Journal of Integrated Health xxx (2022) xxxxxx

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Skin-to-skin Care's Effects on Breastfeeding Rates in Cesarean Births

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ARTICLEINFO

Keywords:

Breastfeeding rates; Cesarean section; Skin-to-skin care

ABSTRACT

Objective: The purpose of the pilot study was to increase breastfeeding rates for term infants born via scheduled cesarean sections by consistently implementing skin-to-skin care in the operating room immediately after delivery through instituting a transitional care policy. **Design:** The pilot study was a pre- and post-quality improvement design.

Setting: The study took place at a tertiary care facility that had an exclusive breastfeeding rate of 42% which was below the World Health Organization's recommendation of 50% and where skin-to-skin care was not occurring in the operating room after cesarean sections. **Participants:** The pre-quality improvement group were a convenience sample of patients that underwent scheduled term c-sections prior to the implementation of the new transitional care policy. The intervention that was implemented in the transitional care policy was skin-to-skin care in the operating room immediately after a c-section. The post-quality improvement group were a convenience sample of patients that underwent term scheduled c-sections after the policy was in place. **Intervention/Measurements:** Implementation of skin-to-skin care in the operating room and breastfeeding rates at hospital discharge were evaluated. Implementation of skin-to-skin care and breastfeeding rates at hospital discharge were evaluated. Results: Implementation of skin-to-skin care did increase slightly (18.58% to 31.09%). Mothers receiving skin-to-skin care in the operating room were more likely to be exclusively breastfeeding at hospital discharge (67.20% versus 44.20%).**Conclusion:** The results of the project indicate that skin-to-skin care implemented in the operating room immediately after birth increases success

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Received 20 March 2022; Received in revised form 04 April 2022; Accepted 10 May 2022

Journal of Integrated Health (JIH)

Available online 12 May 2022

Published by URF Publishers.

Skin-to-Skin Care's Effects on Breastfeeding Rates in Cesarean Births

Exclusive breastfeeding has been shown to provide an ideal source of food for healthy growth and development in the newborn infant [1,2]. According to [3], breastfeeding has many known benefits and should no longer be considered a lifestyle choice but a public health issue. The Joint Commission's core measure PC-05 of exclusive breast milk feeding suggests that a performance rate of 70% is an achievable target for hospitals [4].

Breastfeeding provides all children the healthiest start in life, yet only 40 percent of children under six months of life are fed only breastmilk [5]. Exclusive breastfeeding for the first six months of life has been shown to decrease the incidence of lower respiratory infections, otitis media, asthma, respiratory syncytial virus, dermatitis, gastroenteritis, inflammatory bowel disease, obesity, celiac disease, Type 1 and Type 2 diabetes, and Sudden Infant Death Syndrome [SIDS] .In 2013, Arkansas ranked number one in the United States for cases of SIDS. Arkansas had 141.1/100,000 deaths due to SIDS compared to the national average of 39.7/100,000 [6].

The c-section rate in the United States in 2017 was 32% which is well above the WHO recommendation of no more than 10% to 15% for optimal maternal and neonatal outcomes (Centers for Disease Control and Prevention [7,8]. In 2017 Arkansas had a c-section rate of 33.5% which ranks 14th in the United States [9,10] found that women who delivered via a planned c-section were more likely (OR=1.61; 95% CI: 1.14, 2.26; p = 0.014) to discontinue breastfeeding before 12 weeks postpartum than those who delivered vaginally. [11] found that there is a statistically significant disparity in exclusive breastfeeding rates in the delivery room based on the birth type. Breastfeeding was significantly higher after a vaginal birth compared with after a c-section (71.5% vs 3.5%, p<0.001).

SSC immediately after an infant's birth has been shown to increase successful initiation of breastfeeding among healthy infants [12,13]. The [1] recommends facilitating immediate and uninterrupted SSC to initiate breastfeeding as soon as possible after birth. SSC refers to the infant's bare chest being placed against the mom's bare chest [14].

Although SSC implemented immediately after the birth has been shown to promote the initiation of breastfeeding, it is still the standard practice in most hospital facilities for infants to be placed under radiant warmers for an extended period following a c-section [11]. The delayed onset of SSC in c-sections may lead to a decrease in breastfeeding success. The standard of care should be the same regardless of whether a mother delivers via vaginal or cesarean birth. Health care clinicians need to be properly trained to care for breastfeeding mothers and babies.

Despite evidence supporting SSC positively affecting breastfeeding rates, mother/infant dyads delivered via c-section were not initiating skin-to-skin in the OR after birth. SSC was routinely performed immediately after birth for vaginal births, but after c-sections, it was delayed until the mother was transferred to the recovery room. The infant was assessed on a radiant warmer, wrapped in blankets, briefly shown to the mother, and then separated from the mother to be taken to the recovery room for transitional care. This separation caused a delay in the initiation of SSC and the first breastfeeding. Breastfeeding within the first hour of life has been found to have numerous health benefits and increases the chances of successful breastfeeding which can reduce neonatal mortality by 22% [15].

The purpose of the pilot studywas to increase the consistent implementation of SSC in the OR after a term scheduled c-section. [16] found early SSC significantly improved breastfeeding rates at 6 weeks of age among healthy term neonates with the SSC group reporting 72% versus 57.6% for the control group not experiencing SSC. [17] found that infants that were placed SSC immediately after birth, initiated breastfeeding earlier than infants that did not perform SSC. Since there was no written policy in place on the Mother-Baby Unit (MBU) concerning transitional care after a c-section, the pilot study aimed to change the current workflow in the OR by making SSC immediately after birth the standard of practice for all term infants born via scheduled term c-sections. The study aimed to answer the following research question: In mother/infant dyads delivered via c-section, how did performing SSC in the OR compared with mother/infant dyads who did not undergo SSC in the OR affect breastfeeding rates at hospital discharge?

Background

SSC and Breastfeeding

The early implementation of SSC has been shown to increase the likelihood of the early initiation of breastfeeding [18,19,20]. Early SSC has also been found to increase the likelihood of exclusive breastfeeding for one to four months of life as well as an increased duration for breastfeeding [1]. Mothers who experience early SSC are more likely to have a successful breastfeeding experience during the early postpartum period [21,22]. Evidence has demonstrated support for the early practice of SSC for healthy newborns regardless of the mode of birth [14]. The benefits of breastfeeding include healthier babies who transition into healthier adults and beyond. This leads to an overall improvement in population health [13]. SSC has shown to be beneficial to the initiation and exclusivity of breastfeeding which reduces the need for formula usage in hospitals. This could lead to reduced costs and, in the United States alone, an estimate of $13 billion annually could be saved if 90% of infants were breastfed exclusively during the first 6 months of life [12].

SSC and Birth Type

Although SSC has become the standard practice in most hospitals when healthy newborns are born via vaginal births, it has not become routine care for infants born via c-section. In

the United States, 75% of women who deliver via c-section are separated from their babies for at least the first hour of life [23]. C-section rates continue to rise, and the rates of breastfeeding continue to be lower among women who deliver via c-section versus vaginally [24].

Several studies have investigated the initiation of SSC after a c-section and its effects on breastfeeding. Placing the infant in SSC after a c-section has shown increased patient satisfaction and aided in the bonding and connection between the mother and baby which increases the chance of successful exclusive breastfeeding [19]. A landmark non-experimental observational study was conducted by [11] who followed 2137 infants born at the Department of Pediatrics in the University of Padua's School of Medicine in Italy. The breastfeeding rates for vaginal births were found to be significantly higher than cesarean births. [11] concluded that vaginal deliveries had a higher percentage of exclusive breastfeeding rates than cesarean births, and one of the main differences noted was the initiation of SSC after birth. The infants born via vaginal deliveries received immediate SSC after birth while those born via cesarean birth had delayed SSC until later on in the recovery room. [25] found similar results in their study of 366 women who underwent elective c-sections. The initiation of SSC in the OR increased breastfeeding rates and patient satisfaction. [13] performed a quasi-experimental design with a convenience sample and a mixed-methods approach. Forty-one women were included in the study and the experimental group was allowed to have SSC immediately after cesarean birth in the OR. The experimental group was given routine care with delayed SSC in the recovery room. Breastfeeding initiation, duration, and exclusivity were measured. The women who received immediate SSC had significantly earlier breastfeeding initiation, longer durations of overall breastfeeding, and increased rates of breastfeeding exclusivity over the comparison group. The researchers determined that SSC immediately after birth should be instituted in all hospital environments due to its observed beneficial effects [13]. [26] conducted a randomized study of 205 women who were planning cesarean deliveries and were greater than 37 weeks' gestation. Infants in the study group received immediate SSC in the OR, while the control group received routine cesarean care which included immediate separation. They found that breastfeeding rates were higher in the study group at 81% versus the control group at 69% [26].

Barriers to SSC

Barriers to SSC immediately after a c-section have been studied and identified. Infants born via c-section are thought to be at a perceived increased risk for hypothermia. This is due to the decreased temperature in the OR and the possible drugs that the baby might be exposed to in utero [14]. Research suggests that infants who undergo SSC immediately after a c-section for thirty to fifty minutes are not at a higher risk for hypothermia compared to infants who are kept on a radiant warmer [27,28].

[29] found that the use of immediate SSC after a c-section does not increase the likelihood of an infant being transferred to the NICU. An evidence-based practice project was conducted and analyzed data collected over a five-year period (2011 through 2015). These data were analyzed for the years before SSC was initiated in the OR and the years after it was begun. They found that the admission into the NICU was significantly lower in the years that SSC had been initiated immediately after a cesarean birth. These results are further evidence that SSC should be instituted for any mother giving birth regardless of the mode of birth [29].

Another barrier to the initiation of SSC after a c-sectionis the attitudes and biases of OR personnel [12,30]. When SSC was initially implemented in some ORs, staff were skeptical, reluctant, and afraid to change due to routine habits and practices that had been in place for years. Staffing issues are also a concern due to the need for a nurse for the infant and the mother in the OR which might make immediate SSC not possible due to a shortage of nurses [12,30].

Several studies have noted the benefits that SSC can provide to both mothers and newborns. Implementing SSC in the immediate postpartum period has been found to improve the mother's chances of successful breastfeeding [31]. Although, this practice has become the standard of care for vaginal births the same practice is not occurring consistently with infants that are born via c-section. Some barriers will have to be addressed and overcome with this change in practice. By implementing a written policy for the transitional care of infants born via c-section and providing patient education, the practice of SSC being provided immediately after a c-section can be implemented consistently to improve the quality of care provided to the patient population. [32] was selected as the most appropriate theory to implement this evidence-based practice recommendation and served as a guide to formulate, implement, and evaluate the pilot study.

Methods

Before the beginning of the study, the project received approval from the University's and Hospital's Institutional Research Review Boards. The project evaluated the effectiveness of a transitional care policy on the consistent implementation of SSC in the immediate postpartum period after a c-sectionto increase exclusive breastfeeding rates. The facility had an exclusive breastfeeding rate of 42% which was below the WHO recommendation of 50% [33].

Pre-quality improvement group and a post-quality improvement group were used to conduct the study. The pre-quality improvement group wasa convenience sample of patients that underwent scheduled term c-sectionsbefore the implementation of the new transitional care policy. The intervention that was implemented in the transitional care policy was SSC in the OR immediately after a c-section. The post-quality improvement group wasa convenience sample of patients that underwent term

scheduled c-sections after the policy was in place. Term infants were defined as infants between 37 to 42 weeks' gestation. The outcomes that were measured werethe frequency with which SSC occurred in the OR pre- and post-transitional care policy and exclusive breastfeeding rates at hospital discharge pre- and post-transitional care policy. Exclusive breastfeeding was defined as the infant only receiving breast milk without any additional food or drink [34].

The study took place in the MBU at a regional tertiary care facility that serves many surrounding counties. Study participants included all mothers who were admitted for a term-scheduled c-section. The sample size was dependent on the number of mothers admitted for term-scheduled c-sections. Inclusion criteria included mothers who were greater than 37 weeks and less than 42 weeks' gestation, English or Spanish speaking, and were scheduled for a c-section. Exclusion criteria were mothers who underwent emergency c-sections, have infants with conditions that would preclude breastfeeding such as cleft palate, complications with surgery that prevented SSC, maternal medications that made SSC unsafe such as large doses of ketamine, midazolam, or fentanyl, maternal general anesthesia, non-English or Spanish speaking, or infants with medical issues that required immediate separation from the mother for medical care or NICU admittance. The study intervention was a transitional care policy for term scheduled c-sections that included the implementation of SSC in the OR.

Before implementing the study, a chart review was completed to gather baseline data on discharge breastfeeding rates on mothers who underwent a term scheduled c-section and SSC implementation in the OR. This was utilized for comparison with post-intervention results. A transitional care policy was developed with key stakeholders for term scheduled c-sections, and staff were provided with educational in-services to educate them on the new transitional care policy.

Once the new policy was instituted, when the infant was born via c-section, Apgar scores were assigned at 1 and 5 minutes, and the mother was asked if she would like to place the infant skin-to-skin while still in the OR. If either the mother or infant was medically unstable, SSC would not take place. Medical stability was determined by the obstetrician, anesthetist, and/or transitional care nurse. If both mother and infant were medically stable, and the mother agreed, the infant was placed skin-to-skin for the remaining duration of the c-section. If at any time during SSC either the mother or infant had a change in their medical status, SSC was discontinued. Once the mother had been moved to her recovery room, she was given the option to continue SSC and attempt breastfeeding. Data were gathered weekly to determine the number of scheduled c-sections, qualifications for SSC to occur in the OR, SSC occurrence in the OR of those that are qualified, and type of feeding at hospital discharge.

Pre- and post-intervention outcomes were measured for four months pre and post-intervention. Mothers that had SSC implemented in the OR were compared to the total number of mothers admitted into the regional care facility for a scheduled term c-section who were eligible for SSC. Also, the exclusive breastfeeding rates at hospital discharge for mothers who underwent term-scheduled c-sections were compared. These outcome measures were evaluated for pre- and post-intervention of the new transitional care policy. The project took place from September 2019 through April 2020.

Results

Exploratory data analyses were conducted to develop a snapshot of the two independent samples (pre-intervention: n = 113; post-intervention: n = 119). Analyses were conducted separately for each sample due to their independence. A frequency analysis was calculated for variables containing categorical data, while measures of central tendency (i.e., mean, median, mode) and spread (e.g., standard deviation, range) were calculated for variables containing continuous data. See **Table 1.**

Table 1: Measures of Central Tendency and Spread for Pre-Intervention (n = 113) and Post-Intervention (n = 119) Samples.

Variable	Mean	Median	Mode	SD
Maternal Age	28.95(28.48)	29.00(28.00)	27.00(26.00)	5.31(5.73)
Gravidity	2.93(3.16)	3.00(3.00)	2.00(2.00)	1.62(1.92)

Note. Data outside of parentheses represent values for pre-intervention sample. Data in parentheses represent values for post-intervention sample.

In the pre-intervention sample, 21 cases of SSC occurred in the OR (18.58%) while SSC did not occur in 92 cases (81.42%). In the post-intervention sample, 37 cases of SSC occurred in the OR (31.09%) compared to SSC not occurring in 82 cases (68.91%). In the pre-intervention sample, 50 cases of infants were exclusively breastfeeding at the time of discharge (44.25%) compared to 63 infants not exclusively breastfeeding at the time of discharge (55.75%). In the post-intervention sample, 46 cases of infants were exclusively breastfeeding at the time of discharge (38.66%) compared to 73 infants not exclusively breastfeeding at the time of discharge (61.34%).

Upon admission to the hospital, each patient was asked to indicate their preferred method of feeding their infant after being discharged. Of the 113 cases in the pre-intervention sample, 92 cases reported breastfeeding as the preferred method of feeding upon admission (81.42%). Bottle feeding was the preferred feeding method reported in 20 cases (17.69%). Finally, one case reported being uncertain (0.89%). Of the 119 cases in the post-intervention sample, 80 cases reported breastfeeding as the preferred method of feeding upon admission (67.23%). Bottle feeding was the preferred feeding method reported in 39 cases (32.77%). No one indicated being uncertain in response to this item. In the pre-intervention sample, 19 cases experienced a baby nurse being available for transitional care of the infant (16.81%), while 94 cases did not experience a baby nurse being available for transitional care (83.19%). In the post-intervention sample, 82 cases experienced a baby nurse being available for transitional care of the infant (68.91%) compared to 37 cases did not experience a baby nurse being available for transitional care (31.09%).

A two-by-two contingency tables analysis was conducted to evaluate the relationship between the intervention and resulting SSC in the OR after scheduled C-sections. It was hypothesized that there would be a higher rate of SSC in the OR after scheduled C-sections in the post-intervention sample compared to the rate of SSC in the OR after scheduled C-sections in the pre-intervention sample. The two variables were pre-intervention or post-intervention and whether SSC occurred in the OR (*no* or *yes*). See **Figure 1** for a display of outcomes on these variables.

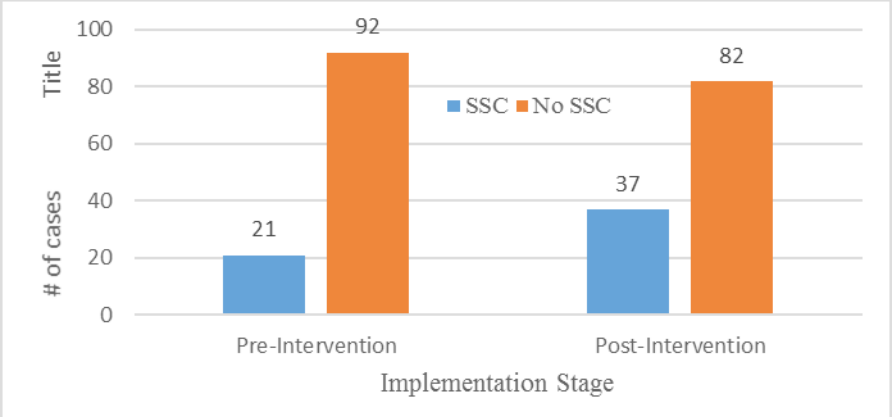

Figure 1: Skin-to-Skin Contact by Stage of Implementation.

The variables were found to be significantly related, Pearson $X^2(1, N = 232) = 4.84$, $p = .03$; $\Phi = 0.14$, $p = .03$. The evidence supports the claim that the proportion of SSC cases in the OR immediately after scheduled C-sections in the post-intervention sample ($n = 37$; 31.10%) was significantly higher than the proportion of SSC cases in the OR after scheduled C-sections in the pre-intervention sample ($n = 21$; 18.60%). Refer to **Table 2** for a concise presentation of results reported for the chi-square analysis.

Table 2: Results of Comparisons Used in Chi-Square Analyses.

Comparison	*N*	*df*	Chi-square value	*ES*
SI by SSC	232	1	4.84*	0.14*
SI by XBf	232	1	0.75	n/a
SSC by XBf(1)	232	1	21.32**	0.30**
SSC by XBf(2)	172	1	11.78**	0.26**
SI by BN	232	1	63.99**	0.55**
Eth by XBf	232	1	0.82	n/a

Note. SI = stage of implementation; SSC = skin-to-skin contact; XBf = exclusively breastfeeding at discharge; BN = baby nurse availability; Eth = ethnicity of mother; SSC by XBf(1) is a comparison that includes all cases in the dataset; SSC by XBf(2) is a comparison that includes data only from mothers who indicated a preference for breastfeeding at the time of admission; N = number of cases used in the comparison; df = degrees of freedom; ES = effect size; * indicates p-value < .05; ** indicates p-value < .001

A two-by-two contingency tables analysis was conducted to evaluate the relationship between the intervention and infants exclusively breastfeeding at the time of discharge. See **Figure 2** for a display of outcomes on these variables.

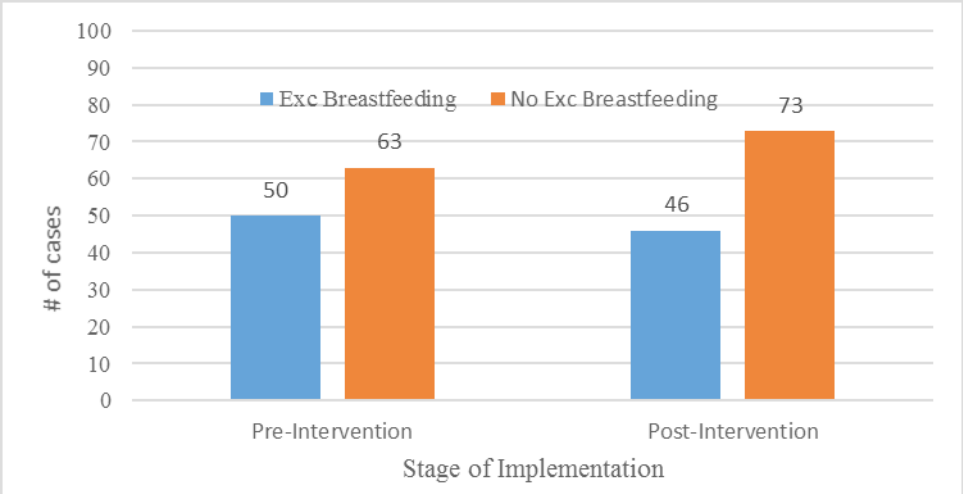

Figure 2: Exclusively Breastfeeding at Discharge by Stage of Implementation.

The variables were not found to be significantly related, Pearson $X^2(1, N = 232) = 0.75$, $p = .39$ Refer to Table 2 for a concise presentation of results reported for the chi-square analysis.

A follow-up exploratory question was examined using a two-by-two contingency tables analysis to evaluate the relationship between occurrences of SSC in the OR and infants exclusively breastfeeding at the time of discharge. The two variables were whether SSC occurred in the OR (*no* or *yes*) and whether the infant was exclusively breastfeeding at discharge (*no* or *yes*). See **Figure 3** for a display of values on these variables.

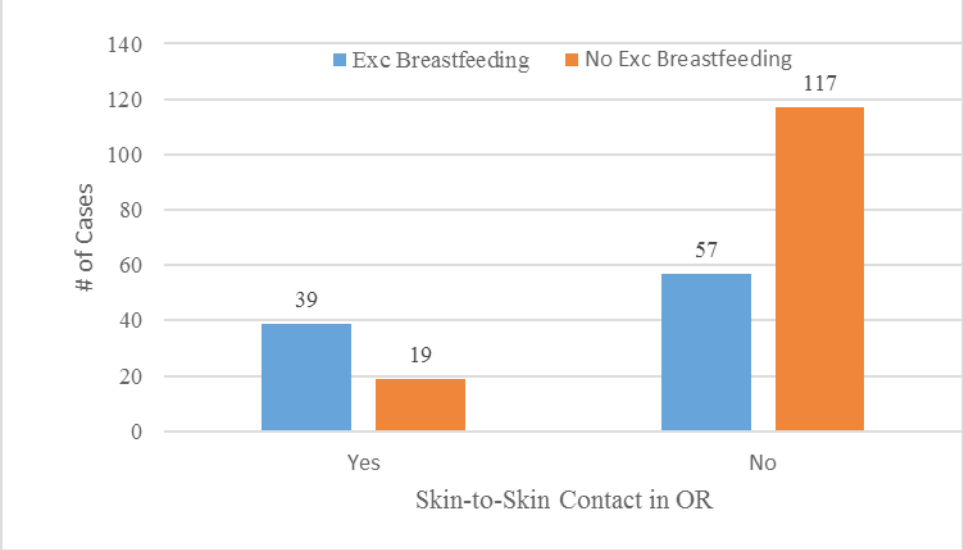

Figure 3: Exclusively Breastfeeding at Discharge by Skin-to-Skin Contact.

The variables were found to be significantly related, Pearson $X^2(1, N = 172) = 11.78$, $p = .001$; $\Phi = 0.26$, $p = .001$. The evidence supports the idea that the proportion of infants exclusively breastfeeding at discharge when SSC occurred in the OR ($n = 39$; 75.00%) was significantly higher than the proportion of infants exclusively breastfeeding at discharge when SSC did not occur in the OR ($n = 56$; 46.70%). This was specific to those cases where the mothers stated upon admission that they prefer to exclusively breastfeed their infants at the time of discharge from the hospital. Refer to Table II for a concise presentation of results reported for the chi-square analysis.

Implications for Nursing Practice

The project did reveal that the mothers that did participate in SSC in the OR were more likely to be exclusively breastfeeding at hospital discharge than those mothers that did not participate in SSC in the OR. Higher breastfeeding rates can equivocate to huge economic dividends. Each mother-infant dyad could have cost savings due to decreased formula costs as well as decreased healthcare costs due to the healthcare benefits of breastfeeding. In terms of reduced healthcare costs due to improved breastfeeding practices, it is projected that a total savings of $300 million can be saved in the United States, Brazil, and urban China alone [35]. Limitations of the project included several days that there was the unavailability of a second nurse to perform transitional care in the postpartum unit. Therefore, SSC did not occur. This did not decrease the number of study participants because all mother/infant dyads that were admitted for a term-scheduled c-section were eligible for the pilot study. It did however lead to infants not receiving SSC in the OR, and transitional care occurring in the NICU instead of in postpartum with the mother. Therefore, in future studies that study the effects of SSC in the OR, adequate staffing must be secured in the NICU to allow for the availability of a second nurse. Also, it was found that many times mothers did not receive SSC in the OR even when a second nurse was available. This could have been due to a lack of staff buy-in and a need for further staff education. The study was further limited by the narrow scope of this patient population due to only including term-scheduled c-sections. The results from this project may be utilized to implement more SSC in the NICU population with very low birthweight infants.

The results of the project indicate that SSC implemented in the OR immediately after birth increases success rates of exclusive breastfeeding. Those mothers that did receive SSC in the OR were more likely (67.20%) to be exclusively breastfeeding at hospital discharge than mothers who did not receive SSC in the OR (44.20%). Although the overall breastfeeding rates did not increase overall for the study participants, those mother/infant dyads that did receive the evidenced-based intervention of SSC immediately after birth did have an increase in breastfeeding rates of 23% over those mother/infant dyads that did not receive SSC. Of significance, SSC was not implemented 70% of the time, but its frequency of implementation was increased from 18.58% to 31.09%. This increase in the use of SSC, coupled with the 23% positive difference in exclusive breastfeeding rate at discharge, among mothers receiving SSC indicates the transitional care policy has significant potential to increase hospital breastfeeding rates. Nurses are in a unique position where they can dramatically influence the success of the evidence-based intervention of SSC in the OR and improve breastfeeding rates and overall population health.

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