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Implementation of Skin-to-Skin Immediately Post C-Section: A Pilot Study

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Abstract

Skin-to-skin contact during the golden hour is a practice that has numerous health benefits following the delivery of a newborn. These benefits include a healthy transition to extrauterine state, initiation of breastfeeding, thermoregulation, and more. However, the mode of delivery affects how often this practice is done. Parents who deliver vaginally are routinely offered the opportunity to perform skin-to-skin immediately after delivery whereas birth parents who deliver by cesarean section are not always offered this same benefit due to various reasons. A quality improvement project was conducted on an 18-bed labor and delivery unit at a Midwest hospital. This project followed a descriptive, observational, and pre-post-test design. The goal was to evaluate the rates of skin-to-skin contact documented within two hours after birth and the time to initiation of skin-to-skin contact between April and May 2024 on all non-emergent, term cesarean births for one month following implementation of the infant securement device in the OR. The total number of participants for this study was n=32. The results showed that the rates of skin-to-skin increased from an average of 46% between January to April to 70% in May 2024 post-implementation. The results also showed that in April 2024, the time to initiation was approximately 51.50 minutes before implementation and in May 2024, for participants who used the infant securement device, the time to initiation was approximately 12 minutes. These findings yielded positive, significant results with a $p = 0.014$ for the rates of skin-to-skin contact and a $p<0.001$ for the time to initiation of skin-to-skin contact.

Keywords: infant securement device, skin-to-skin contact, time to initiation

Implementation of Skin-to-Skin Immediately Post C-Section: A Pilot Study

Skin-to-skin contact (SSC) is a beneficial practice following birth. The time right after delivery, also known as the golden hour, is a crucial time for bonding. It is defined as the practice of lying a newborn prone on the chest after delivery (Widstrom et al., 2019). This golden hour is a sensitive period in which the birth parent is attracted to the infant's smell, and the infant is attracted to the scent of colostrum, which helps to facilitate a chemical communication (Widstrom et al., 2019). Unfortunately, SSC is not routinely initiated for birth parents and newborns immediately after cesarean births, leaving this patient population deprived of the physiological and emotional benefits that patients experiencing vaginal births are routinely offered (Bertrand & Adams, 2020).

The major health benefits of SSC include ensuring there is a healthy transition to extrauterine state, initiation of breastfeeding, stabilization of blood glucose, thermoregulation, and forming a bond between the birth parent and infant (Feldman-Winter et al., 2016). Recent evidence has found that SSC also aids in calming both the parent and baby, regulates infant heart rate, improves breathing, stimulates digestion, enables colonization of the birth parent's good bacteria, and releases oxytocin, which stimulates milk let-down (Feldman-Winter et al., 2016). These physiological benefits are important for the patient and newborn because they help them transition into new life and parenthood. The American Academy of Pediatrics (AAP) endorses SSC as one of the ten steps to successful breastfeeding and is part of their Baby-Friendly Hospital Initiative (Feldman-Winter et al., 2016).

Unless there is a medical contraindication, SSC is safe to provide for healthy newborns, and when the patient is awake and free of complications. SSC is deemed

compliant if the baby is placed skin-to-skin within two hours after the delivery and is documented in the electronic medical record (EMR). However, SSC is not always offered following cesarean sections (c-sections) with the same consistency as vaginal births. At a local midwestern suburban hospital, EMR data showed that patients who had vaginal births were found to have higher rates of skin-to-skin care practices at 88% in the first quarter of 2024. However, in the first quarter of 2024, data showed that SSC following c-sections was documented at only 46%. These findings indicate opportunities for improvement in the initiation of SSC following c-section births.

The purpose of this pilot quality improvement study was to implement the use of an infant securement device in the operating room to promote skin-to-skin contact immediately after birth for parents who have a cesarean section birth. The project was guided by the Institute for Healthcare Improvement (IHI) Model for Change framework. The primary outcome measure was the rates of skin-to-skin contact. The secondary outcome measure was the time to initiation of skin-to-skin for birth parents who delivered by cesarean section. The question for this study was:

In female patients ages 18-49, who have a cesarean section at a suburban midwestern hospital, following application of an infant securement device in the operating room:

1. What is the rate of skin-to-skin contact within two hours after birth over one month?
2. What is the time to initiation of skin-to-skin care over one month?

Review of Literature

A literature search was conducted using PubMed, Medline (EBSCO), and Mobius. The key search terms and phrases included *postpartum women, skin-to-skin contact,*

cesarean delivery, c-section, benefits, health outcomes, exclusive breastfeeding, the golden hour, and kangaroo care, with the use of the Boolean operators AND and OR. Initially, 6,313 results were generated based on the key search terms and phrases. Inclusion criteria were studies from 2018 to 2023 that were published in English to assure data and evidence currency. The criteria also included full text of randomized controlled trials clinical trials, meta-analyses, systematic reviews, and academic journals. Exclusion criteria were those publications before 2018, non-peer-reviewed journals, and books. After inclusion and exclusion criteria were applied, 309 publications were generated. Of these 309, 10 publications were selected for this review of literature based on the significance of their results.

Skin-to-Skin Practice

A study conducted by Ali et al. (2021) aimed to estimate the prevalence of skin-to-skin and identify factors that facilitate or inhibit skin-to-skin in practice. The researchers used a cluster method that included 100 individuals with maternal factors including age, occupation, education level, and sociodemographic factors (Ali et al., 2021) The intrapartum factors included modes of delivery, and complications post-delivery and the newborn factors included birth size, birth order, and sex of the baby (Ali et al., 2021). The results of the study showed that only 28% of mothers reported skin-to-skin practice (Ali et al., 2021). Rates were higher in mothers who had more prenatal visits and in women who delivered in a public facility compared to home or a private facility. The practice of skin-to-skin was also lower among women who delivered via c-section compared to vaginal birth (Ali et al., 2021). A similar study by Cai et al. (2022) aimed to provide a summary of the barriers and facilitators to implementing kangaroo care (which

is defined as an intervention in which the parent puts the infant on their chest for continuous SSC) (Cai et al., 2022). The authors identified reviews that analyzed data from primary studies (Cai et al., 2022). Five of the main factors addressed were environmental, professional, parental/familial, cultural, and access. This study found that maternal medical conditions, like post-cesarean recovery, were a challenge for implementing kangaroo care.

A cross-sectional study by Ekholunetale et al. (2022) aimed to explore the factors associated with skin-to-skin among women in Nigeria. A total of 29,992 women who gave birth in Nigeria were examined by individual factors, household-level factors, and community-level factors and the effects on skin-to-skin rates during the postpartum period (Ekholunetale et al., 2022). Using a regression model, authors found that skin-to-skin practice at any point postpartum was 12% ($p < .05$). Factors which positively influenced immediate SSC probability included higher education levels, certain religions, socioeconomic status, and some geographic locations. Overall, these three studies brought two conclusions: those who underwent cesarean births experienced lower rates of skin-to-skin practice, and those with higher education levels experienced higher rates of skin-to-skin practice.

Skin-to-Skin and Lactation

SSC is practiced as to aid in initiating breastfeeding. A quasi-experimental study by Iqbal et al. (2022) was conducted to compare kangaroo care with regular practices regarding the occurrence of a successful first breastfeeding and the time to initiate breastfeeding. The study had two different groups of 120 couplets and assessed the effectiveness of feedings which included: readiness to feed, rooting, latching, and sucking pattern (Iqbal et al., 2022). The results found that feedings were more successful with the kangaroo care groups and that the time to initiate breastfeeding was significantly less for

this group ($p = .044$) (Iqbal et al., 2022). The study recommended that kangaroo care should be implemented especially in countries with limited resources and that further training and motivating healthcare providers can help patients consider kangaroo care (Iqbal et al., 2022).

A cross-sectional study by Kamedula et al. (2021), reviewed the type of first infant contact, and any problems during the lactation initiation period. In 256 women who underwent a c-section, the authors measured types and location of contact with the baby after birth: immediate SSC in the operating room, SSC in the recovery room, deferred skin-to-skin after transfer to postpartum, or no SSC. The feeding progress was measured and included supplementation, lactation problems, limited supply, and difficulty latching (Kamedula et al., 2021). The results concluded that there was a positive correlation between the type of first contact and exclusive breastfeeding as well as less supplementation. The authors found that babies who had skin-to-skin initiated in the operating room were supplemented with formula less frequently (Kamedula et al., 2021). This study also indicated that "insufficient breast milk supply is more common in mothers whose SSC with the baby was either absent or delayed" (Kamedula et al., 2021, p. 13). Therefore, there were statistically significant differences between the occurrence of top-up feeding and the type of contact with the mother after birth ($p < .05$) (Kamedula et al., 2021). Furthermore, newborns who received SSC with their mothers demonstrated the best sucking ability (Kamedula et al., 2021).

Skin-to-skin, and its effect on lactation, was reviewed during a qualitative study by Zavala-Soto et al (2022). This study sought out small modifications by including SSC with a surgical technique to describe the improvement of the procedure to make it more centered on women (Zavala-Soto et al., 2022). A new term "prolactation cesarean section" was introduced in this study, which is a c-section that includes SSC procedures. The study included factors such as prenatal care, maternal sociodemographic data, and maternal education level. The outcomes measured were patient satisfaction with their

breastfeeding progress. The results found that 132 of the 150 women participating in the study (88%) had immediate skin-to-skin contact after their cesarean section (Zavala-Soto et al., 2022). These mothers described it as an important part of their overall breastfeeding journeys (Zavala-Soto et al., 2022). One of the strengths of this study was that the initiation of skin-to-skin and breastfeeding was guided and supported by healthcare professionals (Zavala-Soto et al., 2022).

A cohort study by Guala et al. (2017) aimed to examine SSC with the parent in the operating room in the case of a cesarean section and its relationship with the onset and duration of breastfeeding. A sample of 252 women who had c-sections were enrolled with inclusion criteria of greater than 37 weeks gestation, APGAR scoring at 5 minutes was greater than 7, and women who were informed about breastfeeding during pregnancy. In the statistical analysis, the research showed a more pronounced statistical difference between the SSC group with the mother and the group that did not perform SSC ($p < .001$) (Guala et al., 2017). In conclusion, the researchers found that having SSC with the mother appeared to be associated with an exclusive breastfeeding period longer than the other groups (Guala et al., 2017).

Factors Contributing to Delay of Skin-to-Skin Post-C-Section

A study by Boyd (2017) discussed specific factors that impede SSC in the OR. Procedures such as placing the newborn on the warmer immediately after delivery, immediate swaddling of the newborn, maternal side effects from regional anesthesia, and personnel barriers were common factors that contributed to the delay of SSC (Boyd, 2017). In a study by Balatero et al. (2019), there were challenges with initiating immediate SSC in the operating room (OR) related to safety and nursing staffing. The researchers found that providing immediate SSC was not a priority during the c-section by all members of the team in the OR and there were no formal policies or procedures in their facility (Balatero et al., 2019).

A study by Mohammed et al. (2023) aimed to investigate the impact of complications and newborn care practices on the early initiation of breastfeeding within the first hour. Similar to previously reviewed studies, this study included maternal factors such as age, education level, marital status, place of residence, household wealth, and parity (Mohammed et al., 2023). The results showed that women with postpartum complications such as retained placenta and postpartum hemorrhage were less likely to perform SSC or initiate breastfeeding within the first hour (Mohammed et al., 2023). With these findings, the researchers suggested that routine postpartum procedures should be delayed after the golden hour and/or after the first successful feeding (Mohammed et al., 2023). They also recommend further studies to consider the impact and duration of skin-to-skin on routine post-delivery care procedures on breastfeeding initiation (Mohammed et al., 2023).

IHI Framework

The IHI Model for Change framework guided this study. This approach was adopted in healthcare quality improvement in 1931 to help guide change (Kourtis & Burns, 2019). The first step of the Plan-Do-Study-Act cycle is to plan to test the change. This is addressed by determining a healthcare need and seeing what changes can be implemented. The next step is do, which is done by implementing the plan in practice to test the change (Kourtis & Burns, 2019). Study is done by evaluating the impact of the change and getting feedback from individuals affected by the change. Lastly, act is done by making necessary changes and implementing these changes into practice (Kourtis & Burns, 2019). This framework was chosen because it allows for ongoing modifications to be made to reach the goal of improving rates of SSC post-c-sections.

SSC immediately after delivery is an essential practice during the immediate postpartum period. Unfortunately, after cesarean births, birth parents are not receiving SSC at the same rates as post-vaginal deliveries. A review of the literature was conducted to determine the factors associated with skin-to-skin practice, skin-to-skin and its effect

on lactation, and factors that result in delayed initiation of skin-to-skin. Many common themes were found in the review and concluded that skin-to-skin improves bonding and exclusive breastfeeding rates at discharge. The studies also found that maternal education plays a role in the rates of skin-to-skin. Furthermore, the provider's attitudes and understanding of skin-to-skin influences the implementation of skin-to-skin.

To address this, the IHI framework was chosen to guide this project and implement it into practice with the use of the World Health Organization (WHO) and UNICEF's recommendations to help create an enabling hospital environment for SSC (Feldman-Winter et al., 2016). With this plan, the overall goal of increasing rates of SSC, decreasing the time to initiation of SSC, and ultimately, improving exclusive breastfeeding rates at discharge can be achieved.

Methods

Design

This quality improvement project followed a descriptive, observational design. A pre-post-test design was utilized to evaluate rates of SSC documented within two hours after birth and the time to initiation of SSC between April and May 2024 on all non-emergent, term cesarean births for one month following implementation of the infant securement device in the OR.

Setting

The quality improvement project took place in a midwestern, suburban hospital on an 18-bed labor and delivery unit with an estimated 3,500 deliveries annually. The use of the infant securement device and practice of skin-to-skin contact occurred in the three operating rooms and continued into the labor and delivery recovery rooms and on the postpartum unit.

Sample

A convenience sample of patients who were at term gestation and had a c-section birth in May 2024 was utilized. The expected sample size for this project was approximately 100 patients. Inclusion criteria were limited to patients ages 18-49, 37.0 weeks gestation or greater, who were delivered by c-section, elected to participate in the use of the infant securement device, and couplets who were stable. Patients who underwent an emergent c-section and those who were outside the stated maternal and gestational age were excluded, along with patients who had a vaginal birth.

Data Collection and Analysis

An electronic medical record (EMR) report was utilized to examine rates of skin-to-skin within two hours of delivery, skin-to-skin initiation time, and to review demographic data. Data was stored on a password-protected computer owned by the principal investigator. All data was de-identified and study participants were coded as A1, A2, A3, etc. Descriptive statistics were used to describe the sample population for both groups and to draw comparisons for clinical significance between the outcomes of the pre- and post-implementation groups. Inferential statistics were used to describe any relationships between the variables and determine statistical significance. Data was collected from the hospital's EMR reporting system and reviewed for one month following the implementation of the infant securement device. Data reports were generated by the onsite committee member for the project and forwarded via email without any Health Insurance Portability and Accountability Act violations.

Approval Process

The project was approved by the hospital's Institutional Review Board (IRB). In addition, IRB approval was obtained from the University. Funding in the amount of $4900 was provided by the Nursing Research Council to purchase the infant securement device.

This was a vulnerable population; therefore, some ethical considerations included the parent's desire to formula feed, birth parents who declined to have any SSC with the infant, or refusal to use the infant securement device. All birth parents were educated on the benefits of SSC by nurses but ultimately could opt-out of performing skin-to-skin in the OR. The birth parents were also informed that the infant securement device's overall intended use is to promote safety by reducing falls and that parents should not be using the device as a sleep sac or a carrier.

Safety Considerations

The infant securement device is designed to place the newborn in an upright or reclined position to help reduce strain on the body of the caregiver and allow easy access for the healthcare staff. The device also helps to mitigate infant falls, injury, and suffocation during the delivery, recovery, and postpartum periods. The proper positioning and safety of the device ensure that specific steps are met based on the Joeyband™ checklist shown in Appendix A. The device is not to be used as a carrier and should only be used when the caregiver is seated or reclined. The device may not be used for co-sleeping and the caregiver should be awake and alert during use for skin-to-skin.

Procedures

Teamwork

A quality improvement team was formed with the doctoral student researchers, the unit's quality improvement leader, and the labor and delivery assistant nurse manager with the common goal of addressing the lack of SSC initiation within two hours after c-sections. The stakeholders included the birth parents, the labor and delivery staff including the anesthesia team, Obstetricians and Gynecologists, staff nurses, neonatal intensive care unit (NICU) nurses, Pediatricians, postpartum nurses, and nurse leaders. Using a collaborative approach ensured there was proper communication between all members of the healthcare team and allowed the patients to receive adequate support during the study.

Staff Education

It was an expectation that at least 75% of the staff on L&D, Postpartum, and NICU have received education by the end of February 2024. Multiple educational sessions were held to reach nurses from each shift. The nurses used the QR code shown in Appendix B to access the Joeyband Education Attestation form shown in Figure 2. On the form, the staff provided their first and last name, the unit they work on, and confirmed that they received adequate education on safe use of the device. This form collected the data in one format and was converted to a spreadsheet once training was complete. The student researchers were the point of contact for any further questions or concerns with the use of the infant securement device.

Skin-to-Skin Benefits

This change began with providing education to the staff on labor and delivery, postpartum, and NICU. The main topics of education were about the golden hour, evidence-based reasons for implementing skin-to-skin, and patient education information about safe use of the product shown in Appendix C.

Proper Use of Infant Securement Device

Representatives from the infant securement device company (Joeyband™) provided a virtual presentation before implementation to specifically "train the trainer." Joeyband™ also came on-site to train the staff on the use of the infant securement device. These were live, hands-on demonstrations. Training information included intended use, safety precautions, patient education materials, and the OR IFU shown in Appendices A, C, and D. The nurse researchers, nurse managers/assistant nurse managers from all units, the nurse educator, and the quality improvement leader also received training. The representatives also provided a pre-recorded training video for nurses who were unable to attend the in-person sessions. These sessions took take place in February and March 2024, and once these educational sessions were complete, the implementation of the device began. Once the nurses were trained on the use of the device, they were able to educate their patients on the OR Process shown in Appendix E.

Documentation of SSC in the EMR

Staff was also educated on documentation requirements for SSC during the educational session. The circulating nurse was responsible for documenting the SSC start time and was instructed to add a comment that the infant securement device was used as shown in Appendix F.

Pre-Operative Patient Instructions

During the pre-operative period, or the time in which the parent was awaiting the procedure, education was provided. The education was done by the primary labor and delivery nurse assigned to the pregnant patient. This patient education included information about SSC and the use of the infant securement device as shown in Appendix A. The nurse reviewed the instructions that were provided by the infant securement device's team and emphasized the safety considerations. This was also the appropriate time to ask the patient what their feeding preference would be once the newborn was

delivered. Lastly, the patient reviewed and signed the Patient Competency Form shown in Appendix G if they chose to consent to the use of the infant securement device.

Intra-Operative Instructions

Step-by-step instructions on how to use the infant securement device in the OR were verbalized to the healthcare team, and laid out on a physical handout as shown in Appendix D. Before use of the infant securement device, it was required that the nurse ensured that the patient signed the Patient Competency Form shown in Appendix G. The device was to be placed on the OR table during linen prep as shown in Figure D2. It was also to be placed at the level of the arm board on the OR table before the procedure began. The parent was positioned onto the table and rolled down directly onto the device.

The device was ordered as a "one size fits most." After the infant was surgically removed, the circulating nurse took the newborn to the warmer to be dried, stimulated, and assessed. Once the parent and newborn were ready and medically stable, an available nurse assisted and wrapped the infant securement device around the parent's trunk and secured it with Velcro pieces on either their back or their side. The circulating nurse then placed the newborn onto the parent's chest horizontally. Once the parent was surgically closed, the infant was adjusted to a vertical position between the breasts, and the infant securement device was adjusted up to their torso, gently stretching it over the infant. Refer to Appendix H to review a video link of a live demonstration of use of the device in the OR.

When the time came to transfer the couplet into recovery and out of the OR, SSC continued as long as the parent and infant were stable. The birth parents hugged themselves when sliding onto the stretcher for recovery, and the pair were moved

together. This offered the opportunity for uninterrupted SSC. Newborn vital signs, monitoring, and assessments were done with the infant participating in skin-to-skin. Weighing and measuring of the newborn were generally done after the golden hour. When the parent was ready to remove the device, they would just stretch and slide the device down their waist and off the infant entirely. It was a priority to always support the infant to prevent a fall.

Results

The total number of participants for this study was 32 (n = 32). Of the birth parents, 81.25% were White/Non-Hispanic (n = 26), while 18.75% were Black/Non-Hispanic (n=6). The youngest birth parent was 25 years old, and the oldest birth parent was 43, with an average age of 33. The average gestational age for the newborns at delivery was 38 weeks and 6 days. The results showed that the rates of skin-to-skin increased from an average of 46% from January to April to 70% in May 2024 post-implementation. The results also showed that in April 2024, the time to initiation was approximately 51.50 minutes before implementation and in May 2024, for participants who used the infant securement device, the time to initiation was approximately 12 minutes.

A Fisher's Exact Test was conducted to examine whether the use of an infant securement device (ISD) and golden hour were independent. There was statistical significance found following the use of the ISD ($p=0.014$), which suggested there was a positive relationship between the variables. See Appendix I.

A two-tailed Mann-Whitney *U* test was run to determine the time to initiation of skin-to-skin between the intervention and control group. A statistically significant relationship was found between time to skin-to-skin following the intervention ($p <.001$).

The median for the group who received the intervention was 12 minutes, compared to 51.50 minutes for the group that did not receive the intervention. See Appendix I.

Discussion

The expected sample for use of the ISD was approximately 100 since this was the number of available devices, however, only 32% (n=32) of the infant securement devices were utilized during May 2024. Unfortunately, some patients elected to use the device but were unable in the operating room due to various reasons including maternal/neonatal instability. The other 88% of the ISD users successfully initiated skin-to-skin contact within the first hour of birth.

Prior to the implementation of the infant securement device, for the first quarter of 2024, the average rate of SSC within the first two hours post-delivery for c-section births was 46.2%. After the initiation of the ISD in May 2024, the rate for SSC within the first two hours post-delivery in cesarean births was 70%. The increase of 24% demonstrates both statistical and clinical significance.

The limitations of this project were time delays, time constraints, and staff participation. Due to the delays from the suppliers and time constraints, the primary investigators were only able to collect data for May 2024 and pre-data for April. There was an unknown number of patients who qualified for the product because many opted out of the use of the ISD, which resulted in a smaller sample size than expected. Overall team hesitation of the use of the device may have influenced participation. Although educational opportunities and support were offered before and after initiation, this was the first month that the new product was introduced. The goal for staff education was 75%, but only 38.5% of the staff were trained on the use of the device. The staff were expected to stop by for training sessions before, during, or after their shift, however, the month that the training

sessions took place was busy for the unit due to high acuity patients and increased census, which resulted in poor attendance. Had there been no time constraints for the initiation of the ISD, more hands-on educational opportunities could have been offered to further support the staff members. Those who were unable to participate in the in-person training likely did not offer the ISD to patients who qualified or felt uncomfortable with using the device, which may have decreased the sample size. Another limitation was the short window of time for educating birth parents on the importance of SSC. Most of these patients received this education immediately before their surgery.

The strengths of this study were the opportunities to train staff and positive feedback. The primary investigator is an employed staff nurse at the project site and thus was able to act as a resource and support staff during implementation after the scheduled dates of training. Another strength was that all the site OBGYN's responded positively and were in full support of using the ISD in the OR during their surgeries. There was also positive feedback on use in the OR from both nurses and patients who were able to participate.

Recommendations for further study would be to allow for more dedicated time for staff training, to reach more individuals on different shifts. Allowing staff access to practice with the device on their own time instead of when the student researchers were available would encourage use as well. Furthermore, providing patients with access to educational materials in their prenatal period on SSC and the ISD for patients with scheduled c-sections may have better prepared them to perform SSC in the OR.

A clear understanding of the strengths, limitations, and recommendations can help improve adherence and yield more positive results in the future with the hopes that use of the ISD will continue based on the significance of the data.

Conclusion

Skin-to-skin contact is such an integral part of the bonding between the birth parent and newborn. There is a range of benefits including a healthy transition to

extrauterine state, aiding in breastfeeding initiation, stabilization of blood glucose, thermoregulation, and much more. This project allowed birth parents undergoing a c-section delivery the opportunity to perform SSC with the use of an infant securement device during the golden hour. The use of this product allowed rates to increase significantly and changed the culture of SSC being performed in the OR and documented in the EMR at the project site. Overall, this project yielded positive results that hopefully set the standard for continued use of the ISD and continued practices of SSC during the golden hour following all deliveries, especially cesarean sections.

Appendix A

Figure 1

Clinical Benefits of Skin-to-Skin

Clinical Benefits of Skin-to-Skin

Baby	Mom
Accelerates brain development	Reduces risk of post-partum depression
Encourages breastfeeding	Increases milk production
Regulates body temperature and blood sugar	Speeds recovery time
Reduces crying and stress	Lowers cortisol levels
Enhances immune system	Increases pain tolerance
Improves quality of sleep	Reduces blood pressure
Stimulates digestion and weight gain	Reduces post-partum bleeding
Synchronizes heart rate and breathing	Promotes psychological well being

AAP TASK FORCE ON SUDDEN INFANT DEATH SYNDROME. SIDS and Other Sleep-Related Infant Deaths: Updated 2016 Recommendations for a Safe Infant Sleeping Environment. Pediatrics. 2016;138(5): e20162938 [1]

Figure 2

How To Put on Infant Securement Device

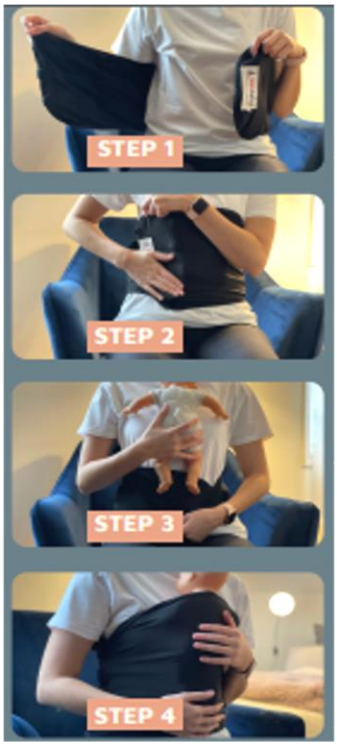


Figure 3

Joeyband™ Safe Positioning Checklist 1

Figure 4

Joeyband™ Safe Positioning Checklist 2

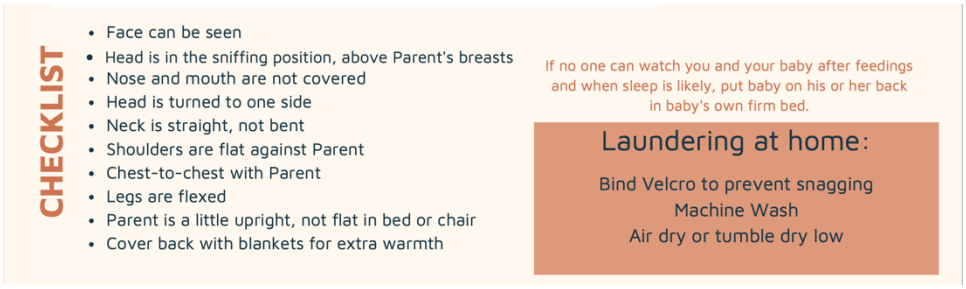


Figure 5

Joeyband™ Safe Positioning Checklist 3

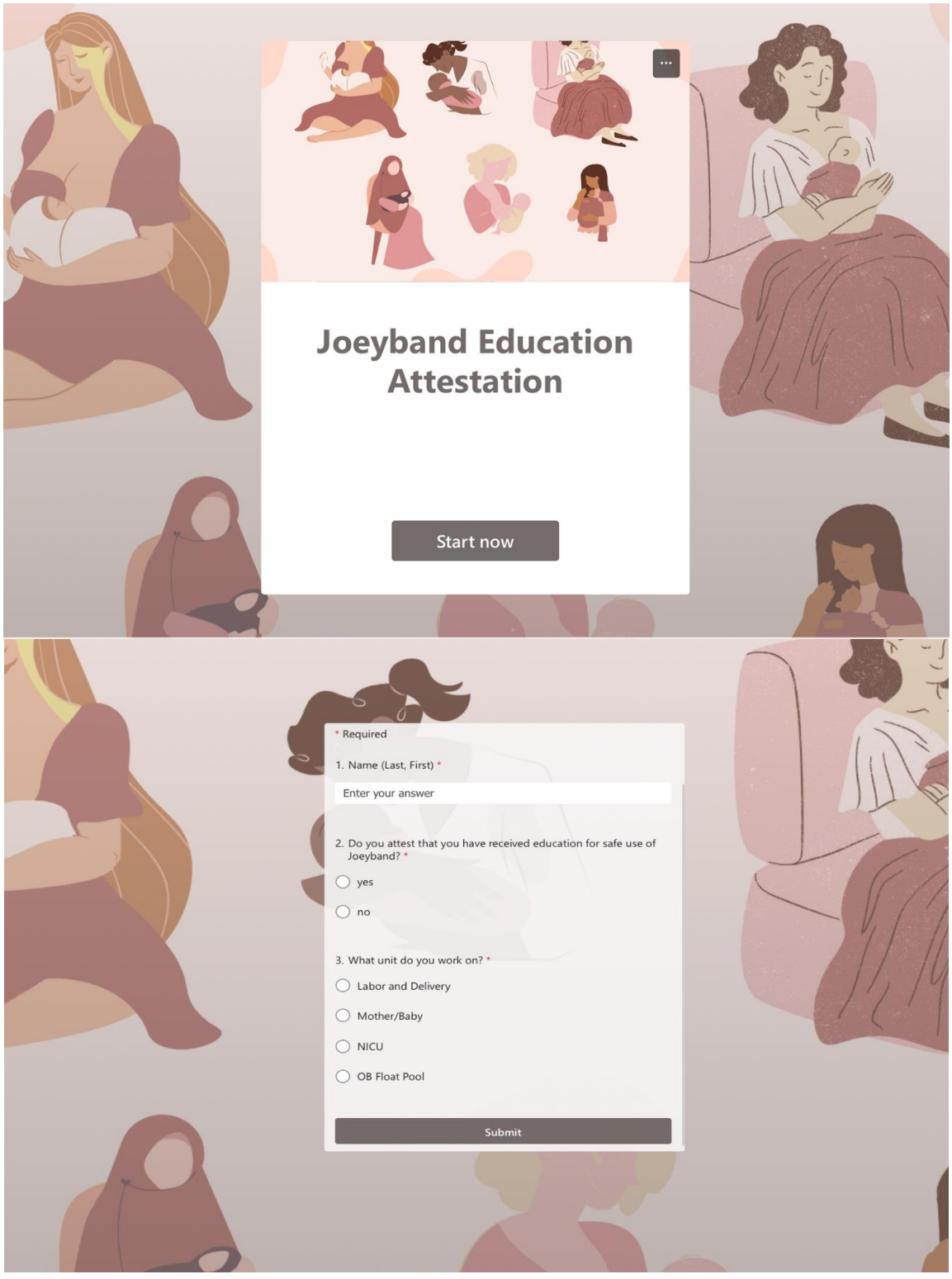
Appendix B

Figure 1

Joeyband Attestation QR Code

Figure 2

Joeyband Education Attestation Form



Appendix C

Figure 1

Skin-to-Skin Brochure

Appendix D

Figure 1

Joeyband™ OR Instructions – Step One

STEP 1
Pre-OP (Prior to non-urgent c-section or during pre-op clinic)
Educate the Patient

Explain:

- importance of placing newborn skin to skin immediately after birth
- purpose of the Joeyband™
- Sign with patient Joeyband™ Patient/Family Consent and Competency form
- If patient is consenting to using the Joeyband™:
  - Select appropriate size of Joeyband™ (A,B,C) that will fit mother comfortably, but will stretch to allow for infant to fit inside and be securely contained. Refer to maternal sizing chart.

- Review with patient the Instruction & Proper use and Safety on the ***Joeyband™ Patient teaching Card*** located inside the Joeyband™ package:
  - Emphasize that JOEYBAND™ IS **NOT** A SLING/CARRIER and is not meant to sleep with the newborn

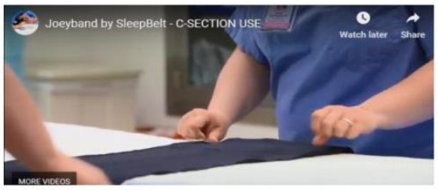
If patient is booked for an elective C-section, place the correct sized Joeyband™ in the patient chart.

Joeyband™ may be secured to mother, prior to prep, by wrapping the band around her bust at armpit level prior to procedure. Follow appropriate guidelines below for STEP 3.

Figure 2

Joeyband™ OR Instructions – Step Two

STEP 2
Patient Prep in the OR
Joeyband™ attached to mother after newborn is delivered
When Maternity RN arrives with patient, OR RNs retrieve Joeyband™ from the patient chart and position the Joeyband™ on the OR table. See Video.
The Joeyband™ is placed at the level of the armboard.



Patient is positioned on the OR table for spinal
Patient lay down on the OR table; OR RN completes the following task:

a) Place BP cuff & O2 stat if not already in place
b) Leads are position behind maternal shoulder
c) Wedge the patient
d) Insert Foley
e) Place compression boots

Figure 3

Joeyband™ OR Instructions – Step Three

STEP 3:
Positioning the Newborn in Joeyband™

Pediatrician:

a) Receive newborn at the warmer
b) Provide initial assessment
c) If newborn is stable; assist Maternity RN in placing newborn skin to skin in the Joeyband™

Maternity RN & Pediatrician:

IF Joeyband™ secure to mother prior to prep:

a) Maternity RN positioned herself on the side of the bed
b) Maternity RN roll down the Joeyband™
c) Peds position herself/himself at the head of the bed and position newborn on his side with baby's head resting on maternal upper chest
d) Maternity RN roll back/adjust Joeyband™ and ensure Velcro opening is maternal side

IF Joeyband™ open & not attached to mother prior to prep:

a) Maternity RN positioned herself on the side of the bed
b) Peds position herself/himself at the head of the bed and position newborn on his side with baby's head resting on maternal upper chest
c) Maternity RN secure Joeyband™ over the newborn and secure Velcro on maternal side

Newborn assessment using the Joeyband™

Newborn Vital Signs and monitoring should be carried out as per Perinatal Guideline or as per physician order.

Initiating breastfeeding

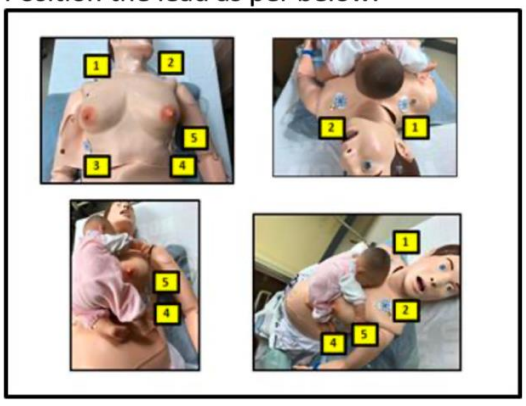
If mother is agreeable and newborn is rooting assist mother/newborn dyad with breastfeeding.

Figure 4

Joeyband™ Anesthesia Lead Placement Instruction

Anesthesiologist:

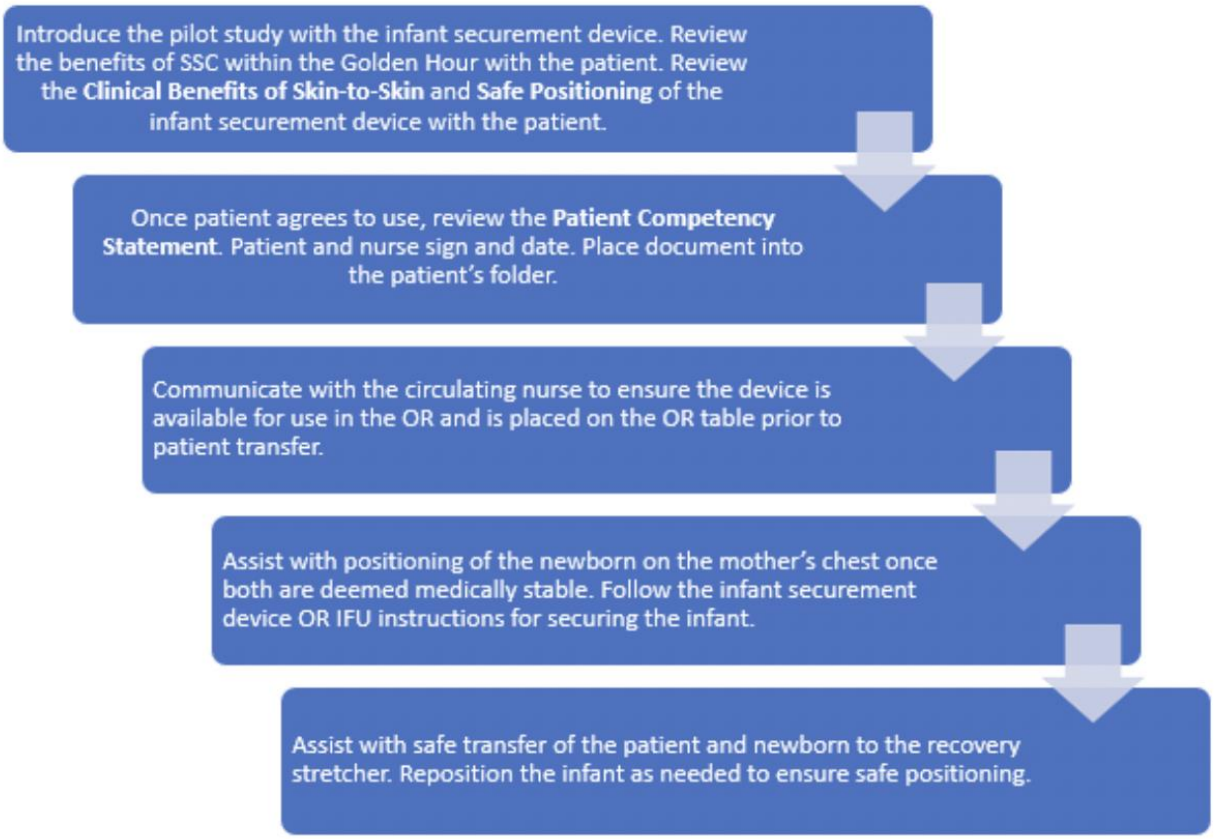
Position the lead as per below:



Appendix E

Figure 1

OR Process Algorithm



Appendix F

Figure 1

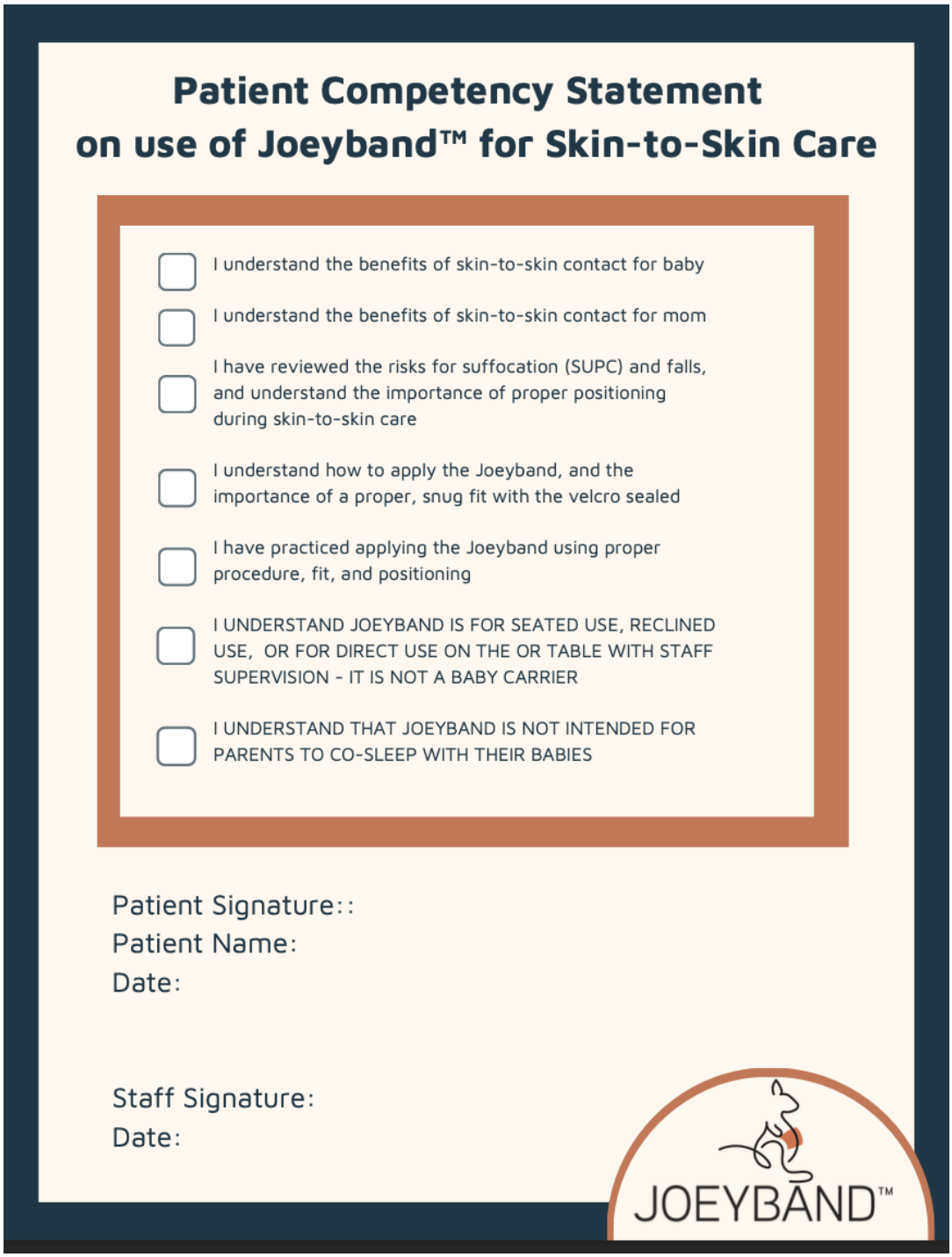
EMR Screenshot of Skin-to-Skin Documentation

Skin to Skin			
Skin to Skin Initiation Date			
Skin to Skin Initiation Time			
Skin to Skin End Date			
Skin to Skin End Time			
Skin to Skin Duration (min)			
How Infant Tolerated Skin to S...			

Appendix G

Figure 1

Patient Competency Statement



Appendix H

Figure 1

Live OR Demonstration: https://www.youtube.com/watch?v=WcAZJK1Z4kY

Appendix I

Table 1

Observed and Expected Frequencies of Golden Hour and Use of ISD

	ISD		
Golden Hour	Used	Not used	*p*
Yes	29[18.28]	29[22.70]	.014
No	0[2.21]	7[2.74]	

Note. Fisher's Exact Test

Table 2

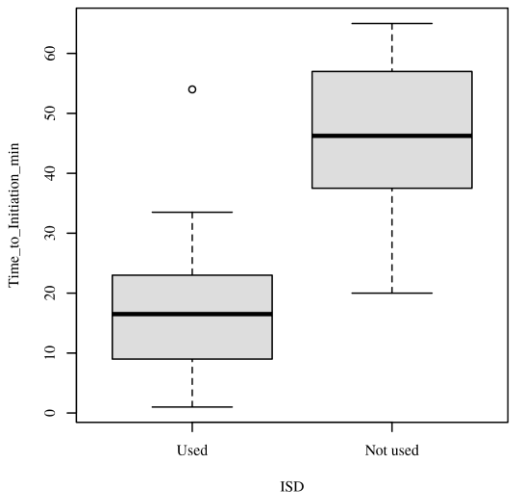
Time to Initiation by ISD

	Used		Not used				
Variable	Mean Rank	*n*	Mean Rank	*n*	*U*	*z*	*p*
Time to Initiation (min)	16.53	29	46.26	36	44.50	-6.31	< .001

Note. Two-Tailed Mann-Whitney Test

Figure 1

Ranks of Time to Initiation in minutes by ISD



References

Ali, N. B., Priyanka, S. S., Bhui, B. R., Herrera, S., Azad, M. R., Karim, A., Shams, Z., Rahman, M., Rokonuzzaman, S. M., Meena, U. S. J., El Arifeen, S., & Billah, S. M. (2021). Prevalence and factors associated with SSC (SSC) practice: Findings from a population-based cross-sectional survey in 10 selected districts of Bangladesh. *BMC Pregnancy and Childbirth*, *21*(1), 709. https://doi.org/10.1186/s12884-021-04189-3

Balatero, J. S., Spilker, A. F., & McNiesh, S. G. (2019). Barriers to skin-to-skin contact after cesarean birth. *The American Journal of Maternal Child Nursing*, *44*(3), 137–143. https://doi.org/10.1097/NMC.0000000000000521

Bertrand, K. M., & Adams, E. D. (2020). A study of skin-to-skin care during cesarean birth: A mother's experience. The Journal of perinatal education, 29(1), 50–58. https://doi.org/10.1891/1058-1243.29.1.50

Boyd M. M. (2017). Implementing skin-to-skin contact for cesarean birth. *AORN Journal*, *105*(6), 579–592. https://doi.org/10.1016/j.aorn.2017.04.003

Cai, Q., Chen, D. Q., Wang, H., Zhang, Y., Yang, R., Xu, W. L., & Xu, X. F. (2022). What influences the implementation of kangaroo mother care? An umbrella review. *BMC Pregnancy and Childbirth*, *22*(1), 851. https://doi.org/10.1186/s12884-022-05163-3

Ekholuenetale, M., Barrow, A., Benebo, F. O., & Idebolo, A. F. (2021). Coverage and factors associated with mother and newborn SSC in Nigeria: A multilevel analysis. *BMC Pregnancy and Childbirth*, *21*(1), 603. https://doi.org/10.1186/s12884-021-04079-8

Feldman-Winter, L., & Goldsmith, J. P., & Committee on Fetus and Newborn (2016). Taskforce on sudden infant death syndrome: Safe sleep and skin-to-skin care in the neonatal period for healthy term newborns. *Pediatrics*, e20161889. https://doi.org/10.1542/peds.2016-1889

Guala, A., Boscardini, L., Visentin, R., Angellotti, P., Grugni, L., Barbaglia, M., Chapin, E., Castelli, E., & Finale, E. (2017). SSC in cesarean birth and duration of breastfeeding: A cohort study. *The Scientific World Journal*, *2017*, 1940756. https://doi.org/10.1155/2017/1940756

Intellectus Statistics [Online computer software]. (2023). Intellectus Statistics. https://statistics.intellectus360.com

Iqbal, A., Iqbal, T., Bashir, F., Bilqees, J., Aslam, S., & Anjum, S. (2022). Comparison of kangaroo mother care with conventional care in newborns in terms of frequency of successful first breastfeeding and time to initiate breastfeeding. *Pak Armed Forces Med* J, 72(3): 1008-1012. https://doi.org/ 10.51253/pafmj.v72i3.6889

Kourtis, S. A., & Burns, J. P. (2019). Frameworks for quality improvement in pediatric intensive care: A concise review. *Pediatric Investigation*, *3*(2), 117–121. https://doi.org/10.1002/ped4.12134

Mohammed, S., Abukari, A. S., & Afaya, A. (2023). The impact of intrapartum and Immediate post-partum complications and newborn care practices on breastfeeding initiation in Ethiopia: A prospective cohort study. *Maternal & Child Nutrition*, *19*(1), e13449. https://doi.org/10.1111/mcn.13449

Kamedula, N., Wegrzyn, P., & Baczek, G. (2021). SSC after cesarean section: Impact on the occurrence of problems during the initiation of lactation. *Medical Science Plus, 15*(2). doi:10.5604/01.3001.0014.9135

United Nations International Children's Emergency Fund (2023). *SSC.* The Baby Friendly Initiative. https://www.unicef.org.uk/ babyfriendly/baby-friendly-resources/implementing-standards-resources/skin-to-skin-contact/

Widström, A. M., Brimdyr, K., Svensson, K., Cadwell, K., & Nissen, E. (2019).

SSC the first hour after birth, underlying implications, and clinical practice. *Acta Paediatrica, 108*(7), 1192–1204. https://doi.org/10.1111/apa.14754

Zavala-Soto, J. O., Hernandez-Rivero, L., & Tapia-Fonllem, C. (2022). Pro-lactation cesarean section: Immediate SSC and its influence on prolonged breastfeeding. *Frontiers in Sociology*, 7, 908811. https://doi.org/10.3389/fsoc.2022.908811