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## Research Article

# Assessing Breastfeeding Behaviour in Indonesia: Does Early Skin-to-Skin Contact Affect Mothers' Breastfeeding Performance and Confidence?

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## Abstract

**Background and Objective:** The skin-to-skin contact after birth is known as the first step in a feeding practice that helps mother and infant in establishing the breastfeeding bond and increases mothers' confidence in nurturing their infants. Despite the benefits, the absence of this contact commonly occurs in maternity practice, which seems to affect mothers' breastfeeding behaviour after discharge. This study aimed to analyse the effect of skin-to-skin contact on mothers' breastfeeding performance and self-efficacy. **Methodology:** This study involved 239 pregnant women who were selected based on cluster random sampling and data were collected from June 2014 to January 2015 in the coastal region of South Sulawesi, Indonesia. Mothers were followed and observed several times: first, during the birth process until 2 h after; second, at 7-10 days postpartum; and third, four weeks postpartum to evaluate skin-to-skin contact, breastfeeding performance and breastfeeding self-efficacy. Subjects were divided into two groups with immediate and delayed skin-to-skin contact. Differences between the two groups were measured by independent t-test. **Result:** Mothers with immediate skin-to-skin contact were more able to breastfeed effectively ( $p = 0.001$ , 95% CI 2.04-5.52) and were more confident ( $p = 0.001$ , 95% CI 9.71-16.55) compared to those in the delayed group. Immediate skin-to-skin contact shows significant differences in breastfeeding performance and maternal confidence. **Conclusion:** Immediate skin-to-skin contact remarkably impacted mother's ability to adapt to breastfeeding. It also eliminated anxiety and lower self-esteem in the beginning of the postpartum period. Later, these mothers were able to cope with and overcome severe breastfeeding problems. This raised their breastfeeding quality to a greater level.

**Key words:** Breastfeeding performance, Indonesia, breastfeeding self-efficacy, skin-to-skin contact, early initiation of breastfeeding

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**Competing Interest:** The author has declared that no competing interest exists.

**Data Availability:** All relevant data are within the paper and its supporting information files.

## INTRODUCTION

Neonatal mortality and morbidity are important problems in every country and especially in developing countries. Initiation of breastfeeding within 1 h after birth reduced newborn deaths by 22% in Ghana<sup>1</sup> and 19% in Nepal<sup>2</sup>. This practice is considered to be a low-cost intervention to reduce the mortality rate of children under 5 years of age worldwide<sup>3</sup>. One meta-analysis result states that early initiation of breastfeeding within the first 1 and 24 h after birth significantly reduces the neonatal mortality rate, low infant body weight and infection<sup>3</sup>. Timely initiation of breastfeeding then becomes a guideline in every birth process. In addition to this opportunity to prevent neonatal death, breastfeeding stimulates the infant immune system to develop faster through the high immunoglobulin and lymphocyte content of colostrum in early breastmilk expressed after mother gives birth<sup>4,5</sup>. Along with the benefits for the baby, the infant sucking on mother's nipple is a strong stimulation to produce oxytocin that prevents postpartum bleeding<sup>6</sup>, which causes maternal mortality in 27% of cases<sup>7</sup>. From a psychological aspect, this practice helps to decrease the mother's postpartum depression, which can occur unconsciously, mostly for first-time mothers<sup>8</sup>. Early bonding influences the mother's awareness of her role as a parent<sup>9,10</sup>. Early skin-to-skin contact plays an important role in establishing a primary pattern of breastfeeding lasting six months or more. The extraordinary first impression of the nature of breastfeeding boosts the mothers' confidence for their motherhood journey.

Unfortunately, this common practice can fail without optimal timing, notably, when the skin-to-skin contact is started late and ends prematurely, before babies are able to suck properly, usually within 1 h<sup>11</sup>. This obstacle is encountered mostly in primary health care and in maternity general hospitals in South Sulawesi, Indonesia. The required time limit, fatigue and the need for considerable midwife support are major reasons for the termination of this process. Mothers are not educated enough before the birth about how important skin-to-skin contact is for their babies. Indeed, the value of breastfeeding is weakened by the personal advantages advertised by formula marketing. The midwife may also attenuate the promotion of breastfeeding, for example, by giving the mother instructions for choosing a formula. The general or maternity hospital rarely provides breastfeeding lactation consultants or a breastfeeding clinic; mothers who recently gave birth will likely receive insufficient lactation aid at hospital discharge. This will affect the mother's level of confidence in breastfeeding, particularly for those who are primiparous<sup>12-15</sup>. A mother's breastfeeding self-efficacy is

formed from the prenatal to postpartum period and it may increase if she feels positive cues from her immediate environment or otherwise. Many mothers attend breastfeeding class only on their own initiative, separate from the place of maternity care. All of these circumstances lead mothers to being insecure in dealing with breastfeeding problems. Therefore, this study aimed to determine the effect of early breastfeeding initiation towards breastfeeding performance and self-efficacy among postpartum mothers.

## MATERIALS AND METHODS

**Study design and sampling method:** The observational study used a cohort design. The subjects included 239 pregnant women who were selected based on cluster random sampling. The clustering subject was defined by village under the sub-district area and selected randomly. Village enrolment was based on the similarity of geographical characteristics. The four selected villages had similar demographic characteristics and were located along the Bajo coastline in the Sub-District of Tanete Riattang Timur, Bone Region, South Sulawesi, Indonesia. The fourth village is mostly inhabited by residents of the Buginese-Bajo ethnicity, who generally work at or are related to someone working with seafood processing, including traditional and semi-traditional fishermen. The subjects were later separated into two exposure groups based on whether early or delayed Initiation of Breastfeeding (IBF) was observed in their birth session. All pregnant women in the 2nd and 3rd trimesters in eight villages were identified by demographic characteristic.

**Data collection, instrument and data analysis:** All data collection commenced at the beginning of June 2014 and ended on January 2015. Subjects were observed and followed up three times: The first follow-up occurred during the birth process to observe the EIBF practice. The second follow-up took place from 7-10 days postpartum to assess breastfeeding performance with the UNICEF BF-Aid instrument<sup>16</sup>, which consisted of 32 items for observation of the breastfeeding process, starting from the beginning of positioning until finishing a single phase of the breastfeeding period. This instrument had a Cronbach's alpha of 0.92. The third follow-up occurred at four weeks postpartum to assess the degree breastfeeding efficacy with the Breastfeeding Self-Efficacy Short Form (BSESF), which consisted of 14 questions<sup>17</sup> and had been translated into Indonesian language<sup>18</sup>. This instrument had a Cronbach's alpha of 0.77. All items in each instrument are described

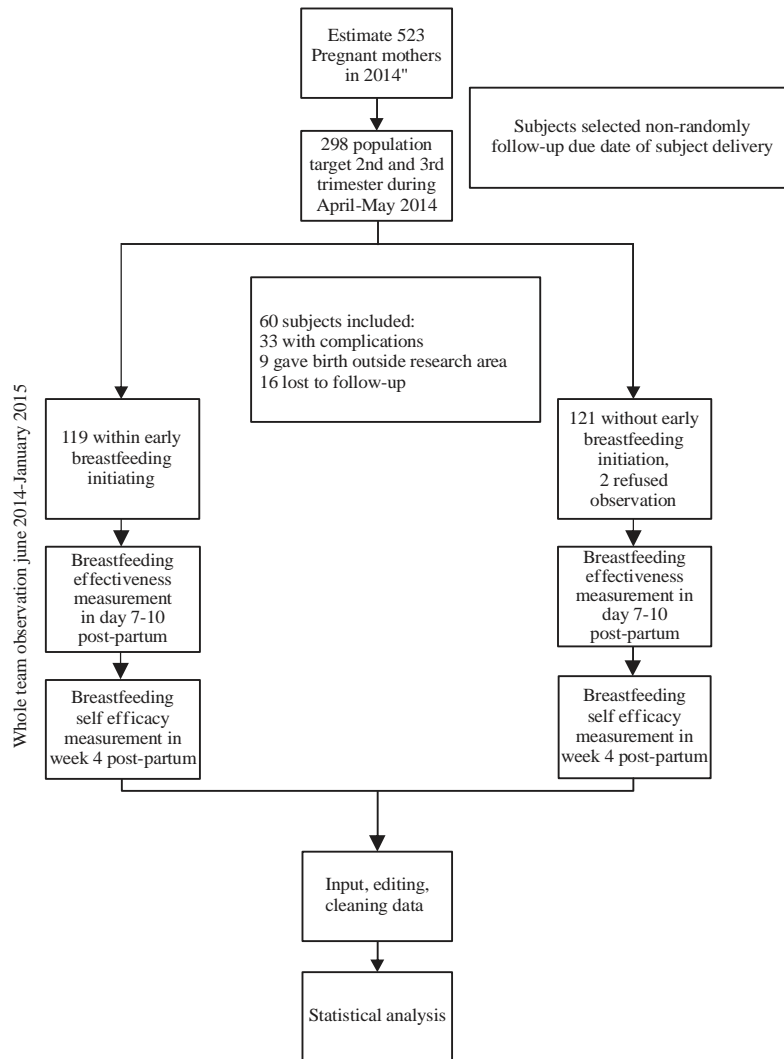


Fig. 1: Research inquiry

separately to address at which point a mother encountered a problem during the breastfeeding period. The main outcome variables were measured and analysed using the independent t-test with a 95% CI; the variables analysed were breastfeeding performance and breastfeeding self-efficacy between early and delayed-IBF groups. The data collectors (20 graduated midwives) were recruited and trained through several pre-test and post-test quality control exercises to gain the same perspective of how to conduct and collect information from participants using all instruments and additional tools (Fig. 1).

**Ethics approval and consent to participate:** The study was approved by the Ethical Review Committee of the Medical Faculty of Hasanuddin University with official written letter number: 01700/H4.8.4.5.31/PP36-KOMETIK/2014. The participants enrolled in the study were informed about the

study purposes, expected outcomes, risks and benefits and guarantee of confidentiality. All participants who agreed to support this research signed a written informed consent letter before all parts started.

## RESULTS

The mother's breastfeeding performance was observed at 7-10 days postpartum. This observation session aimed to assess the mother's breastfeeding technique and process since the beginning of breastfeeding (Table 1). This assessment was done with consideration that the mother's breastfeeding pattern begins to form in the first week postpartum. Sequential measurements are best done in a one week time range until the baby is in its second month. The observation results (Table 1) show the emphasis of the

Table 1: Item observation based on breastfeeding performance observation on day 7-10 postpartum

Item observed	Early (excellent)		Delayed (poor)		*p-value
	Frequency	Percentage	Frequency	Percentage	
Finding a comfortable position and relaxing	103	86.6	103	86.6	0.001
Breasts are opened naturally	109	91.6	96	80.7	
Easy access to nipple and areola	107	89.9	95	79.8	
Mother's view is not hindered by hair/clothes	77	64.7	59	49.6	
Baby's head and body are in a straight line	72	60.5	53	44.5	
Baby's body is attached to mother's abdomen	70	58.8	54	45.4	
Baby's whole body is supported by the mother	84	70.6	54	45.4	
Baby's nose faces the mother's nipple	104	87.4	92	77.3	
Baby responds to finding the breast when attached	91	76.5	83	69.7	
Mother waits for the baby to open her mouth wide	68	57.1	52	43.7	
The baby's mouth is opened wide	94	79.0	83	69.7	
Mother brings the baby to attach to the breast	94	79.0	80	67.2	
Lower lips, chin and tongue touch the breast first	55	46.2	41	34.5	
Baby's chin touches the breast	113	95.0	96	80.7	
The mouth is opened wide	115	96.6	96	80.7	
Baby's cheek is soft and round	117	98.3	109	91.6	
Lower lips are folded out ( <i>membreh</i> )	58	48.7	35	29.4	
Most of the areola is located under the upper lips	58	48.7	37	31.1	
The breast remains rounded during breastfeeding	112	94.1	106	89.1	
There are signs of the release of breast milk (e.g., leaking)	64	53.8	42	35.3	
Mother gives signs of the release of breast milk (tingling, sweating, sleepiness)	100	84.0	103	86.6	
Baby is still attached to the breast	98	82.4	83	69.7	
Baby is relaxed and staring at the mother's breast (concentration)	62	52.1	37	31.1	
The sucking is deep, slow and rhythmic (2 sucks/sec) and becomes longer and slower (1 sucks/sec)	103	86.6	104	87.4	
No sound except swallowing sound	98	82.4	84	70.6	
Swallowing movements are seen rhythmically	118	99.2	108	90.8	
Baby releases the breast spontaneously	108	90.8	91	76.5	
The breast looks soft	115	96.6	112	94.1	
The nipple is in the same form as before feeding	106	89.1	70	58.8	
The skin around the nipple and areola looks healthy	118	99.2	114	95.8	
The baby is always burped at the end of a feeding session	54	45.4	39	32.9	
Mother breastfeeds on left and right side alternately	57	47.9	41	34.5	

N each group: 119, p<0.05, \*independent t-test

observation, which included a focus on latch technique, sucking and breast milk transfer during breastfeeding. The instrument consisted of 32 items, with a Cronbach's alpha coefficient 0.923, which was highly reliable for use at the community level. The mean score of the breastfeeding performance value (Table 3) in the Early IBF group is higher than that in the Delayed-IBF group.

An unpaired t test was used to find the difference in breastfeeding performance in two groups. The test result showed a p-value = 0.001 (95% CI 2.04-5.52), this showed that there was a difference between the 2 groups. Mothers with Early IBF during the birth process were more likely to breastfeed effectively and without obstacles compared to the Delayed-IBF mothers. Several indicators observed in the two groups were obviously different. When mothers in the Delayed-IBF group started to position and attach the baby's lips to the areola, they often had trouble. Mothers also found it inconvenient to establish calm for their baby and were not

confident in recognizing milk transfer during breastfeeding, whereas mothers in the Early IBF group encountered fewer obstacles. In the Delayed-IBF group, the feeding process terminated earlier than expected as a result of diverse problems and issues not controlled by the mother. Restless babies became even more uneasy, crying a lot, which was confusing to the mother. This situation suggested that the babies were unpleasant during breastfeeding and that the mothers' experience was one of failure to satiate their babies.

Further measurement was done in week four postpartum. The aim of this measurement was to assess the confidence level of the breastfeeding mother with an instrument consisting of 14 items, with statements presented as a Likert scale. The result (Table 2) shows that the instrument (BSESF) was reliable, with a Cronbach's alpha of 0.777; all statement items were valid. Based on those criteria, the instrument used is feasible to measure the confidence level of the nursing mother. The breastfeeding self-efficacy mean

Table 2: Confidence Level of Nursing Mother in Week 4 Post-Partum

Statements	Breastfeeding self-efficacy (highly confident)				*p-value
	Early IBF		Delayed-IBF		
	Frequency	Percentage	Frequency	Percentage	
Determining baby is getting adequate milk	26	21.8	7	5.9	0.001
Managed to overcome breastfeeding problems	32	26.9	5	4.2	
Breastfeeding baby without providing formula milk	34	28.6	13	10.9	
Ensuring mouth is well latched onto the nipple when breastfeeding	36	30.3	9	7.6	
Feels the breastfeeding situation is proceeding as desired	33	27.7	10	8.4	
Successful breastfeeding even when the baby is crying	38	31.9	8	6.7	
Wants to always breastfeed	45	37.8	14	11.8	
Feels comfortable during breastfeeding when other members of the family are around	39	32.8	13	10.9	
Satisfied with breastfeeding experience	41	34.5	9	7.6	
Accepts the fact that breastfeeding takes time	35	29.4	9	7.6	
Completes feeding in one breast before moving to the other breast	25	21.0	10	8.4	
Always provides breast milk for the baby at every (baby's) meal time	33	27.7	10	8.4	
Adjusting to the needs of breastfeeding	36	30.0	6	6.0	
Estimating when the breastfeeding is finished	39	32.8	11	9.2	

N each group: 119, p<0.05, \*independent t-test

Table 3: The difference of breastfeeding performance and efficacy between Early IBF and delayed-IBF mothers

Variables	Early IBF (Mean ± SD)	Delayed-IBF (Mean ± SD)	p-value*	Cronbach's alpha
Breastfeeding effectiveness	56.39 ± 5.78	52.61 ± 7.67	0.001	0.737
Breastfeeding efficacy	52.24 ± 12.43	40.10 ± 14.27	0.001	0.963

\*Independent t-test

score in the Early IBF group was much higher than that in the Delayed IBF group. Unpaired t test results [p = 0.001 95% CI (9.71-16.55)] showed a significant difference between the two groups.

Table 3 shows that mothers with Early IBF have higher confidence compared to mothers with Delayed IBF. Several findings that were obviously different between two groups included the mother's ability to recognize her baby's hunger cues and master the latch-on technique. This group of mothers also believed in the idea that breastfeeding is the main requirement for a baby to grow and develop. They were not concerned about breastfeeding in front of many people if their babies were nursing sufficiently.

Distinctively, breastfeeding is a maternal action that consumes the mother's time for herself. Based on that circumstance, we were able to make a sequential tentative conclusion that mothers with EIBF will perform breastfeeding of good quality and the quality of breastfeeding will reinforce the mother's confidence, encouraging her to continue breastfeeding longer. Although our statistical results did not examine this sequence directly, the available findings are mutually supportive.

## DISCUSSION

EIBF mothers have higher confidence and have good belief in their ability to breastfeed. Several mothers admitted

that by seeing EIBF practice, they were able to reduce their anxiety about having a new baby and change their beliefs to understand that the fragile newborn was evidently strong and sound; this could be seen in their ability to crawl and find their mother's breast without assistance. EIBF mothers tend to have a better commitment to breastfeed continuously, to feel satisfied with the breastfeeding experience and to accept the fact that breastfeeding is time consuming. They will always try to breastfeed anytime the baby shows hunger cues. Eventually, these mothers are successfully able to breastfeed without feeling awkward with the presence of other people around.

Mothers with high confidence find it easy to recognize the baby's cues, such as the rooting, sucking and swallowing reflexes. In addition to the detection of hunger signs in the baby, EIBF mothers are also able to detect when their baby is uncomfortable due to a wet diaper, overheating, or sleepiness. These capabilities certainly evolved psychologically from when the mother first observed and felt the baby in the first minute after giving birth, which increased the mother-baby bond. Breastfeeding intensely with love and commitment builds emotional and spiritual closeness between mother and baby. Thinking about, kissing, hugging and listening to the baby sends a stimulus to the hypothalamus to release prolactin, a hormone that is important for breast milk production<sup>19</sup>. Prolactin promotes the secretion of milk by the

milk glands to the alveoli. If this stimulus does not exist or is blocked due to damage to the hypothalamus or pituitary or by discontinued breastfeeding, the breast will lose its ability to produce milk in 1-2 weeks<sup>20</sup>. The prolactin level is highest in the evening and the primary breastfeeding session is done in the evening. It is important to start the baby's sucking stimulus as early after birth as possible. In fact, this stimulus is highly optimal in the first hour.

When the baby is sucking, several neurons in the breast send messages to the hypothalamus. When the hypothalamus receives the messages, it releases a prolactin "Brake". This will start the production of breast milk and the prolactin produced by the pituitary gland stimulates the milk glands in the breast. Milk ejection is a critical factor for the success of the lactation process, because only a small volume of breast milk (1-10 mL) is released by the baby's sucking<sup>21</sup>. Failure of breast milk transfer will decrease breast milk secretion due to the local control mechanism in the breast<sup>22</sup>. Stimulation of the nipple stimulates breast milk secretion through impulses sent to the hypothalamus and then stimulates the posterior pituitary gland to release oxytocin into the bloodstream<sup>23</sup>. Oxytocin contracts the myoepithelial cells around the alveoli, forcing the milk into the duct. Increasing the pressure in the duct dilates the duct and increases the milk flow out through the nipple<sup>24</sup>.

In the beginning phase of breastfeeding, approximately 60 min after birth, the baby will suck approximately 0-5 mL colostrum. In the first 24 h period, the baby generally breastfeeds for 3-8 sessions with approximately 7-123 mL colostrum intake<sup>25</sup>. In the first week, the baby breastfeeds for approximately 10 sessions per day and breast milk intake increases drastically, between 395 and 868 mL day<sup>-1</sup>. Until one month, the baby will consume 750-800 mL day<sup>-1</sup>. Breast milk production in the 6th day is strongly related with breast milk production in the 6th week<sup>26</sup>.

The diameter of fat globules in colostrum are bigger than those in mature breast milk measured less than 24 h post-partum until less than 2 days, the difference in the diameter of the lipid globules is strongly related to the baby's ability to digest in the early of life<sup>27</sup>. The lactogenesis II phase is characterized not only by an increase in breast milk production but also by a dramatic change in breast milk content. Colostrum consists of highly concentrated protein (immunoglobulin, lysozyme and lactoferrin), sodium and chloride, as well as casein, lactose, potassium, citrate, calcium and phosphate. During lactogenesis II, the concentration of breast milk is changing, with increases in lipid content and the concentration of casein, lactose, potassium citric, calcium and

phosphate and a decrease in the total concentration of protein, sodium and chloride<sup>28</sup>. These changes can be seen on day five post-partum.

This hypersensitive interaction is naturally created between the mother-infant dyad. If the mother can accept the consequences of having a baby, with all the beautiful effects that arise, there will be no problems during breastfeeding. This is strengthening the fact that early initiation of breastfeeding can eliminate the mother's concerns about breast milk production. EIBF mothers are likely to more easily adjust to conducting exclusive breastfeeding. Another study of a skin-to-skin contact intervention in 92 primiparous mothers for 2 hs showed that these mothers have a high confidence level in breastfeeding, good knowledge about breast milk, high confidence in breastfeeding continuously even when facing a problem, a feeling of certainty that the baby was getting adequate breast milk and consideration that breastfeeding is much easier<sup>29</sup>.

Despite the biologically plausible mechanism of how early skin-to-skin attachment provides benefits that prolong breastfeeding duration, early initiation of breastfeeding itself still faces a major burden in implementation. A recent systematic review sorted all those burdens into demand- and supply-side categories. On the demand side of the barrier, early initiation faced a major problem in acceptance from mothers and family and a lack of support and access to the educational material. Meanwhile, on the supply side of the barrier, there is still a struggle with correct knowledge and misperceptions about breastfeeding and few antenatal and postnatal visits from skilled birth, homebirth and traditional birth attendants<sup>30</sup>. For this study, the absence of breastfeeding aids such as a lactation consultant to assist mothers before discharge is one of the biggest problems.

Early initiation of the breastfeeding experience should change a mother's perception about breastfeeding, because during this time, many of the complaints from breastfeeding mothers are about inadequate breast milk output at 3 days post-partum. It is in this gap that formula milk is given to the babies. Many mothers do not completely understand the conformity between the baby's need and capacity to drink. They worry that when the baby is crying it means that the baby is still hungry and many times this is emphasized by the grandmother. In this kind of situation, high confidence is needed to address their concern. As long as there are no dangerous clinical symptoms such as rising temperature and skin alteration within the first 3 days or late lactogenesis onset, mothers are strongly recommended not to give formula milk to avoid a disturbance in baby's metabolic development<sup>31</sup>.

From the beginning of early breastfeeding initiation, it has been noted that the baby already has an amazing ability to breastfeed by itself. It would be easier to convince mothers to breastfeed their babies if mothers observed this capability in the first hour post-partum, knowing that breastfeeding will be better in the next days. Mothers only need help and assistance to breastfeed properly<sup>32</sup>. This finding emphasizes the importance of conducting EIBF without any reasonable delay in every spontaneous birth, even those that are caesarean. It is recommended that all care providers work together to create a mother-baby-centred care routine that starts with practising immediate skin-to-skin contact for at least 60 min. Educating mothers and their families will provide the opportunity for breastfeeding to be successful later.

### **CONCLUSION**

Implementation of early or timely initiation of breastfeeding ideally is a guaranteed marker of the breastfeeding early pattern. The skin-to-skin experience gives mothers remarkable power to recognize the value of breastfeeding, eliminating anxiety and fear in the beginning of the post-partum phase. This practice makes a real difference in the mother's confidence in and mastery of the lactation technique. By experience, through seeing and feeling, trust and awareness are formed. This study recommends ensuring EIBF implementation in every birth for a minimum time of one hour. This should include support from multilevel interventions involving the husband, grandmother and health workers, as well as peer-support and maternity leave policies.

### **SIGNIFICANCE STATEMENT**

Poor skin-to-skin contact after birth in the maternity care unit results in major difficulties in breastfeeding practice for mothers after hospital discharge. Early skin-to-skin contact is routine in general maternity practices in Indonesia but rarely begins after less than 30 min and typically ends before 1 h. The findings of this paper indicate that all maternity care practices and hospitals should emphasize the importance of consistently providing an optimal duration of early skin-to-skin contact during the first hour after birth.

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