Evaluation of breastfeeding patterns in the first 24 h of life and associated factors in south of Iran: A cross-sectional study

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ABSTRACT

Background: Breastfeeding is considered to be the best food for infants and plays important role in the formation of growth and development. The factors associated with the initiation and continuation of breastfeeding varies from country to country. The aim of this study was to determine the breastfeeding patterns in the first 24 h of life and its associated factors.

Methods: This cross-sectional study was conducted using multi-stage sampling. The cities of Fars province in Iran were considered as clusters and then samples were taken from hospitals (public and private). Data were collected from 1439 newborns by interviewing the mothers and using a questionnaire. Data were evaluated using descriptive and analytical statistics by SPSS software (version 16.0). Chi-square test and logistic regression were used to determine the variables affecting breastfeeding.

Results: During the first 24 h of life, 96% of mothers started the breastfeeding of their infants, and 1238 newborns (87%) were breastfed exclusively. Breastfeeding rate was significantly higher in mothers with normal vaginal delivery ($P < 0.001$). Hospital type, family income, parental education and parental job significantly associated with Breastfeeding rate.

Conclusion: The rate of breastfeeding in the first 24 h of life was in a good condition. However, given the high rate of cesarean delivery and its negative impact on breastfeeding, it is necessary to take measures to ensure that this type of delivery is performed only if necessary.

1. Introduction

Infancy is a very important period of life due to development and growth formation of a child.^{1,2} Breastfeeding is considered to be the best food for infants³ and has short and long-term benefits for both mother and baby.⁴ Colostrum (the first breast milk) plays an important role for infants due to its nutritional and immunological properties, such as protection against infections,^{5,6} mortality and morbidity reduction,⁷ diarrhea and jaundice reduction,² body temperature regulation,⁶ and improvement of the infants' development.⁸ Breastfeeding is also beneficial to the mother. It can control postpartum bleeding, increase lactation duration, increase the length of pregnancy, give natural birth control protection, Facilitate returning to pre-pregnancy weight,

reduce the risk of ovarian cancer, breast cancer,^{9–13} obesity and type 2 diabetes.^{14,15}

In developed countries, most deliveries take place in hospital settings. Professional interventions in the hospital setting during the first days of life have a positive influence on both the initiation and duration of breastfeeding.⁴ Hence, promoting hospital care is one of the key strategies for increasing breastfeeding rates.¹⁶ The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend the initiation in the first hours of life to maximize the benefits of breastfeeding.⁸ In 1991, the Baby-Friendly Hospital was launched to promote, protect and support breastfeeding around the world.¹⁷

The rate of breastfeeding initiation varies in different parts of the

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world. For example, breastfeeding within the first hour of birth was 17% in Eastern Europe and 50% in Latin America.¹⁸ A study by Edmond et al., on women in Ghana showed that 71% of the cases started breastfeeding within the first 24 h of birth.¹⁹ In a study on infants born in a northern province of Iran, 93.3% of infants were breastfed within the first 24 h.²⁰

Long delivery, cesarean section, as well as long-term separation of the mother and the baby, can delay the breastfeeding initiation.^{21,22} The factors associated with the initiation and continuation of breastfeeding varies in different countries and ethnic groups, such as demographic factors, psychosocial factors,^{23,24} health care and public health policies,³ parents' inadequate education about breastfeeding and lack of family and social support.¹⁴

Considering the importance of breastfeeding at the beginning of the birth, and given the fact that in Iran and especially in Fars province, there are few studies on the initiation of breastfeeding, the aim of this study was to investigate the occurrence of the initiation of breastfeeding within the first 24 h of life and to identify the associated factors of the breastfeeding initiation in Fars province, south of Iran.

2. Methods

This cross-sectional study was conducted on infants born in public, private and Obstetric facility centers in the urban and rural area in Fars province.

Considering the exclusive breastfeeding rate of 62.5% based on similar study,⁴ confidence interval of 95%, power of 90% and design effect of 2 (Since the sampling method was cluster sampling), 1260 people were defined. To cope with falling and non-response 1439 persons were considered.

The multistage sampling method was used in this study. The cities of Fars province were considered as clusters and after selecting some of these cities; samples were taken from public and private hospitals. In each hospital, the sample was selected by random systematic sampling (based on the daily admission schedule) and eventually, 1439 neonates were selected to enroll in the study. Data collection was done by interviewing mothers and using a questionnaire. In addition to demographic questions, questions about breastfeeding were also asked. The Content validity of this questionnaire was reviewed and approved by two infectious diseases specialists and two epidemiologists.

This study was conducted on mothers and infants admitted to the post-partum section and mothers of infants who admitted to the Neonatal Intensive Care Unit (NICU) were excluded from the study. In the present study, information was gathered using trained midwives that working in the post-partum section. Questionnaires were completed within the first 24–48 h of birth (before discharge of mother and baby from the hospital) and in the post-partum section (where the baby and mother are in the same room).

All information about the mother, the child and the hospital was confidential and the results were presented in general. All data were entered in SPSS software version 16.0 and analyzed using descriptive and analytical methods. Chi-square test and enter method logistic regression were used to determine the variables affecting breastfeeding in the first 24 h of birth.

2.1. Ethical consideration

The study was approved by ethics committee of Shiraz University of Medical Sciences.

3. Results

In this study, the data was collected from 1439 neonates, 731 (50.8%) of them were boys. 949 families (approximately 66%) were living in the urban area and the rest were living in rural areas. Parental level of education was mostly up to high school diploma. Most mothers

Table 1

Frequency of associated Demographic variables for breastfeeding patterns within the first 24 h of birth south of Iran.

Variables	Number	Percent
Infant sex		
Boy	731	50.8
Girl	708	49.2
Residency		
Urban	949	65.9
Rural	490	34.1
Mother education		
Illiterate	33	2.3
Primary school	174	12.1
Middle school	236	16.4
High school & Diploma	570	39.6
Academic/University	426	29.6
Father education		
Illiterate	23	1.6
Primary school	158	11.0
Middle school	326	22.7
High school & Diploma	552	38.3
Academic/University	380	26.4
Mother job		
Housewife (Only)	1309	91.0
Employee	130	9.0
Father job		
Unemployment Unemployed	46	3.2
Governmental	271	18.8
Non-governmental	97	6.8
Self employed	1025	71.2
Family income per month		
Less than 15 million IRR (< 410 USD)	1022	71.0
15- 30 million IRR (410–820 USD)	355	24.7
More than 30 million IRR (> 820 USD)	62	4.3
Type of delivery		
Normal vaginal delivery	702	48.8
Cesarean delivery	737	51.2
Site of delivery		
Public hospital	996	69.2
Private hospital	443	30.8
Type of pregnancy		
Wanted	1196	83.1
Unwanted	243	16.9

(91%) were housewives and most fathers were self-employed. The rate of vaginal and cesarean delivery was approximately the same (48.8% and 51.2% respectively). Also, 16.9% of pregnancies were unwanted. The data on the above-mentioned variables and other demographic variables are shown in Table 1.

The mean age of mothers and fathers was 28.72 ± 5.48 and 33.19 ± 6.04 years, respectively. The mean weight of newborns was 3184.43 ± 469.13 gr, and the mean height was 49.93 ± 2.94 cm. The findings showed that first mother neonate meeting, on average, took about 32 min, and the first breastfeeding was average of about an hour (Table 2).

The results showed that 96% of mothers started breastfeeding within the first 24 h, postnatal. 1340 newborns (93.5%, 95% CI; 92.1–94.7) were breastfed at their first postnatal feeding, 1238 neonates (87%, 95% CI; 85.1–88.6) were exclusively breastfed and only 57 infants were fed exclusively with formula (Table 3).

As shown in Table 4, the breastfeeding rate within the first 24 h of birth was significantly higher for mothers who had normal vaginal delivery than in the mothers who had a cesarean delivery ($P < 0.001$). This rate was also significantly higher for mothers who had delivery in governmental (public) hospitals than for mothers who had delivery in private hospitals ($P < 0.001$). Based on the results, the variables such as family income, parental education level and parental job were significantly effective in the breastfeeding rates in the first 24 h of birth.

Based on the results of logistic regression, type of delivery and site of delivery were two important predictive factors in exclusive breastfeeding during the first 24 h of life (Table 5).

Table 2
Mean and standard deviation of associated variables within the first 24 h of birth in south of Iran.

Variables	population	Mean	SD ^a	Median	IQR ^b	Range
Mother age (year)	1439	28.72	5.48	29	25–32	31 (15–46)
Father age (year)	1436	33.19	6.04	32	29–37	50 (20–70)
Gestational age at delivery (week)	1436	38.66	2.66	39	38–40	91 (1–92)
Birthday rating	1427	1.76	0.95	2	1–2	7 ^{1–8}
Infant weight (kg)	1439	3184.43	469.13	3200	2900–3500	3930 (870–4800)
Infant height (cm)	1437	49.93	2.94	50	49–52	26 (33–59)
Infant head circumference (cm)	1436	34.59	2.30	35	34–35	40 (15–55)
First meeting (min)	1376	31.93	105.74	5	4–30	1440 (0–1440)
First touch (min)	1382	46.29	175.56	10	5–60	4320 (0–4320)
First breastfeeding (min)	1367	63.33	70.94	50	30–60	900 (0–900)

^a SD: Standard deviation.

^b IQR: Interquartile range.

Table 3
Frequency of breastfeeding characteristics in the first 24 h of life in south of Iran.

Variables	Number	Percent
First feed after birth		
Breast milk	1340	93.5
Powdered milk	65	4.5
Sugar juice	5	0.4
Not able to drink	23	1.6
Nutrition at 24 h		
Just breast milk	1238	87.0
breast & Powdered milk Formula	128	9.0
Just Powdered milk formula	57	4.0
Assist in nutrition at 24 h		
Health care staff	842	60.6
Family members	548	39.4

4. Discussion

On the basis of this study results, within the first 24 h after birth, 87% of infants were fed exclusively with breast milk, and the rates were significantly higher among mothers who had normal vaginal delivery

and deliveries in governmental (public) hospitals. Variables such as family income, parental education level and parental job were significantly effective in the breastfeeding.

In the present study, 96% of mothers started breastfeeding within the first 24 h postnatal. In a study on neonates in one hospital in northern Iran, 93.3% mothers started breastfeeding in the first 24 h,²⁰ which was somewhat similar to the current study. In a study in one of Saudi Arabia provinces,²⁵ the breastfeeding initiation within the first 23 h and first 72 h of birth was 46.9% and 81.9%, respectively, which was lower than our finding in this study.

Based on the recent studies, cesarean delivery is one of the most important factors affecting the delay in the breastfeeding initiation^{9,21} which was confirmed by the present study results. In another study in Yazd, Iran, it was found that cesarean delivery played an important role in delaying and discontinuation of breastfeeding, which is consistent with the present study results.²⁶ In a study in 2004–2005 in 1309 Brazilian mothers, the rate of breastfeeding in vaginal deliveries was significantly higher than that of cesarean deliveries.²⁷ The results of studies in the neighboring countries of Iran were also consistent with the results of present study and showed that cesarean delivery had a negative impact on breastfeeding.^{5,26}

In this study, some variables such as parental education, family

Table 4
Factors associated with breastfeeding in the first 24 h of life in south of Iran.

Variables		Nutrition at 24 h (%)		P-Value
		exclusive breast feeding	non-exclusive breast feeding	
Type of delivery	Normal vaginal delivery	91.6	8.4	< 0.001
	Cesarean delivery	82.6	17.4	
Site of delivery	Public hospital	90.4	9.6	< 0.001
	Private hospital	79.4	20.6	
Infant sex	Boy	85.7	14.3	0.150
	Girl	88.3	11.7	
Family income per month	Less than 15 million IRR (< 410 USD)	88.6	11.4	0.014
	15–30 million IRR (410–820 USD)	82.6	17.4	
	More than 30 million IRR (> 820 USD)	85.2	14.8	
Mother education	Illiterate	90.6	9.4	0.001
	Primary school	92.4	7.6	
	Middle school	91.0	9.0	
	High school & Diploma	87.6	12.4	
	Academic/University	81.5	18.5	
Father education	Illiterate	91.3	8.7	< 0.001
	Primary school	92.9	7.1	
	Middle school	87.5	12.5	
	High school & Diploma	90.5	9.5	
	Academic/University	78.8	21.2	
Mother job	Housewife (Only)	87.6	12.4	0.024
	Employee	80.6	19.4	
Father job	Unemployment	80.4	19.6	0.001
	Governmental	80.1	19.9	
	Non-governmental	87.6	12.4	
	Self employed	89.0	11.0	

Table 5
Factors affecting exclusive breastfeeding in the first 24 h of life in south of Iran.

Variables		Odds Ratio (95% CI)	P-Value
Type of delivery	Cesarean delivery	Reference	–
	Normal vaginal delivery	1.92 (1.35–2.71)	< 0.001
Site of delivery	Private hospital	Reference	–
	Public hospital	1.75 (1.19–2.57)	0.004
Infant sex	Boy	Reference	–
	Girl	1.24 (0.90–1.72)	0.175
Family income per month	Less than 15 million IRR (< 410 USD)	Reference	–
	15– 30 million IRR (410–820 USD)	1.03 (0.68–1.55)	0.879
	More than 30 million IRR (> 820 USD)	1.84 (0.80–4.22)	0.149
Mother education	Illiterate	Reference	–
	Primary school	1.25 (0.30–5.23)	0.757
	Middle school	1.24 (0.29–5.26)	0.766
	High school & Diploma	0.96 (0.23–4.02)	0.962
	Academic/University	0.83 (0.19–3.61)	0.831
Father education	Illiterate	Reference	–
	Primary school	1.41 (0.26–7.62)	0.689
	Middle school	0.89 (0.16–4.80)	0.894
	High school & Diploma	1.47 (0.26–8.08)	0.655
	Academic/University	0.74 (0.13–4.24)	0.742
Mother job	Employee	Reference	–
	Housewife (Only)	1.01 (0.58–1.75)	0.970
Father job	Unemployment	Reference	–
	Governmental	1.63 (0.69–3.87)	0.261
	Non-governmental	2.67 (0.97–7.30)	0.055
	Self employed	1.74 (0.78–3.88)	0.170

income and parental job had an impact on breastfeeding, which is in line with the results of other studies.^{9,27} The results of a study on Korean women showed that mothers' employment was one of the barriers to breastfeeding.³ In this present study, there was significant relationship between mothers' employment and breastfeeding, which is in line with the above-mentioned study and is similar to other studies in Iran.²

Considering the negative impact of cesarean delivery on breastfeeding and the rate of cesarean delivery in this study, which is higher compared to the Iran's neighboring countries and some other parts of the world,^{5,25,27} the authorities and the organizations in charge should take measures, to ensure that this type of delivery is performed only if necessary.

Exclusive breastfeeding in first 24 h of life was significantly more in babies born at public hospital compared to those who born in private hospital. This finding is consistent with other studies conducted in Saudi Arabia,²⁵ Egypt²⁸ and Korean Women.²⁹ The probable reason for this finding is that mothers with a higher economic status have higher cesarean deliveries and they usually preferred private hospital.

Studies on the breastfeeding patterns and the affecting factors are mostly cross-sectional and based on mothers' memory.²⁸ Therefore, the validity of the data obtained from these studies is somewhat questioned because there is usually a long period of time between the collection of data and the breastfeeding. Hence, one of this study's strength is collecting data in the shortest possible time, and so reduction of the recall bias.

4.1. Limitation of study

One of the limitations of this study is the cross-sectional design of the study, because in this type of design it is difficult to assess the causal relationship with high certainty. The other limitation is that only neonates born in the hospital are being investigated, and maternity delivery in other places, such as the home, has not been studied, which can affect the generalizability of the study.

Based on the evidence, to increase short-term and long-term

breastfeeding rates breastfeeding interventions are more effective than common interventions.¹⁴ Since in this study, breastfeeding was measured only within the first 24 h after delivery, it is recommended to perform cohort studies on the determination of breastfeeding continuation, and if necessary the relevant interventions should be made in this regard.

5. Conclusion

On the basis of the present study findings, the nutritional status of newborns in terms of both breastfeeding initiation rates and exclusively breastfeeding rates within the first 24 h of birth is in good condition. Cesarean delivery is one of the most important causes of delay in breastfeeding initiation. Exclusive breastfeeding in first 24 h of life was significantly more in babies born at public hospital compared to those who born in private hospital. Therefore, in order to maintain and improve breastfeeding rates in the first 24 h of life, it is necessary to consider factors such as type of delivery by the authorities and the organizations in charge.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.cegh.2019.04.002>.

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