

# The Effect of Breastfeeding Duration and Parental Attitudes on Academic Success

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**Abstract:** This study aims to reveal the relationship between the academic success of the students and the duration of breastfeeding, parental attitude, and other variables.

This cross-sectional study was conducted among 9th-grade high school students in 2019. A total of 501 students and their families participated in the research.

Academic success in order of importance in multivariable linear regression analysis, the increase in the education level of the father, the preparation for the exam, the increase in the protective and democratic parental attitude, the shortening of the first walking age, and the increase in the maternal age increase the high school exam score. Breastfeeding duration and authoritarian parental attitudes were not found to be statistically significant.

The protective and democratic attitude of the parents, the high level of father education, and early walking positively affect academic success, while the breastfeeding duration is insignificant.

**Keywords:** Breastfeeding, academic success, parent-child relations.

## INTRODUCTION

Breast milk is a physiological food that meets a newborn baby's needs during the first six months. Every mother produces special milk for her baby. People have accepted that breast milk is a unique nutrient in infant feeding from the past to the present. Infant nutrition and breastfeeding positively affect both child health and community and maternal health [1]. There are many studies in the literature on breast milk and breastfeeding. It was found that the risk of death from all causes [2] and the risk of morbidity and mortality due to diarrhea and lower respiratory tract infections were lower in infants [3].

Breastfeeding does not only contribute to health and disease prevention for the baby; There is increasing evidence that it also provides long-term benefits in the development of human capital. A meta-analysis of 17 observational studies examining the relationship between breastfeeding and performance in childhood and adolescence intelligence tests found that breastfed infants achieved higher IQs than non-breastfed infants [4]. These findings are supported by other studies [5,6]. On the other hand, breastfeeding is thought to be positively associated with long-term benefits in human capital, including higher academic achievement and higher income [7].

Although children are affected by society and their peers, they are more affected by the family. The influence of the family on the child and its role in creativity, cultural, social, and moral aspects is enormous and important. Studies have shown that the interaction between children and parents is among the important factors affecting children's nurturing and positive character [8]. Parental attitude can be defined as a set or system of behaviors that define parent-child interaction in various situations and create an effective interaction environment [9]. Parental attitude determines an effective factor that plays a vital role in the psychopathology and growth of children [10]. It also plays a role in the success of children in education.

The High School Entrance Examination (HEE) is an exam that has been applied in Turkey since 2017-2018 and determines the transition to secondary education. Success in this exam enables students to gain a high school where they can get a good education. In addition, getting a good high school education can also determine the quality of university education. In this context, it is very important to determine the factors that will affect the children's future and careers in this exam.

A study that directly examines the effect of breastfeeding behavior and duration on academic achievement has not been found in the literature. In this study, the effect of breast milk on brain development was determined indirectly by measuring the level of academic achievement by looking at the

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duration of breastfeeding. Apart from breast milk, other factors affecting academic achievement were examined together in multivariate analyzes, and the effect of confounding factors was tried to be eliminated. In this context, it is thought that the study will be a pioneer in the literature.

The study aims to reveal the relationship between the high school entrance exam, which measures students' academic success, and the duration of breastfeeding, parental attitudes, and other variables.

## MATERIALS AND METHODS

### Type of Research

This research was done in cross-sectional type.

### Population and Sample

The research was conducted in high schools in Yozgat city center in 2019. The study consists of students in the 9th grade of a high school located in the city center of Yozgat, including two science high schools, two religious high schools, and one vocational high school. These schools are among the qualified schools affiliated with the Yozgat Directorate of National Education and accept students by examination. It consists of 9th-grade students studying in two Anatolian high schools, two vocational high schools, and two private high schools that do not accept students by examination. The 9th-grade students who agreed to participate in the study with their parents and attempted the HEE were included.

In the sample size calculation, considering that breast milk will affect academic achievement by at least 50%,  $p=0.50$  (95% confidence interval 0.45-0.55),  $\alpha=0.05$ , power 0.80, minimum sample size  $n$  It is calculated as  $\approx 384$ . The research was completed with a total of 501 students, 238 from the schools that accept students by examination and 263 from the schools that do not accept students through examination.

### Data Collection

Data were collected with breastfeeding, infant feeding and development, and parental attitude scale (PAS). Maternal data form 31 questions; breastfeeding status, birth week and weight of the child, preparation for HEE exam, and socio-demographic characteristics. Height, weight, HEE score, and PAS form were applied to the students. The data forms were filled out by the applied persons.

### Parent Attitudes Scale (PAS)

PAS is used to determine parental attitudes, which was first developed by Yıldız Kuzgun in 1972 and later revised by Eldeleklioğlu in 1996 [11]. The scale has 40 items and three sub-dimensions: democratic parental attitude, protective-demanding parental attitude, and authoritarian parental attitude. The answers given to the scale items are Likert-type.

A minimum of 15 and a maximum of 75 points were obtained from the democratic and protective-demand sub-scale, and a minimum of 10 and a maximum of 50 points were obtained from the authoritarian subscale. The internal consistency coefficients of the sub-dimensions of the scale were calculated as 0.897 for democratic parental attitude, 0.823 for protective-willing parent attitude, and 0.785 for authoritarian parent attitude, respectively [11]. In this study, Alpha Cronbach values of scale internal consistency were determined as 0.889 for Democratic attitude, 0.842 for Protective-Demanding attitude, and 0.805 for Authoritarian attitude, and these values are similar to scale development values.

### Analysis of Data

The data were analyzed with the SPSS package program. Chi-square test, t-test, ANOVA, linear regression, and multinomial logistic regression (MLR) analysis were used in the data analysis. HEE score indicating academic achievement was taken as the study's dependent variable.

Independent variables of the research were students' gender, age, perceived achievement level in secondary school, and height. If it belongs to the parents, it is the mother and father's age, the mother and father, the education level of the mother and father, the working status of the mother and father, and the family's income level. And the childbirth order, the type of birth, birth weight, gestation period, breastfeeding status and duration, time to start complementary food, and PAS score. Again, the HEES score was divided into three groups as  $<300$ , 300-399, and  $\geq 400$  and analyzed with multivariate MLR. HEE score was analyzed with univariate tests without classification and classification according to independent variables. And variables found to be significant at the  $p<0.2$  level in the tests were included in multivariate regression. The backward method was used in the regression analysis, and the independent

variables found to be important at the end are shown in the table. In statistical analysis, the significance level was taken as  $p < 0.05$ .

### **Ethical Consent of the Research**

Institutional permission for the research was obtained from the Yozgat Provincial Directorate of National Education, and ethics committee permission was obtained from Yozgat Bozok University Ethics Committee with the decision numbered 16.10.2019/2-2. Data forms were collected anonymously. A letter explaining the purpose and method of the study, as well as the mother data form, the Fathers' Participation in Baby Care form, and the consent form allowing the students to participate in the study, were sent to the parents. The purpose of the study was explained to the children of the families who signed the written parental consent form, filled in and sent the parent data forms, and obtained their consent for their participation in the study.

### **RESULTS**

When the family characteristics of the children participating in the study were examined, It was determined that the majority of the mothers graduated from primary school or below (35.7%), and their fathers were high school graduates (38.9%). In addition, it was determined that the mothers of 70.7% of the children were not working, and the fathers of 28.1% were workers. 44.9% of the mothers stated that their economic situation was moderate when the child was young, and 40.3% were good. In the monthly income distribution of the family, 41.1% have an income less than 3000 TL, 42.1% have a mother's age between 20-24 at birth, 92.6% want to be pregnant with this child by both spouses, 57.7% of them stated that this child had a normal birth.

Of the children participating in the study, 58.9% were girls, 26.1% were born premature, 6.6% were born with low birth weight, 67.1% started walking at age one, and 17.2% were in the height percentile. Values were found to be  $< 25$ .

When the child's nutritional status was examined, it was observed that 66.9% of them were breastfed for 12 months or longer. The average breastfeeding period was 16.2 months, 27.5% of them were given only breast milk for the first four months, and 73.1% of them started complementary foods after four months (Table 1). It was determined that 92.0% of the children were given breast milk at birth when they were young, and

32.7% started breastfeeding within the first half hour. The mean scores of the students on PAS, democratic, protective, and authoritarian, were  $60.5 \pm 10.4$ ,  $51.2 \pm 10.7$ , and  $40.2 \pm 7.3$ , respectively (Table 2).

When the students' educational status is examined, 47.5% of them studied in high schools that accept students by the exam, and 52.5% of them studied in high schools that do not accept students by exam. Of them, 35.3% got 400 or more points in HEE, 91.8% attended secondary public schools, and 88% It was seen that 0.6 of them prepared for the HEE exam, 18.6% of them went to private courses, and 24.8% of them took one-on-one private courses. In addition, 35.5% of the children were very successful in secondary school. HEE score is examined in 3 groups according to the child's educational status 68.1% of the students in those schools that accept students by exam got a score of 400 and above in HEE. And those who stated that they were successful in secondary school, those who prepared for the exam, and children who took private courses got higher scores from HEE, and these situations were statistically significant. It was observed that the status of attending secondary school, reading status in private or public schools, and the duration of breastfeeding were not associated with HEE score level (Table 2).

There was a negative relationship between the HEE score and the child's age and a weak positive relationship between the father's democratic, protective and authoritarian attitude and the mother's age. There was no statistically significant relationship between HEE score whit breastfeeding duration, initiation of complementary food, gestational age, birth weight, BMI percentile, father's age, and the number of living children (Table 3). In contrast, there is a positive relationship between HEE scores and mother and father education level, family income, primary and secondary school success, exam preparation, and private courses. There is no statistically significant difference between the development level till age three and going to a private teaching institution (Table 3).

According to multivariate linear regression analysis, the factors that increase students' HEE scores were found to be statistically significant are the increase in father's education level ( $\beta = 0.204$ ), exam preparation ( $\beta = 0.199$ ), protective ( $\beta = 0.179$ ), and democratic ( $\beta = 0.097$ ) parental attitudes, increase in maternal age ( $\beta = 0.091$ ) shortening of first walking age ( $\beta = -0.121$ ).

At the same time, increased birth weight and female gender were borderline insignificant. Moreover, age,

Table 1: High School Entrance Exam (HEE) Scores According to the Birth and Developmental Status of the Child

		N	HEE points				X <sup>2</sup> , p
			Column	0-299	300-399	400+	
			%	Row N=64 %	Row N=260 %	Row N=177 %	
Gender	Female	295	58.9	9.5	52.5	38.0	7.52
	Male	206	41.1	17.5	51.0	31.6	<b>023</b>
Pregnancy order	First	213	42.5	11.7	51.6	36.6	2.47
	Second	146	29.1	12.3	56.2	31.5	0.650
	Third and more	142	28.3	14.8	47.9	37.3	
Gestational week	<37 weeks	131	26.1	9.9	58.8	31.3	3.66
	37-39.9 weeks	244	48.7	13.5	50.0	36.5	0.454
	≥40 weeks	126	25.1	14.3	48.4	37.3	
Birth weight	< 2500 gr	33	6.6	18.2	66.7	15.2	9.08
	2500-3500 gr	331	66.1	13.6	51.7	34.7	<b>0.059</b>
	≥3510 gr	137	27.3	9.5	48.9	41.6	
	Mean±SD (gr)	3297	±568	3232±519	3256±600	3381±529	P=0.049
Development up to 3 ages	Back from peers	30	6.0	6.7	60.0	33.3	4.10
	Same as their peers	316	63.1	13.6	53.5	32.9	0.393
	Better than their peers	155	30.9	12.3	47.1	40.6	
Time to start walking	Within 12 months	336	67.1	11.6	49.7	38.7	5.30
	After 12 months	165	32.9	15.2	56.4	28.5	0.071
	Mean±SD	12.5	±2.6	13.2±3.4	12.5±2.3	12.2±2.7	P=0.009
Height percentile	< 25	86	17.2	18.6	51.2	30.2	4.99
	25-49.9	125	25.0	14.4	51.2	34.4	0.545
	50-74.9	140	27.9	10.7	51.4	37.9	
	≥ 75	150	29.9	10.0	53.3	36.7	
	Mean±SD	55.8	±27.5	48.3±29.6	56.6±27.6	57.4±26.3	P=0.064
Breastfeeding duration (months)	0-11	166	33.1	13.9	54.8	31.3	2.05
	12-23	175	34.9	11.4	50.3	38.3	0.726
	≥ 24	160	31.9	13.1	50.6	36.3	
	Mean±SD	16.2	±8.9	15.9±9.8	15.7±8.9	17.0±8.6	P=0.331
Exclusive breastfeeding (months)	0-4	138	27.5	15.9	55.1	29.0	5.87
	5- 6	269	53.7	12.6	51.3	36.1	0.209
	≥ 7	94	18.8	8.5	48.9	42.6	
Time to start complementary foods (months)	0-4	135	26.9	13.3	51.9	34.8	0.716
	5- 6	290	57.9	12.8	52.8	34.5	0.949
	≥ 7	76	15.2	11.8	48.7	39.5	
	<b>Total</b>	<b>501</b>	<b>100.0</b>	<b>12.8</b>	<b>51.9</b>	<b>35.3</b>	

**Table 2: High School Entrance Exam (HEE) Scores according to the Educational Status of the Child**

		N	%	HEE points			$\bar{X}$
				0-299	300-399	400+	
				Row N=64 %	Row N=260 %	Row N=177 %	
School type accepting students	Accept by non-exam	263	52.5	22.4	71.9	5.7	336.2
	Accept by exam	238	47.5	2.1	29.8	68.1	410.6
				$X^2=220.8$	$P<0.001$	$t=16.6$	$P<0.001$
Success in secondary school	Middle	82	16.4	34.1	54.9	11.0	321.5
	Successful	241	48.1	12.4	59.8	27.8	364.5
	Very successful	178	35.5	3.4	39.9	56.7	404.2
				$X^2=90.35$	$P<0.001$	$F=65.84$	$P<0.001$
Attended secondary school	Public	460	91.8	13.0	52.2	34.8	370.5
	Private	41	8.2	9.8	48.8	41.5	383.6
				$X^2=0.88$	$P=0.645$	$t=1.29$	$P=0.197$
Preparing for HEE	No	57	11.4	38.6	47.4	14.0	327.6
	Yes	444	88.6	9.5	52.5	38.1	377.2
				$X^2=42.08$	$P<0.001$	$t=5.83$	$P<0.001$
Attending the private course for HEE	No	408	81.4	13.5	51.5	35.0	371.3
	Yes	93	18.6	9.7	53.8	36.6	372.7
				$X^2=0.98$	$P=0.612$	$t=0.19$	$P=0.847$
Taking the private one-on-one private courses for HEE	No	377	75.2	14.9	53.6	31.6	366.6
	Yes	124	24.8	6.5	46.8	46.8	386.6
				$X^2=12.10$	$P=0.002$	$t=3.13$	$P=0.002$
PAS mean score (mean±SD)	Democratic	60.5	±10.4	57.4±10.5	59.7±11.2	62.9±8.6	$P<0.001$
	Protective	51.2	±10.7	46.3±11.1	50.1±11.0	54.5±9.2	$P<0.001$
	Authoritarian	40.2	±7.3	36.2±8.7	40.0±7.2	41.9±6.2	$P<0.001$
	<b>Total</b>	<b>501</b>	<b>100.0</b>	<b>12.8</b>	<b>51.9</b>	<b>35.3</b>	<b>371.6</b>

PAS: Parental Attitudes Scale.

authoritarian parental attitude, family income, maternal and paternal age, maternal education level, number of pregnancies, gestational week, breastfeeding duration, time to start supplementary food, developmental level up to 3 years, taking a private course, were also found to be statistically insignificant (Table 4).

When the HEE scores of the students are made into three groups (<300, 300-399, ≥400) and those with <300 points are taken as the reference group and analyzed with multinomial logistic regression; The probability of students being in the ≥400 point group increases with the shortening of the age at first walking, increase in birth weight, increase in protective parental attitude, increase in father's education level, and preparation for the exam (Table 5).

## DISCUSSION

In this study, the effect of breastfeeding duration and other factors on the academic success of the child was evaluated with multivariate regression analysis. The data about the child's nutritional and developmental status and preparation for the HEE exam were obtained from the mothers. In contrast, the parents' attitudes towards the child were obtained from the children by themselves.

In this study, 35.3% of the students got a score of 400 and above in HEE. The average score for HEE was 371.6; 88.6% of them were preparing for the HEE exam. In the results of the multivariate linear regression analysis performed to determine the factors affecting the HEE score in the study, the increase in

**Table 3: Correlation between HEE Scores, PAS, and other Continuous/Ordinal Variables**

	HEE	1	2	3	4	5	6	7	8	9	10	11	12	
1. Age (years)	-.095*	1												
2. Height percentile	0.058	0.015	1											
3. PAS-Democratic	0.198**	-0.026	-0.028	1										
4. PAS-Protective	0.267**	-0.019	-0.032	0.346**	1									
5. PAS-Authoritarian	0.236**	-0.048	-0.023	0.598**	0.691**	1								
6. Maternal age	0.093*	0.053	0.024	-0.031	0.009	-0.040	1							
7. Father's age	0.041	0.096*	0.050	-0.054	-0.045	-0.084	0.747**	1						
8. Number of living children	0.028	0.033	-0.025	-0.061	0.024	-0.001	0.160**	0.156**	1					
9. Gestational age (weeks)	0.009	0.030	-0.042	0.018	-0.035	0.009	-0.019	-0.025	0.012	1				
10. Birth weight (gr)	0.075	-0.072	0.031	0.019	-0.016	0.060	0.028	0.007	-0.032	0.284**	1			
11. Breastfeeding duration (month)	0.033	-0.006	0.059	-0.058	0.003	0.015	0.049	0.055	0.025	-0.011	0.122**	1		
12. Time to start complementary foods	0.036	-0.040	-0.064	-0.045	0.018	0.027	0.016	-0.001	0.011	0.016	0.118**	0.173**	1	
13. Time to start walking (month)	-0.151**	0.021	0.012	-0.015	-0.015	0.029	-0.046	-0.054	0.058	-0.082	-0.009	0.090	0.006	1

\*Correlation significance level  $p < 0.05$ . \*\*Correlation significance level  $p < 0.01$ .  
HEE: High school entrance exam, PAS: Parental Attitudes Scale.

**Table 4: Analysis of the Factors Affecting HEE Scores by Linear Regression**

$R^2=0.197$	Unstandardized coefficient	95% Confidence Interval for B		Standardized coefficient	t	p
	B	Lower	Upper	$\beta$		
(Constant)	361.595	142.334	580.857		3.240	0.001
Gender=Female	10.078	-0.193	20.349	0.080	1.928	0.054
PAS- Democratic	0.583	0.079	1.088	0.097	2.271	0.024
PAS Protective	1.043	0.549	1.536	0.179	4.154	0.000
Maternal age	1.109	0.152	2.066	0.091	2.276	0.023
Father's education	9.390	5.695	13.084	0.204	4.993	0.000
Birth weight (gr)	8.674	-0.037	17.386	0.079	1.956	0.051
Time to start walking (months)	-2.884	-4.762	-1.006	-0.121	-3.018	0.003
HEE preparing =Yes	39.107	23.434	54.781	0.199	4.902	0.000

HEE: High school entrance exam, PAS: Parental Attitudes Scale.

Independent variables: Age, Gender, Height percentile, PAS Democratic, PAS Protective, PAS Authoritarian, Maternal age, Father's age, Mother's education, Father's education, Number of pregnancies, Gestational week, Birth weight, Breastfeeding duration, time to start complementary food, time to start walking, the development until the age of 3, Preparation for HEE, Attending to private course, Taking private courses, Family income.

the educational level of the father, the protective and democratic parental attitude increased, with the maternal age increased. It was determined that preparing for the exam and the decrease in the age of first walking had a significant effect on the increase in the HEE score, whereas the increase in birth weight

and being female did not have a significant effect. In addition, "age, authoritarian parental attitude, family income, maternal and paternal age, maternal education level, number of pregnancies, gestational week, breastfeeding duration, time to start solid food, development up to 3 years of age, going to private

**Table 5: Analysis of Factors Affecting HEE Scores by Multinomial Logistic Regression**

HEE 3 groups <sup>a</sup>	B	P	O.R.	95% Confidence Interval for O.R.	
				Lower	Upper
<b>HEE 300-399 points</b>					
Intercept	7.672	0.026			
Time to start walking (months)	-0.123	0.013	0.884	0.803	0.974
PAS-Protective	-0.001	0.968	0.999	0.962	1.038
PAS-Authoritarian	0.068	0.028	1.070	1.007	1.137
Gestational weeks	-0.208	0.006	0.812	0.701	0.942
Birth weight (gr)	0.301	0.274	1.352	0.788	2.319
HEE preparing=No	-1.591	<0.001	0.204	0.099	0.421
Father's education levels	0.369	0.004	1.446	1.124	1.861
<b>HEE ≥ 400 points</b>					
Intercept	-2.164	0.568			
Time to start walking (months)	-0.167	0.004	0.846	0.755	0.949
PAS-Protective	0.046	0.032	1.047	1.004	1.092
PAS-Authoritarian	0.033	0.337	1.034	0.966	1.106
Gestational weeks	-0.128	0.123	0.880	0.747	1.035
Birth weight (gr)	0.687	0.023	1.987	1.099	3.594
HEE preparing=No	-2.345	<0.001	0.096	0.037	0.251
Father's education levels	0.521	<0.001	1.684	1.290	2.199

<sup>a</sup>Reference group HEE <300 scores.

HEE: High school entrance exam, PAS: Parental Attitudes Scale, P: Level of significance, B: Coefficient. O.R: Odds ratio.

course, taking private courses" included in the model did not have a significant effect on the HEE score. In the context of the results obtained, it can be stated that as a result of having a democratic attitude, parents are interested in the education of their children, monitor their homework, communicate with their teachers, and contribute to the socialization of their children. Parents' interest in their children's education depends on socioeconomic variables such as uneducated or educated, job or occupation status, working life, and social environment. Parents who take care of their children from an early age can shape a specific personality, guide them and shape their lives by instilling certain values, good attitudes, and behaviors. In the process of socialization, children can imitate the values and behaviors they exhibit, which are adopted and internalized by their parents. Parental attitudes come first among the experiences that shape personal life. The attitude of the parents not only shapes the personal life of the child but also has a significant impact on the success of the school. As a result of the analysis made in this direction, it was determined that there was a significantly negative relationship between the HEE score and the age of the child and a weak

positive relationship between the democratic, protective, and authoritarian attitude of the father and mother's age. In the study of Fallon and Bowers examining the effect of autocratic, democratic, and tolerant parental attitudes on adolescents, it was stated that parental attitudes affect the length of time spent with their children [12]. It has been reported that the child's academic success increases in families who spend more time with their children.

In the research conducted by Yolcu (2015) [13], it has been shown that the parents' attitudes can affect the YGS scores. The study observed that the HEE score of the student decreased as the mother's attitude democratized, while the HEE score of the student increased as the father's attitude democratized [13]. In another study that aimed to reveal the relationship between young people's attitudes towards their parents and their well-being, it was found that higher perceived protection was associated with better mental health and achievement [14]. In this study, it was found that the students who were successful in primary and secondary school, those who were prepared for the exam, and the children who took private courses got

higher scores from HEE, and these situations were statistically significant. It has been determined that the status of going to private or public schools and the duration of breastfeeding are not related to the HEE score level.

Considering the factors of social origin such as socioeconomic status, social class, family size, and parents, the interest in the child's education will positively affect the academic success of the child [15]. The level of development of the student in the family also affects the success at school [16]. Educated parents, especially those who are self-aware of their child's development, pay more attention to how they treat their children. Although not all issues related to child development can be applied exactly in the literature, the efforts of families in this area will yield positive results. It is challenging for students to be successful in families that raise their children by adhering to traditional child development methods [17]. The family's socioeconomic status, the educational and professional status of the parents, the number of children in the family, and the place of residence, are important factors affecting students' academic success. In general, as the monthly income level of the family increases, the average school success increases. This study determined a positive relationship between HEE score and mother and father education level, family income level, success level in primary and secondary school, preparing for the exam, and taking private courses. Arslan's (2008) [18] study determined that socioeconomic status affects a child's success at school and in life [18]. Akay's research in 2017 revealed that "highly educated parents set a living example for their children" [19]. Families with enough income to attend private courses do not have any difficulties in this regard so that their children can receive a better education.

Researchers have found a positive relationship between democratic practices in raising children and students' academic achievement [20,21]. Erdoğan (2007) [22] pointed out that the mother's positive attitude is more related to the child's academic success [22]. The study found that if parents act democratically toward their children and support their studies, their children's academic performance will increase. Baumrind (1991) [23] concluded in his study that democratic attitude, one of the child-rearing styles, positively affects children's academic achievement [23]. In a study, it was found that the level of education

should be drawn attention to increasing students' academic success, and it was stated that awareness should be increased in those with low education levels [24]. In Sarier's (2016) [25] study, it was determined that the positive attitudes and behaviors of the parents, increase in the socio-economic level of the family, increase in the education level of the parents, and the increase in the participation and interest of the parents are significant [25].

The HEE scores of students were classified into three groups, and those with <300 points were taken as the reference group. The multi-group (multinomial) regression analysis revealed the probability of getting a score of  $\geq 400$  and above compared to those with an HEE score of <300, a decrease in the age of first walking, decrease in birth weight. In this study, the increase in protective parental attitudes, the increase in the education level of the father, and preparation for the exam increase academic success. In the studies carried out, it was concluded that the attitudes and behaviors of the parents, their participation in education, the education level of the parents, and the socioeconomic status of the family affect the academic success of the students [26,27]. In a study, it was determined that the education level of the parents affected the academic success of the students [28]. Anil (2009) [29] concluded in his study that there is a positive relationship between a father's education level and students' science achievement scores and that education level affects the degree of children's interest in high school education [29].

## CONCLUSIONS

The study observed that breastfeeding duration was not statistically significant on the HEE score, which is accepted as one of the academic success indicators. It was found that protective and democratic parental attitudes are an important factor in increasing the HEE score. Other factors that increase the students' HEE score are an increase in the father's education level, preparation for the exam, the increase in the mother's age, and the shortening of the first walking age. Increased birth weight and being female were found to be borderline insignificant. Considering the lack of research in this field, it is thought that more studies are needed on this subject.

In the study, it is recommended that parents should be trained on how to behave towards their children since the attitude of protective and democratic parents contributes positively to the success of the exam.

## LIMITATIONS OF THE RESEARCH

The research includes only 9th-grade students studying at high schools in Yozgat city center and taking the HEE exam. And does not include students who do not take the HEE exam or are in other classes.

In addition, the effect of breast milk on children's brain development, that is, the level of intelligence is indirectly measured by examining the level of academic achievement, which constitutes the difficulty and limitation of the research.

## DISCLOSURES

This study was obtained from the master's thesis "The effect of breastfeeding duration and parental attitude on high school entrance exam". The study abstract was presented as an oral presentation at the 5th International and 23rd National Public Health Congress held online between 13 – 18 December 2021.

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest in this study.

## FINANCIAL SUPPORT

No financial support has been received from any person or institution for the study.

## ETHICAL APPROVALS

The study participants were informed about the research, and their consent was obtained. The research was carried out in accordance with the rules and ethical codes specified in the Helsinki Declaration.

## AVAILABILITY OF DATA AND MATERIALS

The study data are stored. The data may be provided if desired. The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

## AUTHOR CONTRIBUTIONS

MK. The research's planning, implementation, statistical analysis, writing, and reviewing. TUO. The research's planning, implementation, conducting surveys, conducting ethical permits, writing, and reviewing. MK and TUO also wrote the initial draft of the manuscript, which was critically reviewed. All authors have read and approved the final version of the manuscript.

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