



Knowledge levels of mothers with 0-3 years-old children about vitamin D and breast milk

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Abstract

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Aim: This study seeks to evaluate the awareness and knowledge levels of mothers with children younger than three years old about breast milk and vitamin D.

Materials and Methods: A questionnaire containing 14 questions was administered to 405 women who applied to a district state hospital in Turkey. Analyses were conducted using the SPSS (Statistical Package for Social Sciences; SPSS Inc., Chicago, IL) 22.0 application.

Results: The knowledge level of the mothers whose education level is high school and above was significantly higher than that of the mothers whose education level is secondary school and below ($p=0.005$). There was a significant difference between the economic status of mothers in terms of knowledge score ($p<0.001$). The knowledge score of the mothers who used vitamin D in their last pregnancy was higher than those who did not ($p=0.028$). The knowledge score of the mothers who gave vitamin D to their last baby was significantly higher than those who did not ($p=0.019$). There was a significant difference regarding the knowledge score according to the last baby's first six months of nutritional status ($p<0.001$) and the number of taking the baby out for vitamin D ($p<0.001$).

Conclusion: It is necessary to inform mothers, fathers, and family elders about breast milk and vitamin D starting from pregnancy. Family physicians, health workers, obstetricians, and pediatricians should constantly emphasize the importance of breast milk and vitamin D supplementation. Breast milk and vitamin D training should be organized regularly for health personnel. Pregnant classes and pregnancy school programs in wellness centers and hospitals should be used more effectively. As far as possible, healthy pediatric outpatient clinics should be opened in all hospitals.



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Introduction

Breast milk is a fantastic food that meets the baby's needs in the first six months, apart from vitamins D and K, and is safe and accessible. Breast milk meets at least half of the baby's nutritional needs between 6 and 12 months and approximately 30% between 1-2 years of age. Breast milk protects the baby from childhood diseases thanks to the antibodies it contains. Breastfeeding lowers the risk of breast and ovarian cancer in the mother. However, according to the World Health Organization (WHO) data, 2 out of every three babies in the world cannot be fed only breast milk for the first six months after their birth [1].

It is recommended by WHO/UNICEF that infants should

be breastfed within the first 1 hour after birth in such a way as to ensure skin-to-skin contact between the mother and the baby and continue uninterruptedly for at least 1-2 years after adequate supplementary food is introduced [2]. Breast milk not only affects the physical development of children but also affects the baby's spiritual development due to the close relationship established between mother and baby during breastfeeding. It is also known that breastfed children are more successful in intelligence tests [1]. Depending on the time of initiation and termination of breastfeeding and whether it is given uninterruptedly, health problems arise for both the mother and the baby in the short, medium, and long term [3].

It is recommended to give 400 units of vitamin D daily until age 1, preferably in the first three years of life, regardless of whether babies are breastfed, especially in countries where vitamin D supplementation is not provided.

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In addition, because of insufficient vitamin D deficiency in pregnant women, babies are born with low vitamin D reserves due to insufficient vitamin that passes to the embryo through the placenta. Therefore, daily additional vitamin D should be given to pregnant women to prevent the adverse effects of vitamin D deficiency in infants [4,5].

Vitamin D plays a vital role in the skeletal system and all immune system cells, the cardiovascular system, brain cells, and reproductive tissues. As a result, it plays an essential role in preventing future autoimmune diseases, infections, cancer, hypertension, cardiovascular diseases, diabetes mellitus, obesity, and metabolic syndrome in children [6].

Vitamin D is a fat-soluble vitamin and is of significant benefit in improving the absorption of calcium, magnesium, phosphate, and zinc from the intestines [7]. Nearly 95% of the vitamin D in the human body is synthesized in the skin by the effect of ultraviolet B rays (UVB) in sunlight. Factors such as the angle of incidence of sunlight that changes seasonally and according to the time of day and the direct contact of light with the skin are the main factors affecting vitamin D synthesis [8].

Intake of foods containing high vitamin D, such as fish, eggs, milk, and vitamin D synthesized from the skin, may only be provided occasionally. For this reason, external D supplementation and going out at reasonable intervals (30 minutes a day with the head uncovered) can prevent vitamin deficiency in the general population [9]. It is vital for mothers to have this information about vitamin D. Because some mothers think feeding with foods rich in vitamin D will be sufficient for their children. Due to this false information, they do not give their children vitamin D supplements.

Encouraging mothers to breastfeed their babies uninterruptedly for up to 2 years is indispensable for both the mother's and child's mental and physical health. However, while delays in the initiation of breastfeeding increase in many countries today, breastfeeding rates are decreasing, and breastfeeding durations are shortening [10,11]. In addition, this situation varies from country to country and in different regions within the same country depending on many parameters such as the mother's education and knowledge levels, traditional beliefs, and economic status [12,13].

Mothers, who know that breast milk is a unique combination with vitamin D supplementation, raise their children in a much healthier way. Therefore, the study aims to evaluate the awareness and knowledge levels of mothers with children younger than three years old about breast milk and vitamin D.

Materials and Methods

The study is a cross-sectional study. Ethical approval was obtained from Adiyaman University Non-Invasive Clinical Research Ethics Committee before the study. Face-to-face interviews were conducted with mothers who came to the Kahta District Hospital pediatric outpatient clinic between November 2021 and March 2022. Fourteen information questions were created by the authors by scanning the literature. Questions were asked of mothers who brought

their children to the pediatric outpatient clinic for various reasons. Those who gave correct answers were given "1 point," and those who gave wrong answers were given "0 points". The minimum score obtained from the information questions is 0, and the maximum score is 14. The higher the score, the higher the level of knowledge we can have.

Statistical analysis

Analyzes were run in the SPSS (Statistical Package for Social Sciences; SPSS Inc., Chicago, IL) 22.0 package program. Descriptive data were exhibited with n, % values in categorical data. Continuous data were shown as mean±standard deviation (mean±SD) and median (minimum-maximum) values. The conformity of continuous variables to normal distribution was checked with the Kolmogorov-Smirnov test. Mann-Whitney U-test was used to compare paired groups, and the Kruskal-Wallis test was used to compare more than two variables. The Spearman correlation test was used to examine the relationship between continuous variables. Linear regression analysis was performed to determine the predictive effects of the mother's sociodemographic features on vitamin D knowledge level. The Enter method was used while creating the model, and those with a significant correlation in the correlation test were included. The statistical significance level in the analysis was defined as $p < 0.05$.

Results

Four hundred-five mothers with children aged 0-3 were included in the study. The mean age of the mothers was 29.6 ± 7.9 years, and the mean age of the first pregnancy of the mothers was 21.5 ± 3.6 . The mean number of children of the mothers was 2.0 ± 1.2 , and the average number of 0-3-year-old children of the mothers was 1.1 ± 0.4 . 60.2% of the mothers graduated from secondary school or below, and 39.8% graduated from high school or above. The economic situation of 43.5% of the mothers is good, 44% is moderate, and 12.6% is wrong. 70.1% of mothers have a child who is breastfeeding. 67.2% of the mothers used vitamin D in the last pregnancy, and 48.4% of the mothers gave vitamin D when the last baby was born. 37% of the mothers used only breast milk for the first six months in the last baby, 53.8% used breast milk + supplementary food/formula, and 9.1% used only complementary food/formula. 19% of the mothers took their children outside for vitamin D daily, 48.9% took them 3-4 times a week, and 32.1% took them 1-2 times a week (Table 1).

The knowledge level of the mothers whose education level was high school or higher was significantly higher than the level of knowledge of the mothers whose education level was secondary school and below ($p = 0.005$). There was a significant difference between the economic status of mothers in terms of knowledge score ($p < 0.001$). It was observed that the difference between all groups caused this difference, and the knowledge score increased as the education level increased. The knowledge score of the mothers who used vitamin D in their last pregnancy was found to be significantly higher than the scores of those who did not use it ($p = 0.028$). The knowledge score of the mothers who gave vitamin D to the baby when the last baby was born

Table 1. Sociodemographic characteristics of mothers.

		Mean±SD	Median (min-max)
Age		29.6±7.9	28 (18-64)
First gestational age		21.5±3.6	21 (1-38)
Number of children		2.0±1.2	2 (1-8)
Number of children aged 0-3		1.1±.4	1 (1-6)
		Number	%
Educational status	Middle school and below	244	60.2
	High school and above	161	39.8
Economical situation	Good	176	43.5
	Moderate	178	44.0
	Bad	51	12.6
Presence of breastfed child	Yes	284	70,1
	No	121	29.9
Use of vitamin D in the last pregnancy	Yes	272	67.2
	No	133	32.8
Status of giving vitamin D when the last baby was born	Yes	196	48.4
	No	209	51.6
Feeding pattern for the first 6 months in the last baby	Breast milk only	150	37.0
	Breast milk + complementary food / formula	218	53.8
	Complementary food/formula only	37	9.1
How many times a week do you take the baby outdoors?	Everyday	77	19.0
	3-4 times a week	198	48.9
	1-2 times a week	130	32.1

Table 2. Comparison of mothers' knowledge scores according to various variables.

		Knowledge score	p
		Mean±SD	
Educational status	Middle school and below	5.6±1.9	0.005*
	High school and above	6.1±1.9	
Economical situation	Good	6.2±1.8 ^a	<0.001**
	Moderate	5.7±1.8 ^b	
	Bad	4.5±2.2 ^c	
Presence of breastfed child	Yes	5.7±1.9	0.214*
	No	6.0±2.1	
Use of vitamin D in the last pregnancy	Yes	5.9±2.0	0.028*
	No	5.5±1.9	
Status of giving vitamin D when the last baby was born	Yes	6.0±2.0	0.019*
	No	5.6±1.9	
Feeding pattern for the first 6 months in the last baby	Breast milk only	6.3±1.9 ^a	<0.001**
	Breast milk + complementary food / formula	5.5±1.9 ^b	
	Complementary food/formula only	5.4±2.1 ^b	
How many times a week do you take the baby outdoors?	Everyday	6.6±2.2 ^a	<0.001**
	3-4 times a week	5.9±1.9 ^b	
	1-2 times a week	5.2±1.7 ^c	

*Mann Whitney U test, ** Kruskal Wallis analysis was applied. ^{a,b,c}Group from which the difference originates.

was significantly higher than those who did not ($p=0.019$). There was a significant difference between the nutritional status of the last baby in the first six months regarding

knowledge score ($p<0.001$). It was determined that the knowledge score of the mothers who gave only breast milk for the first six months in the last baby was higher. There

Table 3. Correlation of knowledge score with age, first gestational age and number of children.

	Knowledge score	
	r	p
Age	0.212	<0.001
First gestational age	-0.197	<0.001
Number of children	0.268	<0.001
Number of children aged 0-3	0.135	0.006

Table 4. Regression analysis of factors predicting knowledge level.

	β	SE	Standard β	t	p
Knowledge level ($R^2=0,126$; $F=15,596$; $p<0.001$)					
Age	.069	.016	.278	4.382	<0.001
First gestational age	-.085	.026	-.156	-3.217	0.001
Number of children	.096	.107	.061	.898	0.370
Number of children aged 0-3	-.277	.231	-.060	-1.201	0.230

was a significant difference between the number of taking the baby to the open area for vitamin D in terms of knowledge score ($p<0.001$). It was observed that as the number of taking the baby out increased, the knowledge score also increased (Table 2).

A positive and significant correlation was detected between the knowledge score and age, the number of children, and the number of children aged 0-3. A negative and significant correlation was observed between the knowledge score and the mothers' first gestational age (Table 3).

According to the multiple linear regression analysis, age ($\beta=0.069$, $p<0.001$) and first gestational age ($\beta=-0.085$, $p=0.001$) predict the knowledge score, and there is a significant relationship between them (Table 4).

Discussion

According to 2010 data in the USA, 43% of mothers do breastfeeding their babies for six months and 21% of them do it for one year [14]. The average rate of feeding with breast milk for the first six months in Turkey is 41%. After birth, 59% of babies in the first month, 45% at 2-3 months, and 14% at 4-5 months are fed only breast milk. Although children under six months are recommended to be fed only with breast milk, 23% of infants are fed with milk other than breast milk and 12% with other foods besides breast milk. Since the general tendency of mothers in Turkey is to breastfeed their babies, 98% of children born in 2018 are breastfed at some point in their lives, but 42% are fed with food other than breast milk in the lactation period [15]. In our study, 37% of the mothers used only breast milk for the first six months in the last baby, 53.8% used breast milk + supplementary food/formula, and 9.1% used only complementary food/formula. 19% of the mothers took their children outside for vitamin D daily, 48.9% took them 3-4 times a week, and 32.1% took them 1-2 times a week. Uninterrupted, quality, and correct breastfeeding

rate is not at the desired level due to social reasons such as false information about breastfeeding, education level or the mother's occupational status. High rates of breastfeeding after birth decrease gradually as the baby grows, and this causes the expected benefit from breastfeeding not to be seen enough. Similarly, the information regarding administering vitamin D to infants needs to be more comprehensive and informative [10, 11]. In our study, the knowledge level of the mothers whose education level was high school or higher was significantly higher than the level of knowledge of the mothers whose education level was secondary school and below ($p=0.005$). There are many reasons why mothers do not feed their babies only with breast milk for the first six months and switch to complementary foods. These reasons can be counted as not getting enough professional support to encourage breastfeeding, feeling of exhaustion in the mother, problems in the mouth and lips of the baby, feeling pain while breastfeeding, the baby gaining enough weight, the attitude of the father and other family members, the thought that using formula is more effortless, economic status, and the mother using medication. One of the most important reasons is that the mother thinks she has insufficient milk due to a lack of knowledge [16]. In a study conducted in England, the rate of discontinuation of breastfeeding due to mothers' thinking that breastmilk is insufficient in quantity was found to be 39% before the pandemic and 49.3% after the pandemic [17]. In our study, there was a significant difference between the economic status of mothers in terms of knowledge score ($p<0.001$). It was observed that the difference between all groups caused this difference, and the knowledge score increased as the education level increased. Although there are separate studies in the literature on mothers' awareness of breastfeeding and vitamin D, there are few studies evaluating breastfeeding and Vitamin D knowledge level together. In a study conducted in Egypt on parents' awareness, 75.1% of mothers emphasized the best way to get vitamin D in breast milk. 28% of families stated milk and eggs, 24% cheese, 8% honey, 7% olives, and 6% meat as the best source of vitamin D [7]. In our study, the knowledge score of the mothers who used vitamin D in their last pregnancy was found to be significantly higher than the scores of those who did not use it ($p=0.028$). The knowledge score of the mothers who gave vitamin D to the baby when the last baby was born was significantly higher than those who did not ($p=0.019$). Even if pediatricians recommend it, only 44% of families in the USA give vitamin D to their babies, and 67% of parents believe breast milk contains all vitamins [17]. In a study conducted in Ankara, although mothers' awareness of vitamin D was found to be much higher than in studies abroad, it was found that only 67.2% of mothers regularly gave vitamin D to their babies [18]. Although family doctors in Turkey distribute free vitamin D, diseases such as rickets and osteomalacia due to vitamin D deficiency are still seen, although their rates have decreased. It should also be noted that the long-term adverse effect of vitamin D deficiency on children is much more significant [19]. In our study, there was a significant difference between the number of taking the baby to the open area for vitamin D in terms of knowledge score ($p<0.001$). It was observed

that as the number of taking the baby out increased, the knowledge score also increased. In developing countries, there is no awareness of vitamin D deficiency in terms of both healthcare professionals and mothers. A study in Switzerland revealed that only 62% of babies are given vitamin D in summer and 72% in autumn/winter. Especially young non-breastfeeding mothers think that the vitamin D in the formula is sufficient for their baby. What is striking is that only 65% of the mothers were recommended vitamin D supplementation by doctors [20]. Similarly, in a study carried out in Canada, mothers stated that vitamin D in formulas was sufficient, and there was no recommendation by health personnel to supplement their babies with vitamin D [21]. A study in the United States also shows that less than half of the doctors recommend vitamin D supplementation, considering that breast milk and sun rays provide enough vitamin D for babies due to the rarity of rickets in their country [22]. It is seen that physicians in Turkey recommend vitamin D in addition to breast milk at a higher rate compared to those abroad. However, some mothers do not want to give vitamin D to their children, thinking that vitamin D added to breast milk causes premature closure of the fontanelles of infants [18]. In our study, a positive and significant correlation was detected between the knowledge score and age, the number of children, and the number of children aged 0-3. A negative and significant correlation was observed between the knowledge score and the mothers' first gestational age. During the COVID-19 pandemic period, although WHO suggests that mothers with COVID-19 are encouraged to breastfeed their infants, in some countries, in case of suspected infection or confirmed diagnosis, infants were separated from their mothers, and breast milk was interrupted in line with the recommendations of health authorities and doctors. There is not enough evidence that coronavirus is transmitted through milk, and coronavirus infection is much milder in infants and children compared to adults [23]. In addition, due to the curfew, social distance rules, and the disruptions in breast milk education given to mothers face-to-face, it has been determined that people with low education levels and poor economic status stop breastfeeding at a higher rate than the pre-pandemic period [24]. In our study, following the literature, it was determined that as the rate of education level, income level, and the use of vitamin D supplements in pregnancies and last-born children increased, the knowledge level of mothers also increased. The knowledge level of those with a large number of children and/or children between the ages of 0-3 and mothers who take their babies out to the sun is high. In addition, it was observed that as the maternal and first gestational age decreased, the level of knowledge also decreased. [7,10,11,24]. However, whether there is a difference in the approaches of mothers regarding breastfeeding and giving vitamin D to infants during the COVID-19 pandemic should be demonstrated by other studies.

Conclusion

Information about breast milk and vitamin D should be given to the mother, father, and family elders who have an impact on the family, starting from the pregnancy period. In addition to breastfeeding for the first six months,

only vitamin D supplementation and continued vitamin D supplementation for up to 1 year, and that breastfeeding should not be stopped until the baby is two years old, should be constantly emphasized by family physicians, family health workers, obstetricians, and pediatricians. In outpatient clinics, it would be beneficial to provide short-comprehensible written and visual handbooks to mothers and expectant mothers, to hang informative posters on the subject, and to broadcast on closed-circuit television. Breast milk and vitamin D supplementation training should be organized regularly for health personnel. Pregnant classes and pregnancy school programs in wellness centers and hospitals should be used more effectively. Healthy pediatric outpatient clinics should be opened in all hospitals as much as possible. It is vital to start and continue breastfeeding in the earliest period in line with the recommendations and to try to eliminate the hesitations about vitamin D supplementation in pregnant women by considering individual differences.

Ethical approval

Adiyaman University Non-Invasive Clinical Research Ethics Committee (Decision Date: 18/01/2022. Number of decision: 2022/1-13).

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