

# Expanding on Baby-Friendly Practices in the Community to Reinforce Continued Exclusive Breastfeeding in Cesarean Deliveries

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## Abstract

**Background:** Step 4 of the Ten steps of the Baby-friendly Hospital Initiative (BFHI) involves immediate skin to skin contact for early breastfeeding initiation. Cesarean section delivery (CSD) can interfere with exclusive breastfeeding (EBF).

**Aim:** to study the effect of an intervention involving daily skin-to-skin care (DSSC), as an expansion of Step 4, to improve EBF in the first weeks of life in CSD.

**Methods:** The study included 90 mother-infant pairs who included CSD (45) and vaginal delivery (VD); (45). Thirty mothers (15 with VD and 15 with CSD) were supported to perform daily SSC (DSSC) from birth and onwards. Controls included 30 mothers that did SSC only at birth and 30 who did not perform SSC at all. The depression score of the women were measured in the last trimester of pregnancy and at six week postpartum. The babies were weighed at the end of the follow-up period at six weeks. The development of the child was assessed by the Denver scale at six weeks. Statistical analysis was done to compare groups for changes in the antenatal and postnatal depression score and correlate this to the child development and growth.

**Results:** By six weeks of age, babies exposed to DSSC were all EBF (100%) in both VD and CSD, compared to the other groups (non DSSC) who were not EBF (. Depression score from pregnancy to after delivery decreased steeply in the group exposed to DSSC, the decrease was more evident in those who underwent CSD. The score for development at six weeks was significantly higher in the intervention group of mothers who performed DSSC ( $P < 0.05$ ). Maternal age correlated positively with depression score before pregnancy ( $r = 0.4$  at  $P = 0.000$ ) and after pregnancy ( $r = 0.4$  at  $P = 0.000$ ) and negatively with frequency of any ANC visits ( $r = -0.3$  at  $P = 0.008$ ) and number of ANC visits ( $r = -0.3$  at  $P = 0.01$ ). Decrease in depression score from ANC to postnatal period correlated with development score at 6 weeks of age ( $r = -0.3$  at  $P = 0.015$ ). Breastfeeding

duration in previous child correlated positively with ANC depression scores of women ( $r=0.4$ ,  $P=0.03$ ).

**Conclusions:** Continuing DSSC in the first weeks of life can boost EBF. This also improved maternal mental health and child development particularly in CSD.

**Recommendations:** Step 4 of the Ten steps of BFHI can be expanded to DSSC for reinforcing implementation of the Ten steps in the community.

**Key words:** *Cesarean section, postpartum depression, exclusive breastfeeding, child development*

**Disclosures:** *This paper is a reanalysis of the data from the thesis of MK Ghalia conducted in Pediatric department, Benha Faculty of medicine, by permission from supervisors.*

## Introduction

Unlike vaginal delivery (VD) caesarean section delivery (CSD), although an important and lifesaving procedure for both the mother and the baby, in certain medical conditions, yet it presents a financial burden, especially for developing countries and can delay breastfeeding initiation. Moreover, unnecessary CSD can lead to increased medical risks for both mothers and infants. The World Health Organization recommends a CSD rate of 15% or less to balance the benefits and risks of CSD. However in Egypt CSD has steadily increased, reaching more than one half of all deliveries according to the most recent 2014 Egypt Demographic and Health Survey representing more than a 100% increase in the CSD rate since 2005<sup>(1)</sup>. Moreover CSD interferes with immediate and spontaneous care of the

baby, and thereby undermines her self-efficacy in caring for her child. Making mothers satisfied and confident empowers their nurturing skills of motherhood and is one of the most essential factors in securing a healthy, well-balanced, secure and socially competent child. However mothers are exposed to many stresses in modern times with little outlets to release their stress. Identifying ways to increase their self-efficacy in their nurturing and parenting skills is important to further their skills in child care and child feeding.

Breastfeeding provides the best start in life for children. There are many benefits that are provided by breastmilk and breastfeeding to the child<sup>(2, 3)</sup>. The mother also benefits physically and psychologically<sup>(4,5)</sup>. This makes it an inevitable choice for

mothers to excel in their care giving skills to their child. In addition breastfeeding combined with early initiation of breastfeeding through Skin to skin care (SSC) can save lives<sup>(7)</sup>. These practices are not only a means of providing the best nourishment for children, but it also strengthens the communication between the mother and her child and thereby improves the understanding between them for a more successful and effective parenting experience<sup>(8)</sup>. Maternal postpartum and postnatal depression (PND) is a common cause for disempowering mothers to nurture their children. This has increased considerably with the separation routines and medicated deliveries especially with CSD<sup>(9, 10)</sup>. Across cultures PND varies from 4 to 68%<sup>(11)</sup>. In Egypt PND was reported to be 20%, while postpartum blues which are more common was 68%<sup>(12)</sup>. Hence the magnitude of the problem of PND in Egypt is high and needs to be addressed by identifying the predictors of PND, triggering factors and preventive measures that can assist in reducing its occurrence.

In this study the effect of an intervention consisting of encouraging mothers delivered by CSD to practice daily SSC (DSSC) for a few hours with their term baby on their

depression and child development at six weeks of age.

### Methods

This is a prospective observational case-controlled study that was conducted in Benha University hospital and Ain Shams University hospital during the period from June 2019 to March 2020. It included mothers who are expected to deliver full-term normal healthy babies by CSD or NVD.

Inclusion criteria were healthy mothers at the child bearing period aged 20-44 years old with full-term normal healthy babies. Exclusion criteria were maternal medical or obstetrical maternal complications, intrapartum neonatal complications including asphyxia and trauma, admission to neonatal intensive unit for over 24 hours, preterm babies, born needing oxygen and ventilator after 6 hours of life, infants with congenital anomalies and sick or jaundiced infants.

The study group was randomly divided into the following groups: Group I (15 NVD and 15 CSD): FSSC at birth until the first breastfeeding is completed, but no follow-up for SSC thereafter, they included 15 NVD and 15 CSD. Group II (15 NVD and 15 CSD): early SSC at birth until the first breastfeeding is completed and follow-up DSSC for 6 weeks for at least 2

hours/day. Group III (30): (Control group) not exposed to do early SSC or DSSC (only early initiation of breastfeeding within the first hour of birth). Mothers underwent a one to one interview to collect data related to their age, education, health, past and present obstetric and breastfeeding practices. The infants were assessed for weight, length, head circumferences, neonatal reflexes and health. They were followed-up at 2, 4, 6 weeks of age. Development assessment using Denver developmental scale was done for babies at 6 weeks of age<sup>(13)</sup>. Maternal mental health was assessed in the later period of pregnancy (ANP) and at six weeks in the postnatal period (PNP) using postnatal depression score assessment using the Beckwith Depression scale revised in 1978 as the BDI-1A, and the BDI-II, published in 1996 and translated into Arabic<sup>(14)</sup>.

**Ethical consideration:** An informed written consent will be obtained from patients before participation; it included data about aim of the work, study design, site, time, subject, tool and confidentiality. An approval from Research Ethics Committee in Benha university hospital and Ain Shams university hospital was obtained.

**Statistical analysis:** The collected data were tabulated and analyzed using SPSS version 16 software (SPSS Inc, Chicago, ILL Company). Normally distributed variables were expressed as mean  $\pm$  standard deviation and analyzed by student "t" test and one way analysis of variance (ANOVA) for 2 and 3 independent groups respectively. ANOVA (F test) was used to compare the continuous variables expressed as mean standard deviation ( $\pm$  SD). "F" is the ratio between variations due to the studied variable to variation due to error. The more the value of "F" the more significant is the result. Correlative studies were done using Pearson's correlative studies. The cut off of significance used was  $P < 0.05$ .

## Results

Table (1) presents the mean values of age of mother, number antenatal care visits, by group according to mode of delivery and exposure to skin to skin care. Maternal age correlated with duration of breastfeeding in previous child ( $r=0.5$  at  $P < 0.001$ ) and gravidity ( $r=0.6$  at  $P < 0.01$ ). EBF correlated negatively with mother gravidity ( $r=-0.3$  at  $P < 0.05$ ).

Mother level of education did not correlate with EBF or duration of CBF in previous child  $P > 0.05$ . None of the

maternal personal factors correlated with breastfeeding frequency as shown in table (2).

Maternal age correlated positively with depression score before pregnancy ( $r=0.37$  at  $P=0.000$ ) and after pregnancy ( $r=0.39$  at  $P=0.000$ ) and negatively with frequency of any ANC visits ( $r=-0.28$  at  $P=0.008$ ) and number of ANC visits ( $r=-0.26$  at  $P=0.012$ ). Decrease in depression score from ANP to PNP correlated with development score at 6 weeks of age ( $r=-0.26$  at  $P=0.015$ ) as shown in table (3).

With regards practice of DSSC, the depression scores of women who practiced DSSC correlated significantly with breastfeeding duration in previous child ( $r=0.4$ ,  $P=0.03$ ) but border line with PNP depression scores and negatively with the change in the depression score ( $0.35$ ,  $P=0.06$  and  $r=0.35$ ,  $P=0.6$  respectively). There were no evident correlations between current or previous breastfeeding practices and depression scores in those who did not practice DSSC daily in the first six weeks after birth as shown in table (4).

**Effect of mode of delivery (vaginal vs. cesarean):** In women who practiced DSSC those who delivered

by CSD showed a more statistically significant decrease the mean depression scores from before to after delivery (VD:  $-1.5\pm 1.7$  vs. CSD:  $-3.1\pm 2.2$  at  $P<0.03$ ) as shown in table (5). There were no significant differences in mean and  $\pm$ SD values in breastfeeding practices and depression scores by mode of delivery in the women who did not practice DSSC as shown in table (6).

**Practice of SSC in first six months (irrespective of mode of delivery):** There was a significant difference in the EBF:  $1.0\pm 0.0$  in DSSC group vs.  $1.5\pm 0.8$  in the non DSSC groups at  $P=0.002$ ). Mother's depression score showed a more significant decrease from ANP to PNP in DSSC group ( $-2.3\pm 2.1$ ) compared to the non DSSC group ( $-0.12\pm 2.2$  in at  $0.0001$ ) as shown in table (7). Also there was a highly significant difference in the developmental score:  $100\pm 0.0$  in the DSSC groups vs.  $64.7\pm 17.5$  in the non DSSC at  $P<0.000$ . There were no statistically significant differences in the depression score ANP or PNP and breastfeeding frequency or breastfeeding duration in the previous child in-between those who performed DSSC and those groups who did not practice DSSC.

**Table (1) Mean values of age of mother, number antenatal care visits by group according to mode of delivery and exposure to skin to skin care**

		Range	Mean±SD	95% Confidence Interval for Mean	P-value
<b>Age of mothers</b>	DSSC (VD) 15	20.0 - 38.0	28.9±5.9	25.6 - 32.1	0.878
	DSSC (CSD) 15	21.0 - 37.0	28.3±4.8	25.6 - 30.9	
	No DSSC (VD) 30	20.0-39.00	27.9±5.8	25.7-30.09	
	No DSSC (CSD) 30	19.0-38.0	27.4±6.3	25.0-29.76	
<b>Antenatal care visits</b>	DSSC (VD) 15	6.8-2.7	2.7±0.71	0-10.00	0.662
	DSSC (CSD) 15	5.5-1.4	1.4±0.36	3-8.00	
	No DSSC(VD) 30	6.1-3.1	3.1±0.57	0-10.00	
	No DSSC(CSD) 30	6.0-3.3	3.3±0.60	0-12.00	

DSSC: daily skin to skin care:

**Table (2) Correlative studies between maternal factors and breastfeeding practices and depression scores**

	EBF	Previous duration of BF	BF frequency
<b>Maternal age (90)</b>	r-0.3	r0.5**	r-0.1
<b>Mother level of Education (90)</b>	r0.2	r-0.24	r0.17
<b>Gravidity (90)</b>	r-0.3*	r0.6**	r-.03
<b>ANC visits (90)</b>	r0.06	r-0.2	r-0.1

EBF: exclusive breastfeeding, ANC: antenatal care visits, BF: breastfeeding, r= Pearson Correlation;

\*correlation is significant at the 0.05 level (2-tailed). \*\*. Correlation is significant at the 0.01 level (2-tailed).

**Table (3) Correlative studies between depression score and mother age, education, antenatal care and development score of child at 6 weeks of age**

	Maternal Age	Mother level of Education	Any ANC	Frequency of ANC Visits	Development score at 6 weeks of age
<b>Depression score before pregnancy (90)</b>	r0.37**	r-0.204	r-0.28**	r-0.26*	r0.112
	0.000	0.053	.008	0.012	0.29
<b>Depression score at 6 weeks postnatal (90)</b>	r0.39**	r-0.25*	r-0.37**	r-0.35**	r-0.017
	0.000	.019	.000	.001	0.876
<b>Changes in Depression score from AN to PN (90)</b>	r-0.167	r0.116	r0.076	r-0.013	r-0.26*
	0.115	0.276	0.476	0.904	0.015

ANC: antenatal care. AN to PN: from the antenatal to the postnatal period. r.= Pearson Correlation;

\*correlation is significant at the 0.05 level (2-tailed). \*\*. Correlation is significant at the 0.01 level (2-tailed).

**Table (4) Comparison of correlations between breastfeeding practices and depression scores in women who practiced STSC and those who did not practice continued skin to skin care daily in the first six weeks after birth**

		Depression score in antenatal period		Depression score in postnatal period		Changes in depression	
		DSSC (30)	No DSSC (60)	DSSC (30)	No DSSC (60)	DSSC (30)	No DSSC (60)
<b>Exclusive breastfeeding</b>	Pearson Correlation	. <sup>a</sup>	r-0.020	. <sup>a</sup>	r-0.048	. <sup>a</sup>	r-0.055
	Sig. (2-tailed)	.	0.877	.	0.7	.	0.68
<b>Duration of breastfeeding in previous child</b>	Pearson Correlation	r0.4 <sup>*</sup>	r0.2	r0.35	r0.18	r-0.35	r-0.03
	Sig. (2-tailed)	0.035	0.2	0.06	0.2	0.06	0.8
<b>Breastfeeding frequency</b>	Pearson Correlation	r0.137	r0.05	r0.18	r0.02	r0.12	r-0.09
	Sig. (2-tailed)	0.469	0.723	.342	0.86	0.5	0.5

EBF: exclusive breastfeeding. ANC: antenatal care visits. BF: breastfeeding. r= Pearson Correlation; \*correlation is significant at the 0.05 level (2-tailed). \*\*. Correlation is significant at the 0.01 level (2-tailed).

**Table (5) Comparison of breastfeeding practices and depression scores in women exposed to vaginal delivery versus cesarean section among women who practiced daily skin to skin care**

		Range	Mean ± Std. Deviation	95% Confidence Interval for Mean	F	Sig.
<b>Exclusive breastfeeding</b>	VD (15)	1.0-1.0	1±0.0	1.0-1.0		
	CSD (15)	1.0-1.0	1.0±0	1.0-1.0		
<b>Duration of breastfeeding in previous child</b>	VD (15)	0.0-21.0	11.9±6.8	8.1-15.6	0.7	0.4
	CSD (15)	0.0-24.0	9.5±8.1	5.1-14.0		
<b>Breastfeeding frequency</b>	VD (15)	9.0-12.0	10.6±0.7	10.2-11.0	0.58	0.45
	CSD (15)	8.0-12.0	10.3±1.5	9.4-11.11		
<b>Depression score AN</b>	VD (15)	0.0-21.0	9.3±6.3	5.8-12.7	0.50	0.49
	CSD (15)	0.0-32.0	11.3±8.9	6.3-16.2		
<b>Depression score PN</b>	VD (15)	0.0-17.0	7.7±4.9	5.0-10.4	0.05	0.8
	CSD (15)	0.0-28.0	8.2±7.8	3.9-12.6		

		Range	Mean $\pm$ Std. Deviation	95% Confidence Interval for Mean	F	Sig.
<b>Change in depression score AN to PN</b>	VD (15)	-4.0-2.0	-1.5 $\pm$ 1.7	-2.4- -0.5	5.4	0.03
	CSD (15)	-7.0-0.0	-3.1 $\pm$ 2.2	-4.3- -1.9		
<b>Development score at six weeks</b>	VD (15)	100-100	100 $\pm$ 0.0	100-100		
	CSD (15)	100-100	100 $\pm$ 0.0	100-100		

**Table (6) Comparison of breastfeeding practices and depression scores in women exposed to vaginal vs. cesarean section among women who did not practice continued skin-to-skin care in the first 6 weeks of life**

		Range	Mean Std. Deviation	95% Confidence Interval for Mean	F	Sig.
<b>Exclusive breastfeeding</b>	VD (30)	1.0-3.0	1.40 $\pm$ 0.77	1.1-1.7	0.400	0.530
	CSD (30)	1.0-3.0	1.5 $\pm$ 0.86	1.2-1.8		
<b>Duration of breastfeeding in previous child</b>	VD (30)	.0-24.0	9.8 $\pm$ 7.9	6.8-12.7	2.222	0.141
	CSD (30)	.0-24.0	13.1 $\pm$ 9.4	9.6-16.6		
<b>Breastfeeding frequency</b>	VD (30)	8.0-12.0	9.8 $\pm$ 1.1	9.4-10.2	4.247	0.044
	CSD (30)	8.0-12.0	10.4 $\pm$ 1.3	9.9-10.9		
<b>Antenatal depression score (AN)</b>	VD (30)	0.0-22.00	9.1 $\pm$ 5.4	7.1-11.1	0.082	0.775
	CSD (30)	0.0-25.00	8.7 $\pm$ 6.31	6.3-11.0		
<b>Postnatal depression score (PN)</b>	VD (30)	0.0-21.0	9.1 $\pm$ 5.37	7.1-11.1	0.114	0.737
	CSD (30)	0.0-21.0	8. $\pm$ 5.4	6.6-10.6		
<b>Change in depression score from AN to PN</b>	VD (30)	-4.0-6.0	-1 $\pm$ 2.3	-0.9-0.8	0.031	0.862
	CSD (30)	-4.0-3.0	-0.2 $\pm$ 2.06	-.94-0.6		
<b>Development</b>	VD (30)	28.6-100	67.1 $\pm$ 19.5	59.8-74.4	0.707	0.404
	CSD (30)	28.6-85.7	63.3 $\pm$ 15.3	57.5-69.0		

VD: vaginal delivery, CSD: cesarean section delivery, P<0.05 significant, P>0.05 not significant.



**Table (7) Comparison of breastfeeding practices and depression scores in-between groups that performed daily skin-skin care**

Variables		N	Range	Mean ±Std. Deviation	95% Confidence Interval for Mean	F	Sig.
Exclusive breastfeeding	DSSC	30	1.0-1.0	1.0±0.0	1.0-1.0	9.845	0.002**
	No DSSC	60	1.0-3.0	1.5±0.8	1.2-1.7		
Duration of breastfeeding in previous child	DSSC	30	0.0-24	10.7±7.4	7.9-13.5	0.155	0.7
	No DSSC	60	0.0-24	11.4±8.7	9.2-13.7		
Breastfeeding frequency	DSSC	30	8.0-12	10.4±1.2	9.9-10.9	1.362	0.25
	No DSSC	60	8.0-12	10.1±1.2	9.8-10.4		
Depression score AN	DSSC	30	0.0-32	10.3±7.7	7.4-13.1	0.867	0.35
	No DSSC	60	0.0-25	8.9±5.8	7.4-10.4		
Depression score PN	DSSC	30	0.0-28	8.0±6.4	5.6-10.4	0.426	0.52
	No DSSC	60	0.0-21	8.8±5.3	7.4-10.2		
Change in depression score	DSSC	30	-7.0-2	-2.3±2.1	-3.1- -1.5	20.340	0.000**
	No DSSC	60	-4.0-6	-0.12±2.2	-0.7-0.5		
Development at 6 weeks	DSSC	30	100-100	100±0.0	100-100	112.13	0.000**
	No DSSC	60	28.7-100	64.7±17.5	60.1-69.4		

EBF: exclusive breastfeeding. BF: breastfeeding. AN: antenatal, PN: postnatal.

## Discussion

The study showed that mothers who performed DSSC were EBF at 6 weeks irrespective of mode of delivery. Other studies have shown that continuous SSC through KMC in preterms can promote breastfeeding<sup>(7)</sup>. Oxytocin, mostly intracerebral oxytocin, is also linked to motherly feelings towards her child. The same hormone is responsible for the milk

ejection reflex and thus promotes continued breastfeeding. Hence SSC, especially when continued on daily basis in the first weeks of life is important for triggering mothers' responsiveness to her baby enhancing nursing and nurturing efficacy. The increased mother-infant interactions help build up the hormones that increase the loving motherly feelings

and promote flow of maternal milk, increase the frequency and duration for optimal emptying of the breast and thereby increasing milk production and milk intake for optimal growth and development of infants.

Also mother groups who underwent CSD and VD tended to have higher depression scores before delivery that decreased significantly after delivery in the postnatal period in both the CSD and VD groups who performed DSSC. However, mothers in the CSD group showed a steeper decrease. Other studies showed that DSSC was associated with a significant reduction in the level of depression in the postnatal period. Studies that examined DSSC in full-term babies in the postnatal period are limited.

Our researchers showed that mothers of full-term infants, SSC during the first hours after birth decreases maternal anxiety, improves maternal caregiving behavior and is associated with longer breastfeeding duration<sup>(15,16)</sup>. A one-month intervention period of DSSC was associated with a quicker maternal postpartum decrease in cortisol concentrations<sup>(17)</sup> which is an indicator of physiological stress<sup>(18)</sup>. A more recent study<sup>(19)</sup> showed that daily practice of DSSC for 20 to 120 minutes can be have marked effects in improvement of the depression status

of mothers and the growth and development of their babies<sup>(19)</sup>. Another DSSC intervention trial in full-term infants conducted at one-month starting immediately after birth in which mothers were encouraged to provide 6 hours of DSSC with their infant during the first week after birth, and then 2 hours per day until the infant was 1 month of age, showed that mothers in the intervention group showed statistically significant lower levels of postpartum depressive symptoms at 1 week and at 1 month after birth<sup>(17)</sup>.

Most of the studies in the literature focus on preterm babies exposed Kangaroo mother care (KMC) and show decrease in the depression score in mothers who practiced KMC with their preterm baby<sup>(20,21,22)</sup>.

The underlying mechanism by which DSSC improves EBF is possibly through improving maternal mental health is linked to maternal oxytocin concentrations. The hormone oxytocin is released by stimulation of the skin, including touch, as well as to suckling of the nipple<sup>(23)</sup>. Oxytocin concentrations increase during social interaction, especially parent-infant interactions<sup>(24)</sup>. It has been shown that salivary oxytocin levels increased significantly during SSC for mothers, fathers and infants. Infant cortisol

levels decreased significantly during SSC as compared to before and after SSC <sup>(25)</sup>. Also the latter study reported that parent anxiety scores were significantly related to parent oxytocin and serum cortisol levels <sup>(25)</sup>. Hence the elevated concentrations of oxytocin may be the underlying mechanism for the improved maternal mental health, by lowering maternal anxiety and stress, and improving bonding between mother and child <sup>(26)</sup>. Moreover a systemic review of oxytocin and parent infant interactions identified 17 studies that showed that Oxytocin levels significantly increased in infants, mothers and fathers during SSC and parents with higher oxytocin levels exhibited more synchrony and responsiveness in their infant interactions <sup>(27)</sup>. Beyond its well-described functions in childbirth and lactation, oxytocin has been shown to have a potential role in treating postpartum depression <sup>(28)</sup>.

Another mechanism whereby SSC can reduce depression could be related to its effect on diminishing the stress hormones and the stimulation of the intracerebral oxytocin and increasing the maternal endogenous endorphins <sup>(29)</sup>. Also when SSC was used in mothers with eclampsia and postpartum depression it was shown to have a synergistic effect on sedating

and calming both mother and baby and empowering the mother to care and feed her fullterm <sup>(30)</sup> and preterm baby <sup>(31)</sup>.

The finding that both EBF and depressive symptoms were improved in mothers practicing routine SSC in both vaginal and CSD may be related to gut microbiota. Whereas VD allows for colonization of the infant's gut with microbiota, CSD does not allow for this to happen. However SSC may facilitate the development of the infant intestinal microbiota, subsequently influencing infant outcomes, through direct and indirect pathways. First, daily periods of SSC could provide extra opportunities to exchange bacteria from the mother's skin to the infant, hence enhancing microbiota development. Research has shown that infants born with a C-section receive fewer of their mother's bacteria, but bacteria can still be passed on from the skin of the mother to the infant although in a lower frequency <sup>(32)</sup>. The same mechanism may explain why infants who are provided routine SSC have less colics <sup>(33)</sup> and cry less <sup>(34)</sup>.

In this study we examined other breastfeeding practices as frequency of breastfeeding. We expected that mothers who performed DSSC would be more responsive to their babies and thereby breastfeed them more often.

However we found no significant differences between the number of feeds between groups exposed to DSSC and those not, also we found no difference between VD and CSD. Also we found no correlation between breastfeeding frequency and maternal depression score. Our study found no relationship between duration of breastfeeding in previous child and DSSC. Measuring frequency of breastfeeding is often difficult and recall of mothers maybe inaccurate. However, in another study SSC in preterm infants was shown to improve the duration and frequency of breastfeeding<sup>(35)</sup>.

However, in this study, DSSC was significantly associated with superior development at six weeks compared to those who did not practice DSSC. SSC is reported to facilitate positive feelings in the mother and enhance her bonding to the infant, which in turn improves the quality of maternal caregiving behavior (e.g. more sensitive and less intrusive caregiving behavior)<sup>(36)</sup>. Long-term effects of SSC are also seen, as SSC in preterm infants is related to better cognitive and motor development at 6 months of age and even to better cognitive control at ten years of age<sup>(36, 37)</sup>.

A more recent study indicated that extended SSC may benefit the

neurodevelopment of full-term infants<sup>(38)</sup>. They reported that by performance of EEG studies on different parts of the brain of babies exposed to SSC and those exposed to low or no SSC, the left frontal area of the brain appears to be stimulated. Notably, left frontal brain activation has been associated with more neuro-maturation, approach motivation, and positive emotions<sup>(39- 41)</sup>. Moreover the dyads show increased oxytocin along with decreases in stress reactivity as measured by lowered cortisol levels. This may indicate that these hormones also influence neurodevelopment. Hence extended SSC in full-terms can favorably influence both neurodevelopmental trajectories and infant neurobiological functioning<sup>(38)</sup>.

The potential positive effects of SSC may also be related to various beneficial outcomes in the full-term infant. In preterm infants, daily SSC has been related to better infant health and reduced stress, including increased weight gain, fewer infections, less crying, better sleep and attenuated cortisol levels related to stress responses<sup>(31)</sup>.

In conclusion, although CSD has been shown to have negative effects on breastfeeding and child survival<sup>(42, 43)</sup>

our findings show that daily SSC performed at least two hours daily for

the first six weeks of life have a positive effect on improving breastfeeding and maternal mental health status by reducing her depression scores and increasing her bonding and her satisfaction with her new role as a mother and thereby in her child caring abilities <sup>(44)</sup>. This effect was shown in both mothers delivered by VD and CSD, but it was steeper in the latter, indicating that DSSC may have a healing effect on the negative effects caused by CSD. It

also has a positive effect on improving her child's development in both the VD and CSD groups exposed to DSSC, probably through increased mother-infant interactions but also directly through the effect SSC may have on enhancing neurodevelopmental processes in the brain of the child. Hence DSSC should be routine practice for all babies whether preterm or fullterm and especially for those undergoing invasive operative delivery procedures.

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التوسع في الممارسات الصديقة للطفل في المجتمع لتعزيز الرضاعة الطبيعية  
الحصرية المستمرة في حالات الولادات القيصرية  
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### نبذة مختصرة

**الخلفية:** تتضمن الخطوة ٤ من الخطوات العشر لمبادرة المستشفيات صديقة للطفل البدء الرضاعة الطبيعية المبكر بالتلامس الفوري بالجلد بالجلد بين الأم والمولود، ولكن يمكن أن تتداخل الولادة القيصرية مع استمرار الرضاعة الطبيعية الحصرية .

**الهدف:** دراسة تأثير التدخل الذي يتضمن الرعاية اليومية بالجلد للجلد، كتطبيق متصل بالخطوة الرابعة لمبادرة المستشفيات صديقة الطفل ، لتحسين الرضاعة الطبيعية الحصرية في الأسابيع الأولى من الحياة في الذين تعرضوا للولادة عن طريق عملية قيصرية.

**الطريقة:** اشتملت الدراسة على ٩٠ زوجا من الأمهات والرضع الذين تعرضوا للولادة بعملية قيصرية (٤٥) والولادة الطبيعية (45). تم دعم ثلاثين من الأمهات (١٥) بالولادة الطبيعية و (١٥) بالولادة القيصرية) لأداء ممارسة الرعاية بملامسة الجلد للجلد منذ الولادة والاستمرار بها بصفة يومية لمدة ساعتين على مدار ٦ أسابيع. اشتملت الضوابط على ٣٠ من الأمهات اللاتي مارسن تلامس الجلد للجلد عند الولادة فقط و ٣٠ من اللواتي لم يقمن بإجراء ممارسة الجلد للجلد على الإطلاق. تم قياس درجة الاكتئاب لدى النساء في الأشهر الثلاثة الأخيرة من الحمل وفي ستة أسابيع بعد الولادة. تم وزن الأطفال في نهاية فترة المتابعة عند ستة أسابيع. تم تقييم نمو الطفل على مقياس دنفر عند ستة أسابيع. وأخيراً تم إجراء التحليل الإحصائي لمقارنة المجموعات للتغيرات في درجة الاكتئاب قبل الولادة وبعدها وربطها بنمو الطفل ونموه.

**النتائج:** بحلول ستة أسابيع من العمر ، كان الأطفال الذين تعرضوا للممارسة اليومية لتلامس الجلد للجلد بصفة يومية على الرضاعة الطبيعية الحصرية بنسبة ١٠٠% في كل من الولادة الطبيعية و الولادة القيصرية ، مقارنة بالمجموعات الأخرى (التي لم تمارس الرعاية اليومية بالجلد للجلد) الذين أدخلوا بعض الإضافات مع الرضاعة الطبيعية. كما انخفضت درجة الاكتئاب من الحمل إلى ما بعد الولادة بشكل حاد في المجموعة التي تعرضت لممارسة الرعاية اليومية بالجلد

للجلد ، كان الانخفاض أكثر وضوحاً في أولئك الذين خضعوا للولادة القيصرية. كانت درجة التطور عند ستة أسابيع من العمر أعلى بشكل ملحوظ في مجموعة التدخل للأمهات اللائي أجريين الممارسة بصفة يومية. كما ارتبط عمر الأم بشكل إيجابي مع درجة الاكتئاب أثناء الحمل ( $r=0.4$  ،  $P = 0.000$ ) وبعد الحمل ( $r=0.4$  ،  $P = 0.000$ ) وسلبياً مع تكرار أي زيارات رعاية الحمل ( $r=-0.3$  ،  $P = 0.008$ ) وعدد زيارات رعاية الحمل ( $r=-0.3$  ،  $P = 0.01$ ). كما ارتبط انخفاض درجة الاكتئاب من وقت الحمل إلى فترة ما بعد الولادة بدرجات التطور عند 6 أسابيع من العمر ( $r=-0.3$  عند  $P = 0.015$ ) ، وارتبطت مدة الرضاعة الطبيعية في الطفل السابق بشكل إيجابي مع درجات اكتئاب أثناء الفترة الأخيرة من الحمل لدى النساء ( $r=0.4$  ،  $P = 0.03$ ).

**الاستنتاجات:** استمرار الرعاية بالجلد للجلد في الأسابيع الأولى من الحياة يمكن أن يعزز الرضاعة الحصرية. أدى هذا أيضاً إلى تحسين الصحة النفسية للأم ونمو وتطور الطفل خاصة في الولادة القيصرية.

**التوصيات:** يمكن توسيع الخطوة الرابعة من الخطوات العشر لمبادرة المستشفيات صديقة الطفل التي تخص ممارسة الجلد للجلد عند الولادة وممارستها بصفة يومية أثناء الأيام والأسابيع الأولى بعد الولادة لتعزيز استمرار الرضاعة الحصرية وتعزيز الصحة النفسية للأم وتطور الطفل.