

## Quality of Mother–Infant Attachment after Physiological Birth

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### Abstract

#### Background

Childbirth affects the quality of mother–neonate attachment after delivery. The aim of this study was to compare the quality of mother–infant attachment in physiological delivery with non-physiological delivery after birth.

#### Materials and Methods

A case-control study was conducted on 60 women (n = 30 non- physiological delivery, 30 physiological delivery) referred to Shahid YahyaNejad Hospital (Babol city, Iran) during 2015 to 2016. Subjects in the physiological delivery group received special care from the midwife or significant other, labor mobility, spontaneous progress of labor, and non-pharmacological methods. Subjects in the non-physiological delivery group received medical interventions including birth aids, use of analgesics, and local anesthesia. Quality of mother-infant attachment after delivery was assessed with a valid Persian version of Avant's mother-infant attachment. Multivariate analysis of variance (MANCOVA) was also used to assess the differences in two groups.

#### Results

The mean of mother–infant attachment scores in the physiological delivery compared with non-physiological delivery group were as follows: emotional behavior ( $2.29 \pm 38.7$  vs.  $1.56 \pm 27.23$ ), proximity behavior ( $1.82 \pm 27.30$  vs.  $1.49 \pm 20.70$ ), caring behavior ( $1.17 \pm 15.77$  vs.  $1.13 \pm 10.80$ ), and total score ( $4.58 \pm 81.72$  vs.  $3.66 \pm 58.73$ ). Results showed that in all three dimensions of attachment (emotional, caring, and proximity behavior), physiological delivery showed higher scores than did non-physiological delivery ( $P < 0.05$ ).

#### Conclusion

The quality of mother–infant attachment (emotional, proximity, and caring behaviors) was higher in women with physiological birth than non-physiological birth.

**Key Words:** Attachment, Infant, Mother, Birth, Physiology.

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## 1- INTRODUCTION

Mother–infant attachment influences on early and later development of the child (1). The attachment process is an interaction between behaviors and characteristics of the child and emotions and behaviors of the mother (2). Attachment begins at the beginning of pregnancy and continues throughout pregnancy, gradually increasing in strength (3). The most critical time for mother–infant attachment is 45–60 minutes after birth (4). Researchers believe that if this opportunity is missed, a relationship between parent and infant may not form (5). The gradual development of mother–neonate emotional attachment takes shape and creates an incentive for mothers to be competent and satisfied in their role as mothers in the postpartum period (6).

A research reported that increased intimacy and attachment lead to the creation of positive emotions and stability in the mother, which results in improved mental health and reduced anxiety in mother and child, as well as long-term effects on child growth and development of the most important determinants of personality (7). Women with strong attachment to their infants are often more sensitive to their needs, and this sensitivity also influences many aspects of emerging characteristics, such as curiosity, socialization, self-esteem, independence, cooperation, and honesty (8). In contrast, the lack of a warm relationship during the first months of life creates sustainable behavior problems in children, and stress, anxiety, and hopelessness in women may be exacerbated (9). Children with poor attachment relationships show poorer mental and emotional development and more school-averse behavior, in addition to poor social interactions, reduced ability to create long-term relationships and more hostile and aggressive behavior (10). In other words, attachment disorder, resulting from separation from the mother or lack of

care or interaction with mother, can lead to complications such as separation anxiety, failure to thrive, lack of close personal relationships, and academic problems (11). Several factors affect the rate of mother–infant attachment feelings. Birth, especially childbirth pain, is a stressful event that affects the quality of mother–neonate attachment after delivery. Suitable support from pregnancy to delivery can reduce stress and increase interaction between mother and child after delivery (12, 13). Reports suggests that maternal psychiatric disorders are related to the state of the mother during and after birth, maternal–fetal attachment during pregnancy, use of non-pharmacological methods (e.g., relaxation), skin-to-skin contact mother and infant, verbal interaction, and contact between the two influences on mother–infant attachment (3). Delivery is a natural process, and modern medical advances have increased safety. However, in most cases, as a result of necessary medical intervention, the concept of delivery as a physiologic phenomenon is compromised (14).

The World Health Organization (WHO) defines physiological delivery as follows: spontaneous labor and free movement during labor, ongoing support during labor, lack of common interventions, straining spontaneous non-supine position, and no separation of mother and neonate at birth (15). Fear, anxiety, and pain are three factors that cause turmoil in maternal mental and physical relaxation (16). To promote mental and physical relaxation and a pleasant maternal birth experience, and to improve maternal health, a new process called safe pregnancy with physiological delivery has been developed by the Ministry of Health for use by hospitals (17). Previous studies have shown that labor pain, anxiety, and fear are reduced in mothers after physiological delivery (18, 19). Despite the effects of mother–infant attachment on child growth

and development at all stages of life, the many benefits of physiological delivery on mental and physical health of the mother and infant (20), and the new policy emphasis of the Ministry of Health and Medical Education (Islamic Republic of Iran) regarding physiological delivery, no research has examined quality of mother–neonate attachment in physiological delivery. This study is the first to compare the quality of mother–infant attachment in physiological and non-physiological delivery in Iran. The aim of the current study was to compare the quality of mother–infant attachment after physiological and non-physiological delivery in three domains: emotional behavior, proximity behavior, and caring behavior.

## 2- MATERIALS AND METHODS

### 2-1. Participants and Settings

A case-control study was carried out on pregnant women referred to Shahid Yahyanejad Hospital in Babol city (North of Iran), during a 4-month period (March 2015 to June 2016). This study was approved by Ethics Committee of Islamic Azad University of Sari Branch (IR.IAU.SARI.REC.1395.5). Inclusion criteria were all women undergoing vaginal delivery with cephalic presentation, gestational age between 38 and 42 weeks, and provision of informed consent. Exclusion criteria were previous cesarean section, preterm birth, and high-risk pregnancies such as hypertension, diabetes, polyhydramnios, and preterm rupture of membrane, fetal macrosomia, abnormal presentation or history of mental illness, medical complications, maternal smoking and/or drug abuse, respiratory failure, etc. Regarding the previous studies, with 95% confidence interval (CI), 80% statistical test power, and 5% difference between case and control group, the study sample size were estimated to be 60 (30 participants each group).

$$(Z_{1-\alpha/2} + Z_{1-\beta})^2 (\delta_1^2 + \delta_2^2)$$

$$n = \frac{\dots}{(x_1 - x_2)}$$

During the study, 349 women were referred to the hospital, and 86 were eligible for inclusion. Qualified women were divided into two groups based on the study of aims; physiologic and non-physiologic delivery. Thirteen non-physiological delivery patients were excluded due to emergency cesarean conditions or abnormal labor (shoulder dystocia). Moreover, 13 physiological delivery patients were excluded due to the necessity of induction, shoulder dystocia, and emergency cesarean section.

Finally, 30 participants in each group completed the study. In this study, physiological delivery is defined as not requiring medical intervention with only training and surveillance during delivery offered to mothers, emphasizing the natural physiologic process in promoting health (15). The Lamaz global organization of physiological delivery principles based on the World Health Organization guidelines were as follows: spontaneous labor and free movement during labor, ongoing support during labor, lack of common interventions, straining spontaneous non-supine position, and no separation of mother and neonate at birth, someone having accompanied the patient, intermittent auscultation of fetal heart rate, minimal vaginal examinations.

In general, new surveillance and evidence-based solutions can reduce the amount of unnecessary interventions during labor, to help turn birth into something pleasant (15). Non-physiological delivery includes other acts such as medical interventions, medication, and surgery. The common method of delivery can include intravenous measures with modern midwifery, amniotomy, oxytocin use, shave, food and fluid restriction, frequent vaginal examinations, continuous

monitoring of fetal heart rate, and limiting the mother's movement limitation mother, too much coffee shop episiotomy, recommendation and forcing the mother to deliver in the supine position, excluding on-time birth along with the mother, and interventions involving tearing of membranes and application tools that increase all the fruits of this style of delivery in the country. Immediately after delivery, two midwives who were not aware of the type of birth observed and recorded mother–neonate behaviors, including mother providing milk to the neonate and place on the womb throughout the study. The midwives filled in a questionnaire on mother–infant attachment (Avant) for 15 minutes. In the 15 minutes, each minute is divided into 30-second intervals, where the first 30 seconds is observing behavior and the second 30 seconds is behavior recording. Again, the birth data and information for neonates was checked after birth by the researcher. SPSS version 22.0 was used to analyze the data. Means, standard deviations, and percentage were used to describe the data. Multivariate analysis of variance (MANCOVA) was also used to assess the differences in mother–neonate attachment between the physiological and non-physiological delivery groups.  $P < 0.05$  was considered as statistically significant.

## 2.2 Assessment Questionnaire of Mother–Infant Attachment (Avant):

To assess mother–infant attachment behaviors, the Avant questionnaire was used to assess the quality of the mother–infant attachment after delivery. The Avant questionnaire contains three types of emotional behavior (kissing, look out, cuddling, talking, smiling, and shaking/rocking), proximity behavior (hugging, body contact with the mother, the neonate's arm round hoop), and caring behaviors (replace cover and adjust clothing, bringing child back up to the chest, mother tending to neonate) (21).

The questionnaire was evaluated for 15 minutes, with 1-minute intervals consisting of 30 seconds of observation and 30 seconds of recording. The observed behavior is recorded only once per minute. The maximum for any behavior observed in the 15 minutes, then, is 15 times. A total of 11 treatments within 15 minutes can be seen, and observed behaviors are awarded 1 point per minute, with a maximum score of 165. The total score reflects attachment to the mother, with higher scores indicating greater attachment (22).

Vakilian et al. (2007) reported the Avant has a high internal correlation coefficient ( $r = 0.98$ ) for Persian version of Avant's mother-infant attachment (22). In this study, the reliability of the simultaneous observation method was confirmed by two raters with a correlation of 97%.

## 2.3 Data analysis

To analyze the data, software package SPSS software version 22.0 (Inc, Chicago, IL, USA) was used. Normality was assessed with Kolmogorov–Smirnov tests. Data were analyzed using descriptive statistics such as percentage, frequencies, and means, and t-tests were used to compare demographic characteristics between groups. To compare the two groups in attachment behavior across the three areas of emotional attachment and the total score, a MANCOVA was used.

## 3- RESULTS

The aim of this study was to compare the quality of mother–infant attachment in physiological delivery with non-physiological delivery after birth. Some demographic and pregnancy characteristics are shown in **Table 1**. The age range of mothers was 20–30 years, and the average age of husbands was  $4.31 \pm 26$  years in the physiological group and  $4.59 \pm 32$  years in the non-physiological group. There was no difference between groups in baseline characteristics ( $P < 0.05$ ). **Table 2** shows the correlation of type of delivery,

physiological /non-physiological, with demographic characteristics of the study population. Only birth weight of the infants was correlated significantly with type of delivery ( $P < 0.05$ ). MANCOVAs on the Avant mother–neonate attachment subscales (**Table.3**) revealed a significant effect for all attachment subscales. Women undergoing physiological delivery had significantly higher scores on emotional

behavior, proximity behavior, and caring behavior ( $P < 0.05$ ). There were also differences between groups in total attachment behavior scores. MANCOVAs on total scores of mother–infant attachment revealed that women undergoing physiological delivery had significantly higher total scores than did women undergoing non-physiological delivery ( $P < 0.05$ ).

**Table-1:** Demographic characteristics of the study population

Variables	Physiologic birth	Non-physiologic birth
Women's jobs (number /percent)		
Housewife	0(100)	23(76.76)
Staff / student	0(0)	7(23.34)
History of infertility (number/percent)		
Yes	0(0)	1(3.33)
No	30(100)	29(96.67)
Duration of marriage, Mean (SD)	2.21±4	2.24±4
Women age, Mean (SD)	4.22±28	4.17±27
Spouses age, Mean (SD)	4.31±26	4.59±32
Birth weight in birth, Mean (SD)	9.288±3452	2.279±3381

SD: Standard deviation.

**Table-2:** Correlation on type of delivery, physiological /non-physiological, with demographic characteristics of the study population

Variables	Correlation coefficient*
Women's jobs	0.112
History of infertility	-0.972
Duration of marriage	0.952
Women age	-0.034
Spouses age	-0.018
Birth weight in birth	0.35**

\*Spearman's rho; \*\* Correlation is significant at the 0.01 level.

**Table-3:** The comparison of means of quality of mother- infant attachment in two groups

Type of behavior	Group	Mean (SD)	Significance level	Sum of squares	F- test	Significance level*
Emotional behavior	Physiologic	38.7(2.296)	0.991	1972.267	17.049	<0.001
	Non-physiologic	27.23(1.562)	0.886			
Proximity behavior	Physiologic	27.3(1.821)	0.964	370.02	9.21	0.004
	Non-physiologic	20.7(1.499)	0.303			
Caring behavior	physiologic	15.77(1.175)	0.614	653.4	7.83	0.007
	Non-physiologic	10.8(1.139)	0.335			
Total score of attachment	Physiologic	81.726(4.586)	0.927	7912.01	15.307	<0.001
	Non-physiologic	58.73(3.664)	0.116			

\*Multivariable analysis variance (MANOVA) test was done to compare means; SD: Standard deviation.

#### 4- DISCUSSION

This study showed that quality of mother–infant attachment after delivery in emotional behavior, care behavior, and proximity behavior, and total attachment scores was higher in women who underwent physiological delivery than it was in women who underwent non-physiological delivery. Although no published study has compared mother–infant attachment after delivery between women undergoing physiological and non-physiological delivery; some research has shown that physiological delivery affects mother–infant attachment. Carter-Jessop reported that interventions during pregnancy have a positive effect on attachment behavior after birth (23).

Further, Muller found that the first few hours after birth is a critical time for the development of attachment behavior in newborns (24). A study concluded that scientific research up to now has assumed that breastfeeding has a positive effect on the quality of the mother– neonate attachment relationship, despite a lack of support (25). A study conducted in Sweden showed that mothers who had skin contact for 15–20 minutes after birth spent more time kissing and looking at the neonate (26). Prodromidis et al. concluded that attachment behaviors, including looking at, talking, and touching were higher in those who had immediate contact with the infant (27).

Charpak et al. also suggested that skin contact leads to the identification of parents among kids, leading them to be more responsive to their children’s needs, thereby improving family relations and infant attachment (28). The important question is how we can explain the effect of physiological delivery on increasing attachment between mother and infant after delivery. Why quality of mother–infant attachment (emotional, proximity, and caring behaviors) was higher in women with physiological birth than non-

physiological birth? Here, we explore some possibilities. First, bonding behaviors of the mother and infant after birth, including cheek-to-cheek contact, looking, and skin-to-skin contact in the hours after birth facilitates a pattern of mutual interaction and coordination (22). Second, non-pharmacological methods such as relaxation, distraction, emotional support, and confidence encourage skin contact (29). Third, the postpartum period is important for both mother and baby, and an important factor here is the birth method (30).

##### 4-1. Limitations of the study

Despite efforts to eliminate or control confounding variables, there were limitations to this study. First, this was a case-control study. Randomized clinical control trials are a more reliable way of determining casual differences in quality of mother–neonate attachment between physiological and non-physiological delivery groups. Second, we relied on reports to provide us with information from the midwives, using observation-report questionnaires. Future research using alternative methods, such as interviews, might obtain a more complete view of the quality of mother–infant attachment. Third, the sample size was small. The results need to be replicated with a larger group and at multicenter birth wards. Fourth, the delivery ward was very crowded. Therefore, filling in the Avant questionnaire may not have had the full attention of midwives.

#### 5- CONCLUSION

The quality of mother–infant attachment (emotional, proximity, and caring behaviors) was higher in women with physiological birth than non-physiological birth. The findings propose that a greater focus is placed on increasing mother–infant attachment by offering the training and skills necessary for both midwives and obstetricians to raise

awareness about physiological delivery. The results also suggest the need for hospitals to provide requirements for physiological delivery with pregnant women in both private and educational hospitals.

## 6- AUTHOR CONTRIBUTIONS

Study design: ZZ, M.F, BM

Data Collection: Z.Z.

Manuscript writing: ZZ, M.F

Critical revision: ZZ, M.F, BM

**7- CONFLICT OF INTEREST:** None.

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