approach is to use a tube on the breast, which promotes suckling from the nipple while allowing for supplementary feeding. This method is particularly recommended in instances of delayed lactation or weak suckling (Kachlová et al., 2022). Based on the nurses' experience, bottles are used only in exceptional cases, as they could negatively impact proper breastfeeding technique.

There are slight differences in opinions regarding the influence of delivery type on lactation. According to nurse S1, the type of delivery no longer plays such a crucial role, as mothers have the chance to bond with their babies very early on. In contrast, nurses S2, S3, and S8 still notice a slight delay in the onset of lactation following a caesaren section. However, they agree that the differences are significantly smaller today than in the past. Frequent breastfeeding and early skin-to-skin contact have been shown to improve lactation outcomes even after caesaren section, as demonstrated by Xu et al. (2024), who reported significantly earlier onset of lactogenesis II and longer initial breastfeeding in the group receiving uninterrupted contact.

Another important factor influencing the success of breastfeeding is choosing the right position. This depends not only on the shape of the breasts and nipples but also on the mother's physical condition after giving birth. Roztočil et al. (2020) recommend trying

as many positions as possible before leaving the maternity hospital. For women who have undergone a caesaren section, choosing an appropriate position is often constrained by pain in the scar area. Therefore, nurses recommend using nursing pillows or other aids to alleviate pressure on the abdominal wall. Nurses S1 and S2 typically prefer sitting or semi-sitting positions with their legs propped up. Nurses S7, S8, S9, and S10 favour breastfeeding while lying down backs.

Mazúchová et al. (2024) recommend using the BSES-SF (Breastfeeding Self-Efficacy Scale) as an effective screening tool. The goal is to identify mothers who have a chance of overcoming breastfeeding problems, are at risk of early breastfeeding termination, need further education and help in the breastfeeding process, and who need further support aimed at increasing their self-efficacy.

Study limitations

The study included only ten nurses from two hospitals, which may limit the generalisability of the findings. Data were collected through semi-structured interviews, relying on participants' perceptions, which may introduce some subjectivity. The focus was exclusively on healthy newborns after caesareans under spinal anesthesia, so the results may not fully reflect care for more complex cases or caesarens sections under general anesthesia. Despite these limitations, we believe the study provides valuable insights into post-caesaren sections nursing care, highlighting maternal involvement, breastfeeding initiation, and early father participation, and helps to improve understanding of newborn care practices.

CONCLUSION

Care for newborns after a caesaren section primarily differs from spontaneous delivery in terms of timing, as bonding and education start later, and lactation begins later. Mothers who have undergone a caesaren section tend to be less self-sufficient initially due to their postoperative condition. Caring for a newborn is more time-consuming and physically demanding for the mother, which results in a longer hospital stay following a caesaren section. This creates higher demands on nurses, who must not only assist with practical tasks but also provide psychological support.

Nurses agree that differences in the care of newborns after spontaneous delivery and caesaren section still exist. However, because of opportunities for early contact with the baby, tailored education, and a greater emphasis on an individualised approach, these differences are significantly smaller. The study's results indicate that adapting care to the specific needs of the woman and the baby is crucial for effectively managing the early postpartum period.

Ethical aspects and conflict of interest

The authors have no conflict of interest to declare.

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