INCREASING EARLY SKIN-TO-SKIN FOR NEWBORNS OF UNCOMPLICATED CESAREAN BIRTHS

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Abstract

Background: Following a cesarean birth (CB), newborns can be separated from the mother for up to 3 hours, delaying skin-to-skin contact (SSC). Immediate or early SSC is recommended as a standard of care to prevent hypothermia, hypoglycemia, tachypnea in newborns and to increase bonding, yet few newborns of CB engage in this practice. When mothers are unable to engage in SSC, fathers/support persons are viable options to facilitate early SSC in newborns.

Local Problem: The proposed clinical site houses a small labor and delivery unit where it was not standard practice for newborns of cesarean births to engage in SSC within 1 hour following delivery. The purpose of this quality improvement (QI) project is to implement early SSC between fathers/support persons and stable, full-term newborns of uncomplicated cesarean births when the mother is unable to provide SSC. For this QI project, early SSC was considered to be SSC within 1 hour of birth

Interventions: A process change was introduced to allow fathers/support persons perform SSC soon after CB. Nurses learned how to identify eligible participants and a checklist was used to serve as a reminder for when and how to execute the new process. Once identified, families were educated on SSC, then the mother appointed an alternative SSC provider. Unit practice was changed to allow fathers/support persons to follow the newborn and the nurse to the nursery after an uncomplicated CB for an opportunity to perform early SSC. If newborns were determined to be stable, SSC was initiated. During the course of the project, goals, information and results were disseminated on the unit via presentations, discussions, posters and handouts.

Results: There was a total of 21 CBs during the implementation timeline; nine ineligible cases and twelve eligible cases. Out of the 12 eligible cases, 5 newborns received SSC in less than 1 hour, 5 newborns received SSC more than 1 hour but less than 2 hours and 2 newborns did not receive SSC in the required time frame. The nurses also engaged mothers in early SSC with their newborns. As a result, outcomes included 6 mothers who performed SSC with their newborns within 2 hours of birth.

Conclusions: Creating an environment that incorporates early SSC as a standard of care, regardless of method of delivery, is important to improving newborn and family outcomes. In situations where mothers are not available to perform SSC, it is feasible for fathers/support persons to act as alternative SSC provider. This process change allows the newborns of uncomplicated CB to safely enjoy the same benefits as newborns of vaginal deliveries, who routinely perform immediate or early SSC. During this QI project, the checklist made it easier for the nurses to facilitate early SSC. Although adoption to utilize the checklist was slow, when used, it served to streamline the process change. By the end of implementation there was an increased awareness of fathers/support persons as alternative SSC providers and increased action to initiate SSC earlier for newborns of uncomplicated CB on the unit.

Background and Practice Problem

The benefits of skin-to-skin contact (SSC) on newborns has been established in research and has gained popularity in the recent years. The World Health Organization (WHO) & United Nations International Children's Emergency Fund (UNICEF) (2009) have issued recommendations for skin-to-skin care in all newborns after birth. Further recommendations call for immediate or early (within 1 hour) SSC, which is widely implemented in many institutions for vaginal deliveries but not for births by cesarean section.

Often times, mothers who have cesarean sections do not perform SSC with their newborns until after initial recovery, which may take more than 1 hour (Erlandsson, Dslina, Fagerburg & Christensson, 2007). In situations when the mother is unavailable for SSC, fathers/support persons can provide many of the benefits of SSC (Baby Friendly, USA, 2016; Gouchen et al., 2010), however are often overlooked as viable SSC providers. Many times, delay in SSC between the mother and newborn in cesarean births creates missed opportunities for immediate or early SSC for these babies. The delay in SSC for the newborns in this population leads to an increased risk for hypothermia, hypoglycemia, tachypnea, tachycardia, problems breastfeeding and bonding, and increased formula supplementation (Hung & Berg, 2011). In 2015, cesarean births accounted for 32% of all deliveries thus representing approximately one-third of the deliveries in the United States (Martin, et al., 2017). The risks that these babies are exposed to and the number of cesarean births that occur in the United States, call attention for the need to facilitate early SSC for newborns in this population.

Purpose Statement, Short Term and Long Term Goals

The project clinical site housed a small labor and delivery unit where there is no current policy to ensure SSC within 1 hour following cesarean birth. Although their SSC policy

incorporates fathers/support persons as alternative SSC providers, this practice is not utilized to facilitate early SSC for newborns of CB. After a cesarean delivery, the newborns are separated from the mother for several hours in the nursery before reuniting the mother-infant dyad for skin to skin. The purpose of the Doctorate of Nursing Practice (DNP) project was to implement early SSC between father/support person and stable, full-term newborn of cesarean births and evaluate the initiation and length of time for SSC and the effects of early SSC on thermoregulation in this population. Early SSC was identified as the initiation of SSC within 1 hour of birth. On this labor and delivery unit, stable newborns of uncomplicated cesarean births, were considered to have Apgar scores greater than or equal to 7 at five minutes of birth and were full term between 37-42 weeks.

The short term goals for this DNP project were (a) 50% of fathers/support persons, will perform safe skin to skin with their stable, full term newborn of uncomplicated cesarean births within 1 hour of delivery; (b) SSC between father/support person and stable, full-term newborn will be maintained for at least 15 to 45 minutes; (c) 50% of the newborns who performed SSC will have temperatures greater than or equal to 36.3C and less than or equal to 37.5C. The long-term goals for this DNP project were (a) 80% of stable, full term newborns of uncomplicated cesarean births will be exclusively breastfed at discharge and (b) there will be a 50% increase in patient satisfaction scores in patients of cesarean births. Some of these parameters were currently documented in the electronic medical record (EMR) but a checklist (Appendix A) supported complete documentation for the project.

Description of the Knowledge to Action (KTA) Theoretical Framework

The KTA framework is a model that takes evidence-based information and transforms it into actions that will lead to practice change (Field, Booth, Illot & Gerrish, 2014). The KTA

comprises of two components, the knowledge creation and the action cycle (White & Dudley-Brown, 2012). The knowledge creation is the step where the knowledge is acquired, synthesized and used to develop tools while the action cycle involves the activities that are used to implement or apply the knowledge (White & Dudley-Brown, 2012).

Both components are made up of different phases that are iterative, dynamic, overlapping and can influence each other (Field, Booth, Illot & Gerrish, 2014). The knowledge phases include knowledge inquiry, knowledge synthesis, and development of knowledge tools. The action cycle phases include, identify problems, adapt knowledge to the local context, assess facilitators and barriers to knowledge use, select, tailor and implement intervention, monitor knowledge use, evaluate outcomes and sustain knowledge use (White & Dudley-Brown, 2012). The action phases may occur sequentially or simultaneously and can be impacted by the knowledge phases (Field, Booth, Illot & Gerrish, 2014).

Applying the KTA to the Doctorate of Nursing Practice (DNP) Project

Using the KTA framework to guide this DNP project provides a systematic plan from the beginning of the project to the final evaluation stage. Identification of a problem and the knowledge creation phase occurred simultaneously, involving meetings with the stakeholders (hospital providers, staff, patients and family), gathering the evidence from the literature and identifying validated tools. Gathering the evidence, identifying validated tools and preliminary meetings with some of the stakeholders, (unit manager, the lactation consultant and an identified champion) led to creating activities that allowed progress to the next steps of the KTA framework.

The activities for implementation included, disseminating the knowledge to stakeholders, developing checklists, monitoring compliance, modifying consents, modifying electronic

medical records and identifying barriers and champions. Evidence was disseminated through posters and PowerPoint presentations to the staff and through currently used hospital SSC information to parents prior to admission in the doctor's office or on the unit. A checklist (Appendix A) was used as a point of reference for nurses to ensure eligibility criteria for SSC were met and documentation in the EMR is complete. The hospital-wide changes to the EMR system included steps to modify the EMR to ensure checklist criteria and relevant measures were incorporated. Charts were audited for compliance and barriers with the help of champions were addressed based on whether compliance was an issue or not.

Completing the activities developed worked to adapt the knowledge to the unit setting, assess barriers to the use of the knowledge, tailor implementation strategies and monitor how the knowledge was used. The next step was to evaluate a set of project outcomes with the guide of expected outputs. Participation and compliance from stakeholders promoted the implementation of the practice change. Performing chart reviews and disseminating implementation information gathered with the support of champions helped to achieve project goals. The KTA served as a framework which was used for the implementation of this DNP project and all steps taken to put the project together aimed to produce long term outcomes and sustain the knowledge that was translated into practice.

Literature Review

The need to incorporate SSC for stable, full-term newborns of uncomplicated cesarean births is the focus of this literature review. The review will begin with evidence that shows SSC reduces risk of hypothermia and allows the newborn to reach a calm state. The discussion will be followed by a review to show that full term, stable infants of cesarean births are not at a higher risk for hypothermia if they engage in early SSC. Finally, the review will conclude with

evidence that supports the role of father/support person as a feasible and viable alternative to providing SSC for newborns of cesarean births (CB) until mother is available after birth. Melnyk and Fineout-Overholt (2014) and Newhouse (2006) were used to appraise the articles which are found in Table 1.

Analysis and Synthesis

Positive Impact of SSC on Infant Outcomes

A review of the research provides evidence from four articles that SSC plays a vital role in allowing newborns to achieve a calm state and reducing the risk of hypothermia (Beijers, Cillessen, & Zijlmans, 2016; Takahashi, Tamakosh, Matsushim, Kawabe, 2010; Srivastava, Gupta, Bhatnagar & Dutta, 2014; Crenshaw, 2014). In the articles, cortisol levels and temperature were measured in full term, healthy, stable infants who performed SSC compared to those who did not. Beijers et al. (2016) and Takahashi et al. (2010) used validated measuring tools, established causal effect and determined inter-observer reliability to arrive at their conclusions. Takahashi et al., (2011) and Srivastava et al. (2014) had a large sample size, which reduced the risk of type 1 errors in this study. In Beijers et al. (2016) and Takahashi et al., (2011) cortisol levels were lower than baseline in the infants who were placed SSC versus not. In addition, studies done by Takahashi et al., (2011) revealed cortisol levels were significantly lower between 60 minutes and 120 minutes after birth in skin-to-skin group. In Srivastava et al. (2014) all newborns who had SSC had higher temperature gains and were normothermic at the end of 2 hours. Crenshaw et al., (2014) performed an evidence-based review of various articles but did not discuss the rigor of the article selection. However, in the studies selected validated tools were used to measure outcomes. In Crenshaw (2014), research concluded that infants who performed SSC benefited from maternal thermoregulation and had higher temperature gains.

In synthesis, infants who performed SSC compared to those who did not, successfully had reduced crying times, lower cortisol levels and higher temperature gains. Both mothers and fathers performed SSC with the newborns with favorable results in outcomes measured. This infers that full term, stable infants who performed SSC had reduced stress, achieved a calm state quicker and was at a lower risk of hypothermia.

Reduced Risk of Hypothermia in Newborns of CB who Perform SSC

Gouchen et al. (2010) and Beiranvand, Valizadeh, Hosseinabadi, and Pournia (2014), examined the risk of adverse effects to stable, full term newborns of CB if they engaged in SSC within 1 hour. Both studies were RCTs, performed in hospital settings, with a sample size of 34 and 90 respectively. Gouchen et al. (2010) and Beiranvand et al. (2014) both used validated measuring tools. Beiranvand et al. (2014) also assessed the validity and reliability of questionnaires used in the study. Gouchen et al. (2010) and Beiranvand et al. (2014) discovered similar results and concluded there was no mean difference or drop in temperature between newborns of CB who were able to perform SSC with mother. In addition, Gouchen et al. (2014) found that newborns of CB, who were SSC with fathers before mother's arrival versus SSC with mothers, had no difference in the mean temperatures.

Shorey, Hong-Gu and Morelius, (2016) performed an integrative review on the impact of infants SSC with fathers in maternity wards of different settings. Shorey, et al., (2016) carefully reviewed all articles used in the study and articles included studies with sample sizes that varied from 11-338 participants. Shorey, et al., (2016) found no significant differences among newborns in temperature if they performed SSC with fathers instead of the mothers. In synthesis, fathers are also able to maintain normal temperature if they performed SSC with the newborns. In other

words, newborns of CB who performed SSC regardless of whether SSC was with mothers or fathers were not at an increased risk of hypothermia.

SSC with Fathers/Support Persons as a Feasible and Viable Option

To conclude this review, articles were analyzed for evidence to support the feasibility of an implementation process that incorporates SSC of fathers/support persons with their stable, full-term newborn and the viability of the intervention (Erlandsson, Dslina, Fagerberg & Christensson, 2007; Erlandsson, Christensson, & Fagerberg, 2008; Velandia, Uvnäs-Moberg & Nissen, 2011). In the three identified studies, the newborns were initially laid SSC with mother, placing 2 blankets over the naked newborn, for duration of 30 seconds to 40 minutes; after which either mother continued SSC or fathers assumed the role of SSC provider. Erlandsson et al., (2007) conducted an RCT to measure the crying time of 30 stable, full term newborns born via CB who performed SSC with the fathers. In Erlandsson et al., (2007) infants who were SSC with father stopped crying earlier than infants who were in a cot/crib. Erlandsson et al. (2008) conducted a phenomenological design study at two maternity clinics in Sweden to study fathers as primary caregivers during the mother's postoperative care following the birth. The fathers who performed SSC with their newborns perceived an enhanced bonding experience. Lastly, Velandia et al. (2011) performed an RCT with 42 parent-infant dyads in a large obstetric clinic also in Sweden. The observations in Velandia et al. (2011) were scrutinized for inter-observer reliability. Results from the study showed there was no significant difference in temperature if newborns performed SSC with fathers instead of mothers.

A synthesis of the 3 studies, provide evidence that performing skin-to-skin with the father, is a feasible intervention to implement. The researchers in all 3 articles were able to successfully implement SSC between fathers and stable, full term newborns of CB. Findings

from the articles conclude that SSC between stable, full term newborns with fathers achieves a calm state and normothermia faster than if not placed SSC. Thus, concluding that SSC with the father is a viable alternative for infants of CB until mother is available after birth.

Implementation Project

Description of Project

A quality improvement project focusing on early SSC for newborns of uncomplicated cesarean births was implemented with a sample of patients and nurses. Inclusion criteria for the patient population included all newborns between 37 weeks and 42 weeks with Apgar scores of greater than or equal to 7 at 5 minutes of life and showed no sign of respiratory distress. Exclusion criteria included newborns who required resuscitation, admission to the special care nursery (SCN), absent father/support person and cesarean births of mothers 18 and younger. There was sample size (n=12) of eligible participants for the 8 week "go live" period. The project was carried out on a small labor and delivery unit in a community hospital on the East Coast.

Procedures and Timeline Plan

The quality improvement project took place over 14 weeks. During the first and second week, the DNP project leader recruited project champions and met with the nursing supervisor, nurse manager, unit neonatologist and charge nurses. The Information Technology (IT) department was already in the process of changing the electronic medical record (EMR) to accommodate documentation requirements for the unit's transition to Baby Friendly status which would incorporate project measures. The third week was used to train the staff champion on the process of skin-to-skin contact for newborns of uncomplicated cesarean births.

During week four through six, other staff members were educated on the process change. Presentations were held at the staff meetings and binders were created to disseminate information and collect questions. The DNP project leader and champion worked together to host roundtable discussions and huddle sessions to discuss the proposed change with other stakeholders of the hospital. Posters illustrating the process change were displayed on the unit. Reminders were also displayed in the nursery, at the nurses' station and in break rooms.

Week six marked the beginning of the "go live" period, involving implementation of the project. The implementation period lasted until week fourteen. Early SSC was initiated between stable, full-term newborns of uncomplicated cesarean births and the father/support person, utilizing the "Determine Eligibility for SSC of Newborns of Uncomplicated Cesarean Birth" checklist (Appendix A). The checklist served as a reminder during the change process to determine which families were eligible and which newborns fit the criteria for early SSC. The checklist also helped facilitate the process change and compliment EMR documentation of outcomes measures. A "Go Live" binder was created to contain PowerPoint slides of the process change and a "Read and Sign" sheet for staff nurses. The DNP leader and champion continued to engage nurses throughout the implementation period using posters, charts, huddles and staff meetings to disseminate information and progress.

Data Collection

Data collected for this project included, 1) the time SSC was initiated and 2) who initiated SSC with the full-term newborns of uncomplicated cesarean births (CB). Data was collected through chart reviews, completed checklists and nurse interviews. Attempts to collect data to measure the duration of SSC and temperature after SSC were unsuccessful, due to

inconsistent and incomplete documentation and inability to verify correct information for these measures.

Data Analysis

Statistical analysis was conducted to examine the percentage of eligible participants who initiated SSC compared to those who did not. Data collected was further analyzed to determine whether SSC was initiated within less than 1 hour or greater that 1 hour but less than 2 hours, and whether SSC was initiated with father/support person or with mother of the newborn. The Chi-square test was used to test difference in proportions of measured variables and to examine whether there was a relationship between who the SSC provider was and how early SSC was initiated. Due to the small sample size, the Fisher's test was used to calculate the statistical significance of the data obtained. Demographics data was not collected during this project due to limited permissions and access to EMR set by the hospital and therefore was not analyzed.

Results

There was a total of 21 CBs during the implementation timeline; nine ineligible cases and twelve eligible cases. Out of the 12 eligible cases, 5(41.7%) newborns performed SSC in less than 1 hour, 5(41.7%) newborns performed SSC later than 1 hour but less than 2 hours and 2(16.7%) did not perform SSC in less than 2 hours (Figure 1). The two cases where SSC was not initiated within in less than 2 hours did not fit into the categories to be examined, therefore were not part of the analysis. As a unit practice prior to implementation, accommodations were made for mothers who requested early SSC in the operating room. The unit nurses thus found it easy to engage mothers during the implementation period and sought to include mothers in early SSC with their newborns when possible. Consequently, 60% of newborns who were SSC within 1 or 2 hours of birth, did so with their mothers (Figure 2). Data analysis also revealed that, of the

fathers/support persons who performed SSC with their newborns, the proportion of those who did so within 1 hour of birth was 75% (3 out of 4) and of the mothers who performed SSC with their newborns, the proportion of those who performed SSC with their newborns within 1 hour of birth was 33% (2 out of 6) (Figure 3). Analysis using computations from the 2x2 cross-tabulation table (Table 2), revealed the odds ratio of newborns performing SSC in less than 1 hour with fathers/support persons relative to mother is 6, but p value of >0.05 was calculated to determine the test was not statistically significant. Even though the effect of the intervention was not statistically significant, there is data to support that the intervention had positive results.

Facilitators and Barriers

There are facilitators and barriers during the implementation of the project that helped shape the outcome of the process change. The hospital was in the process of seeking the nationally recognized, Baby-Friendly status and policies and actions had been put in place to promote activities to support this effort. Unit policies on SSC provided direction on how to, who can and when to perform SSC, however, policy had not become standard practice on the unit for families of cesarean births. Thus, support for the process change was easy to obtain from the manager, lactation consultant and charge nurses. There was a champion assigned to the project who served as a strong advocate and resource for change on the unit, often reminding the nurses to follow through with the process. The hospital was also transitioning to a new EMR documentation system which would enhance documentation to reflect outcome measures and facilitate accountability and adherence of practice.

Certain barriers to the project needed to be addressed in order to achieve the project goals. There were different levels of commitment to change and some of the senior nurses, in addition to others, felt the change was unnecessary. Access to the EMR was provided late into

the implementation process, which hindered data collection and chart audit for all relevant data. The process change utilized the old EMR system, which did not reflect some of the intended measured outcomes. Multiple system wide changes at the hospital were occurring at the same time, which made it difficult for the nurse manager to fully support implementation and formally communicate details of the project with the leadership team. With QI projects, there are challenges that arise, and it is important to address them to promote change in the right direction.

Regardless of the barriers encountered, the project design and facilitating factors produced some unexpected benefits. Although slow to adopting the process change, some nurses were committed to positive outcomes for their patients and started to embrace the idea once they noticed many of the families were willing and excited to participate in early SSC. Nurses also started to provide feedback during the discussion sessions. Through feedback from one of the senior nurses, the nurse manager was able to work with the obstetrics offices to introduce information about early SSC options to patients prior to admission. A handout was designed for the patients and became a part of the prenatal packet given with other information and resources.

Human Subjects Protection

The proposal for the DNP project was submitted to the University of Maryland Baltimore (UMB) Institutional Review Board (IRB) for non-human subjects' research determination and the proposal was submitted to the hospital site for further approval. To ensure data security, all patient identifiers were removed, and number codes were used instead, to maintain patient confidentiality. Data collected was stored in a secure cabinet and on a password protected computer to be accessed by the project leader and nurse manager.

Sustainability

To facilitate sustainability of the process, early engagement of the decision makers was necessary for continued support. The findings of this project will be shared with hospital stakeholders and shared with the new unit educator. EMR documentation changes to include SSC beginning and end time and who performed SSC, in addition to other Baby Friendly measures, will serve to standardize documentation expectations and ease quality assessment of practice. Long term goals for the project will be measured through collecting the number of newborns who were exclusively breastfed at discharge and patient satisfaction scores of families of cesarean births. Policy change to support the continued practice of SSC with fathers/support persons and a quality improvement plan to maintain surveillance of outcomes is recommended. Widespread practice will be promoted by disseminating findings at professional conferences.

Discussion

Prior to this QI project, this small labor and delivery unit, newborns of uncomplicated CBs did not engage in early SSC if their mothers were unavailable. For the purpose of this QI project, early SSC was considered to be SSC within 1 hour of birth, however, SSC greater than 1 hour but less than 2 hours of birth was also analyzed. Fathers/support persons as an alternative SSC provider was not being utilized as an option on this unit, which led to delayed SSC for stable newborns of uncomplicated CBs. This QI project explored the use of alternative SSC providers to promote early SSC for stable newborns of uncomplicated CB. The project involved educating the staff and families about using the father/support person as an alternative SSC provider. A checklist developed for this project, served as a useful guide to streamline the new process change. Pre-implementation data was not collected during this QI project but reports from the manager and unit staff confirmed that SSC with fathers/support persons was not routine

nor was it offered as an option for newborns of CB. An analysis of available data provided an overview of the outcomes after the implementation period.

The process change allowed stable newborns of CB to safely enjoy the same benefits of SSC as newborns of vaginal births, who routinely perform immediate or early SSC. Adding fathers/support persons as possible SSC providers when mothers were unavailable, increased the number of newborns of CB who were able to perform early SSC. Out of the 12 eligible families, 10 newborns performed SSC within 2 hours of birth, 6 newborns were SSC with their mothers and 4 newborns were SSC with their fathers/support persons. Although there were fewer instances where fathers/support persons were utilized as SSC providers, SSC within 1 hour of birth was more likely to occur if fathers/support persons were available for SSC. The results from this project though not statistically significant, alluded to a conclusion that early SSC can be implemented as a standard of care in stable newborns of uncomplicated CBs, regardless of who is designated as the SSC provider.

Multiple studies have provided evidence that support the possibility and benefits of engaging stable, full term newborns of CB in early SSC using SSC providers other than the mother. Erlandsson et al. (2007), Erlandsson et al. (2008) and Velandia et al. (2011) conducted studies that showed earlier SSC produced similar normothermic levels in the newborn regardless of SSC provider, calmer newborns and increased bonding between the newborns and SSC providers.

Early SSC can be determined as a desirable practice for institutions that strive for better patient outcomes and improved patient satisfaction. Verbal report from nurses revealed that all but one father/support person was willing to perform early SSC before mother was available. Some fathers/support persons were also excited when given the option to play the role of

alternative SSC provider. Subjective observations from the nurses revealed that the newborns were calm during SSC and SSC providers were pleased to be engaged skin-to-skin with their newborns. Temperature was not measured as planned due to variations in the time temperature was measured after SSC was initiated, however, prompt follow up on each case revealed there was only one case where SSC had to be interrupted because the newborn was hypothermic.

Some strengths of the project included clearly laid out goals, a plan that included who the stakeholders were, how they would be involved in the change process and timelines for project activities. Support from the manager, the project champion and the unit charge nurses were also strong positives of the project. However, execution met with some challenges and limitations. During the one-week trial period there was only one eligible case, limiting opportunities to examine the process and adjust for lessons learned. Different levels of awareness and acceptance of stakeholders, limited EMR access and multiple unit changes was responsible for difficulties to ensure a cohesive change process. Attempts to minimize the effects of the limitations on the project involved discussions with the unit manager and champion prior to the "Go Live" date with continued feedback from the staff during the implementation period. The checklist served to improve correct documentation and adequate data collection, supplementing the EMR documentations.

Conclusion

WHO & UNICEF (2009) recommend immediate or early SSC as a standard of care for all newborns. However, on many labor and delivery units, placing newborns in immediate or early SSC is not a routine practice for newborns of cesarean births (Hung & Berg, 2011). This QI project shows that it is feasible to implement fathers/support persons as alternative SSC providers to facilitate early SSC in stable newborns of uncomplicated cesarean births. The

prenatal information sheet about early SSC and possible SSC providers is currently being used in the obstetric clinic. Nurses continue to offer early SSC support for newborns of CB involving fathers/support persons. By the end of implementation there was an increased awareness of fathers/support persons as alternative SSC providers and increased action to initiate SSC earlier for newborns of uncomplicated CB on the unit.

Future Implications for Practice

Nurses play a major role in establishing early SSC as a standard of practice for all stable newborns, regardless of method of delivery. Implementing this DNP project can be extended to newborns of all CBs if they are stable. The goal would be to increase the number of newborns of CBs who receive early SSC even if the mother is unavailable. The new EMR system introduced to the unit, incorporates all the measures of this project and produces future opportunity to derive reports for data analysis. Effective communication must be established among all stakeholders to ensure there is a cohesive goal and so successful implementation of process change can occur. It is the responsibility of advanced practice nurses to translate research into practice and facilitate adoption of evidence-based practice in order to improve patient outcomes.

Future Quality Improvement Projects

The future of improving health care is realized by continually enhancing practice through implementing evidence-based strategies to improve patient outcomes. This QI project can be further extended to examine temperature of newborn after SSC, nurse adherence and patient satisfaction. Implementing projects to measure these factors, would be the next steps to evaluate outcomes and ensure quality care for patients.

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Tables

Table 1.

Evidence Rating Table Reviewing Evidence for Increasing Skin-to-Skin Contact in Newborns

Author and Date	Objective	Study Design	Sample Size	Outcomes (how measured)	Results	Level & Quality
Shorey, Hong-Gu & Morelius, 2016	Perform a review of the evidence related to the impact SSC with father and infant patient outcomes	Integrative review: 10 quantitative studies; 8 of which were RCTs and 2 qualitative studies	Varied from 11-338 participants	Infant outcomes: infant temperature and pain, infant bio-physiological markers, and infant behavioral response Paternal outcomes: paternal role attainment, paternal interaction behavior, and paternal stress and anxiety	Infants who were SSC with fathers had significantly higher temperature than infants placed in a cot or in the incubator; No significant difference noted in the temperature regardless of infants receiving SSC from fathers or mothers; fathers were marginally less effective than mothers in decreasing pain response; there was no significant difference in infant bio-physiological markers in those who performed SSC with fathers versus mothers; there was significant difference in blood glucose levels but no significant difference in catecholamine levels with infants SSC with father versus placement in the cot; infants SSC with father after a cesarean section cried less and reached a relaxed state earlier than if placed in a cot or with mother. SSC facilitated paternal role attainment, vocalization, more caring behaviors between fathers and infants; paternal oxytocin levels	IB

					significantly increased and cortisol levels significantly decreased in fathers who performed SSC	
Erlandsson, Dsilna, Fagerberg & Christensson, 2007	To compare the effects of infants SSC with fathers compared to the conventional care in the cot	Randomized control trial	30 healthy 37-41 week newborns of cesarean birth	Amount of crying time of newborns who were SSC with father compared to conventional care in cot within the first 2 hours after birth measured using crying time Pre-breastfeeding behaviors (duration of wakefulness, rooting, sucking activities) of newborns who were SSC with father compared to conventional care in cot within the first 2 hours after birth measured using NBAS	The group of infants who were SSC cried less than those in the group who were in the cot ($p < 0.001$) SSC infants reached a drowsy state at 60 mins while those in the cot reached a drowsy state 110mins ($p< 0.01$); rooting and sucking activities of those SSC with fathers were more frequent than those in the cot ($p<0.01$ and $p\leq0.001$ respectively)	IIA
Erlandsson, Fagerburg & Christensson, 2008	Describe the perceived experience of fathers who performed SSC with their infants while mother was in recovery	Phenomeno-logical design	Father-infant dyad at two maternity clinics	Ability to balance feelings of alienation, comfort with ambiguity were key outcomes that were measured	When awaiting outcome of mother some fathers found they distanced themselves from their newborn but some were able to spontaneously take care of the newborn. Fathers found that they were confident and able to take responsibility of their newborn until unable to console infant	IIIC
Beijers, Cillessen &	To examine the effects of	Experiment al within-	17 mother-infant dyad;	Cortisol reactions and infant behavioral distress	Cortisol levels at T2 were significantly lower in infants who	IIIB

Zijlmans, 2016	SSC on full-term newborn infants and cortisol levels and its impact on behavioral reactions to mild stressors	subject study	Infants were healthy, weighing ≥2500 g, Apgar scores of ≥7 at 5 min and ≥37 weeks	in full term newborns who performed SSC after a bath compared to those who performed solitary resting after a bath. Cortisol levels were measured at T1 (resting alone), T2 (SSC condition before bath), T3 (bathing session), T4 (recovery period) using saliva samples to obtain cortisol concentration in the newborns; infant behavioral distress during bath was measured by assessing the extent to which the child cries, fusses, frowns, tenses body while crying, or any other discontent behaviors using a 7 point scale.	performed SSC versus cortisol levels in infants who were resting alone ($p<0.01$) before the bath; there is a significant increase in cortisol levels response in newborns who were SSC during the bath session compared to those who were resting alone ($p<0.05$), there was no significant difference in cortisol levels between T1 and T4 There was no significant difference between an infant behavioral stress during the bath regardless of whether newborn was SSC or resting alone ($p>0.05$)	
Srivastava, Gupta, Bhatnagar & Dutta, 2014	To assess the success of very early skin to skin on breastfeeding , maternal satisfaction and infant well-being,	Randomized control study	298 mother-baby dyad; infants were stable and full term	Sucking, breastfeeding at 6 weeks, maternal satisfaction, thermal regulation, weight and morbidity for newborns who were SSC compared to those who were clothed and placed near mother Sucking was measured using a modified IBFAT	In newborns who performed SSC, suckling competence is significantly better than those who had not done SSC ($P < 0.0001$). The SSC group had a significantly higher rate of exclusive breastfed at first follow-up visit and at 6 weeks compared to the group who had not performed SSC ($P = 0.002$ and $P< 0.0001$ respectively).	IIB

	by measuring temperature, weight and morbidity at 6 months			Temperature was measured using a digital thermometer Weight taken at discharge and 1st follow up using an electronic weighing machine Maternal satisfaction measured using a 4 point Likert scale Breastfeeding at 6 weeks was measured using mode of feeding at follow up visit and at 6 weeks visit	SSC group had higher maternal satisfaction rates ($p<0.0001$) The SSC group attained higher temperature gains in immediate post-partum period than the newborns who were not SSC ($p<0.0001$) The SSC group had a lower rate of weight loss at discharge and at first follow-up (both $P < 0.0001$) The SSC group had lower morbidity rates than the non-SSC group ($P = 0.006$).	
Gouchon, et al.,2010	To determine if infants of uncomplicated cesarean sections are at a higher risk than infants of vaginal delivery	Randomized controlled trial	34 planned cesarean section mother/ child couplets	Outcome measured was temperature of infants who were SSC versus those who were dressed and placed in crib/given to mother within 2 hours after mother returned from operating room. Temporal artery temperature was measured using an infrared ray thermometer at half-hour intervals	There was no significant difference in temperature between infants who performed SSC with mother within 2 hours and the control group who were not skin to skin with mother within 2 hours. Mean temperature drop for SSC infants was from 36.0-C to 35.0-C and from 36.3-C to 35.9-C for control group	IIB
Beiranvand, Valizadeh, Hosseinabadi, & Pournia, 2014	To assess temperature of mothers and infants after a cesarean	Randomized controlled trial	90 mother/ infant dyad; mother 18-40 years old Infant 38-42 weeks	Outcomes were measured between infants who were infants SSC after cesarean delivery versus routine care (infants were dressed before given to mother)	The temperature of infants who were SSC with mothers after cesarean sections was not significantly different from those who had routine care ($p=0.021$, $F=1.68$).	IIA

	delivery		old	included: Temperature using an infrared ray thermometer at half-hour intervals for 1 hour; Breastfeeding behaviors and successful breastfeeding using IBAT tool; Maternal satisfaction which was measured using a validated 11 item questionnaire	Readiness to breastfeed and sucking were significantly different in the SSC versus those who received routine care (p=0.021 and p=0.03 respectively) Latching and rooting behaviors were not significantly different in the SSC versus those who received routine care. Majority of the mother gave a "yes" answers to the satisfaction with SSC question	
Velandia, Uvnäs-Moberg & Nissen, 2011	To examine infants behavior towards breastfeeding when SSC with mother or father after a cesarean section and at time of breastfeeding	Randomized controlled trial	42 Healthy 38-42 week newborns of cesarean section mothers	Outcomes measured were strong rooting, breast-massaging movements, breastfeeding, crying and parental behaviors (touch, smile, kiss and speech). Measured using inter-rater reliable observers of measuring outcomes	In infants who were SSC with mothers versus father, there was no significant difference in the appearance of the first strong rooting (p= 0.603) or breast-massaging movements (p=0.576), however first breastfeeding appeared significantly earlier (p = 0.018), girls cried significantly more when SSC with the mother versus father (df = 1, F = 10.977, p = 0.004) while there was no significant difference with boys crying if they were SSC with mother versus father (df = 1, F = 1.433, p = 0.251); Parental behaviors: Mothers in SSC touched their infants significantly more than fathers in SSC (F = 14.138, p = 0.001), smiling occurred significantly less in the	IIA

					mothers rather than fathers in SSC (F = 14.785, p = 0.001), No significant differences were found between mothers versus fathers kissing their infants (p = 0.922); no significant difference of speech between mother and infant girls versus infant boys (df = 1, F = 0.349, p = 0.558), there was a significant decrease of speech between father and infant girls versus infant boys (df = 1, F = 4.481, p = 0.042)	
Crenshaw, 2014	Review of the evidence that supports limitless opportunities for SSC and breastfeeding	Evidence-based review	Healthy mothers and newborns	Measured outcomes includes SSC influence on innate physiologic response in 1st hour of birth, attachment responses, breastfeeding behaviors, breastfeeding duration and exclusivity.	Newborns who were SSC cried less, had more stable HR, oxygen saturation, blood glucose, and decreased salivary cortisol levels compared to those who did not have SSC. The risk of hypothermia was reduced by SSC. Birth cry, relaxation, awakenings, activity, rest, crawling, familiarization, suckling and sleeping are enhanced by SSC. A positive correlation between early SSC and exclusively breastfeeding at discharge and longer durations of breastfeeding.	IIB
Takahashi, Tamakosh, Matsushim, Kawabe, 2010	Evaluate how initiation time and duration of early SSC	Non-experimental Study	147 stable, full-term newborns	HR, oxygen saturation and salivary cortisol were measured	HR of 120-160 bpm was obtained faster in infants who were SSC at birth versus those who were SSC very early. Salivary cortisol levels were significantly lower at 60	IIIB

can influence stress after birth	minutes and 120 minutes in the group who continued SSC for more than 60 minutes compared to those SSC for 60 minutes or less

Note. HR – Heart Rate; bpm – Beats per Minute; IBFAT - Infant Breastfeeding Assessment Tool; NBAS - Neonatal Behavioral Assessment Scale; RCT - Randomized Control Trial; SSC – Skin-to-Skin Contact

Table 2

Comparison of Skin-to-Skin Contact (SSC) Provider with the Time Skin-to-Skin Contact (SSC) was Initiated (n=10)

SSC Provider	Number of newborns who were SSC <1 hour	Number of newborns who were SSC >1 hour but <2 hours
Father/Support Person	3	1
Mother	2	4

Note. p>0.05 (0.238).

Figures

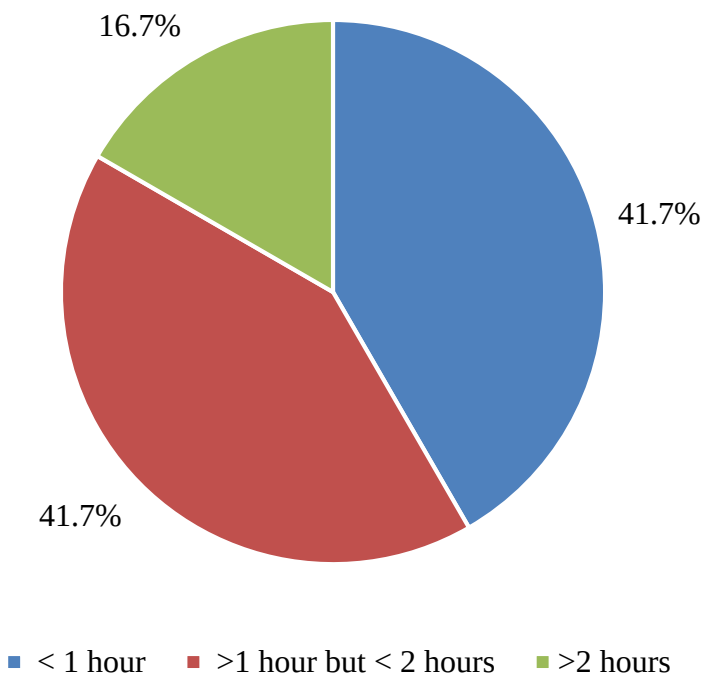

Figure 1. Number of newborns who performed skin-to-skin contact

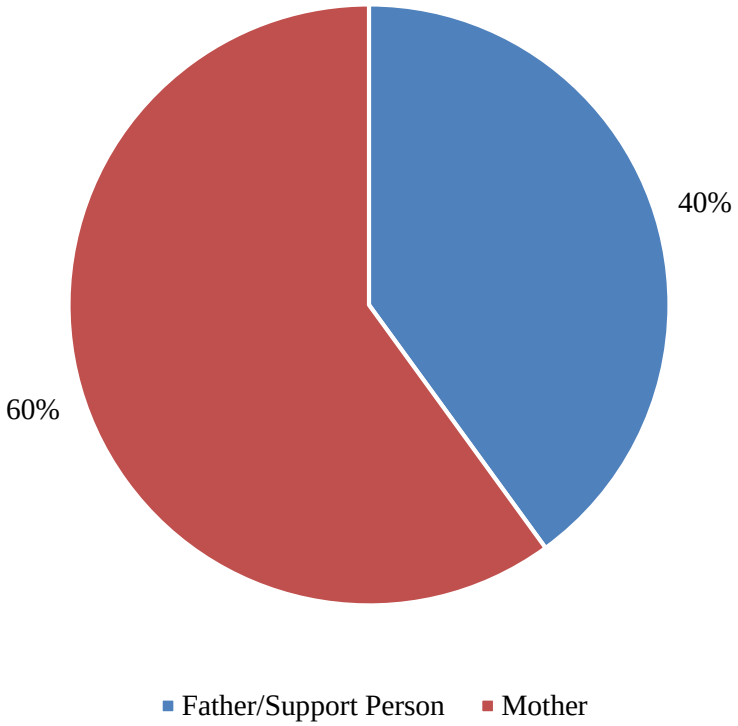

Figure 2. Total number of skin-to-skin providers

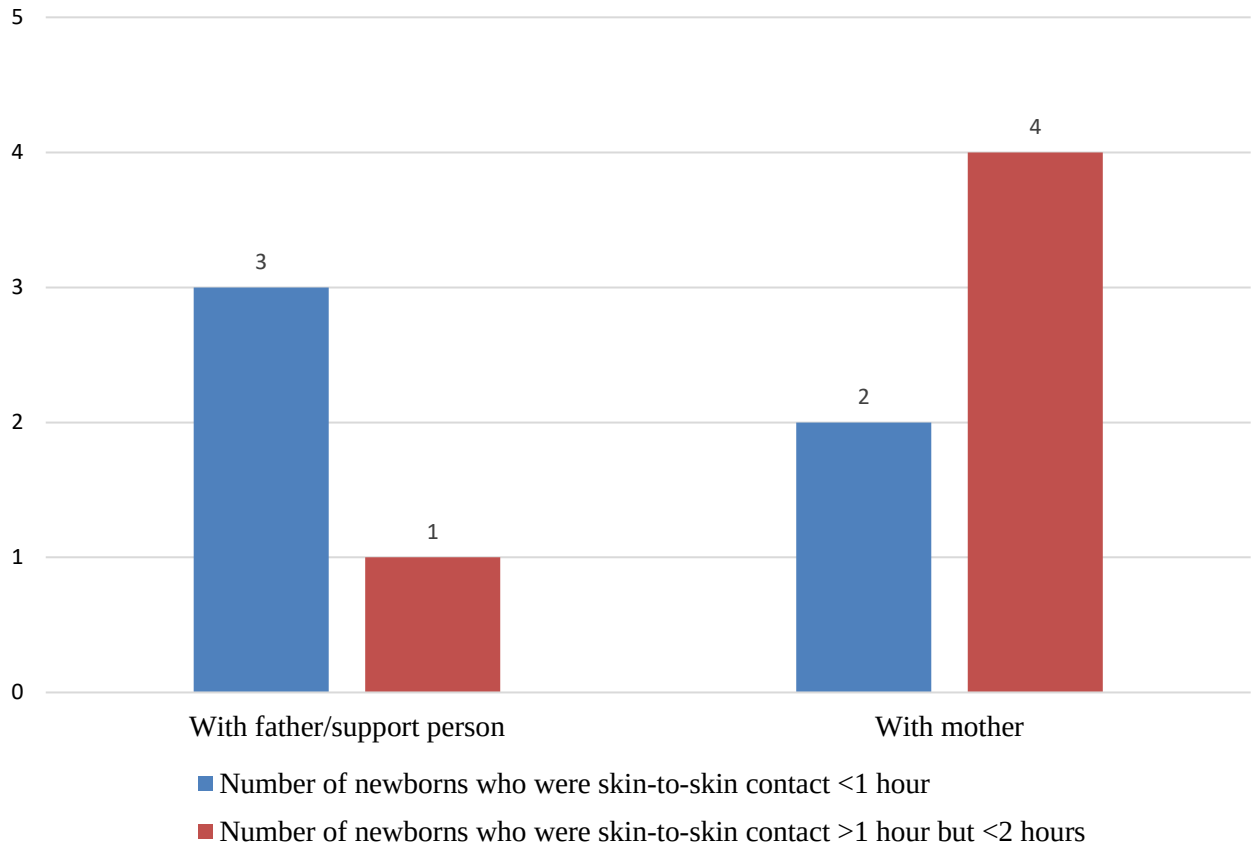

Figure 3. Comparing skin-to-skin providers and skin-to-skin contact (SSC) initiation time

Appendix A

Checklist to Determine Eligibility for SSC of Infants of Uncomplicated Cesarean Births

Name _____

Medical Record #_____

Check Yes or No for each item to indicate completion.

Item	**Yes**	**No**
Before birth		
• Uncomplicated cesarean section		
• Gestational age of newborn will be 37-42 weeks at birth		
• Mother has identified support person		
• Nurse has discussed the process and rationale for SSC with mother and support person		
• Signed consent from mother and support person on safe SSC in chart		
At birth		
• Does this newborn meet criteria to perform SSC (*follow unit policy*)		

Note. SSC- Skin-to-skin contact

Newborn Documentation Assistant

Time of Birth _____ Date of Birth _____

Skin-to-Skin Provider: Mother / Father / Significant Other / Support Person (Who)_____

Skin-to-Skin Start Time: _____

Skin-to-Skin End Time: _____

Vital Signs from the time of SSC:

15 minutes: T _____, HR _____, RR _____

30 minutes: T _____, HR _____, RR _____

60 minutes: T _____, HR _____, RR _____