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Efficacy of Early Skin-to-Skin Contact on Thermal Regulation and Breastfeeding of the Newborns and on 3rd Stage of Labor and Postpartum Maternal Condition

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Abstract: Twenty two percent of newborns mortality rate in the first month of life is reduced if they start breastfeeding and Skin to Skin Contact (SSC) within the first hour after birth. Early initiations of breastfeeding and SSC immediately after birth lead to acceleration of oxytocin, endorphins and other hormones secretion that decrease time of third stage of labor and promote bonding between mothers and their her newborns. Aim: The study aimed to estimate the influence of early SSC on the thermal regulation of the newborn and the rate of breastfeeding at different points of time. We also aim to establish whether SSC reduce maternal pain during episiotomy repair and decreases the time to expel placenta. Study Design: Non randomized controlled trial was used in this study. Setting: This study conducted at Labor and Delivery Unit at Mansoura University Hospitals and private hospital in El-Mahalla El-Kobra city. Subjects: A convenience sample of 118 mothers and their newborns chosen on the base of inclusion and exclusion criteria. Data collection tools:, Three tools were used for collecting data; namely (Structured Interview Questionnaire, Newborn assessment sheet and Maternal assessment sheet) Results: Early maternal/ newborn SSC during 3rd stage of labor shows more thermal stability of the newborn, start breast feeding within 30 minute from delivery of baby, the third stage duration was shorter and level of pain decreased in SCG than control group where Mean ±SD was 1.9 ±1.0 and 6.7 ±1.7 respectively. There was statistically significant difference between two groups (p < .001). Conclusion Initiation of SSC during 3^{rd} stage of labor results in more thermal stability and early breastfeeding initiation to the newborn. As well, short duration of the 3rd stage of labor and decrease pain level to mother than control group.

Keywords: Skin-to-Skin Contact, Thermal Regulation, Breastfeeding, Third Stage of Labor, Postpartum Maternal Condition.

1. INTRODUCTION

Immediate skin-to-skin contact (SSC) and starting of breastfeeding may reduce morbidity and mortality among newborn infants. World Health Organization states that more than one and half million deaths among newborn annually occur as a result of decrease intake of breast milk (*World Health Organization,2016*) Twenty two percent of newborns mortality rate in the first month of life is reduced if they start breastfeeding and SSC immediately after birth. This is considered as one of step recommended in the "Ten Steps to Successful Breast feeding (*Lawrence, 2005*). Skin to skin contact is the practice where a newborn is dried and laid directly on their mother's bare chest after birth, both of them covered in a warm blanket. This action is also called Kangaroo Mother Care (*Mahmood et al., 2011; Rodgers 2013; Essa and Ismail, 2015*). The 3rd stage of labor begins immediately after fetus delivery and continues until placenta and fetal membrane are delivered. It considered as a critical time for mother and infant health and wellbeing, and it is the starting point of time for their unique life-long relationship (*Burke., 2010*). Nowadays, the standard practice in most modern obstetrical settings

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give medications that stimulate strong uterine contraction to accelerate the third stage, in order to avoid bleeding. This is known as active management that consisted of early clamping of the umbilical cord, and pulling it to faster delivery of the newborns' placenta. In normal, un medicated, uncomplicated birth, it is reasonable to plan a physiological or natural 3rd stage, without aggravate the danger of bleeding. Usually in normal 3rd stage, the newborn's umbilical cord should not clamped or cut and the mother and newborn should be kept in SSC, in a warm, calm delivery room after delivery of the placenta. (*The Royal College of Midwives.*, 2012)

In recent times, several studies conducted to apply different technique to reduce pain throughout episiotomy repair. These studies applied interventions before starting labor, used different methods to suture and applied special intervention during the postpartum (*East., et al 2007&Kindberg., et al 2008*). But there is no previous study conducted to assess the effect of skin to skin contact on maternal pain throughout episiotomy repair.

Maternal interaction with newborn by grabbing, seeing, hearing, smelling and caressing a naked newborn of the beloved skin lead to release of oxytocin from the mothers and newborns. Oxytocin continuously released in large amounts throughout prolonged SSC when the newborn move hand and leg, crawls near the mother's breast and looks for the nipple. During the sucking of the nipple by the newborn, more oxytocin is released so that the mother and the newborn are flooded with oxytocin that is responsible for lifelong love relationship. (*Holmberg et al, 2014*)

Early initiations of breastfeeding and SSC immediately after birth lead to acceleration of oxytocin, and other hormones secretion that decrease time of third stage of labor and promote bonding between mothers and their her newborns. Maternal oxytocin support uterine contractions that assistance the placenta to separate and the uterus to contract. In this way, oxytocin stops bleeding and forms the close bond that will ensure the care and protection of the mother with the other hormones and this maintain survival of the newborn (*Phillips, 2013;Essa & Ismail, 2015*).

When the woman feels fear, the adrenaline is released under the effect of the sympathetic system thus decreasing the blood flow to the pelvic organs and increasing it in vital organs as heart, brain and muscles for fight or flight. This stimulation causes pallor, sweating, tachycardia, tachypnea, and hypertension (*Casper et al., 2018*). The adrenaline secretion reduce oxytocin and causes decreasing of the uterine ability to contract thus this sympathetic stimulation affects the uterine efficiency during and after birth. Prolonged labor and primary postpartum hemorrhage are seen to be caused by fear (Saxton et al., 2014). Mothers who practice skin contact with their newborns are more relaxed, express less anxiety, have increased maternal affectionate/nurturing behaviors, sleep synchronized with their newborns and respond to the needs of their newborns with more self-esteem. (American College of Nurse-Midwives., 2013)

It is a relevant benefit of skin contact for the mother following vaginal birth. Frequent uterine massage and perineal tears that may occur during delivery cause painful sensation for the woman after delivery. However, putting the newborn in prone position on his mother's chest after delivery diverts the mother attention away from pain. Also regarding the newborn, skin contact reduces the plasma cortisol levels resulting in reducing level of stress (*Mejbel et al., 2012*)

Significance of the study

Immediately after birth SSC has been recommended by Baby Friendly Hospital Initiative (BFHI) as a means to promote breast feeding, exclusivity, and duration after hospital discharge. (*WHO. UNICEF, 2009*). Therefore it is recently applied as a routine care because of its benefits. Egyptian hospitals did not apply SSC despite that evidence based practice supported its application (*Nahidi, 2010; Essa and Ismail, 2015*). Also few studies manipulate this practice and its impact at Mansoura University Hospitals. Therefore, the current study was applied to encourage early SSC and to evaluate its efficacy on thermal regulation and breastfeeding of the newborns and on 3rd stage of labor and postpartum maternal condition.

Study Aim:

This study aimed to evaluate the efficacy of early SSC on thermal regulation and breastfeeding of the newborns and on third stage of labor and postpartum maternal condition

Hypothesis:

Mothers who will be exposed to early SSC with their newborns expected to experience maintenance of newborn temperature in the delivery room, starting breast feeding early, decreases the time of placenta delivery, and reduce maternal pain during suturing episiotomy than those who did not.



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2. SUBJECTS AND METHOD

Design: non randomized controlled trial was used in this study.

Setting: This study conducted at Labor and Delivery Unit at Mansoura University Hospitals and private hospital in El-Mahalla El-Kobra city that randomly selected (using bowl methods).

Subjects: A convenience sample 118 mothers and their neonates selected according to the following criteria.

Inclusion criteria:

- A. Nulliparous mothers.
- B. Full term pregnancy (38–42 weeks gestation).
- C. Single, healthy, viable fetus with cephalic presentation
- D. Free from any complications.
- E. Had vaginal delivery.
- F. Want to breast-feed her baby immediately after birth
- G. Newborns free from any medical or congenital anomalies.

Exclusion criteria:

- A. Multiparous women.
- B. Had medical or obstetrical complications.
- C. Present of fetal distress signs during labor.
- D. Had caesarean section
- E. Newborns exposed to or need resuscitation.
- F. Newborn with meconium aspiration

Sample Size:

This is a clinical trial proposes to evaluate the efficacy of SSC on thermal regulation and breastfeeding of the newborns and on third stage of labor and postpartum maternal condition. A previous study (*Marín Gabriel et al., 2013*) showed that body temperature Mean during the first life minute was $36.6 \pm 0.79^{\circ}$ C in SSC group compared to $36.9 \pm 0.58^{\circ}$ C in the control group. Considering that the significance level = 5%, Power = 80%, test type = two-sided, then the calculating formula sample size is

 $\mathbf{n} = [(\mathbf{Z}_{\alpha/2} + \mathbf{Z}_{\beta})^2 \times \{2(\mathbf{SD})^2\}] / (\text{mean difference})^2$

Where, $Z_{\alpha/2}$: This depends on level of significance, for 5% this is 1.96; Z_{β} : This depends on power, for 80% this is 0.84

Hence

 $n = [(1.96 + 0.84)^2 \times (2(0.58)^2]/(36.9 - 36.6)^2 = 58.6$

Based on the above mentioned formula, the sample size is 118 (59 per each arm).

Data Collection Tools

Three tools were utilized in data collection of the present study; namely (Structured Interview Questionnaire, Newborn assessment sheet and maternal assessment sheet).

Tool I: Structured Interview Questionnaire is developed by the researchers examining the recent relevant literature. It divided into two parts as the following:

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- *Part I:* It planned to assess characteristics of parturient mothers such as age, level of education, residence, occupation and....etc.

- *Part II:* concerned about data and consisted 3 questions that are; number of pregnancy, number of miscarriage, gestational age.

Tool II: Newborn assessment sheet is designed to assess the newborn condition; it entails two parts as follow:

Part I: newborn temperature chart: in which the newborn's temperature measured after 1, 5, 10, 15 and 30 minutes of application SSC.

Part II: Assessment Observational checklist of first breastfeeding (Mathews 1988)

It Includes assessment of the time between delivery of the newborn and 1^{st} breastfeeding, (it measured per minutes), duration of the 1^{st} breast feeding, readiness to breast feeding, sucking, latching and rooting.

Tool III: Maternal assessment sheet is designed to assess the maternal condition; it entails two parts as follow:

Part I: This part will include assessment of the uterus' characteristics (consistency- level of fundus- position of the uterus), placental examination and duration of the 3rd stage.

Part II: Pain assessment level during episiotomy suturing by using

1. Wong-Baker FACES Pain Rating Scale



a.No Hurt b.Hurts Little Bit c.Hurts more Bit d.Hurts Even more e.Hurts Whole Lot f.Hurts Worst 2. Visual analogue pain intensity scales.



'If used as a graphic rating scale, a 10 on baseline is recommended.
'A 10-on baseline is recommended for WAS scales.

The Visual Analogue Scale (VAS) used to assess mother's pain during suturing. The form of VAS is appear as a horizontal line, 10 cm in length with score ranging from 0 (no pain) to 10 (very severe pain).

Validity and Reliability of the tools:

Data collection tools of this study were revised by three experts in obstetric and pediatric nursing field to test its validity, the modifications done accordingly. Regarding to the reliability of the tools were done by measuring the internal consistency of their items using the Cronbach's alpha coefficient. It was ascertained where it was 84 for tool I; 96 for tool II and 86 for tool III.

Pilot Study:

A pilot study was conducted involving ten percent of the sample size (12 parturient mothers and their newborn) to test the applicability, relevance and clarity of the tools and the required modifications were done accordingly. These twelve mothers and their neonate were excluded from the subjects.

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Ethical Considerations

This study was confirmed by research ethics committee of the Faculty Nursing, Mansoura University. An official permission was obtained from the director of Labor and Delivery Unit at Mansoura University Hospitals and private hospital in El-Mahalla El-Kobra city to apply the study after explaining its aim and process. Then the researchers obtained the informed consent from each mother join in the study after clarification of its purpose and process. They informed about their rights to refuse participations or withdraw from the study at any time without giving reasons. Also they were reassured about the anonymity, privacy, safety and confidentiality of the collected data throughout the whole study.

Data collection

• This study, conducted in the field work within six months started from December 2017 and extended to April 2018.

• During the study period, the researcher attended to Labor and Delivery Unit at Mansoura University Hospitals 2 days per week from 9 am to 1 pm and 2 days in private hospital in El-Mahalla El-Kobra city.

• The researchers started by introducing themselves to study subjects the researchers introduced themselves to parturient women and obtain an informed consent of them to be involved in the study sample after clarifications of study aim and process.

In the skin to skin contact group (SSC)

1. The newborn umbilical cord was compressed 10–15 sec after delivery and they were immediately laid directly on their mother's abdomen. The newborns were rigorously dried and only wore diaper and cap, and placed in upright position between the mother's breasts. The newborns and their mothers were covered with a warm blanket around the newborns' back during SSC to maintain newborn body temperature. The identification process was performed throughout SSC.

2. After two hours of continuous SSC, the newborn were removed from the mother abdomen and hospitals routines care, such as weighing, and vitamin K prophylaxes were applied and the newborn were then dressed and given to their families.

• In the control group (CG)

1. The umbilical cord was clamped 10–15 sec after delivery and newborn were immediately placed under heater on the examination table. The newborn were rigorously dried and wore diaper and cap. The identification process was performed on the warming table. Finally, newborns were covered with a warm blanket and then given to their families at an average of 10 min of life.

- 2. After two hours without SSC, routine procedures were made as in the SSC group.
- Newborn's temperature in both groups axillary measured when he/ she was 1, 5, 10, 15 and 30 minutes old.
- Time of placental delivery was considered as the interval of time from childbirth to totally expelled placenta.

• Observational checklist (Mathews 1988) to assess the time between delivery of newborns and their first breastfeeding.

• The Visual Analogue Scale (VAS) and Wong-Baker FACES Pain Rating Scale were used to measure mother's pain while suturing.

• All data collected are coded then stored and the results were analyzed.

Data analysis

The collected data were organized, tabulated and statistically analyzed using SPSS (statistical package of social sciences) version 16. for qualitative data frequency and percentage were calculated while quantitative data were presented as mean \pm SD. The Chi square (X2) was used to compare between qualitative variables. Student t test was used to comparing quantitative variables in two groups, while one way ANOVA test used to verify the difference in more than two groups. Statistical significance was considered with a value of p <0.05.

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3. RESULTS

1	SSC group		Control group		Р
	(n=59)	%	(n=59)	%	
Age					
18 – 23 years	19	32.2%	29	49.2%	
24 – 30 years	30	50.8%	26	44.1%	
31 – 35 years	10	16.9%	4	6.8%	0.085
Residence					
Rural	43	72.9%	40	67.8%	
Urban	16	27.1%	19	32.2%	0.545
Educational level					
Illiterate	6	10.2%	4	6.8%	
Primary/preparatory	44	74.6%	48	81.4%	
Secondary/university	9	15.3%	7	11.9%	0.662
Occupation					
Housewife	52	88.1%	56	94.9%	
Working	7	11.9%	3	5.1%	0.186
Family income					
Not enough	15	25.4%	14	23.7%	
Enough	29	49.2%	26	44.1%	
More than enough	15	25.4%	19	32.2%	0.716
Religion					
Muslim	43	72.9%	51	86.4%	
Christian	16	27.1%	8	13.6%	0.067
Marital status					
Married	43	72.9%	51	86.4%	
Divorced	16	27.1%	8	13.6%	0.067

Table 1.Frequency Distribution of the General Characteristics of both Groups

Table (1) illustrates that, there were no statistical significant differences in relation to the socio-demographic characteristics between two groups. More than half of SSC group age ranged from 24-30 years (50.8%). The highest percentages of in SSC group and control group were come from rural origin (72.9% and 67.8% respectively). Primary/preparatory was the highly distributed educational level in both groups (74.6% for SSC and 81.4% for control one). Concerning occupation, it is clear that house wives were more than worker women in both groups (88.1% in SSC versus 94.9% for control group). Nearly half of family in SSC and control group had enough family income (49.2% and 44.1% respectively).

Table 2. Frequency Distribution of Obstetrical History of both Groups	Table 2. Frequency	Distribution of Obstetrica	al History of both Groups
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	SSC group		Control group		Р
	(n=59)	%	(n=59)	%	
Gravida					
1	35	59.3%	33	55.9%	
2	16	27.1%	18	30.5%	
3-5	8	13.6%	8	13.6%	0.916
Abortion					
None	36	61.0%	35	59.3%	
1	15	25.4%	18	30.5%	
2 - 5	8	13.6%	6	10.2%	0.751
Gestational age					
38-40	54	91.5%	51	86.4%	
41-42	5	8.5%	8	13.6%	0.378
Antenatal care attendance					
Yes	18	30.5%	10	16.9%	
No	41	69.5%	49	83.1%	0.083

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Table (2) illustrates that more than one half of mothers in SSC and control group were the first pregnancy (59.3% and 55.9% respectively). Ninety one point five percent of mothers in SSC versus 86.4% of them in control group were pregnant between 38-40weeks. Regarding antenatal care attendance, 69.5% % of pregnant women in SSC and 83.1 in another group didn't attend antenatal classes. No statistical significant differences were found among the both groups (p>0.05).



Figure1. Temperature Difference at Different Time Points in the SSC Group and Control Group

Figure 1 show more thermal stability in the SSC group than control group (0.75).

Comparison of breastfeeding assessment of the newborns in both Groups

	SSC group		Control group				
	(n=59)	%	(n=59)	%	Р		
Time between delivery of newborn and 1 st breastfeeding							
Within 1st 30 minutes	33	55.9%	0	0.0%			
More than 30 minutes	24	40.7%	31	52.5%			
More than 2 hours	2	3.4%	28	47.5%	< 0.001		
Duration of first breastfeeding	13.9 ± 5.7		10.9 ± 6.5		0.009		
Readiness							
No attempts	31	52.5	15	25.4			
Needing weak stimulation	19	32.2	22	37.3	.009		
Needing more stimulation	5	8.5	15	25.4			
Sleepiness	4	6.8	11	18.6			
Sucking							
Good	37	62.7	16	27.1			
Moderate	16	27.1	15	25.4	.000		
Weak	2	3.4	16	27.1			
No sucking	4	6.8	12	20.3			
Latching							
Immediately	30	50.8	10	16.9			
After 3–10 minutes	14	23.7	16	27.1	.000		
After more than 10 minutes	10	16.9	15	25.4			
Not start breastfeeding	5	8.5	18	30.5			
Rooting							
Immediately	30	50.8	13	22			
Needing stimulation	19	32.2	25	42.4	.004		
Weak rooting	4	6.8	14	23.7	1		
No rooting	6	10.2	7	11.9]		

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Table (3) shows Comparison of breastfeeding assessment of the newborns in both groups. It was obvious that more than half of newborns in SCC group start breast feeding within 30 minute from delivery compared to 0.0% % in control group. Also, the duration of 1st breastfeeding was longer in SSC than in control group, where the mean duration was 13.9 \pm 5.7minutes and 10.9 \pm 6.5minutes in the SSC and control groups, respectively (p < 0.009).

Regarding readiness to breastfeeding the same table also represents that, 52.5% of the newborns in the SSC group and 25.4% in the control group showed readiness to breastfeed without doing any attempts, with statistically significant P (.009).

In relation to sucking, 62.7% and 27.1% of the newborns in the SSC group represented good and moderate sucking, respectively, compared to 27.1% and 25.4% in the control group, 27.1% and 25.4% respectively and the difference was statistically significant P (.000).

Concerning latching, 50.8% of the newborns in the SSC group and 16.9% in the control group held mothers' breasts immediately, with no a statistically significant difference between the two groups P (.000).

Regarding rooting, 50.8% in the SSC group and 22% the control group, immediately started to rotate to mothers' breasts to suck it, there was significant difference between the two groups P (.004).

Table 4. Comparison of characteristics of the uterus and duration of 3rd stage of labor between both groups					
	SSC group		Control group		Р
	(n=59)	%	(n=59)	%	
Level of fundus					
above umbilicus	8	13.6%	1	1.7%	
at umbilicus	32	54.2%	47	79.7%	
below umbilicus	19	32.2%	11	18.6%	0.005
Consistency					
Soft	1	1.7%	1	1.7%	
Firm	58	98.3%	58	98.3%	-
Duration of 3rd stage of labo	or				
Less than 5 minute	22	37.3%	0	0.0%	
5:10 minute	33	55.9%	16	27.1%	
11:15 minute	4	6.8%	36	61.0%	
>15 minute	0	0.0%	7	11.9%	< 0.001

Table (4) Compare the characteristics of the uterus and duration of 3rd stage of labor between both groups. The table illustrates that fundus was at umbilical level in 79.7% in SCG compared to 54.2% for control group. The same table also shows that the 3^{rd} stage duration was shorter in the SSC group than in the control group, where 55.9% of the SSC group take 5 to 10 minutes compared to 27.1% in the control group. The difference between the two groups here was statistically significant, (p < .001).

 Table 5. Comparison of the pain score during episiotomy suturing between skin to skin contact

 group and the control group

8F						
	SSC group	Control group	Р			
	Mean ±SD	Mean ±SD				
Pain score	1.9 ±1.0	6.7 ±1.7	< 0.001			

Table (5) Compare pain scores during episiotomy suturing between the SSC group and the control group. It was clear that the level of pain decreased in SCG than control group, where Mean \pm SD were 1.9 \pm 1.0 and 6.7 \pm 1.7 respectively. There was statistically significant difference between the two groups, (p < .001).

Discussion

The early SSC between the mothers and her newborns is most beneficial and should be encouraged in low risk and normal newborns birth. Which prevents heat loss in newborns, improves maternal-infant interaction, and promote the delivery of

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the placenta also it promotes breastfeeding that reduces risk of breast cancer. In addition oxytocin leads to reduce risk of postpartum bleeding. As well as, it is a cheap methods to enhance the standard of care, and is one among the essential steps in achieving Millennium Development Goals four and five of decrease the mortality of the newborn and improvement of mothers health (**Byaruhanga et al 2008; Monteiro et al, 2011; D' Artibale and Bercini 2014).**

The present study indicated that more thermal stability was found in the SSC group than control group. This result may be due to conduction of temperature from the mother to the newborn. This explanation come in the same line with **Bystrova et al. (2007)** who cited that mothers' axillary and chest temperature increased during SSC; therefore, the temperature conducting from mother to the newborn. Similarly, this finding was in the same line with the study of **Gabriel et al. (2010)** who reported that thermal stability was more in the SSC group.

Early initiation of breastfeeding within 1 h of life is recommended from WHO. So the first 2 hours of life is important time for attachment and the spontaneous onset of breastfeeding (**World Health Organization, 2016**). The results of current study shows that more than half of SSC group start breast feeding within 30 minutes from delivery of the newborn. The possible explanation for these finding could be due to stimulate feminine role of the mothers and increases self-efficacy in breast feeding. Also could be due to increase infant response to different cues from their mother such as tactile, thermal and odor clues. Also this result could be explained in the light of the fact that all mothers in the current study were vaginal delivery that may allow to mother to contact with her newborn immediately after delivery.

The findings of the current study coinciding with the study of **Redshaw et al. (2014)** who found that the majority of mothers who had a normal vaginal birth held their baby within 5 min of birth. In addition **Essa and Ismail, (2015)** stated that duration between delivery and first breast feeding was significantly shorter among SSC group compared to another group.

Similarly, this finding was agreed by **Moore and Anderson (2007)** in their study found strong sucking, and quicker readiness in the newborns in the SSC group compared to those in the routine care group. **Beiranvand, et al. (2014) and Karimi et al. (2019)** showed that SSC between mothers and their newborns lead to increases the rate and duration of the first breast-feeding. Therefore it considered as the best provider of postnatal care for the newborns.

Another study reported that early SSC significantly improve exclusive breastfeeding until the end of 1st month of age (**Casper et al, 2018**). The Baby-Friendly Hospital Initiative stated that applying Kangaroo care with SSC is one of the "ten steps to successful breastfeeding". Improving breastfeeding considered as the first and most important benefits of SSC. In randomized controlled trials, premature newborns with Kangaroo care showed early starting of breast feeding, higher breastfeeding exclusivity, and a longer duration of breastfeeding in comparison control group (**Conde-Agudelo et al, 2014**).

In contrary with the current finding **Crenshaw et al. (2012)** reported that the minority of newborns breastfed within the first hour and the majority of them within the first two hours of life. The separation of mothers and newborns during this critical time had negative impact on the initiation of breastfeeding. It is important for newborns to cared by SSC, because it improves breastfeeding.

The present study represented that slightly more than half of the studied babies in the SSC group started rooting reflex immediately this was in the same line with **Bystrova et al. (2009)** who found that the newborn in SSC with their mothers immediately after birth started to rotate for the mother's breast, and started sucking without assistance from the mother or health care personnel.

The current study also showed that slightly less than two thirds of newoborns in the SSC group had good sucking reflexes. Some studies have stated that if the full term newborns placed immediately after birth in SSC on the mother's abdomen the will start to move toward the breasts and onto the nipple, but these behaviors are less likely to occur if newborns are first placed under a radiant warmer. This finding supported by **Mohammed et al. (2017)** they revealed that babies exhibited early initiation of breastfeeding in the SSC group than control group.

Concerning latching the current study show that more than half of the newborns in the SSC contact group and only few percentages of the babies in the control group held mothers' breasts immediately. There was statistically significant difference between the two groups. In contrary with the current study results **Beiranvand**, et al. (2014) reported that there

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was not a statistically significant difference between the two groups in relation to latching on as he found that slightly less than half in the skin-to-skin contact group and about one third of the routine care group infants immediately started looking for mothers' breasts to suck.

The current study indicated that the 3^{rd} stage period was shorter in the SSC group compared to control group. The difference between two groups was statistically significant. This may be due to SSC stimulates maternal oxytocin's production which in turn accelerate the uterine contractions lead to separation of placenta. This explanation come in the same line with **Sharma (2016)** who reported that the shortness of the 3^{rd} stage of the labor could be explained by the fact that sensory stimuli , such as touch and warmth accelerate production of maternal oxytocin, reduce level of maternal anxiety, and improve relaxation and uterine contraction. Also, newborn motor activity after SSC over mother's abdomen appears to have the same effect of uterine massage to facilitate delivery of the placenta and to avoid postpartum bleeding.

The present study is supported by the study of **Mohammed et al. (2017)** who found that short 3rd stage in SSC group than control group. **Gabriel et al. (2010) and Mejbel and Ali (2012)** indicated that SSC had a positive effect on the 3rd stage of labor especially regarding complete placental separation. In addition **Gabriel et al. (2010)** who showed that the time consumed for placental expulsion was short in mothers in SSC in comparison to control group. **Mejbel and Ali (2012)** cited that SSC had a positive effect on the 3rd stage of labor especially regarding complete placental expulsion.

Our study also found that level of pain decreased in SCG than control group with statistically significant difference. This was in the same line with **Sharma (2016)** who cited that level of maternal pain during episiotomy repair was significantly lower in the SSC group in comparison with the control group.

4. CONCLUSION

This study concluded that, initiation of SSC during 3^{rd} stage of labor results in more thermal stability and early breastfeeding initiation to the newborn. In addition to short period of the 3^{rd} stage of labor and decrease pain level to mother than control group.

5. RECOMMENDATIONS

Based on the study findings, the researchers recommend the following:

- 1. Skin-to-skin contact between mother and her newborn must be continued during perineum repair.
- 2. Developing and implementing of SSC educational program for all nurses is very important in the delivery rooms.
- 3. Early imitation of successful first breastfeeding process is important then routine infant's care.
- 4. Future research is recommended to recognize care systems that promote the application of SSC post CS and longitudinal research to determine the long-term effects of immediate or early SSC after CS.

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