

# Breastfeeding Status and Some Related Factors in Northern Iran

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Received: 15 Mar 2011/ Accepted: 26 Jun 2011  
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## Abstract

**Objectives:** The main objective of this study is to assess the Breastfeeding Duration, Exclusive Breastfeeding Duration and other related factors among children aged less than 5 years old in rural areas of Northern Iran.

**Methods:** This is a descriptive cross-sectional conducted on 2520 children aged 6-60 months (male: 1309, female: 1211) chosen by cluster random sampling from 20 out of 118 villages. Data were collected from mothers using a questionnaire. The duration of breastfeeding was computed only for children aged over 24 months old. Breastfeeding duration and Exclusive Breastfeeding Duration were classified based on WHO definition. SPSS Version 16 was used for data analysis.

**Results:** The mean Exclusive Breastfeeding Duration was 5.59 months, while 66.4% of children had exclusive breastfeeding for at least 6 months. The lowest Exclusive Breastfeeding Duration and the highest Breastfeeding Duration were observed among the Turkman ethnic group. Exclusive Breastfeeding duration of at least 5 months was 14.6%, thus the results were significantly higher than in the Turkman ethnic group ( $p=0.001$ ). Meanwhile, the results showed that exclusive breastfeeding duration significantly increased with maternal education level ( $p=0.004$ ). The study found that the mean breastfeeding duration was 20.6 months, and 89.3% and 74.7% of children were breastfed for at least 18 and 24 months, respectively. A positive correlation was reported between breastfeeding duration and family size, birth order, maternal age and children nutritional status, ( $p<0.05$ ). Additionally, lactation period in underweight children was significantly higher than in obese children, ( $p=0.023$ ).

**Conclusion:** The study found that two-thirds of children exclusively breastfed during the first six months of life and the mean breastfeeding duration was 20.6 months. While both exclusive breastfeeding duration and breastfeeding duration were influenced by socio-demographic factors in the rural areas of Northern Iran.

**Keywords:** Breastfeeding; Rural; Socio demographic factors; Iran.

## Introduction

The most important food for infants is breast milk in the form of mother's gift. Breastfeeding in the first six months of life, provide all of the nutritional requirements for children and plays an important role in the growth and development.<sup>1</sup> Mother's milk contains unsaturated fatty acids which are necessary for childhood brain development,<sup>2</sup> and it enables the prevention of allergies and infectious disease.<sup>3</sup>

Human milk has several advantages in the feeding of very-low-birth weight infants. It is associated with decreased risk of sepsis,<sup>4,5</sup> necrotizing enterocolitis,<sup>6,7</sup> and improved motor and cognitive development.<sup>8</sup> The benefits thus increase with prolonged and exclusivity of breastfeeding up to six months.<sup>9</sup>

Factors thought to influence the Exclusive Breastfeeding Duration (EBFD) and Breastfeeding Duration (BFD) include; race, maternal age, maternal occupation, parent's educational level, social-economic status, insufficient milk supply, infant health problems, maternal obesity, smoking, parity, method of delivery, maternal interest and other related factors.<sup>10</sup>

Breastfeeding is well established in Iran, and the history of it can be traced back to the fourth century AH in the Canon Medicine Text book written by Avicenna.<sup>11</sup> Iran is a Muslim country and Islam emphasizes on the importance of breastfeeding.<sup>12</sup>

Based on the results of the Health and Disease Study in Iran (2000), breastfeeding rate and exclusive breastfeeding rates established were 90% and 45% of children, respectively. Exclusive breastfeeding rate decreased from 44% in 2000 to 27% in 2004.<sup>13</sup> The breastfeeding Promotion Committee in the Iranian Ministry of Health was established in 1991, to promote and monitor breastfeeding expansion, prevention of disease and reduction of child mortality.<sup>14</sup>

Of the 1,600,000 population in the Golestan province (Northern Iran), 7% are under five years old, whereas 43.9% and 56.1% live in urban and rural areas respectively.<sup>15</sup> Agriculture is the main occupation in the rural area, which is inhabited by different ethnic groups, namely; Fars-native, Turkman and Sistani.

Due to restrictions in executing epidemiological projects, there has not been any study examining breastfeeding status in this area

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until now. The aim of this study is to investigate the BFD and EBFD and other related factors, such as maternal age, maternal BMI, economic status, level of education, parent's occupation, family size, birth order, children nutritional status and ethnicity in Northern Iran.

## Methods

This is a descriptive cross-sectional study conducted during a three-month study period on 2520 children aged between 6 and 60 months (male: 1309, female: 1211) in the rural regions of Northern Iran. The study was orchestrated by healthcare workers. The study participants were selected using the cluster random sampling technique. Of the 118 villages, 20 villages were randomly selected as cluster and all children aged between 6 and 60 months were included in the study. Data on children's age, maternal age, economic status, ethnicity, maternal BMI, and maternal education were collected from the mothers using a questionnaire. BFD was computed only for children aged over 24 months old, but EBFD was computed for all cases. SPSS.16 was used for data analysis. The data were analyzed using the variance (ANOVA) and t-test to compare the means between the two groups, and the chi-square test was used to compare the frequencies between the two groups. A  $p$  value  $<0.05$  was considered statistically significant. The reliability test showed that the Cronbach's Alpha value was 0.84 for the attributes tested.

EBFD was classified based on WHO,<sup>16</sup> definition. WHO defined exclusive breastfeeding as; "the infant has received only breast milk from his /her mother or a wet nurse, or expressed breast milk, and on other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines."

Economic status was categorized based on possession of 10 consumer items considered necessary for modern day life such as; telephone, running water, gas pipeline, home ownership, color television, computer, video, private car and cooler. According to this list, the economic status of the sample population in this study was as follows; low:  $\leq 3$ , moderate: 4-6 and good: 7-10.<sup>17,18</sup>

In this study, ethnicity was defined as follows: 1) Fars-native ethnic group: People residing in Northern Iran over very long periods of time and are considered to be the native residents. 2) Sistani ethnic group: People who immigrated to this region from the Sistan and Baluchistan Province (South-Eastern Iran) during the past decades. 3) Turkman ethnic group: This group does not have any family relation with the other ethnic groups, and can therefore be considered as an independent race which resides in a particular rural area.

Based on Iranian educational grades; the parents' educational levels are classified in terms of years of schooling. The data analyses includes three educational levels; Illiterate (without schooling), 1-12 schooling years (low educated), beyond high school ( $>12$  years schooling or college). While the father's job was categorized into two occupational groups; employed and unemployed.

On the other hand, nutritional status was divided into three categories according to McLaren: Malnutrition, normal, overweight or obese.<sup>19</sup> If a mother is unable to breastfeed her baby despite her wishes, it is considered breastfeeding failure. Maternal Body Mass Index (BMI) was defined based on categories from the WHO reference values.<sup>20</sup> Unwilling mothers and those who could not remember their children's breastfeeding conditions were excluded from the study.

## Results

The results from this study showed that of ethnic groups included in this study, 21.9% were Fars (native), 36.2% were Turkman, and 40.6% were Sistani, while 1.3% accounted for other ethnic groups. In terms of the economic status; 38.5% of the studied group were poor, 55.5% were moderate, and only 6% exhibited good economic status. The results also revealed that 96.3% of mothers were housewives. Thus, other jobs and activities were not considered.

The results for EBFD and other related factors are presented in Table 1. The findings revealed that 40 of the studied children were not breastfed. The mean of EBFD was found to be 5.59 months and exclusive breastfeeding rates for five and six months were 83.8% and 66.4%, respectively.

With respect to family size; the mean EBFD in family size of  $<5$  was significantly higher than in a family size of  $\geq 5$ , ( $p=0.001$ ). Additionally, the prevalence of EBFD of at least 5 months was significantly higher by up to 11.4% in a family size of  $<5$ , ( $p=0.001$ ). On the other hand, the mean EBFD among Fars-native, Turkman and Sistani ethnic groups was significant ( $p=0.001$ ), while the duration of EBFD in the Turkman ethnic group was less than the other ethnic groups. However, EBFD of at least 5 months in the Fars-native group (94.2%) was 14.6% higher than in the Turkman group (79.6%), thus the difference was statistically significant ( $p=0.001$ ). In addition, there was a positive correlation between EBFD and maternal education level ( $p=0.004$ ). The results also showed that 94.7% of college educated mothers fed their children for at least five initial months of life.

Despite the fact that no significant correlation was observed between maternal age and EBFD, the chi-square test was significant between the two maternal age groups ( $\leq 25$  and  $36 \leq$  years) whose children were exclusively breastfed for at least 5 months, ( $p=0.001$ ). However, the ANOVA test did not reveal any statistically significant difference between EBFD and birth order, father's occupation, maternal BMI, maternal age or the children's nutritional status.

BFD and other related factors are presented in Table 2. The mean and standard deviation for BFD was  $20.6 \pm 7.6$  months and the duration of breastfeeding for at least 12 and 18 months of age were 89.3% and 74.7%, respectively. There was a significant correlation between BFD and family size, birth order, maternal age and children's nutritional status ( $p < 0.05$ ). A significant statistical difference was observed between the two family size groups ( $<5$  and  $5 \leq$ ) based on 18 months breastfeeding duration ( $p=0.032$ ).

**Table 1:** Exclusive Breastfeeding duration and some related factors in Northern Iran. (N=2520)

Variables	Exclusive Breastfeeding							
	N	Mean (SD)	ANOVA p value	Duration (Month)			p value	
				1-2 N (%)	3-4 N (%)	≤ 5 N (%)		
Family size (No)	<5	1808	5.7(1.1)	0.001	52(2.9)	183(10.1)	1573(87.0)	0.001
	5≤	712	5.3(1.3)		44(6.1)	130(18.3)	538(75.6)	
Birth order (No)	1-2	1640	5.7(1.1)	0.627	46(2.8)	156(9.5)	1438(87.7)	0.071
	3≤	872	5.7(1.2)		18(2.1)	106(12.2)	748(85.8)	
Father's Job	Unemployment	105	5.7(1.0)	0.677	2(1.9)	11(10.5)	92(87.6)	0.901
	Employment	2397	5.7(1.2)		63(2.6)	251(10.5)	2083(86.9)	
Economic status *	Poor	954	5.8(1.2)	0.054	20(2.1)	110(11.5)	824(86.4)	0.122
	Moderate	1374	5.6(1.1)		36(2.6)	143(10.4)	1195(87.0)	
Ethnic group **	Good	148	5.6(1.1)	0.001	6(4.1)	7(4.7)	135(91.2)	0.001
	Fars-native	553	5.9(0.9)		9(1.6)	23(4.2)	521(94.2)	
Maternal BMI (kg/m <sup>2</sup> )*	Turkman	911	5.4(1.1)	0.506	32(3.5)	154(16.9)	725(79.6)	0.536
	Sistani	1024	5.9(1.2)		23(2.2)	82(8.0)	919(89.7)	
Maternal Education Level	Others	32	5.5(1.4)	0.004	1(3.1)	5(15.6)	26(81.3)	0.001
	Low	158	5.7(1.1)		3(1.9)	18(11.4)	137(86.7)	
Maternal Age (year)	Normal	1218	5.7(1.1)	0.677	25(2.1)	133(10.9)	1060(87.0)	0.001
	Overweight	688	5.6(1.2)		27(3.9)	69(10.0)	592(86.0)	
Nutritional Status	Obese	413	5.7(1.2)	0.688	9(2.2)	36(8.7)	368(89.1)	0.935
	Illiterate	635	5.6(1.4)		16(2.5)	109(17.2)	510(80.3)	
Family size (No)	0-12 years schooling	1727	5.7(1.1)	0.677	47(2.7)	147(8.5)	1533(88.3)	0.001
	College	152	5.9(0.7)		1(0.7)	7(4.6)	144(94.7)	
Birth order (No)	≤25	903	5.7(1.1)	0.677	30(3.3)	65(7.2)	808(89.5)	0.001
	26-35	1278	5.7(1.2)		27(2.1)	144(11.3)	1107(86.6)	
Father's Job	36≤	339	5.6(1.3)	0.688	8(2.4)	55(16.2)	276(81.4)	0.935
	Malnutrition	488	5.7(1.2)		13(2.7)	49(10.0)	426(87.3)	
Economic status *	Normal	1753	5.7(1.1)	0.688	43(2.5)	187(10.7)	1523(86.9)	0.935
	Overweight	259	5.7(1.1)		8(3.1)	25(9.7)	226(87.3)	

Note: Forty cases have not breast-feeding.\* Hoc test is not significant.\*\* Hoc test is significant between Fars and Turkman and between Turkman and Sistani. (p<0.001).

**Table 2:** Breastfeeding duration and some related factors in Northern Iran. (N=1566)

Characteristics	Duration of Breastfeeding (Months)								
	N	Mean(SD)	p value	0-6 N(%)	6-12 N(%)	12-18 N(%)	18-24 N(%)	p value	
Family size (No)	<5	1491	20.7(6.3)	0.021	84(5.6)	57(3.8)	219(14.7)	1131(75.9)	0.032
	5≤	74	19.0(8.1)		10(13.5)	4(5.4)	12(16.2)	48(64.9)	
Birth order (No)	1-2	1015	20.3(6.3)	0.004	59(5.8)	45(4.4)	165(16.3)	746(73.5)	0.025
	3≤	551	21.3(6.6)		35(6.4)	16(2.9)	67(12.2)	433(78.6)	
Father's Job	Unemployment	68	20.3(6.1)	0.668	4(5.9)	1(1.5)	13(19.1)	50(73.5)	0.741
	Employment	1492	20.7(6.4)		89(6.0)	60(4.0)	218(14.6)	1125(75.4)	
Economic status *	Poor	574	20.3(6.1)	0.140	29(5.1)	32(5.6)	92(16.0)	421(73.3)	0.225
	Moderate	865	20.9(6.4)		52(6.0)	23(2.7)	126(14.6)	664(76.8)	
	Good	106	21.2(6.4)		7(6.6)	3(2.8)	12(11.3)	84(79.2)	

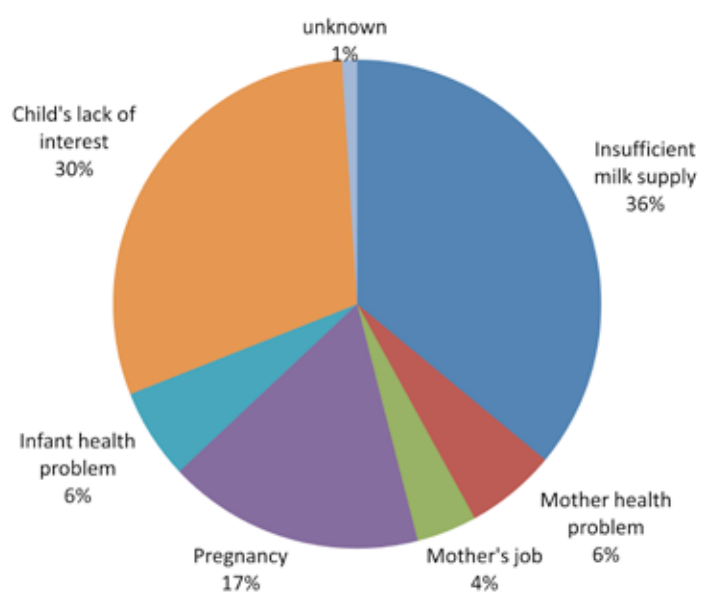
**Table 2:** Breastfeeding duration and some related factors in Northern Iran. (N=1566)*-continued*

Characteristics	Duration of Breastfeeding (Months)								
	N	Mean (SD)	p value	0-6 N(%)	6-12 N(%)	12-18 N(%)	18-24 N(%)	p value	
Ethnic group *	Fars-native	362	20.8(5.4)	0.082	13(3.6)	13(3.6)	65(18.0)	271(74.9)	0.003
	Turkman	560	21.1(7.2)		47(8.4)	9(1.6)	57(10.2)	447(79.8)	
	Sistani	632	20.1(6.1)		34(5.4)	37(5.9)	107(16.9)	454(71.8)	
	Others	15	20.3(6.9)		0(0)	2(13.3)	3(20.0)	10(66.7)	
Maternal BMI (kg/m <sup>2</sup> )	Low	85	21.2(6.1)	0.214	3(3.5)	5(5.9)	10(11.8)	67(78.8)	0.186
	Normal	712	20.3(6.6)		44(6.2)	33(4.6)	108(15.2)	527(74.0)	
	Overweight	467	20.8(6.1)		26(5.6)	14(3.0)	82(17.6)	345(73.9)	
Maternal Education Level *	Obese	275	21.2(6.5)	0.373	18(6.5)	7(2.5)	29(10.5)	221(80.4)	0.431
	Illiterate	407	21.0(6.8)		25(6.1)	21(5.2)	46(11.3)	315(77.4)	
	0-12 years schooling	1079	20.5(6.3)		67(6.2)	36(3.3)	168(15.6)	808(74.9)	
Maternal Age (year)**	College	77	20.7(5.0)	0.013	1(1.3)	4(5.2)	17(22.1)	55(71.4)	0.001
	≤25	77	19.9(5.9)		22(4.6)	30(6.3)	96(20.1)	329(69.0)	
	26-35	832	21.0(6.4)		49(5.9)	22(2.6)	114(13.7)	647(77.8)	
Nutritional Status ***	36≤	260	20.9(7.3)	0.042	23(8.8)	9(3.5)	22(8.5)	206(79.2)	0.023
	Malnutrition	317	21.0(6.5)		22(6.9)	7(2.2)	42(13.2)	246(77.6)	
	Normal	1140	20.7(6.3)		63(5.5)	47(4.1)	167(14.6)	863(75.7)	
	Overweight	111	19.2(6.9)		9(8.1)	7(6.3)	23(20.7)	72(64.9)	

Note= Under 2 years old children exclude in this section. Forty cases have not breast-feeding. \*Hoc test is not significant. \*\* Hoc test is significant between ≤25 and 26-35 years age groups.( $p<0.013$ ). \*\*\* Hoc test is significant between Malnutrition and overweight groups.( $p<0.03$ ).

The results showed that BDF was higher in the Turkman ethnic group compared to the other groups, but the differences between BFD among the three ethnic groups (Fars-native, Turkman and Sistani) was not significant. However, the difference among the different ethnic groups and BFD for 18 months was significant, ( $p=0.003$ ). The duration of breastfeeding among mothers aged between 26 and 35 years was longer than the other age groups, but BFD of at least 18 months among mothers aged over 36 years was significantly higher than the other age groups ( $p=0.005$ ). In thinner children, BFD was found to be higher than in overweight and obese children, in addition, breastfeeding for at least 18 months duration was significantly higher (12.5%) in this group than in normal or obese groups, ( $p=0.023$ ).

The most significant risk factors for breastfeeding failure are presented in Fig. 1. Based on the mothers' reports; insufficient milk supply (36%), the child's lack of interest (30%) and pregnancy (17%) were the most frequently reported factors for breast-feeding failure.



**Figure 1:** The most reasons for breastfeeding failure in Northern Iran.

## Discussion

This report focuses on three main aspects of breastfeeding; BFD, EBFD and other related factors. EBFD of at least five and six initial months of life were investigated, and the results revealed that 83.8% and 66.4% of children were exclusively breastfed for five and six months, respectively. The mean BFD was 20.6 months and breastfeeding for at least 12 and 18 months duration was observed in 89.3% and 74.7% of children, respectively. Olang et al. in Iran reported that 90% and 57% of infants were breastfed at one and two-years of age, respectively; and exclusive breastfeeding rates at 4 and 6 months of age at national level averaged 56.8% and 27.7%, respectively.<sup>21</sup>

Another study conducted in Iran (2000) described that exclusive breastfeeding duration had decreased from 44% to 27% over the last years.<sup>13</sup> In comparison to the aforementioned studies, EBFD and BFD status in Northern Iran was better than other parts of Iran. The duration of breastfeeding in South-Asian Countries such as Bangladesh,<sup>22</sup> India,<sup>23</sup> and Sri Lanka,<sup>24</sup> were reported as 28.2, 18.4, 21.8 and 23.2 months, respectively.

According to the WHO report,<sup>25</sup> children fed exclusively on breast milk for six months in Eastern Mediterranean countries, including Pakistan, Iraq, Saudi Arabia and Egypt were 16%, 25%, 31% and 38%, respectively. In the current report, exclusive breastfeeding for at least six months was 66.4%. Compared to other studies, EBFD of at least six initial months of life in children of Northern Iran was appropriate. Iran is a Muslim country and breast-feeding is highly emphasized in Islam. The breastfeeding policy is encouraged by the government, and is enforced by the "Breastfeeding Leave Law" in Iran. Thereby, employed mothers who are pregnant can leave work for two months before and for four months after childbirth without any problem.

In the current study, family size was negatively correlated with BFD, whereas birth order was positively correlated with BFD. Pregnancy can lead to a decline in breast milk secretion. Studies in other parts of the world have shown a significant positive relationship between BFD and delivery frequencies (parity).<sup>26,27</sup> However, Li et al. showed that multiparous women were less likely to early breastfeed but tended to continue with breastfeeding.<sup>28</sup>

The father's occupation and economic status did not have any correlation with either EBFD or BFD in our study. However, other studies reported that lactation period was low in household women with poor economic status.<sup>29,30</sup> In Ontario, Evers et al. found that low income women who were successful at breastfeeding, were better educated and more likely to go to prenatal classes.<sup>31</sup> Our study was conducted in a rural area and all the villages were covered by National Primary Healthcare. Based on the Iranian health policy, health workers should follow up on breastfeeding mothers. Therefore, it can positively influence the breastfeeding rate of Northern Iran. Rural mothers in Iran are mostly housewives, as shown in this study (96.3%), therefore it was not necessary to investigate other occupations.

In the present study, the EBFD was shorter in the Turkman

ethnic group compared to the other ethnic groups, but BFD was generally longer in the Turkman group compared to the other groups. The socio-demographic factors were different among the three ethnic groups but it was better than in Fars-native ethnic group. The Turkman ethnic people have traditional costumes and their language is not Persian, while the Sistani ethnic people have immigrated from the South East to Northern Iran, and did not have good socio-economic conditions.

Researchers believe that racial factors influence nutritional status. Veghari and Golalipour,<sup>32</sup> in Northern of Iran reported that nutritional status in Turkman children was better than in Fars-natives and Sistani children, while the pattern of obesity,<sup>17</sup> and anemia,<sup>18</sup> in Turkman women was different from the others.

On the other hand, Forste et al.<sup>33</sup> and Liu et al.<sup>34</sup> showed that black women were less likely to breastfeed than non-black women, while Jevitt et al.<sup>35</sup> reported that the duration of breastfeeding in American black obese women was lower than in White and Hispanic immigrant women. The influence of immigration on BFD has also been reported in other studies.<sup>36,37</sup>

The association between maternal BMI, EBFD and BFD in the present study is different from the findings of others studies. Unlike the current study, other studies have reported that obese women were less willing to early breastfeed.<sup>34,35,38,39</sup> In Northern Iran, all the villages are under the management of the National Primary Health Center, where health workers conduct training and implement the breastfeeding policy. Consequently, this strategy affects both EBFD and BFD to a greater extent than maternal BMI.

The results from studies across the world in view of the relationship between educational levels and BFD have not yielded similar results. Rakhshani and Mohammadi reported the level of education to be a risk factor for breastfeeding continuation.<sup>40</sup> While Huus et al. found in their study, that short term exclusive breast-feeding was less common if one of the parents had university education.<sup>38</sup> On the other hand, Wijndaele et al. found strong evidence of association between early weaning and low maternal education.<sup>41</sup> Another study investigating the continuation of breastfeeding and educational background found that education-related differences were factors affecting the start of breastfeeding.<sup>42</sup> However, in the current study; the results suggest that higher maternal education was associated with increased EBFD. But at the same time, high maternal education was correlated with decreased BFD, however, these findings were inconsistent with the aforementioned studies.

Maternal age was coupled with decreased EBFD and increased BFD in this study, this finding has also been reported in other studies.<sup>31,43-45</sup> Also in this study; the BFD was longer in malnourished children than in normal or obese children. In a study by Huus et al. EBFD among obese children under 5 years old was shown to be much shorter than in children of normal weight. There was no significant correlation between EBFD and child obesity with other socio-economic factors.<sup>38</sup> Factors such as insufficient milk supply, child's lack of interest

and pregnancy were found to be the three major causes of breastfeeding failure in Northern Iran. Inadequate milk supply, either real or perceived, is when a mother feels that her milk supply is not sufficient to either satisfy the infant's hunger or to maintain adequate weight gain, and is a compound problem which crosses international, cultural and socio-economic planes.<sup>46,47</sup>

Despite the fact that the study highlights the breastfeeding status and some related factors in the rural areas of Northern Iran, not all the related factors such as accommodating baby friendly hospitals, delivery status and breastfeeding status in urban areas are included in this study. At present, baby friendly hospitals are neither significant nor well established in Iran, compared to other well established hospitals in developing countries.

## Conclusion

Overall, the study found that two-thirds of the children were exclusively breastfed for at least six months and the mean BFD was 18 months. The parent's educational level exhibited a negative correlation with BFD. The Turkman ethnic group exhibited the shortest EBFD, while accounting for the longest BFD compared to the other ethnic groups. No correlation was observed between EBFD and birth order, father's job, maternal BMI or the children's nutritional status. However, birth order, maternal age and children's nutritional status were related to lactation period. The overall outcome of this study suggests the need to implement suitable policies and public health programs in order to increase and enhance breast-feeding in Northern Iran.

## Acknowledgements

The authors would like to thank the medical and administrative staff at the Primary Health Care Centers of Golestan University of Medical Sciences for their valuable assistance during the field work. Also, the Research Deputy of the University is thanked for supporting this project financially.

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