



The relationship between sleeping place, duration of breastfeeding and weaning time in children aged 2-3 years

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Abstract

Background and aims: Due to the importance of breastfeeding and the necessity of identifying the factors affecting the creation and promotion of this behavior, this study aims to determine the relationship between sleeping place, duration of weaning time, and breastfeeding in Children aged 2-3 years.

Methods: This study was descriptive and analytical-correlational research in 2021. The participants were 214 children aged 2-3 years old from the health centers of Ramsar city, Iran. The sampling method of the present study was convenient. The tool of the study was a researcher-made questionnaire on infant sleeping places and breastfeeding. The data were entered into SPSS 16 and analyzed using the univariate chi-square test, Pearson correlation coefficient, and analysis of variance ($P=0.05$).

Results: Exclusive feeding 69.2% (148 people) of children who were exclusively breastfed and in the usual place of sleep, 36.4% (78 people) of children slept in a shared bed with adults, and 57.5% (123 people) shared a room. However, in a separate bed, 1.6% (13 people) slept in a separate room. The average age of weaning in children sleeping in a shared room in the mother's bed and next to the mother is 1.27 times and 1.30 times that of children sleeping in a separate room, respectively. The relationship between Infant's sleeping place and the duration of exclusive breastfeeding ($P=0.005$), age of weaning onset ($P=0.007$), length of weaning ($P=0.018$), and definite age of weaning ($P=0.014$) was significant. 56.5% of infants ($n=121$) were female, and 56.1% ($n=120$) had the first birth rank. Breast milk exclusively fed 69.2% ($n=148$) of infants.

Conclusion: The results showed that the place of sleep has a significant relationship with the exclusive feeding of milk and the age at which the child is weaned. The results of this study can be useful in planning interventions to promote exclusive breastfeeding and increase the duration of feeding infants with breast milk.

Keywords: Breastfeeding, Child, Sleep, Beds, Weaning

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Introduction

The infant's sleeping place definition is the infant's usual sleeping place, such as sleeping infant and mother in a shared bed (BS, bed-sharing), sleeping Infant and mother in a shared room with a separate bed (RS, room-sharing), and sleeping infant alone (SS, solitary sleeping) are the methods parents can select (1,2).

Different factors such as parents' demographic characteristics, the infant's feeding method, physician's recommendations, attitudes, cultural, social, and economic norms, and race play roles in determining the infant's sleeping place (3). In contrast, a proper posture during sleep increases safe attachment between mother and Infant, increasing the infant's sense of security, better and high-quality sleep for mother and the infant, less crying, peace and comfort, better control of the infant, better breastfeeding can be mentioned as advantages of this method (4).

"Sleeping of the infant with mother in a room but separate bed" is another less common method; however, studies have indicated that this method is more common among parents as the infant gets older, especially above six months. The prevalence of this method has been reported from 22% in infancy to 65% in the sixth week after birth and 45% in the 6th to 12th weeks after birth (2).

"Sleeping the infant alone" is the third common method, which is not recommended for children under one year of age due to the consequences it may have for the infant (5). A study showed that an infant's sleeping place is an effective factor in exclusive nutrition and constant breastfeeding and is a protective factor against early weaning (6,7).

Exclusive breastfeeding is 'when the infant has received only breast milk and no other liquids or solids' (8). Breastfeeding is one of the most important periods of an infant's life, and nutrition is important regarding growth

and development (5).

The most complete and best source of nutrition for the baby is breast milk (9). It is recommended to breastfeed the infant exclusively in the first 6 months of his life, and breastfeeding along with complementary food for 2 years or more is emphasized (10). The statistics of exclusive breastfeeding in Iranian children is 53.1% (11).

Weaning from breastfeeding is switching a baby's diet from breast milk to other foods and drinks (12). Stopping breastfeeding in the initial weeks or months of an infant's life leads to increased danger of diseases, malnutrition, or death (13).

Fifty-seven percent of Iranian infants are exclusively breastfed for three months, 90% for 6-9 months with complimentary food, and 57% for 20-23 months after birth (14).

Different studies have investigated the influential factors of onset, persistence, success, duration of breastfeeding and weaning, including child-related factors (such as race (15), disease (13), birth weight (15)), parent-related factors (such as mother's age (15), mother's occupation (13)), breastfeeding-related factors (such as mother and infant are in the same room after birth (16), mother's tendency to breastfeeding (16)), childcare-related factors (such as kangaroo care (16)), and social factors (such as religious and cultural beliefs (13), spouse's support (17)).

In addition to known factors affecting breastfeeding duration and weaning, there are other unknown or less-known factors. An infant's sleeping place is one of the factors affecting breastfeeding, on which there are many discussions (6-7,18). Therefore, due to the importance of breastfeeding, it is necessary to identify the factors affecting the creation and promotion of this behavior (19).

Success in breastfeeding requires knowledge, skills, and the mother's support. Considering their position as counselors, support, and instructors, the health staff and nurses have an important role in identifying, reinforcing, and training safe breastfeeding mothers.

The first step in creating or modifying care behavior is to obtain information about that behavior. Also, we need to get information about the sleeping place of Iranian children and the relationship between the Iranian children's sleeping place and duration of breastfeeding and time of weaning. On the other hand, demographic and sociological differences between Iranians and other communities were mentioned in the previous studies. The present study aimed to survey the relationship between sleeping place, duration of weaning time, and breastfeeding in Children aged 2-3 years.

Methods

This study was descriptive and analytical-correlational research in Ramsar city in 2021. The participants consisted of all mothers of 2-3-year-old children with health records in the health centers of Ramsar city. The study setting was all health centers (5 centers) in Ramsar city, Iran. The research community includes all health centers in Ramsar

city. However, due to the small number of children who meet the inclusion criteria and the willingness of the participants to participate in this study, it was first started from one of the centers with the convenient sampling method. Several samples were collected to complete the samples. As there were 5 health centers in this city, researchers in the present study obtained the required sample size by sampling from 3 centers under its coverage.

To determine the sample size, with the assumption of a minimum linear correlation of 0.2 (a weak correlation) between the scores of sleeping place and duration of breastfeeding, according to the following formula, considering $r=0.2$, the power of the test is 80%, and the first type error is 5%, the sample size is 193 people, which was selected with a drop of 10% equal to 213 people.

$$\omega = \frac{1}{2} \ln \frac{1+r}{1-r}$$

$$n = \frac{\left(Z_{1-\alpha/2} + Z_{1-\beta} \right)^2}{(\omega)^2} + 3$$

The inclusion criteria were history of being breastfed and weaning (17), living in Ramsar, no history of a long hospitalization (17), absence of any uncontrolled chronic disease (17), absence of formula prescription and powdered milk by the physician due to improper weight gain of the infant in the first months of birth for infants. Having parents with conditions such as being literate, not using drugs or alcohol (7), not working the night shift (7), not having postpartum complications in mothers (7), not using sleeping pills by parents (7), The possibility of calling parents by phone or cell phone (7). The exclusion criteria were the failure of parents to respond to researchers' phone calls or cell phone calls with them.

First, the purpose of the study to the parents of children, and then those who signed the consent form could participate. The researcher prepared a list of files of the 2-3-year-old children and recorded the date of parents' return to monitor growth. In the next stage, under the coordination of each center, the families were contacted via phone to refer for growth monitoring on the determined date. On the referral day for growth monitoring, the researcher collected the data. The eligible parents and volunteers for the study were scheduled at different hours and days using the electronic health appointment system to prevent mothers from gathering in the centers during the COVID-19 pandemic. If the mothers were unwilling to attend the centers, the questionnaires were sent to their addresses with prior coordination. If participants were unwilling to complete the questionnaire in the center and the researcher's presence, the questionnaire was provided to them to be delivered to the centers. The tools used in this study were a researcher-made questionnaire, parents' personal information, infants' personal information, infants' sleeping place, and weaning place, which was

suggested by studying the related texts.

Questionnaire of parents and child characteristics, children's sleeping and weaning place, exclusive breastfeeding, breastfeeding duration

For design, this questionnaire applied similar studies (2,3,7,9,12,20-22). This questionnaire comprised parents' age, education, occupation, number of children, income, history of breastfeeding, and marital status (7). The questionnaire of the infant's personal information included questions about the infant's age, gender, and birth rank. Questions about the duration of exclusive breastfeeding, total duration of breastfeeding (2,7,9,9,21), age of weaning, the length of weaning, children's age at a definite time of weaning (12), type of feeding in the first 6 months of life, feeding up to 3 years old, sources of information about breastfeeding, a children's sleeping place from birth to weaning (including infancy, 1-3 months, 3-6 months, 9-12 months, 1-3 years), children's usual sleeping place, and the source of information about the children's suitable sleeping place(2,3,7,20).

The mother was asked which of the following foods was used to feed your infant up to 6 months old to measure the variable of exclusive breastfeeding—only breast milk, powdered milk, and breast milk with powdered milk. The mothers marked each question with yes or no.

The mother was asked at what age the infant was breastfed to measure the variable of breastfeeding duration?

In this study, sleeping the infant with the mother in a shared bed (BS) refers to sharing the bed and sleeping the infant and mother together in a shared bed or any other surface (22). Sleeping the infant and mother in one room but a separate bed (RS) refers, in this study, to sleeping the infant in a shared room but in his/her bed (separate from the mother's bed) (2). Sleeping the infant alone (SS) refers, in this study, to sleeping the infant in a separate room from the parents (2). In the content validity stage, the average content validity index (CVI) and content validity ratio (CVR) were equal to 0.79 and 0.62, respectively. The researchers measured the reliability of this questionnaire, and Cronbach's alpha was confirmed to be 0.80.

Data analysis

The data was imported into SPSS 16 and analyzed using descriptive statistics to show the number and frequency of demographic characteristics and infants' sleeping places, as well as inferential statistics including the Pearson correlation coefficient to examine the predictive relationship between sleeping place and the duration of exclusive breastfeeding, onset age of weaning, duration of weaning, and definite age of weaning. Analysis of variance was used to demonstrate the demographic characteristics of parents of children aged 2-3 years in the city of Ramsar based on infants' sleeping places, parents' demographic characteristics, and breastfeeding status. Additionally, the univariate chi-square test was employed to show

children's sleeping places according to their age from birth to weaning ($P=0.05$).

Ethical considerations

First, the purpose of the study was to help the parents of children, and then those who signed the consent form could participate. The researchers tried to observe the principles of confidentiality and privacy.

Results

Demographic characteristics of 214 parents of children aged 2-3 years old in the city of Ramsar and their relationship with infant sleeping places are shown in Table 1. The mean age of mothers and fathers was 32.63 ± 4.72 and 36.67 ± 5.01 , respectively. Most of the male and female participants had academic education (mothers (46.3%) and fathers (39.3%)). Most mothers were housewives (8%), and most fathers were self-employed (72.9%). The results showed that the sleeping place of 36.4% of infants ($n=78$) was a shared bed with parents, 57.7% ($n=123$) slept in a shared room, but a separate bed and 6.1% ($n=13$) slept in a separate room. The results of the univariate chi-square test showed children's sleeping place according to their age from birth to weaning ($P<0.001$; Table 1).

In this study, Poisson regression was used to examine the prediction rate of sleeping place on the duration of exclusive breastfeeding, the onset age of weaning, duration of weaning, and definite age of weaning. The deviation statistic was divided by the degree of freedom to evaluate the model's goodness of fit. Due to the proximity of this ratio to one, the result was equal to the mean and variance in the four proposed models, indicating the adequacy of the models. In this model, the response variable was considered to be the duration of breastfeeding, the onset age of weaning, the length of weaning, and the definite age of weaning, and the predictive variable was considered to be the sleeping place. In addition, the demographic variables were the control variables. The results showed that sleeping location predicts the response variables in the fitting model. The average length of breastfeeding in children with a shared sleeping place with parents and a shared room but separate bed was 1.27 and 1.31 times higher than in children with separate bedrooms. The average lengths of weaning in children with a shared room and a shared room but separate beds were 2.28 and 3.60 times higher than in children with separate bedrooms. The mean age of definite age of weaning in children with a shared room and a shared room but a separate bed was 1.218 and 1.26 times more than that in children with a separate bedroom (Table 2).

Discussion

This study aims to determine and specify the connection between a child's sleeping place, duration of breastfeeding, and weaning time. According to the results, 69.2% of children were exclusively breastfed. In Allahgholi and

Table 1. Demographic characteristics of parents and children aged 2-3 years old, breastfeeding status of children, and age from birth to weaning in the city of Ramsar according to Infant's sleeping place (n=214)

Parents' demographic characteristic		Total number (percent)	Statistical test and level of significance	Children's demographic characteristics, breastfeeding status, and children's age from birth to weaning	Total number (percent)	Statistical test and level of significance according to the infant's sleeping place		
Mother's education	Below diploma	43 (20.1)	2.790 ^a 0.594	Gender	Female	121 (56.5)	1.974 ^a	
	Diploma	72 (33.6)			Male	93 (43.5)	0.373	
	Academic education	99 (46.3)		1	120 (56.1)	6.614 ^a 0.158		
Mother's occupation	Housewife	167 (78)	2.102 ^a 0.717	Birth rank	2		82 (38.3)	0.370 ^a 0.832
	Employee	28 (13.1)			3		12 (5.6)	
	Self-employed	19 (8.9)			Exclusive breastfeeding	0 (0)		
Number of children	1	109 (50.9)	9.359 ^a 0.049	Only breast milk	148 (69.2)	1.204 ^b 0.302		
	2	92 (43)		Breast milk and powdered milk	66 (30.8)			
	3	13 (6.1)		Children's age (months); M (SD)	30.78 (4.62)			
Income	Insufficient	90 (42.1)	2.564 ^a 0.277	Duration of exclusive breastfeeding (months); M (SD)	20.26 (5.24)	5.512 ^b 0.005		
	Sufficient	124 (57.9)		The onset age of weaning (months); M (SD)	20.01 (5.16)	5.157 ^b 0.007		
Father's education	Below diploma	61 (28.5)	4.358 ^a 0.360	Duration of weaning (days); M (SD)	12.08 (5.27)	4.097 ^b 0.018		
	Diploma	69 (32.2)		Definite age of weaning (months); M (SD)	20.19 (5.21)	4.391 ^b 0.014		
	Academic	84 (39.3)		Children's age from birth to weaning	Infancy	316.439 ^c <0.001		
Father's occupation	Worker	9 (4.2)	1-3 month		82.131 ^c <0.001			
	Employee	49 (22.9)	3-6 month		84.150 ^c <0.001			
Marital status	Self-employed	156 (72.9)	4.335 ^a 0.114	6-9 month	79.692 ^c <0.001			
	Married	205 (95.8)		9-12 month	69.374 ^c <0.001			
Mother's age (year); M (SD)	Divorced	9 (4.2)	0.208 ^b 0.812	1-3 years	22.776 ^c <0.001			
Father's age (year); M (SD)			0.054 ^b 0.948					

M: Mean; SD, Standard Deviation;

^a Chi-squared test; ^b Analysis of variance; ^c Univariate chi-square test.

colleagues' study in Iran, 57% of children were exclusively breastfed for three months (14). The results of a study by Ruiz Botia et al in Iran showed that 57% of children were exclusively breastfed for three months (24). Also, Ogbo et al study showed that there are wide differences in the exclusive feeding of infants with breast milk in regions of India, such that South India reported the highest prevalence (79.2%) and Northeast India reported the lowest prevalence (68.0%) (23).

Also, in another study, 53.1% of Iranian infants are exclusively breastfed (11), similar to these results. Given the importance of breastfeeding and the necessity of identifying the factors affecting the creation and promotion of this behavior, it is necessary to identify the most effective strategies to increase the breastfeeding rate (19). Various studies have investigated the factors affecting the onset, continuation, success, and duration of breastfeeding and weaning (13-17). An infant's sleeping

place is one of the factors affecting breastfeeding, which has long been debated (6-7,18).

In the present study, the sleeping place of 36.4% of infants slept in a shared bed with parents, 57.5% of them slept in a shared room, but a separate bed and 6.1% of infants had a separate room. Stremler et al found that 46% of infants had a shared room with parents but a separate bed (RS), and 51% of infants slept in a shared bed with parents, which is similar to these results (2). Also, the Ruiz-Botia et al study found that 48.0% of infants slept in a crib in the parental bedroom (24). Proper position and posture while sleeping, increased safe attachment between mother and infant, increased sense of security in infant, high-quality sleeping, decreased crying, and sense of comfort and peace in mother and infant (4). Also, to prevent sudden infant death, it is recommended that infants sleep in the parents' room, close to the parent's bed, but on a separate surface designed for infants for at

Table 2. The Poisson regression model fit results

Dependent variable	Variable	Class	Risk ratio	Confidence interval (EXP (ß) and level of significance)
Exclusive breastfeeding duration	Intercept		15.846	(13.823 and 18.165) <0.001
	Sleeping place	A shared sleeping place with mother	1.272	(1.100 and 1.471) 0.001 >
		A shared room but separate bed	1.313	(1.139 and 1.513) <0.001
		Separate room (reference)		
The onset age of weaning	Intercept		15.692	(13.680 and 18) <0.001
	Sleeping place	A shared sleeping place with mother	1.279	(1.105 and 1.479) <0.001
		A shared room but separate bed	1.302	(1.129 and 1.502) <0.001
		Separate room (reference)		
Weaning duration	Intercept		4.077	(3.115 and 5.336) <0.001
	Sleeping place	A shared sleeping place with mother	2.286	(1.730 and 3.021) <0.001
		A shared room but separate bed	3.601	(2.741 and 4.733) <0.001
		Separate room (reference)		
Definite age of weaning	Intercept		16.385	(14.326 and 18.740) <0.001
	Sleeping place	A shared sleeping place with mother	1.218	(1.055 and 1.405) <0.001
		A shared room but separate bed	1.266	(1.101 and 1.456) <0.001
		Separate room (reference)		

least the first six months (25).

There was an association between a child's sleeping place and the number of children, so the common sleeping place of infants and parents with one child, two children, and three children was RS, RS, and BS, respectively. Irgens et al and Carroll et al found similar results (26,27). Also, in Cook and colleagues' study et al, a significant relationship was found between the baby's first birth rank and the baby's sleeping place, bedtime routine, and sleep onset delay (28).

In this study, the families with more children had worse economic and social conditions, and children slept in a shared sleeping place with their mothers due to a lack of enough room to allocate for smaller children.

There was a significant relationship between a child's sleeping place and duration of breastfeeding, the onset age of weaning, length of weaning, and definite age of weaning. The average length of exclusive breastfeeding, the onset age of weaning, the duration of weaning, and the definite age of weaning were lower in children with a separate sleeping place than in children with a shared sleeping place with the mother, which is in line with the results of Smith et al (7) and Huang et al (22). Also, the study by Henrique et al stated a significant relationship between the infant's sleeping place and the duration of weaning(29).

The results indicated that a children's sleeping place

was an influential factor in exclusive and continuous breastfeeding and a protective factor against early weaning (6,7). Sleeping place of 90.7% of infants had a shared sleeping place with their mothers in infancy. Moreover, as the infant ages, the shared sleeping place with the mother changes to a shared room with a separate bed. The study of Beijers et al indicated that sleeping the infant in a shared room but in a separate bed became more common among parents with the increase in the infant's age, significantly above six months old (30). Stremmer et al reported the prevalence of RS from 22% in infancy to 65% in the sixth week after birth to 45% in weeks 6 to 12 after birth (2). It seems that in infancy, due to the infant's need to more and better control and breastfeed, mothers prefer to put the infant to sleep beside them, but with the increase of age and as the Infant's needs to control and support reduces, the infant's sleeping place changes from a shared sleeping place with mother to a shared room but separate bed.

Conclusion

There was a significant relationship between an infant's sleeping place and duration of breastfeeding, the onset age of weaning, duration of weaning, and definite age of weaning. The average length of breastfeeding, the onset age of weaning, duration of weaning, and definite age of weaning were lower in infants with a separate sleeping place than infants with a shared sleeping place with parents. In

addition, the infant's sleeping place changed from a shared place with parents to a shared room with a separate bed. Due to the importance of breastfeeding for many infants in the first weeks or months of life and its role in reducing the risk of diseases, malnutrition, and death, it is required to perform more effective interventions and programs to improve breastfeeding. The results of this study can be useful in planning interventions to promote exclusive breastfeeding and increase the duration of feeding infants with breast milk. Also, Health education provided based on these results by doctors and nurses and counseling and support by trained volunteers will improve the number of women who start feeding their babies with breast milk and continue it until the end of infancy. Also, high-quality research is needed to understand which interventions are most likely effective in different populations. More studies are needed in low- and middle-income countries to find out which strategies will encourage women to start breastfeeding after childbirth. The limitations of this study were a low sample size, self-reported data collection, and cultural, social, and/or organizational factors of the research setting, which can affect the results.

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Competing Interests

The authors declare that there is no conflict of interest.

Data Availability Statement

The datasets are available from the corresponding author upon reasonable request.

Ethical Approval

This article was extracted from research approved by the Research Committee of Babol University of Medical Sciences (Design code: 724133863, Code of ethics IR.MUBABOL.HRI.REC.1400.071) in the Research Council of Babol University of Medical Sciences

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