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Effect of early skin to skin contact between mother and her neonate on initiation of breast feeding and neonate physiological parameters

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Abstract

The evidence supporting the practice of skin-to-skin contact after birth is robust, indicating multiple benefits for both mother and baby. However, separation of mothers and infants seems to be common practice in many hospitals. Thus, the present study aimed to investigate the effect of early Skin to skin contact immediately after birth between mother and her neonate on initiation of breast feeding and neonate physiological parameters. A quasi-experimental research design was utilized for this study. A purposeful sample of 70 mothers and their neonates who met the inclusion criteria and admitted to the delivery room in Minia General Hospital. They divided randomly into two groups (study and control). One tool was used to collect the required data. A structured interview questionnaire sheet included three parts: 1)-Neonates data, 2)-Personal and obstetric data of mothers and 3)-Neonate vital signs, time of initiating breast feeding and duration of the first breast fed. Results of the present study shows that, decreasing mean time to initiate breast feeding and increasing mean duration of the first breast fed of the study group than the control group with statistically significant differences ($P = <0.0001$, 0.0001 & $P = <0.0001$) respectively and mean auxiliary temperature, heart rate and respiratory rate of neonates in the study group are increasing their mean (within the normal range) than the control group with statistically significant differences ($p = <0.0001$, 0.0001 & 0.0001) respectively. The study concluded the effectiveness of early skin-to-skin contact immediately after birth to full-term newborns in early successful initiation of breastfeeding and increasing the duration of first breastfed and stability of physiological parameters of the newborn. The study recommended that, a nursing simulation training program may help promote acceptance of skin-to-skin contact.

Keywords: Breast Feeding, Physiological parameters, Skin to Skin Contact

Introduction

The transition from fetus to newborn is the most complex adaptation that occurs in human experience. The first hour in a baby's life can have a significant-lifelong-impact on his health and mother's bond. It is extremely sensitive and important for the stabilization of vital functions. So, keeping mothers and babies together is a safe and healthy birth practice (Zakšek *et al.*, 2018) [31].

According to Unicef, 2.9 million babies die each year within 28 days and the first 24 h after birth are the most risky period both for the child and the mother (Bedaso *et al.*, 2019) [8]. The neonatal management in the first hour of life has an important effect on both immediate and long-term outcomes of all neonates (Sharma, 2017) [23].

Skin-to-skin contact (SSC) is defined as placing the naked baby on the mother's bare abdomen or chest immediately for less than 10 minutes after birth or soon afterwards. The World Health Organization (WHO) recommends the practice of SSC between mother and infant for at least one hour after birth. It also named as Kangaroo mother care (KMC) and it is a method of care for all newborns and creates better conditions for mother and newborn (WHO, 2017 and Dehghani *et al.*, 2015) [11]. KMC is postulated to improve neonatal outcomes by maintaining the neonate's temperature and other vital sign parameters through and by providing the benefits of breastfeeding. These effects are thought to be beneficial for all newborns. Furthermore, Kangaroo Mother Care (KMC) is an evidence-based intervention that reduces neonatal morbidity and mortality (Boundy *et al.*, 2016 and Chan *et al.*, 2017) [9, 10].

The evidence supporting skin-to-skin at the first hour is so compelling in 2018 revision of the World Health Organization (WHO)/United Nations International Children's Emergency Fund (UNICEF) Ten Steps to Successful Breastfeeding that form the basis of the Baby-Friendly Hospital Initiative. Step 4 states 'Facilitate immediate and uninterrupted skin-to-

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skin contact and support mothers to initiate breastfeeding as soon as possible after birth' (WHO, 2018). Breastfeeding has many advantages for the child, mother and the environment. Moreover, the smooth first hour after birth and mother's skin-to-skin contact to newborn have positive impact on the effectiveness and duration of breastfeeding (Zakšek *et al.*, 2018) [31].

Early initiation of breastfeeding stimulates breast milk production; produces antibody protection for the newborn and its practice determines the successful establishment, longer duration of breastfeeding, and lower risk of neonatal mortality (Safari *et al.*, 2018) [19]. Early initiation of breastfeeding (EIBF) within one hour of birth can decrease neonatal death. However, the prevalence of EIBF is approximately 50% in many developing countries (Takahashi *et al.*, 2017) [26].

Many studies showed that skin-to-skin contact through KMC leads to breathing regulation and stabilizing heart rate (HR) regulation, and increased arterial oxygen saturation rate. In addition, the mother's supportive and caring behaviors become further during this procedure and her lactation enhances. Furthermore, the newborn feeding is performed better in this method and the newborn grows faster (Dehghani *et al.*, 2015) [11]. However, Yet, at present, skin-to-skin contact is not widely adopted in delivery wards, the main reason being a lack of knowledge and education about contact at birth, and the absence of standardized guidelines for skin-to-skin contact (Barbaglia *et al.*, 2019) [7].

Significance of the study

Usually, separating the newborn from the mother cause the secretion of a harmful effect to the newborn's health as decreasing the body temperature, irregularity in heartbeats and breathing (Dehghani *et al.*, 2015) [11]. SSC immediately after normal delivery, which lasts for at least an hour has positive effects like maintaining body temperature normal, maintains heart rate and respiratory rate normal and more likely to breastfeed exclusively and breastfeed longer period (Bedaso *et al.*, 2019) [8]. However, despite the World Health Organization's (WHO) recommendation for immediate skin-to-skin contact (SSC) after birth, separation of mothers and infants seems to be common practice in many hospitals. Therefore, more researches are needed in relation to the practice and implementation of SSC to support the benefits of skin-to-skin contact after normal birth (Abdulghani *et al.* 2018) [1].

Aim of the study

The aim of this study was to investigate the effect of early Skin to skin contact immediately after birth between mother and her neonate on initiation of breast feeding and neonate physiological parameters.

Research hypotheses

H1: Mothers with skin to skin contact initiate neonatal breast feeding early than others.

H2: Neonates with skin to skin contact maintain their physiological parameters than others.

Subjects and Method

Research Design

A quasi-experimental research design was utilized for this study.

Operational definitions

1-Skin-to-skin contact (SSC) is defined as placing the naked baby on the mother's bare abdomen or chest immediately for less than 10 minutes after birth or soon afterwards for at least one hour after birth (WHO, 2017) [29].

2- Physiological parameters refer to vital signs of the neonate and include (temperature, heart rate and respiratory rate).

Setting

This study was conducted at the delivery room and postpartum room in Minia General Hospital at Minia Governorate – Egypt.

Sample

A purposeful sample of 70 mothers and their neonates. They were divided randomly into two equal groups (the study & the control groups).

Inclusion criteria

- Normal delivery.
- Healthy full-term neonates.

Tool of data collection

One tool was used to collect the required data. A structured interview questionnaire sheet which was designed especially for this study and it included three parts:-

Part one: Personal and obstetric data of the mothers as age, education level, no. of parity and history of breast feeding.

Part two: The neonate's data as gender, first minute Apgar score and birth weight.

Part three: Neonate vital signs (auxiliary temperature, heart rate, and respiratory rate), time to initiate breast feeding, and duration of first breast fed.

Tool validity and reliability

The tool was submitted to a panel of three experts in pediatric nursing confirmed its validity. Reliability of the tool was performed and calculated statistically by Cronbach's alpha test was 0.870 for part three of this tool.

Pilot study

A pilot study was done on 10 % of the total sample (8) mothers and their neonates (4 from study group and 4 from control group) before starting data collection to test the clarity and competency of designed tool and to estimate the time required for filling the tool. Mothers and neonates were included in the sample because no modifications were needed.

Ethical Considerations

An approval was obtained from each faculty of nursing ethical committee and an official permission was obtained from the director of the Minia General Hospital and the head of delivery room after explaining the aim and nature of the study. All mothers who participated in the study and the control groups were informed about the aim, procedure, benefits and nature of the study and the written consent was obtained from them. The researchers emphasized that participation in the study is voluntary and they can refuse to participate in the study without any reason and it will not affect on the care provided to them and their neonates. Data obtained were used only for the research purpose and the confidentiality of information was assured.

Data collection procedure

The study group, mothers who admitted to the delivery room in Minia General Hospital and fulfill inclusion criteria were explained, aim of the study, steps, technique and advantages of the technique and the interview of mothers was conducted during admission to collect the required data. It takes about 10 to 15 minutes. After the neonate was delivered by a physician, dried by towel and the first minute Apgar scoring was determined immediately after delivery. Then cutting umbilical cord and measuring weight. After that, the mother was experienced skin to skin contact immediately after cutting umbilical cord. The naked neonate is placed in prone position attached with the mother's chest near to the nipple immediately after delivery and is covered by diaper or gown, wrapped around a neonate and the mother to prevent heat loss and the infant's head was covered with a dry cap. The naked neonate, only wearing diaper and cap, was placed in a straight state between the mother's breasts and was supported by the gown. The time required to apply the skin to skin contact ranged between 60 – 90 minutes. Measuring neonate vital signs (auxiliary temperature, heart rate, and respiratory rate) were done immediately during direct skin to skin contact for three times (every 20 minute) to confirm its stability and the average were recorded and all other routine care was done. The researchers begin to monitor and record time of initiating breast feeding immediately after skin to skin contact. The first breast fed duration was calculated by stop watch/ min and recorded when neonate started first sucking until ending the first breast fed. The mother was transferred to postpartum room with continuous skin to skin contact for 60 to 90 minutes. The researchers stay with each mother until the end of 60- 90 minutes after delivery.

The control group, mothers who admitted to the delivery room in Minia General Hospital and fulfill inclusion criteria, aim and nature of the study were explained, and the interview of mothers was conducted during admission to collect the required data. It takes about 10 to 15 minutes. After the neonate was delivered by a physician, wrapped in dry towel, dried and placed under radiant warmer. The first

minute Apgar scoring was determined immediately after delivery. Then cutting umbilical cord, dressed and measuring weight. After that, the neonate vital signs (auxiliary temperature, heart rate, and respiratory rate) were taken for three times (every 20 minutes) to confirm its stability and the average were recorded. The neonate was provided routine care by the nurses working in the delivery room and he/she was handled to the mother. Mother was encouraged to begin breastfeeding. The routine care of placing a neonate under radiant warmer is performed in the least time possible (30-40 min). The neonate physiological parameters, time of initiating breast feeding and duration of the first breast fed for both the study and control groups were measured, calculated and recorded at the same time and with the same manner.

Field of the work

The study was conducted over a period of four months; from the beginning of June 2018 to the end of September 2018. Data collection was done two days per week in the afternoon shift, (2-3 mothers / day). The time required to apply the skin to skin contact ranged between 60-90 minutes. The researchers stay with each mother until the end of 60- 90 minutes after delivery.

Statistical analysis

Data were summarized, tabulated, and presented using descriptive statistics in the form of frequency distribution, percentages, means and the standard deviations as a measure of dispersion. A statistical package for the social science (SPSS/IBM, 25) was used for statistical analysis of the data, as it contains the test of significance given in standard statistical books. Numerical data were expressed as mean and standard deviation. Qualitative data were expressed as frequency and percentage. For quantitative data, comparison between two variables was done by using independent samples t-test. Probability (P-value) is the degree of significance, less than 0.05 was considered significant.

Results

Table 1: Characteristics of both the study and the control groups as regards neonate's data (n= 70)

Neonate data	Study group (n= 35)		Control group (n= 35)		Fisher/ χ^2	P value
	No.	%	No.	%		
Gender						
male	11	31.4	9	25.7	.280	.597
female	24	68.6	26	74.3		NS
Apgar score at the 1st minute						
7	4	11.4	3	8.6	.195	.907 NS
8	22	62.9	22	62.9		
9	9	25.7	10	28.6		
Birth weight / kg						
2.500 - <3.000	29	82.9	31	88.6	.467	.495 NS
3.000 – 3.500	6	17.1	4	11.4		
Mean \pm SD	2.8 \pm 2 kg		2.8 \pm 2 kg			

NS= No statistical significant difference

Table (1): demonstrates the characteristics of both the study and the control groups as regards neonate's data. It was found that, about three thirds (68.6%, 74.3) of neonates in both the study and the control groups were females. About two thirds (62.9%) of both groups had Apgar score of 8 and most of them (82.9%, 88.6%) had birth weight ranged

between 2.50 kg - <3.00 kg with mean \pm SD was 2.8 \pm 0.2 kg for both groups respectively and there were no statistically significant differences were found between the two groups regarding all the neonates data (p = 0.597, 0.907 & 0.495) respectively.

Table 2: Personal and obstetric data of the studied mothers (n= 70)

Personal and obstetric data	Study group (n= 35)		Control group (n= 35)		Fisher/ χ^2	P value
	No.	%	No.	%		
Age/ year						
20- <25	14	40.0	18	51.4	.921	.631 NS
25- <30	16	45.7	13	37.1		
30-< 35	5	14.3	4	11.4		
Mean \pm SD	25.7 \pm 3.4 years		25.0 \pm 3.4 years			
Educational level						
Read and write	21	60.0	18	51.4	.575	.750 NS
Basic education	6	17.1	8	22.9		
High education	8	22.9	9	25.7		
No. of gravida						
Two	17	48.6	14	37.1	.602	1.859 NS
Three	12	34.3	13	37.1		
Four	6	17.1	8	22.9		
No. of parity						
One	15	42.9	12	34.3	0.877	.831 NS
Two	11	31.4	12	34.3		
Three	9	25.7	11	31.4		
History of breast feeding						
Yes	32	91.4	30	85.7	.565	.452 NS
No	3	8.6	5	14.3		

NS= No statistical significant difference

Table (2): Shows the personal and obstetric data of the studied mothers. It was found that, 40.0% of mothers in the study group vs 51.4% in the control group aged between 20 - < 25 years, and 60.0% in the study group vs 51.4% in the control group was read and write and there were no statistically significant differences between the two groups regarding age and educational level ($p = 0.631$ & 0.750) respectively. Regarding number of gravida and parity, it was noticed that, less than half (48.6%) of mothers in the study

group vs 37.1% of the control group had two gravida, 54.3% vs 51.4% had one para. As regard previous history of breast feeding, the majority (91.4% vs 85.7%) of mothers in the study and the control groups had previous history of breast feeding respectively and there were no statistically significant differences between the two groups regarding all their personal and obstetric data ($p = 0.631, 0.750, 0.831$ & 0.452) respectively.

Table 3: Comparison between mean time of initiating breast feeding and duration of first breast fed between mothers in the study & the control groups (n= 70)

Items	Study group (n= 35)	Control group (n= 35)	t-test	P – value
Time to initiate breast feeding/ min	1.5 \pm .5	39.3 \pm 7.1	31.285	0.0001**
Duration of first breast feeding/ min	11.9 \pm 2.3	2.6 \pm .6	23.185	0.0001**

**Highly statistical significance differences

Table (3) and figure (1): displays decreasing the mean time to initiate breast feeding of the study group than the control group with highly statistically significance differences ($P = \text{value} < 0.0001$). Concerning duration of first breast feeding,

finding of the present study revealed increasing mean duration of first breast fed among mothers in the study group than those in the control group with highly statistically significant differences ($P = \text{value} < 0.0001$).

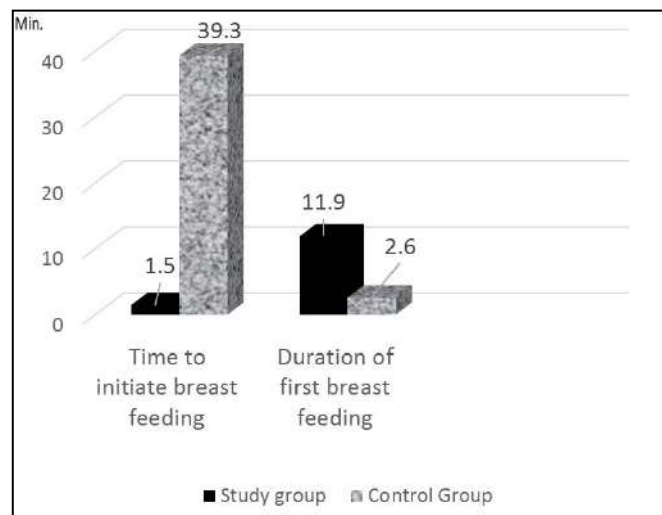


Fig 1: Comparison between mean time of initiating breast feeding and duration of first breast fed between the study & the control groups (n= 70)

Table 4: Comparison between mean vital signs of neonates’ in the study and the control groups (n= 70)

Vital signs	Study group (n= 35)	Control group (n= 35)	t-test	P – value
Auxiliary temperature	37.1 ± 133	36.2 ± 157	24.288	0.0001**
Heart rate	134.0 ± 3.9	115.2 ± 3.6	20.288	0.0001**
Respiratory rate	45.4 ± 2.7	36.9 ± 2.6	13.299	0.0001**

**Highly statistical significance differences

Table (4) and figure (2): Verifies that, mean of auxiliary temperature, heart rate and respiratory rate of neonates’ in the study group were increasing (within normal range) than those in the control group with highly statistically significant differences ($p = \text{value} < 0.0001, 0.0001 \& 0.0001$) respectively.

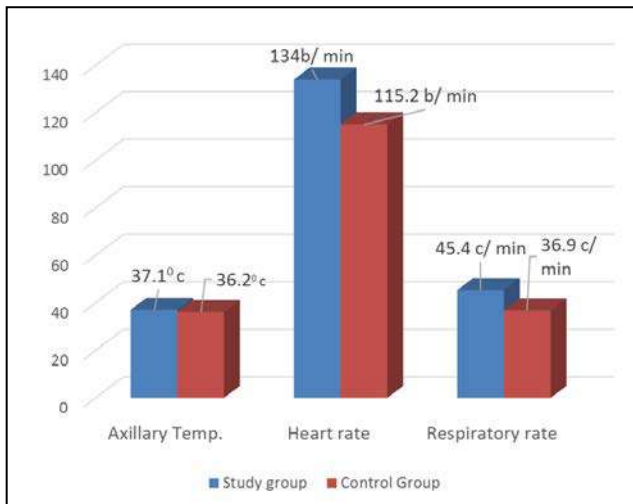


Fig 2: Comparison between means score of vital signs among neonates in the study and the control groups (n= 70)

No statistically significant differences were found between neonates’ characteristics, mothers’ personal and obstetric data and time of initiating breast feeding and duration of first breast fed between both the study and the control groups.

Discussion

Bringing a child into the world is a joyous moment. Evidently, First hour following birth for mature newborn is without doubt the most critical hour in life of human beings. During this time, a lot of changes happen for both mother and newborn. Changes are also physiological, as well as psychological (Al-Morbaty *et al.*, 2017 and Zakšek *et al.*, 2018) [3, 31]. Even though, the evidence supporting the practice of skin-to-skin contact after birth is robust, indicating multiple benefits for both mother and baby. However, separation of mothers and infants is common in many hospitals and infants are often placed in cots or under warmers. Indeed, few studies reported starting time and duration of SSC practice after normal birth (Moore *et al.*, 2016 and Abdulghani *et al.*, 2018) [16, 1]. Therefore, this study was conducted to investigate the effect of early Skin to skin contact immediately after birth between mother and her neonate on initiation of breast feeding and neonate physiological parameters.

The 2016 Cochrane Review supported using immediate or early skin-to-skin contact to promote breastfeeding. Breastfeeding within one hour of birth is a critical component of newborn care and is estimated to avert 22% of neonatal mortality globally (Moore *et al.*, 2016 and

Karim *et al.*, 2019) [16, 14]. Skin-to-skin contact immediately after birth which lasts for at least an hour has positive effects like an earlier successful first breastfeed, breastfeed longer and more likely to breastfeed exclusively with more optimal suckling, as well as maintaining body temperature, heart rate and respiratory rate normal (Widstrom *et al.*, 2019 and Bedaso *et al.*, 2019) [28, 8].

The present study results showed that, the two groups were not significantly different in terms of the neonate’s data including neonate’s gender, First-minute Apgar scoring and birth weight. This confirms that these two groups were homogenous groups prior to the study. Also, it was found that, about three thirds of them were females. About two thirds of both groups had Apgar score of 8 at first minute and Mean ± SD birth weight were 2.8 ± 2 kg for both groups (Table 1). This finding was approximately consistent with the results of Dehghani *et al.* (2015) [11] who showed that there were no significant differences between the means of gestational age, birth weight, and sex in two groups of newborns while dissimilar to these findings, the study of Amin *et al.* (2015) [6] revealed that, A total of 106 neonates were included (About two thirds of newborns were males while about one third of them were females). Even though, it is possible to conduct the assessment of the Apgar score, as well as any other necessary assessments, on a healthy full-term newborn infant without disturbing the infant, allowing skin-to-skin to continue uninterrupted. It is more effective and advantageous to assess the newborn infant when skin-to-skin with mother since babies are less likely to cry; they are more likely to remain warm and not waste energy (Widstrom, 2019) [28].

The current study results also showed that the two groups were not significantly different in terms of the mothers’ personal and obstetric data including number of gravida, number of parity and history of breast feeding ($p = 1.859, 783 \& 0.452$) respectively (Table2). This confirms that these two groups were homogenous groups prior to the study which were nearly consistent with the results of Safari, et al. (2018) [19] who found that, approximately, the same proportion (50%) of the mothers in both groups were primipara and their results showed that the two groups were not significantly different in terms of the mothers’ demographic characteristics including maternal age, occupation, gravidity, number of miscarriages, parity and number of antenatal visits.

The current study results showed, decreasing the mean time to initiate breast feeding among mothers in the study group than those in the control group with statistically significance differences among both groups ($P\text{-value} < 0.0001$). Likewise, duration of first breast fed, mothers in the study group experienced increasing mean duration of first breast fed than those in the control group with statistically significance differences ($P\text{-value} < 0.0001$). These results were approximately supported by The American College of Nurse Midwives (2013) which reported that with SSC the baby will smell and find the nipple so that breastfeeding is initiated by the infant more rapidly and successfully and

were in congruent with Safari *et al.*, (2018) [19] who assessed the effects of skin to skin contact on initiation of breastfeeding and newborn temperature, at Hawler Maternity Teaching Hospital of Erbil, Iraq indicated that, contact through the skin between the women and their newborns after birth led to greater initiation of breastfeeding and also go in line with the findings of a randomized controlled trial study was carried out in Pakistan by Mahmood *et al.* (2011) [15] who evaluated the effect of mother-infant early skin-to-skin contact on breastfeeding behavior of infants and with Srivastava *et al.* (2014) [24] who reported that the mother-infant skin to skin contact immediately after birth increased the success rate and duration of the first breast-fed significantly ($p < 0.05$) and also with a meta-analysis study by Moore *et al.* (2016) [16] who assessed the effects of immediate or early SSC for healthy newborn infants compared to standard contact on establishment and maintenance of breastfeeding and infant physiology showed that the mother-Infant Skin to Skin contact after birth had beneficial effects on the success and duration of exclusive breast-feeding. Similarly, Redshaw *et al.*, (2014) [18] stated that early contact appeared beneficial. Women who held their infant within five minutes of birth were more likely to initiate breastfeeding.

Correspondingly, as regard the mean time to initiate breast feeding and duration of first breast fed. The present study findings are contrary with a study done by Thukral *et al.* (2012) [27] who found that there was no significant relationship between mother-infant skin to skin contact and the success rate and duration of first breast fed. In this regard, despite breast-feeding initiation within the first half hour after birth is one of the World Health Organization recommendations, however certainly, most hospitals, mother-infant contact and breast-feeding initiation are delayed due to modernization of hospital policies and routine cares such as putting baby under the warmer to prevent hypothermia can cause the separation of the mother and the newborn (Karimia *et al.*, 2019 and Srivastava *et al.*, 2014) [14, 24]. These findings suggest that, increased workload in the delivery room did not allow the researcher to continue SSC more than 60 to 90 minutes after birth, although most of the mothers were very pleased and enjoyed the experience of SSC and wished to prolong its duration.

It is interesting to note in the present study that, there were statistically significant differences between neonates in both the study and the control groups regarding vital signs in which, auxiliary temperature, heart rate and respiratory rate of the study group increasing their mean (within normal range) than those in the control group. Hence, the present study emphasizes that early skin-to-skin contact leads to vital signs stability or its increase in the normal range. This result was consistent with Moore *et al.*, (2016) [16] who found that SSC infants had higher SCRIP (stability of the cardio-respiratory system) scores overall, suggesting better stabilization on three physiological parameters and Svensson *et al.*, (2013) [25] indicated that SSC immediately after birth, which lasts for at least an hour has positive effects like maintaining body temperature normal, maintains heart rate and respiratory rate normal and also with Safari *et al.*, (2018) [19] who found that near half of the newborns who did not receive SSC care had hypothermia; however, just 2% of the newborns who received SSC developed hypothermia after birth.

Regarding physiological parameters (auxiliary temperature,

heart rate and respiratory rate), this result can be attributed to that early Skin-to-skin contact immediately after birth has a positive effect on physiological parameters of the newborn. Furthermore, it was found that the mother's breast temperature increases when mother and newborn infant are in skin-to-skin contact, resulting in an increase of newborn infant's foot temperature. The warmer foot temperature is an indication of the decrease of the negative effect of the 'stress of being born' that is associated with skin-to-skin (Widstrom *et al.*, 2019) [28]. Indeed, the newborns placed in SSC with their mothers were more likely to be warmer because of the thermal response of maternal skin temperature (mediated by oxytocin) in reaction to skin-to-skin contact with their newborns (Al-Morbaty *et al.*, 2017) [3]. Yet, besides, hypothermia during the newborn period is widely regarded as a major contributor cause of significant morbidity and, at its extreme, mortality in developing countries (Safari *et al.*, 2018) [19].

Certainly, this result was disagree with Sharma, (2016) evaluated the efficacy of early skin-to-skin contact (SSC) on the rate of exclusive breastfeeding (EBF) among term neonates born by vaginal delivery at Government medical college, Chandigarh, a tertiary hospital in Northern India who showed that, there was no significant difference between the groups with regards to auxiliary temperature, heart rate and respiratory rate during the first 24 hours of life. Likewise, Dehghani *et al.*, (2015) [11] determined the impact of KMC method on vital signs and arterial oxygen saturation of newborns compared to the incubator care method in order to facilitate this method in Yazd, Iran who showed that there was no significant difference in the average respiratory rate per minute in the KMC group than to the incubator care and Schlez *et al.*, (2011) [20] showed that infants' physiological responses like respiratory rate did not differ significantly. These results are also in direct contrast to findings of Boundy *et al.*, (2016) [9] who conducted a systematic review and meta-analysis estimating the association between KMC and neonatal outcomes who found that neonates receiving KMC was associated with lower respiratory rate and higher Mean body temperature and also with Nimbalkar *et al.* (2013) [17] who showed that the HR was statistically significant and lower in KMC group.

Unfortunately, according to the results of this study, there were no statistically significance relations were found between neonates' data, mothers' personal and obstetric data and time to initiate breast feeding and duration of first breast feeding between both the study and control groups. The possible explanation for these findings may be related to studied mothers young age, low educational level, lack of guidelines, awareness and training of mothers regardless that the majority of them in both groups had previous history of breast feeding. Even though, most hospitals delay mother-infant contact and breast-feeding initiation due to modernization of hospital policies and routine cares such as putting baby under the warmer to prevent hypothermia. These findings were approximately go on line with Karim, *et al.* (2019) [13] who identified in their analysis that, timely initiation of breastfeeding was not significantly associated with maternal education or urban/rural residence of the mother except for mode of delivery by C-section that significantly delays the early timely initiation of breastfeeding among the mothers and are consistent with Takahashi *et al.*, (2017) [26] identified in their analysis that

maternal socio-demographic characteristics were not found to be factors associated with timely initiation of breastfeeding and also with a study in Egypt by Essa and Ismail (2015) ^[12] whom found that there were no statistically significant differences among the study and control groups in relation to their socio demographic and obstetric history and with Setegn *et al.*, (2011) ^[21] stated that early timely initiation of breastfeeding was not significantly associated with maternal education, place of residence (urban or rural), number of antenatal visit, child's size at birth or skin-to-skin contact between mother and newborn immediately after delivery.

As regard, relation between neonates' data, mothers' personal and obstetric data and time to initiate breast feeding and duration of first breast fed between both the study and the control groups. The current study findings were in direct contrast with Bedaso *et al.* (2019) ^[8] who showed that SSC practice of mothers to their newborns is associated with their educational status. Illiterate mothers were 18 times more to practice SSC to their infants since majority of mothers in this study were housewives and they pass all their time with their newborns and feed their breast milk while employed mothers were mostly unable to do this and also with Safari *et al.* (2018) ^[19] who mentioned that, mothers in the SSC group had completed lower levels of education compared to mothers in the routine care group and were contrary to the findings of a study by Adhikari *et al.*, (2014) ^[2] who indicated that early timely initiation of breastfeeding was more likely to be practiced by educated, urban mothers from the richer household. On the other hand, American Academy of Pediatrics, (2012) ^[4] indicated that many factors affect the establishment of breastfeeding, such as ethnic, educational, and age-related differences, as well as marital status, length of maternity leave, work environment, and cultural traditions. Further, Early initiation of breastfeeding (EIBF) within one hour of birth can decrease neonatal death (Takahashi *et al.*, 2017) ^[26].

Limitations of the study

The researchers faced the following limitations

- Generalizability of this study is limited by fact that all data were collected in one hospital; therefore, any conclusions and generalization that are reached may be applicable only to this population and newborn infants.
- The most crowded ward in the morning shift, so the study was conducted in the afternoon shift and the quiet hours.

Conclusion

The present study highlighted the effectiveness of early skin-to-skin contact immediately after birth to full-term newborns as a safe, low-cost and a very simple intervention, mothers who practice early maternal/newborn skin-to-skin contact after birth exhibit early successful initiation of breastfeeding and increasing the duration of first breastfed than those who do not perform skin-to-skin contact. Also, early skin-to-skin contact immediately after birth to full-term newborns has a positive effect on stability of physiological parameters of the newborn; increasing the temperature, the heart rate and respiratory rate stability in neonates. There were no statistically significant differences were found between neonates' personal characteristics, mothers' personal and obstetric data and time of initiating breast feeding and duration of first breast fed between both

the study and the control groups.

Recommendations

In the light of the finding of current study, the following are recommended

1. All stable neonates born at term via vaginal delivery should experience skin-to-skin contact soon after birth for at least the first hour of life with continuous monitoring of mother and neonate during early SSC.
2. A nursing simulation training program may help promote acceptance of SSC
3. It is critical to provide all neonatology nurses with continuous educational and training programs on how to implement SSC for all mothers.
4. Future studies and guidelines to improve immediate, continuous and uninterrupted SSC should include a standardized set of indicators and measurement tools that document SSC starting time and duration.
5. Further researches should be conducted on the long-term impact of SSC on multiple variables, like weight gain, period of hospitalization, mother's breastfeeding rate, etc., Furthermore; the procedure could be performed for the underweight newborns and lower gestational age under certain circumstances.

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