

# The Effect of an Interventional Program based on the Theory of Ethology on Infant Breastfeeding Competence

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## ABSTRACT

**Background:** According to the Ethology Theory, the immediate separation of the mother from the infant upon birth could directly interfere with the infant's innate behavior regarding the initiation of breastfeeding. This study aimed to determine the effects of an interventional program based on the Theory of Ethology on infants' breastfeeding competence.

**Methods:** One hundred and fourteen prim parous, Iranian, healthy, full-term mothers between 18-35 years were involved in this study. All of them had normal vaginal delivery and intended to breastfeed their infants. They were put through skin-to-skin contact with their infants immediately after birth for as long as two hours. Afterwards, the rate of the infants' breastfeeding competence was compared with that of a control group receiving routine hospital care.

**Results:** The rate of the infants' breastfeeding competence was higher in the skin-to-skin contact group compared to the routine care group ( $P=0.0001$ ).

**Conclusion:** Early skin-to-skin contact between the mother and the newborn greatly contributes to the promotion of the infant's natural feeding behavior and thus, results in a higher rate of infant breastfeeding competence. The findings in our study confirm the Theory of Ethology.

**Keywords:** Breastfeeding Competence, Infant, Theory of Ethology

## Introduction

Numerous benefits have been documented for breastfeeding regarding the health of both mother and infant (1, 2). The American Academy of Pediatrics (AAP) recommends exclusive breastfeeding for the first six months of life and its continuation for at least one year after birth (1, 3). Strong evidence exists that breastfeeding can decrease the incidence and/or severity of many diseases in infants (3, 4). It is also associated with remarkable cognitive development in infants and boosting the mother-infant bonding (5, 6). Like many other countries in the world (7), many Iranian mothers discontinue exclusive breastfeeding prematurely (8) and this necessitates the administration of policies for the early initiation and continuation of breastfeeding. The first two hours after birth is a critical period in this regard. It is also an ideal opportunity for the establishment of early skin-to-skin contact and the initiation of breastfeeding (9). According to the Ethological Theory, newborns are

biologically equipped to actively establish a bond with their caregivers (10). After the infants are placed in direct skin-to-skin contact with their mothers immediately after birth, exploration begins which enhances the maternal tactile as well as verbal stimulations. It is a time of great importance in promoting the mother-infant relationship (5, 10). The Theory of Ethology was proposed by two biologists, Tinbergen and Lorenz who were awarded the Nobel Prize for their theory in 1973 (11). John Bowlby applied this theory to the infant-caregiver bond for the first time (10). According to this theory, early skin-to-skin contact within the first hours upon birth can enhance the establishment of the infant's built-in behavior that helps them to keep the mother nearby. Thus, it is the best time to initiate breastfeeding (5, 10, 12). The aim of this study was to determine the effect of an interventional program based on the Theory of Ethology on infants' breastfeeding competence.

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**Table 1.** IBFAT scores of infants according to the intervention they received

| IBFAT SCORE | Skin to skin contact group | Routine care group | P value |
|-------------|----------------------------|--------------------|---------|
| 0-4         | 1 (2.1%)                   | 5(11.1%)           | 0.02    |
| 5-8         | 13(27.7%)                  | 20(44.4%)          |         |
| 9-12        | 33(70.2%)                  | 20(44.4%)          |         |

## Materials and Methods

### Setting

A randomized control trial was conducted from April 2012 to July 2012 in Omolbanin Obstetric Hospital, Mashhad, Iran.

### Participants

The study was conducted on 114 prim parous, Iranian; healthy, full-term mothers between 18-35 years of age who had been through normal vaginal delivery and had decided to breastfeed their babies.

The study was approved by the Ethical Committee of Mashhad University of Medical Sciences prior to performance and eligible mothers signed informed consent.

### Exclusion criteria were as follows

#### Maternal Exclusions

Having certain medical complications such as diabetes, hypertension, psychiatric problems, severe postpartum hemorrhage, multiple pregnancy, cesarean section, anatomical breast defects, a history of breast surgery and drug use not compatible with breastfeeding.

#### Neonatal Exclusions

Gestation <37 weeks, weight <2500 or >4000 gr, Apgar score <7, major congenital anomalies, severe medical problems, severe hypotonia and NICU admission.

### Intervention

We randomly assigned eligible mother-infant pairs into either of the two groups: the skin-to-skin contact (SSC) group (n=57) and the routine care group (n=57).

In the SSC group, infants were placed naked against their mothers' chest in prone position. Infants' heads were covered with dry caps and warm towels were placed on their backs as well. We helped mothers to keep this position for at least 2 hours. Routine hospital care such as weighing and vitamin K injections were postponed for 2 hours in this group. In the Routine Care (RC) group, infants received vitamin K injection and their weight, length and head circumference measurements were recorded

under a radiant warmer immediately after cutting their cords. Afterwards, they were wrapped in pre-heated blankets and given to their mothers. A research assistant accompanied mothers in both groups till the end of the second hour post partum. When the infant initiated his/her first breastfeeding, the breastfeeding was evaluated using Infant Breast Feeding Assessment Tool (IBFAT).

The IBFAT evaluates four parameters of infant breastfeeding competence including the readiness to feed, rooting reflex, latch-on and suckling pattern. The infant can gain a score of 0-3 on each item. The maximum score is 12. IBFAT has been applied in many previous studies and is a reliable tool (9, 13, 14). The reliability of this tool was assessed by observing 20 cases of breastfeeding in a pilot study, in which Kapa coefficient was 0.92.

### Statistical Analysis

All data were analyzed using SPSS software, version 14. Student's t-test was used for quantitative data and Chi-square for qualitative data. The level of significance in terms of p value was 0.05 in all tests.

## Results

Ninety-two mother- infant dyads were assessed in this research. Forty-seven pairs (10 out of 57 mothers were lost to follow-up) in the Skin-to-Skin Contact (SSC) group and 45 (12 out of 57 mothers were lost to follow-up) in the Routine Care (RC) group. The rate of infant breastfeeding competence was higher in the SSC group compared to the RC group (Table 1).

The mean IBFAT score was  $9.8 \pm 2.1$  in the SSC group and  $7.8 \pm 2.7$  in the RC group ( $P=0.0001$ ) which is significantly higher in the SSC group.

## Discussion

Human Ethology Theory can explain the effect of early mother-infant skin-to-skin contact on the infant's breastfeeding competence. When healthy-term newborns are put through skin-to-skin contact with their mothers they exhibit their built-in behavior to keep their mothers nearby. According to the Ethological Theory, immediate mother-infant separation after birth could interfere with such innate behaviors. By contrast, early skin-to-skin contact during this critical period can improve their establishment (5, 10, 12).

The results of this study prove that immediate mother-infant skin-to-skin contact leads to a higher rate of infant breastfeeding competence in the immediate post partum period. It is similar to the

results of a study by Moore and Anderson (9) as well as the studies of Bramson and Walters (15, 16).

The American Academy of Pediatrics (AAP) suggests that healthy newborns are kept in direct skin-to-skin contact with their mothers until after the first breastfeeding (17). Infants are quite alert and capable of a proper latch-on to the mother's nipple within the first hour after birth. However, certain hospital policies might impede infants from the benefits that early skin-to-skin contact can provide them with (18,19).

Our findings in this study imply that direct mother-infant skin-to-skin contact can heighten the rate of infant breastfeeding competence. Previous studies have also indicated that early skin-to-skin contact positively affects the duration of breastfeeding as well (20-22).

These findings should be incorporated into hospital-based policies in order to augment the maternal-infant skin-to-skin contact which results in a more efficient breastfeeding. We recommend at least two hours of direct mother-infant skin-to-skin contact within the first 2 hours post-partum which is a time of utmost importance for the infant breastfeeding competence.

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## References

1. Kramer MS, Kakuma R. Protecting Infants through Human Milk. In Pickering, L.K., Morrow, A.L., Ruiz-Palacios, G.M., Schanler, R., editors. Optimal duration of exclusive breastfeeding; 2004. p.63-77.
2. Parsai S, Khadiivzadeh T. Effect of exclusive breastfeeding and complementary feeding on infant growth and morbidity. *East Mediterr Health J*. 2004;10 (3): 289-94.
3. American Academy of Pediatrics, section on Breastfeeding. Breastfeeding and the use of human milk. *Pediatrics*; 2012; 129(3):e827-41.
4. WHO & UNICEF. Baby friendly hospitals initiative-revised, updated and expanded for integrated care. Geneva:World Health Organization; 2009.
5. Moore E, Anderson GC, Bergman N. Early skin to skin contact for mother and their healthy newborn infants. *Cochrane database Syst Rev*. 2007; 18(3):1-63.
6. Karimi A, Tara F, Khadiivzadeh T, Aghamohamadian Sharbaf HR. The Effect of Skin to Skin Contact Immediately after Delivery on the Maternal Attachment and Anxiety Regarding Infant. *Iran J Obstet Gynecol Infertil*. 2013; 16 (67):7-15. (Persian).
7. WHO. World Health Statistics. Geneva: WHO; 2011.
8. Ministry of health and medical education. Innovative system of reproductive health services evaluation and control. Tehran: Ministry of health and medical education; 2005. available from: <http://www.mohme.gov.ir/health/index.html>
9. Moore E, Anderson GC. Randomized control trial of very early mother-infant skin to skin contact and breastfeeding states. *J midwifery women's health*. 2007; 52(2):116-25.
10. Bowlby J. Attachment: Attachment and Loss Volume One(Basic Books Classics).2nd ed. New York: Basic books; 1983.
11. Wikipedia. Ethology. Available from: <http://en.wikipedia.org/wiki/Ethology>.
12. Porter H, Winberg J. unique salience of maternal breast odors for newborn infants. *Neurosci Biobehav Rev*. 1999; 23(3):439-49.
13. Carfoot S, Williamson P, Dickson R. A randomized controlled trial in the north of England examining the effects of skin-to-skin care on breast feeding. *Midwifery*. 2005; 21(1):71-9.
14. Khadiivzadeh T, Karimi A. The effects of post-birth mother-infant skin to skin contact on first breastfeeding. *Iranian Journal of Nursing and Midwifery Research*. 2009; 14 (3):111-17.
15. Walters MW, Boggs KM, Ludington-Hoe S, Price KM, Morrison B. Kangaroo care at birth for full term infants: A pilot study. *MCN Am J Matern Child Nurs*. 2007; 32(6): 375-81.
16. Bramson L, Lee JW, Moore E, Montgomery S, Neish C, Bahjri K. Effect of early skin to skin mother infant contact during the first 3 hours following birth on exclusive breastfeeding during the maternity hospital stay. *J Hum Lact*. 2010; 26(2):130-7.
17. American Academy of Pediatrics. Breastfeeding and the use of human milk; policy statement. *Pediatrics*. 2005; 115(2):496-506.
18. Righard L, Alade M. Effect of delivery room routines on success of first breastfeed. *Lancet*. 1990; 336(8723):1105-07.
19. Awi D, Alikor E. Barriers to timely initiation of breastfeeding among mothers of healthy full term babies who deliver at the University of Port Harcourt Teaching Hospital. *Niger J clin Pract*. 2006; 9(1):57-64.
20. Mikeil-kostyra K, Mazur J, Boltruszko I. Effect of early skin to skin contact after delivery on duration of breastfeeding: a prospective cohort study. *Acta Paediatr*. 2002; 91(12):1301-06.
21. De Chateau P, Wiberg B. Long term effect on mother-infant behavior of extra contact during the first hour post partum II: a follow-up at three months. *Acta Paediatr scand*. 1977; 66(2):145-151.
22. Karimi A, Khadiivzadeh T, Bagheri S. Effect of immediate and continuous mother-infant skin-to-skin contact on breastfeeding self-efficacy of primiparous women: A randomised control trial. *Women Birth*. 2014; 27(1):37-40.