

## Effect of Early Maternal/Neonatal Skin to Skin Contact on Neonates' Body Temperature and Initiation and Continuation of Breastfeeding at One and Three Months of Age

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**Abstract:** This study aimed to investigate the effect of early maternal /neonatal skin-to-skin contact on neonates' body temperature and initiation and continuation of breastfeeding at one and three months of age. A quasi experimental design was used to accomplish this study. The study was conducted at postpartum department affiliated to the National Medical Institute of Damanhour City Albehera Governorate, Egypt. A convenient sample of 100 full-term healthy neonates comprised the study sample. The subjects were divided into an intervention group (50) who received skin-to-skin contact (SSC) with their mothers and a control group (50) who received routine hospital care. Three tools were used to collect data. The first tool was characteristics of mothers and neonates' clinical features structured interview schedule. Second tool was The Infant Breastfeeding Assessment Tool (IBFA). Third tool was effect of early maternal/neonatal skin to skin contact on neonates' body temperature and initiation and continuation of breastfeeding at one and three months of age. The results revealed that there was a statistically significant difference between the intervention and control groups in mean body temperature at 2 hours after birth, time of starting breastfeeding, success in first and second breastfeeding sessions and continuation of breastfeeding at 3 months of age. The mean body temperature after 2 hours of birth in the intervention group was significantly higher ( $37.12 \pm 0.30^\circ\text{C}$ ) than among those in the control group ( $36.89 \pm 0.19^\circ\text{C}$ ) ( $p < 0.001$ ). The mean time of starting breastfeeding in the intervention group was significantly shorter ( $38.70 \pm 5.33$  minutes) than among those in the control group ( $52.30 \pm 6.72$  minutes) ( $p < 0.001$ ). The study concluded that neonates who received early SSC after birth with their mothers maintained their body temperature and started their first successful breastfeeding session better than those in the control group. Consequently, it is recommended that neonates should receive SSC soon after birth.

**Key words:** Skin to skin contact • Neonates • Body temperature • Initiation of breastfeeding • Successful breastfeeding sessions

### INTRODUCTION

In the new millennium breastfeeding has been recognized globally to be very important to the general health of neonates, neonatal survival, mother's health and national and international policies. The WHO [1] "actively promotes breastfeeding as the best source for nourishment for infants and young children." as well as Lawrence and Lawrence [2].

One of the Healthy People 2020 goals is to increase the proportion of mothers who breastfeed their infants as breast milk provides age specific nutrients with best nutritional balance for them. [3, 4] The WHO defined

exclusive breastfeeding as "feeding the infant only breast milk and no solids or other liquids" and recommend exclusive breastfeeding to six months followed by continued breastfeeding with complementary foods to two years [5].

Inadequate feeding leads to increased rates of neonatal death in many parts of the world. The WHO declared that more than 1.5 million infants die yearly due to inadequate intake of breast milk. Increased breastfeeding could reduce the mortality rate of children under 5 years old by 20% [6].

Modern culture has brought with it the trend of mother/neonate separation that may not be beneficial to

mothers and neonates [7]. In this regard, routine care and hospital policies such as placing the neonate under the radiant warmer to prevent hypothermia can cause mother/neonate separation and interfere with their interaction [8]. Separation can also lead to increased crying in the neonates, reduction of successful breastfeeding and lactation duration [9, 10].

One of the supportive procedures that minimize mother/infant separation is the mother/infant skin to skin contact (SSC) after delivery. Skin to skin contact refers to placing naked neonates after being dried prone on their mothers' bare chest after birth, both of them covered in a warm blanket and left for at least an hour or until after the first feed. This action is also named and known as Kangaroo Mother Care [11, 12]. Early skin to skin contact between mother and healthy neonate soon after birth improves mother/infant bonding and successful breastfeeding later on [13, 14].

Initial two hours after birth are called the critical period because this is the optimal time to establish breastfeeding [8, 15]. In this sensitive time, neonate's feeding behaviors such as rooting and sucking strongly exist; in addition, this is the best time for mothers and their neonates to develop bonding when they are kept together in an intimate contact [16, 17].

Skin to skin contact in this period shortly after birth, increases the incidence and/or duration of successful breastfeeding thereafter [18]. Also, it makes the neonate able to move towards the mother's nipples and latch effectively [13]. Furthermore, it improves rooting and attachment which could develop exclusive breastfeeding rates in infancy [16]. Initiation of successful breastfeeding through skin to skin contact is a basic step recommended in the "Ten Steps to Successful Breastfeeding" [19].

Skin-to-skin contact immediately after birth maintains the neonate's body temperature at a normal level better even than in an incubator [20]. The heat is transferred from the mother to the neonate because the mother's body temperature activates the neonate's sensory nerves and it results in the neonate's relaxation, reduction in the tone of the sympathetic nerves, dilation of the skin vessels and increase in the neonate's body temperature [21]. A neonate not in close contact with his mother by distance (under a heat lamp or in an incubator) or swaddled in a blanket, may become too sleepy or lethargic or becomes disassociated altogether or cry and protest in despair. For all these reasons, it has been recommended to keep mother and neonate together for at least the first hour of life [22].

Skin-to-skin contact is a key part of the Unicef UK Baby Friendly Initiative standards. It helps the neonate to adjust to extra uterine life and is highly important for supporting mothers to initiate breastfeeding and to develop a close, loving relationship with their neonate [23]. In addition: it regulates heartbeat, body temperature and breathing of the neonate; shortens interval between delivery and initiation of breastfeeding, calms sleep, elongates breastfeeding period and enhances success of continued breastfeeding [24].

For all what have been mentioned above, this study was carried out to assess the effect of early maternal/neonatal skin to skin contact after birth on neonates' body temperature and initiation and continuation of breastfeeding at one and three months of age.

**Aim of the Study:** This study aimed to investigate the effect of early maternal /neonatal skin-to-skin contact on neonates' body temperature and initiation and continuation of breastfeeding at one and three months of age.

**Hypotheses of the study:**

- Neonates who receive early maternal/neonatal SSC after delivery will exhibit earlier initiation of breastfeeding and more successful breastfeeding sessions compared to those who do not receive SSC.
- Neonates who receive early maternal/neonatal SSC after delivery will continue breastfeeding for 3 months compared to those who do not receive SSC.
- Neonates who receive early skin to skin contact with their mothers will achieve rapid thermal control and maintain it better than those in the control group who do not perform this contact.

**Operational Definitions:** In this study SSC means holding the neonate undressed except for a cap and a diaper in a prone position against the mother's bare chest while the back of the neonate is covered with a linen sheet. This skin to skin contact commences within 30 minutes after delivery and continued for 2 hours.

Continuation of breastfeeding in this study means that the infants will feed only on breast milk without any other solids or liquids for three months of age.

**MATERIAL AND METHODS**

**Research Design:** A quasi experimental design was used to accomplish this study.

**Setting:** The study was conducted at postpartum department affiliated to the National Medical Institute of Damanhour City Albehera Governorate.

**Subjects:** A convenient sample of 100 healthy full-term neonates who fulfilled the following criteria comprised the study sample:

- Neonates are born through normal vaginal delivery
- Healthy full-term neonates (born between 38 to 42 weeks of gestation).
- Normal birth weight (from 2.500 to 4.000 kg).
- Free from congenital anomalies.
- Not admitted to Neonatal Intensive Care Unit.
- Neonates' mothers are free from any chronic illness.

**Sample Size:** According to Epi Info 7 sample size estimation program, the total sample size was (100 neonates) calculated by using the following parameters:

- Population size (135 neonates)
- Expected frequency (50%)
- Margin of error (5%)
- Confidence co-efficient (95%)

**Sampling Technique:** The neonates were divided into two groups; 50 neonates as intervention group receiving SSC and the other 50 neonates as a control group receiving routine hospital care. The subjects were assigned to intervention or control group as follows: one subject for intervention group then the other for control group and so on.

**Intervention Group:** It included 50 full-term neonates who received early skin to skin contact (SSC) following receiving the routine hospital care. The routine hospital care included cutting the umbilical cord, drying, putting under a radiant warmer, vitamin K injection, weighing and estimating APGAR score and then the bare neonate except for a cap and a diaper was placed prone on the mother's bare breast. The neonate should be placed soon after delivery within 30 minutes of birth. After that, both the neonate and his mother were covered with a bed sheet and linen. The SSC was continued for 2 hours.

**Control Group:** It included 50 full-term neonates who received the routine hospital care as group I. Then the neonates was clothed, wrapped in a sheet and a blanket and placed next to the mother.

## Tools

### Three Tools Were Used to Collect the Required Data:

**Tool 1: Characteristics of the mothers and neonates'** clinical features structured interview schedule:

It was developed by the researchers after thorough review of the related literature. It was conducted to collect data related to the mothers and their neonates. It was comprised of two parts:

**Part (1):** Characteristics of the mothers such as age (in years), educational level, employment status, residence, family income and source of mother's knowledge about breastfeeding.

**Part (2):** Data related to the neonate's clinical features as gender, Apgar score, gestational age and birth weight.

**Tool II: *The Infant Breastfeeding Assessment Tool (IBFAT)*** [25].

It was design by Matthews in 1988 [25]. The IBFAT assesses four items namely: readiness to feed, rooting reflex, latching on and suckling pattern. Each item was assigned a score from 0-3 and the total score ranged from 0-12. Scores ranging from 10-12 were considered as successful breastfeeding, while scores less than 10 represented unsuccessful breast feeding.

**Tool III:** Effect of early maternal/neonatal skin to skin contact on neonates' body temperature and initiation and continuation of breastfeeding at one and three months of age.

It was developed by the researchers after thorough review of the related literature. It was comprised of two parts.

**Part (1):** It included assessment of temperature at birth and after 2 hours of birth.

**Part (2):** It included data regarding to time of initiation of first breast feeding and continuation of breastfeeding at one and three months of age.

## Methods:

- An official letter was obtained from the Faculty of Nursing, Damanhour University and submitted to the responsible authority of the Postpartum Department at National Medical Institute of Damanhour City to obtain their approval for data collection after explaining the aim of the study.

- Tool I and Tool III of the study were developed by the researchers after thorough review of related literature.
- Tool I and Tool III of the study was tested for content validity by five experts in the pediatric nursing field.
- Reliability of the tool II was ascertained by measuring the internal consistency of its items using Cronbach's Alpha test which was 0.988.
- A pilot study was done on 10 neonates (10% of the sample) to test the clarity and feasibility of the tool.. Accordingly, necessary modifications were done. These 10 neonates were excluded from the sample.
- Every neonate's mother was interviewed individually by the researchers on the day of birth at hospital to obtain the necessary data.
- All mothers, regardless of the allocated group, were advised to give breastfeeding to their neonates during the hospital stay and to continue to do so till 6 months of age.
- The Infant Breastfeeding Assessment Tool (IBFA) was used twice by the researchers to assess first and second breastfeeding sessions after birth. Score of 10-12 was considered as successful feeding.
- Axillary temperature using a digital thermometer was recorded at birth then after 2 hours.
- Time to initiate first breastfeed was measured in minutes from birth till the infant started the first breastfeed.
- Follow-up phone calls for mothers were made at one and three months after birth for assessing the continuation of breastfeeding.
- Comparison between the two groups was done to evaluate the effect of early maternal/neonatal skin to skin contact on neonates' body temperature and initiation and continuation of breastfeeding at one and three months of age.
- Data were collected over a period of 4 months, starting from the beginning of May till the end of August 2017.
- Significance of the obtained results was judged at the 5% level.
- Chi-square test: for categorical variables, to compare between different groups.
- Fisher's Exact or Monte Carlo correction: Correction for chi-square when more than 20% of the cells have expected count less than 5.
- McNemar Test used to analyze the significance between the different stages.
- Student t-test: For normally distributed quantitative variables, to compare between the two studied groups.
- Paired t-test: For normally distributed quantitative variables, to compare between two periods.
- Graphical presentation: were done for data visualization by using Microsoft Excel.

#### **Ethical Considerations:**

- Oral informed consents were obtained from mothers of neonates after explaining the aim and nature of the study.
- The researchers ensured confidentiality of the information given. Data collected was only used for the intended research purpose.
- Privacy was considered.
- Mothers had the right to withdraw their neonates from the study at any time of the study.

#### **RESULTS**

Table (I) shows mothers distribution according to their characteristics. It is clear from the table that mothers' age ranged between 20.0-36.0 years with a mean age of  $25.64 \pm 4.37$  years in the intervention group. While, in the control group, their ages ranged from 20.0-39.0 years with a mean age of  $25.46 \pm 5.02$  years. No statistically significant difference was found among the two groups ( $t=0.191$ ,  $P=0.849$ ).

Regarding mothers educational level, the same percentage (26%) of mothers in the intervention group read and writes and had primary educational level compared to 22 % and 34% of mothers respectively in the control group. No statistically significant difference was observed among the two groups ( $\chi^2= 3.574$ ,  $^{MC}p= 0.476$ ).

Concerning mothers' occupation, it is clear from the same table that less than half of the mothers in the intervention and control groups (40 and 46%, respectively) were working mothers. No statistically significant difference was found among the studied groups ( $\chi^2= 0.367$ ,  $P=0.545$ ). Moreover, the high

**Statistical Analysis of the Data:** Data were fed to the computer and analyzed using IBM SPSS software package version 20.0.

#### **The Following Statistical Measures Were Used:**

- Qualitative data were described using number and percent.
- Quantitative data were described using range (minimum and maximum), mean and standard deviation.

Table 1: Percent distribution of the studied mothers according to their characteristics

Mothers characteristics	Intervention group (n = 50)		Control group (n = 50)		Test of Significant	p
	No.	%	No.	%		
Mother's age (years)						
Less than 25	21	42.0	25	50.0	$\chi^2= 0.644$	0.422
25 and more	29	58.0	25	50.0		
Min.-Max.	20.0-36.0	20.0-39.0	t= 0.191			
Mean±SD.	25.64±4.37	25.46±5.02				
Mother's educational level						
Illiterate	4	8.0	1	2.0	$\chi^2= 3.574$	<sup>MC</sup> p= 0.476
Read and write	13	26.0	11	22.0		
Primary	13	26.0	17	34.0		
Secondary	9	18.0	6	12.0		
University	11	22.0	15	30.0		
Mother's occupation						
Working	20	40.0	23	46.0	$\chi^2= 0.367$	0.545
Non-working	30	60.0	27	54.0		
Place of residence						
Rural	32	64.0	31	62.0	$\chi^2= 0.043$	0.836
Urban	18	36.0	19	38.0		
Income						
Not enough	8	16.0	14	28.0	$\chi^2= 2.347$	<sup>MC</sup> p= 0.419
Enough	40	80.0	35	70.0		
Enough and save	2	4.0	1	2.0		

$\chi^2$ : Chi square test

MC: Monte Carlo

t: Student t-test

p: p value for comparing between the studied groups

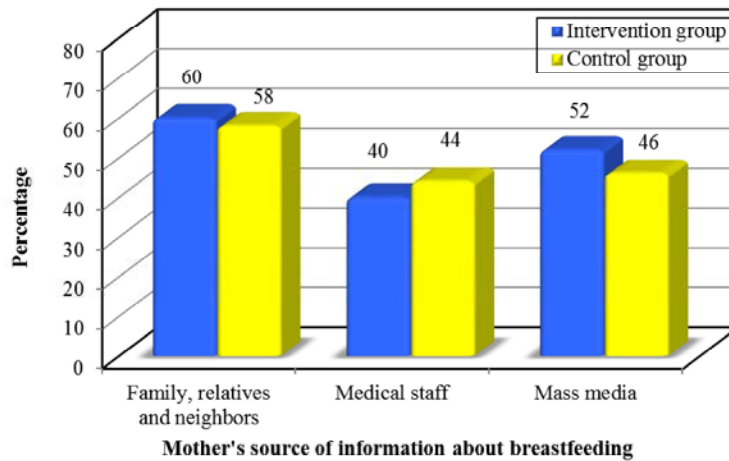


Fig. 1: Mother's source of information about breastfeeding<sup>#</sup>

<sup>#</sup>More than one answer

percentage of mothers in the intervention and control groups (80 and 70 %, respectively) mentioned that their income was enough.

Figure (1) portrays mother's source of information about breastfeeding. The figure shows that approximately two thirds (60%) of mothers in the intervention group and more than half (58 %) of mothers in the control group obtained their information about breastfeeding from family members, relatives and neighbors.

Table (2) illustrates percent distribution of the studied neonates according to their characteristics and clinical features. It is revealed from the table that 60% and 68% of neonates in both groups were males. There was no statistically significant difference among both groups ( $\chi^2= 0.694$ ,  $p = 0.405$ ).

Regarding gestational age, it is observed that mean gestational ages of the neonates in the intervention and control groups were approximately the same

Table 2: Percent distribution of the studied Neonates according to their characteristics and clinical features

Neonates characteristics and clinical features	Intervention group (n = 50)		Control group (n = 50)		Test of Significant	P
	No.	%	No.	%		
Neonate 's sex						
Male	30	60.0	34	68.0	$\chi^2= 0.694$	0.405
Female	20	40.0	16	32.0		
Apgar at 1 min.						
Min.-Max.	7.0-9.0		7.0-9.0		$t= 0.415$	0.679
Mean±SD.	8.20±0.49	8.16±0.47				
Apgar at 5 min.						
Min.-Max.	10.0-10.0	10.0-10.0	-	-		
Mean±SD.	10.0±0.0	10.0±0.0				
Gestational week						
Min.-Max.	37.0-40.0		37.0-40.0		$t= 0.107$	0.915
Mean±SD.	38.40±0.95	38.38±0.92				
Neonate's birth body weight (kg)						
2.500 -	17	34.0	12	24.0	$\chi^2= 1.216$	0.544
3.000 -	21	42.0	24	48.0		
3.500-4.000	12	24.0	14	28.0		
Min.-Max.	2.50-4.0		2.50-3.85		$t=0.994$	0.323
Mean±SD.	3.15±0.36		3.22±0.36			

$\chi^2$ : Chi square test

t: Student t-test

p: p value for comparing between the studied groups

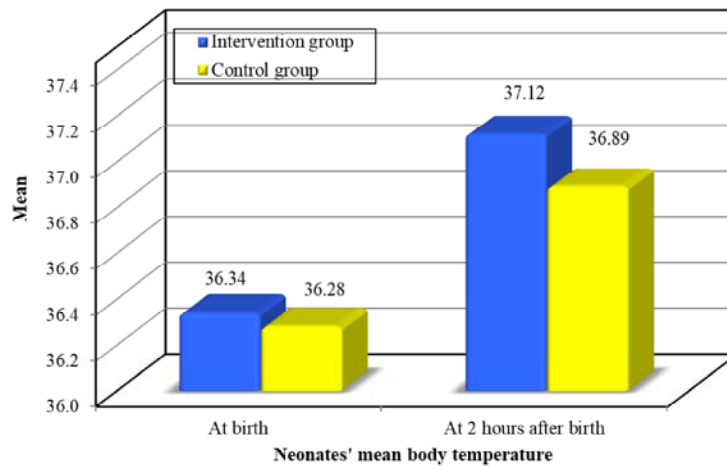


Fig. 2: Distribution of the neonates' mean body temperature at birth and 2 hours after birth among the studied groups

(38.40±0.95 and 38.38±0.92 weeks, respectively). There was no statistically significant difference among both groups ( $t=0.107$ ,  $p= 0.915$ ). Moreover, the neonates' birth weight ranged from 2.50-4.0 Kg with a mean weight of 3.15±0.36 Kg in the intervention group, while in control group, the neonates' birth weight ranged from 2.50-3.85 Kg with a mean weight of 3.22±0.36 Kg. No statistically significant difference was found among both groups ( $t= 0.994$ ,  $p= 0.323$ ).

Distribution of the neonates' mean body temperature at birth and 2 hours after birth among the studied groups is portrayed in Figure (2). It is clear that approximately the same means of birth body temperature (36.34±0.24 and

36.28±0.22 °C) were found among neonates in intervention and control groups respectively. No statistically significant difference was found through both groups ( $t= 1.133$ ,  $p= 0.260$ ). On the other hand, it was found that the mean neonates' body temperature after 2 hours of birth among the intervention and control groups was 37.12±0.30 and 36.89±0.19°C, respectively. A statistically significant difference between both groups was observed ( $t = 4.555$   $P<0.001^*$ )

Table (3) illustrates the distribution of time of starting breastfeeding among the studied groups. It was found that more than three quarters (78%) of neonates in the intervention group compared to only 6% of neonates in

Table 3: Distribution of time of starting breastfeeding among the studied groups

Time of starting breast feeding (min)	Intervention group (n = 50)		Control group (n = 50)		Test of Sig.	p
	No.	%	No.	%		
30-	39	78.0	3	6.0	$\chi^2= 56.381$	<0.001*
45-	11	22.0	31	62.0		
60-	0	0.0	16	32.0		
Min.-Max.	30.0-50.0		40.0-65.0		t =11.218	<0.001*
Mean±SD.	38.70±5.33		52.30±6.72			

$\chi^2$ : Chi square test

t: Student t-test

p: p value for comparing between the studied groups

\*: Statistically significant at  $p \leq 0.05$

Table 4: Distribution of total score of assessment of breastfeeding sessions among the studied groups

Breast feeding assessment score	First session				Test of Sig. (p)	Second session				Test of Sig. (p)
	Intervention group (n = 50)		Control group (n = 50)			Intervention group (n = 50)		Control group (n = 50)		
	No.	%	No.	%		No.	%	No.	%	
Unsuccessful breast feeding (<10)	18	36.0	28	56.0	$\chi^2=4.026 (0.045^*)$	7	14.0	19	38.0	$\chi^2=7.484 (0.006^*)$
Successful breast feeding ( $\geq 10$ )	32	64.0	22	44.0		43	86.0	31	62.0	
Min.-Max.	8.0 -11.0		8.0-10.0		t=2.465 (0.015*)	8.0-12.0		8.0-11.0		t=4.032 (<0.001*)
Mean±SD.	9.52±0.95		9.06±0.91			10.44±0.95		9.60±1.12		
$t_0 (p_0)$						6.890 (<0.001*)		5.409 (<0.001*)		

$\chi^2$ : Chi square test

McN: McNemar test

t: Student t-test

$t_0$ : Paired t-test

p: p value for comparing between Intervention group and Control group

$p_0$ : p value for comparing between first and second breastfeeding sessions in each group

\*: Statistically significant at  $p \leq 0.05$

the control group started breastfeeding from 30 to less than 45 minutes after birth. A statistically significant difference was revealed between the two groups ( $\chi^2=56.381$ ,  $p < 0.001^*$ ). Additionally, time of starting breastfeeding ranged from 30-50 minutes with a mean time of 38.70±5.33 minutes in the intervention group, while in the control group the time ranged from 40.0-65.0 minutes with a mean time of 52.30±6.72 minutes. A statistically significant difference was found among the two groups ( $t=11.218$ ,  $p<0.001^*$ )

Table (4) clarifies the distribution of total score of assessment of first and second breastfeeding sessions among the studied groups. The table reveals that approximately two thirds (64 %) of neonates in the intervention group had successful first breastfeeding session compared to approximately half (44 %) of neonates in the control group. A statistically significant difference was found among the two groups ( $\chi^2 = 4.026$ ,  $P= 0.045^*$ ). Additionally, the mean score of assessment of the first breastfeeding session was 9.52±0.95 and 9.06±0.91, respectively among intervention and control groups. A statistically significant difference was found among the two groups ( $t=2.465$ ,  $P= 0.015^*$ ).

Regarding the total score of assessment of second breastfeeding session, it was found that the majority (86%) of neonates in the intervention group compared to approximately two thirds (62%) of neonates in the control group had successful second breastfeeding session. A statistically significant difference was found among the two groups ( $\chi^2=7.484$ ,  $p=0.006^*$ ). Moreover the mean score of assessment of the second breastfeeding session was 10.44±0.95 and 9.60±1.12, respectively among intervention and control groups. A statistically significant difference was found between the two groups ( $t=4.032$ ,  $p < 0.001^*$ ).

Distribution of continuation of breastfeeding at 1 and 3 months of age among the studied groups shows in Figure (3). It is clear from the figure that the majority of neonates (94 and 90%) in the intervention and control groups respectively continued breast feeding at 1 month of age. No statistically significant difference was found between both groups ( $\chi^2 = 0.543$ ,  $p=0.715$ ).

Concerning continuation of breast feeding at 3 months of age, the same figure reveals that the majority (84%) of neonates in the intervention group continued breast feeding for 3 months compared to only 16 % of the

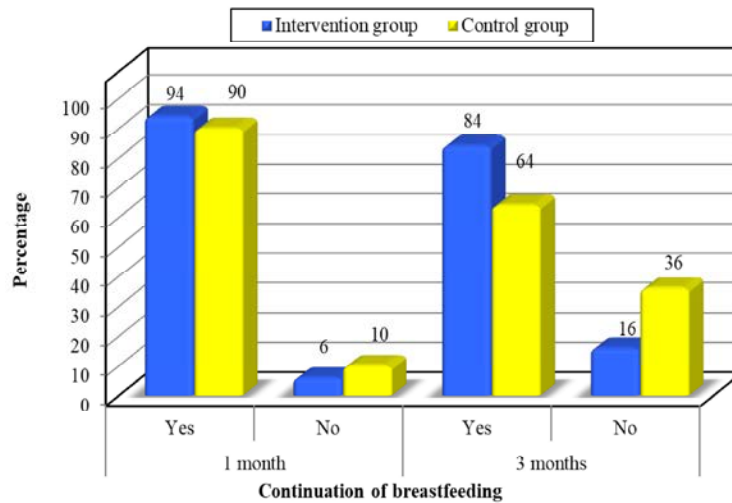


Fig. 3: Distribution of continuation of breastfeeding at 1 and 3 months of age among the studied groups

neonates in the control group. A statistically significant difference was found among the two groups ( $\chi^2 = 5.198$ ,  $p = 0.023$ ).

## DISCUSSION

Skin to skin contact shortly after birth has many positive effects in the short and long terms. It provides warmth to the neonates and enhances parenting bonding. [26]. It also has beneficial effects on early initiation of successful breastfeeding and duration of exclusive breastfeeding [27]. It is worthy to mention that human lactation provides optimal nutrition for the infants, promoting their proper growth and development and therefore reducing morbidity rates among them [28]. SSC is a simple and cost-effective method which should be implemented routinely after delivery as it is a basic step in achieving Millennium Development Goals 4 and 5 to reduce mortality of children less than 5 years of age [29].

Results of the current study declared that neonates who received SSC achieved rapid thermal control and maintained their body temperature significantly better than those who didn't receive this contact at 2 hours after birth. This may be attributed to the fact that temperature is transferred by conduction from the mother's body to the neonate. Similar findings have been reported by Al-Morbaty *et al.* [22] who studied the effect of SSC on the duration of placental separation in Saudi Arabia and found that there was a significant correlation between the duration of placental delivery and neonates' temperature and that the neonates in the experimental group were warmer than those in the control group. In addition, this

finding is in accordance with other studies which stated that the mean body temperature of neonates in the SSC group was significantly higher than the neonates in the control group at all stages of reading temperature during the first 48 hours of life and the SSC was associated with reduced incidence of hypothermia at discharge [30, 31]. Hence, the reduced risk of hypothermia will result in an improvement in neonatal outcomes, as hypothermia is an independent predictor for neonatal mortality and it is always correlated with other major causes of neonatal mortality such as sepsis, prematurity and birth asphyxia [32].

On the other hand the current finding is dissimilar with the findings of Sharma [18] and Beiranvand *et al.* [33]. The first conducted a study in Northern India to investigate the effect of SSC on the rate of exclusive breastfeeding in term neonates and reported that there was no significant difference found between the groups regarding axillary temperature during the first 24 hours of life. The second performed a study in Iran to explore the effect of SSC on neonates' body temperature and breastfeeding successfulness after delivery and proclaimed that the neonates' mean body temperature immediately after SSC, half an hour and one hour after the intervention didn't show statistically significant differences between the two groups.

The findings of the current study reported that the neonates in the intervention group started their first breastfeeding session at about 39 minutes after delivery, while in the control group this time was about 52 minutes after delivery. Although the mechanism by which SSC improves breastfeeding behaviors among neonates is



not completely known but this finding is in harmony with a large pool of results from other researchers who stated that SSC led to faster initiation of breastfeeding. They attributed their findings to the fact that SSC stimulates the neonates' intuitive behaviors and increases the neonates' response to the mother's body leading to the development and progression of breastfeeding nutritional behaviors. As a result, the neonates take the mother's breast and started to nourish [34- 37] Over and above, the American College of Nurse-Midwives stated that SSC will help the neonate to smell and find the nipple so that breastfeeding is initiated more rapidly and successfully [38].

The current study revealed that SSC was associated with significant high success rates of the first breastfeeding session according to the IBFAT score. This finding may be related to the fact that the first 2 hours after birth are the best time for the neonate to learn how to suck because during this time, the neonate is alert and very sensitive to tactile and olfactory stimulation from the mother. A large gathering of data from other researchers has supported this finding [8, 14, 33, 39, 40].

Regarding the second breastfeeding session, 86% of the neonates in the intervention group had successful breastfeeding session compared to 62% of the neonates in the control group. Likewise, Redshaw *et al.* [41] reported that early SSC appeared to be beneficial.

Dissimilar to this finding, a study conducted by Thukral *et al.* [16] in India and another one conducted by Carfoot *et al.* [42] in England, both of them studied the effect of SSC on breastfeeding stated that there was no significant relationship between maternal/neonatal SSC and the success of the first breastfeeding session as well as the subsequent sessions before discharge. This discrepancy between the results of the current study and the other couple of studies of Thukral and Carfoot may be due to the difference in scoring of breastfeeding success. In the current study, obtaining a score of 10 to 12 in the IBFAT was considered as a successful breastfeeding session, whereas, in the two other studies they considered that obtaining scores from 8 to 12 in the IBFAT as a successful breastfeeding session.

Findings of the current study showed that SSC had positive significant effect on the continuation of breastfeeding at three months of age. This result is congruent with other several studies which proved that SSC had contributed in the continuation of breastfeeding for different periods of time ranging from few weeks up to 4 months postpartum [11, 18, 27, 39, 43, 44].

In this regard, the results of the current study supported the various benefits of early SSC after delivery; therefore, early SSC may be recommended to be implemented routinely after delivery.

## CONCLUSION

According to the results obtained from the current study, it is obvious that early SSC was very effective in maintaining neonates' body temperature, as the neonates in the SSC group achieved rapid thermal control and maintained it as compared to those in the control group. SSC also improved breastfeeding initiation and facilitated the first and second successful breastfeeding experience compared to routine method of care. It also likely resulted in continuation of breastfeeding into the early months of life.

**Recommendations:** Based on the results of the current study, SSC should be incorporated into the neonates' routine care after delivery in order to meet the goal of Healthy People 2020 [3] of increasing the proportion of mothers who breastfeed their infants and to reduce neonatal morbidity and mortality rates. Therefore, early uninterrupted SSC after birth should be performed and continued for at least two hours whenever possible. It is also important to state that the findings of the current research can be generalized to healthy stable full-term neonates. However, SSC has been used with preterm neonates and proved to be beneficial.

In order to achieve this goal, it is crucial to provide continuous educational and training programs to all nurses working in the postpartum departments as well as the other nurses and assistants about implementing SSC method for all neonates.

## REFERENCES

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