



Impact of Breastfeeding Duration on Infant Health Outcomes in Türkiye: A Cross-Sectional Analysis

Emzirme Süresinin Bebeklerin Sağlık Sonuçları Üzerine Etkisi: Türkiye'den Kesitsel Bir Çalışma

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ABSTRACT

Aim: The present study aims to examine the relationship between breastfeeding duration and health outcomes among children aged 12-24 months in Türkiye to provide evidence-based recommendations for improving public health strategies and better breastfeeding practices.

Materials and Methods: This study relies on data from the Turkish Statistical Institute, Türkiye Health Survey 2022 dataset on children aged 0-14 years. The dataset contains information about breastfeeding duration and the health outcomes in children. Health outcomes, including general health status, chronic diseases, restrictions in daily life, and infectious diseases were analyzed using the chi-square and Mann-Whitney U tests. A p-value of <0.05 was considered statistically significant.

Results: Among the 343 infants aged between 12 and 24 months, 83% were breastfed for at least six months and 65% for at least 12 months. Infants who were breastfed for six months or longer were found to have better health status ($p=0.021$), lower rates of chronic diseases ($p=0.042$), and fewer restrictions in daily life ($p=0.014$). Breastfeeding for at least six months was associated with reduced history of communicable diseases ($p=0.026$) and lower respiratory tract infections ($p=0.010$). No significant differences were observed for acute gastroenteritis or urinary tract infections. Breastfeeding for a period longer than 12 months was associated with lower communicable disease history ($p=0.047$).

Conclusion: Our study highlights the significant benefits of breastfeeding. Particularly breastfeeding at least for 6 months was associated with improved infant health outcomes and reduced history of acute and chronic diseases in early childhood.

Keywords: Breastfeeding, infant health, communicable disease, chronic disease

Öz

Amaç: Bu çalışmanın amacı, Türkiye'de 12-24 aylık çocuklar arasında emzirme süresi ile sağlık sonuçları arasındaki ilişkiyi inceleyerek halk sağlığı stratejilerinin geliştirilmesi ve daha iyi emzirme uygulamaları için kanıta dayalı öneriler sunmaktır.

Gereç ve Yöntem: Bu çalışma, Türkiye İstatistik Kurumu, Türkiye Sağlık Araştırması 2022 veri setinde yer alan 0-14 yaş arası çocuklara ilişkin verilere dayanmaktadır. Veri seti, emzirme süresi ve çocuklarda sağlık sonuçları hakkında bilgi içermektedir. Genel sağlık durumu, kronik hastalıklar, günlük yaşamdaki kısıtlamalar ve bulaşıcı hastalıklar dahil olmak üzere sağlık sonuçları ki-kare ve Mann-Whitney U testleri kullanılarak analiz edilmiştir. <0,05 p-değeri istatistiksel olarak anlamlı kabul edilmiştir.

Bulgular: Yaşları 12 ila 24 ay arasında değişen 343 bebeğin %83'ü en az altı ay, %65'i ise en az 12 ay anne sütüyle beslenmiştir. Altı ay veya daha uzun süre anne sütüyle beslenen bebeklerin sağlık durumlarının daha iyi olduğu ($p=0,021$), kronik hastalık oranlarının daha düşük olduğu ($p=0,042$) ve günlük yaşamda daha az kısıtlama yaşadıkları ($p=0,014$) saptandı. En az altı ay emzirenlerde, daha az bulaşıcı hastalık ($p=0,026$) ve alt solunum

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yolu enfeksiyonu ($p=0,010$) öyküsü ile ilişkili bulundu. Akut gastroenterit veya idrar yolu enfeksiyonları için anlamlı bir farklılık gözlenmedi. Emzirme süresinin 12 aydan uzun olması daha düşük bulaşıcı hastalık öyküsü ile ilişkilidi ($p=0,047$).

Sonuç: Çalışmamız anne sütü ile beslenmenin önemli faydalarını vurgulamaktadır; özellikle en az 6 aylık anne sütü ile beslenme, bebek sağlığı sonuçlarının iyileşmesi ve erken çocukluk döneminde akut ve kronik hastalık öyküsünün azalması ile ilişkili bulunmuştur.

Anahtar Kelimeler: Emzirme, bebek sağlığı, bulaşıcı hastalık, kronik hastalık

INTRODUCTION

Breastfeeding is widely regarded as the most ideal infant feeding method and offers significant health benefits for infants and mothers alike. The World Health Organization highlights the importance of exclusive breastfeeding in the first six months of life and continued breastfeeding with appropriate complementary foods up to two years of age or beyond. This approach is considered critical in achieving the optimum growth, development, and health outcomes in children¹. The literature indicates that breastfeeding has an added advantage to the health of infants; it decreases the likelihood of infectious diseases such as respiratory tract infections, diarrhea, and otitis media². In addition, the longer the child is breastfed, the lower the risks of chronic diseases such as obesity and diabetes are. Also, a positive correlation is suggested in the literature between breastfeeding duration and the child's cognitive development in later childhood³.

The national health policy in Türkiye also emphasizes the importance of breastfeeding. According to the Türkiye Health Survey (THS) of the Turkish Statistical Institute (TurkStat), breastfeeding practices among children aged 0-14 years old provide critical insights into the present state of child health in the country⁴. However, the prevalence of exclusive breastfeeding is still below the global targets^{5,6}. Socio-economic, cultural, and health system-related factors influence the rates of breastfeeding⁷. An understanding of the effect that breastfeeding duration has on child health outcomes in the context of Türkiye can contribute to developing targeted interventions that improve these rates and promote child health.

This study aimed to examine the association between breastfeeding duration and health outcomes among children aged 1-2 years using data from THS in order to provide evidence-based recommendations that may improve the effectiveness of public health programs and contribute to increasing breastfeeding rates in Türkiye.

MATERIALS AND METHODS

Source of Data

This study relies on the TurkStat, THS-2022 data, which was collected in cross-sectional survey design research. TurkStat

conducts survey in every 3 years. Approval for the use of anonymized secondary data from the Turkish Statistical Institute Presidency, Department of Information Distribution and Communication dataset was obtained (decision no: 27964695-622.03-E.9930, date: 20.04.2018). This study was conducted under the ethical standards outlined in the Declaration of Helsinki. THS-2022 used the sampling frame obtained from updated version of the National Address Database in August 2022. The sample size was calculated by applying a stratified two-stage cluster sampling method with the external stratification criterion being the urban-rural distinction. In the first stage, clusters (blocks) consisting of approximately 100 addresses were selected randomly using a probability proportional to size approach. In the second stage, systematic random sampling was employed to select household addresses from each chosen block. A total of 1.117 clusters have been identified, from which 10 household addresses were selected per cluster, resulting in 11.170 household addresses across Türkiye⁴.

Variables

In the TurkStat questionnaires, the health conditions of the participants in the previous six months were investigated. In this study, the duration of breastfeeding was determined by the number of months the participants had breastfed. To evaluate the outcomes of breastfeeding for a minimum of six months and a minimum of one year during the infantile period, we used the data of infants between 12 and 23 months of age in the THS survey for "0-14 age group". Independent variable of the study was the duration of breastfeeding in months. Breastfeeding duration was categorized into two different variables: Breastfeeding at least 6 months and 12 months. Dependent variables consist of gender, perceived general health status, and oral and dental health status along with the past 6 months' occurrence of chronic conditions, restriction in daily life, communicable diseases, upper respiratory tract infections (URTI), lower respiratory tract infections (LRTI), acute gastroenteritis (AGE) and urinary tract infections (UTI). "general health status" and "oral and dental health status" were 5-item Likert scale questions and "restriction in daily life" was a 3-item question. The variable definitions can be found in the Supplementary Table.

Statistical Analysis

Data were analyzed by using IBM SPSS Statistics version 29.0. Descriptive statistics were used to summarize the baseline characteristics (gender, general health status, oral and dental health status), breastfeeding duration, and health outcomes of the children. Frequencies and percentages were calculated for categorical variables, while means and standard deviations were calculated for continuous variables. The Shapiro-Wilk test and graphical analyses were used to evaluate the conformity of continuous variables to normal distribution. The Mann-Whitney U test was used to compare continuous variables that did not show normal distribution between two groups, and the t-test was used for comparisons of continuous variables that conformed to normal distribution. The Fisher-Freeman-Halton test and Pearson chi-square test were employed to examine the associations between breastfeeding duration categories and acute (e.g., respiratory infections, diarrhoea) and chronic illnesses. General health status and oral and dental health

status variables were dichotomized in chi-square analysis, in which a p-value of less than 0.05 was considered statistically significant.

RESULTS

The study included data from 343 infants aged between 12 and 23 months, sourced from THS-2022 data. Among the infants, 55.1% were female. The mean breastfeeding duration was 12.39 (± 6.3) months [median: 13, minimum: 0, maximum: 24, interquartile range (IQR): 8-17 months], and the rate of infants aged between 12-24 months and breastfed for at least six months was 83%, and it was 65% for those breastfed for at least 12 months. The general health status of 93.6% and oral health status of 96.5% of the infants was good. The rate of disease lasting longer than 6 months (chronic disease) was 8.5%, and 8.7% of the infants had experienced restrictions in daily life due to an illness in the last 6 months. According to the questions about acute infectious diseases in the last 6 months, 3.2% of the infants had communicable disease

Table 1. Descriptive characteristics of breastfeeding and health outcome data by gender

		Female		Male		Total	
		n	%	n	%	n	%
Breastfeeding ≥ 6 months	Yes	152	80.4	132	85.7	284	82.8
	No	37	19.6	22	14.3	59	17.2
Breastfeeding ≥ 12 months	Yes	120	63.5	103	66.9	223	65.0
	No	69	36.5	51	33.1	122	35.0
General health status	Good	176	93.1	145	94.2	321	93.6
	Fair	10	5.3	5	3.2	15	4.4
	Bad	3	1.6	4	2.6	7	2.0
Oral and Dental health status	Good	182	96.3	149	96.6	331	96.5
	Fair	6	3.2	4	2.6	10	2.9
	Bad	1	0.5	1	0.6	2	0.6
Chronic disease	Yes	14	7.4	15	9.7	29	8.5
	No	175	92.6	139	90.3	314	91.5
Restriction in daily life	Yes	15	7.9	15	9.7	30	8.7
	No	174	92.1	139	90.3	313	90.3
Communicable disease history*	Yes	5	2.6	6	3.9	11	3.2
	No	184	97.4	148	96.1	332	96.8
URTI	Yes	22	11.6	25	16.2	47	13.2
	No	167	88.4	129	83.8	296	86.3
LRTI	Yes	12	6.3	13	8.4	25	7.3
	No	177	93.7	141	91.6	318	92.7
AGE	Yes	68	36.0	62	40.3	130	37.9
	No	121	64.0	92	59.7	213	62.1
UTI	Yes	5	2.6	4	2.6	9	2.6
	No	184	97.4	150	97.4	334	97.4

URTI: Upper respiratory tract infections, LRTI: Lower respiratory tract infections, AGE: Acute gastroenteritis, UTI: Urinary tract infections, THS-2022: Türkiye Health Survey-2022, *In the THS-2022 questionnaire, the communicable disease history question was designed to determine the history of infectious diseases, such as chicken pox, mumps, etc

(such as varicella or mumps), 13.7% had URTI, 7.3% had LRTI, 37.9% had AGE, and 2.6% had UTI. No gender differences were found in the assessment of health outcomes. Descriptive characteristics of breastfeeding and health outcome data by gender are shown in Table 1.

In the assessments of health outcomes regarding breastfeeding durations, infants general health status was "good" for 86.4% of infants who were breastfed for less than 6 months, whereas this rate was 95.1% for infants who were breastfed for at least 6 months, and the difference was statistically significant ($p=0.021$). The rates of chronic disease (disease lasting longer than 6 months) and restriction in daily life were higher in infants breastfed for less than 6 months ($p=0.042$ and $p=0.014$, respectively). There was no significant difference in the oral-dental health status of children aged 12-24 months in relation to the duration of breastfeeding. The rates of communicable diseases (such as rubella, mumps, etc.) and LRTI history were higher in infants who were breastfed for less than six months ($p=0.026$ and $p=0.010$, respectively). No statistically significant difference was observed in URTI, AGE and UTI history rates ($p=0.652$, $p=0.851$, $p=0.624$, respectively). The comparison of health outcomes according to breastfeeding for at least 6 months are presented in Table 2.

Higher rates of good general health and oral-dental health status were found in infants who were breastfed for at least

12 months, but the difference was not significant. There was no difference between breastfeeding for at least 12 months and chronic disease and restriction in daily life (Table 3). No statistically significant difference was observed in the breastfeeding duration of children regarding general health status, oral-dental health status and chronic disease history ($p=0.190$, $p=0.144$ and $p=0.323$, respectively), but the median breastfeeding duration in infants with a history of restrictions in daily life was longer (11.5 vs. 13 months, $p=0.019$). The mean differences in breastfeeding duration according to the health status of the children were presented in Table 4.

In the second year of life, the median (IQR) duration of breastfeeding in children with a history of communicable disease in the previous six months was 6 (10) months, while the median duration in infants without a history of infectious disease was 13 (10) months ($p=0.005$). No statistically significant difference was observed in the breastfeeding duration of children with a history of URTI, LRTI, AGE and UTI ($p=0.951$, $p=0.198$, $p=0.836$, $p=0.816$, respectively). Infants who were breastfed for less than 12 months had higher rates of communicable disease, URTI, LRTI AGE and UTI history ($p=0.047$, 0.855 , $p=0.064$, $p=0.904$, and $p=0.390$, respectively), but the difference was significant only in communicable disease history. The comparison of the health outcomes according to breastfeeding duration is presented in Table 3.

Table 2. The comparison of health outcomes among infants aged 12-24 months according to breastfeeding at least 6 months of age

		Breastfeeding <6 months		Breastfeeding ≥6 months		p-value
		n	%	n	%	
General health status	Good	51	86.4	270	95.1	0.021*
	Fair/Bad	8	13.6	14	4.9	
Oral and Dental health status	Good	56	94.9	275	96.8	0.341*
	Fair/Bad	3	5.1	9	3.2	
Chronic disease	Yes	9	15.3	20	7.0	0.042*
	No	50	84.7	264	93.0	
Restriction in daily life	Yes	10	16.9	20	7.0	0.014
	No	49	83.1	264	93.0	
Communicable disease history	Yes	5	8.5	6	2.1	0.026*
	No	54	91.5	278	97.9	
URTI history	Yes	7	11.9	40	14.1	0.652
	No	52	88.1	240	85.9	
LRTI history	Yes	9	15.3	16	5.6	0.010
	No	50	84.7	268	94.4	
AGE history	Yes	23	39.0	107	37.7	0.851
	No	36	61.0	177	62.3	
UTI history	Yes	1	1.7	8	2.8	0.624
		58	98.3	276	97.2	

URTI: Upper respiratory tract infections, LRTI: Lower respiratory tract infections, AGE: Acute gastroenteritis, UTI: Urinary tract infections, *Fischer exact test

Table 3. The comparison of health outcomes rates among infants aged 12-24 months according to breastfeeding at least 12 months of age

		Breastfeeding <12 months		Breastfeeding ≥12 months		p-value
		n	%	n	%	
General health status	Good	109	90.8	212	95.1	0.127
	Fair/Bad	11	9.2	11	4.9	
Oral and Dental health status	Good	113	94.2	218	97.8	0.081*
	Fair/Bad	7	5.8	5	2.2	
Chronic disease	Yes	13	10.8	16	7.2	0.245
	No	107	89.2	207	92.8	
Restriction in daily life	Yes	15	12.5	15	6.7	0.071
	No	105	87.5	208	93.3	
Communicable disease history	Yes	7	5.8	4	1.8	0.047*
	No	113	94.2	219	98.2	
URTI history	Yes	17	14.2	30	13.5	0.855
	No	103	85.8	193	86.5	
LRTI history	Yes	13	10.8	11	5.4	0.064
	No	107	89.2	211	94.6	
AGE history	Yes	46	38.3	84	37.7	0.904
	No	74	61.7	139	62.3	
UTI history	Yes	4	3.3	5	2.2	0.390*
	No	116	96.7	218	97.8	

URTI: Upper respiratory tract infections, LRTI: Lower respiratory tract infections, AGE: Acute gastroenteritis, UTI: Urinary tract infections, *Fischer exact test

Table 4. Mean differences in breastfeeding duration according to the health status of the children (n=343)

		Breastfeeding duration				p-value
		Mean	Standard deviation	Median	IQR	
General health status	Good	12.52	0.35	13	9	0.190
	Fair/Bad	10.59	1.55	11	22	
Oral and Dental health status	Good	12.48	0.35	13	9	0.144
	Fair/Bad	10	1.75	10.5	9	
Chronic disease	Yes	11.38	7.60	12	14	0.323
	No	12.49	6.22	13	9	
Restriction in daily life	Yes	9.70	1.25	11.5	8	0.019
	No	12.65	0.35	13	10	
Communicable disease history	Yes	7.09	1.72	6	10	0.005
	No	12.57	0.35	13	10	
URTI history	Yes	12.36	0.83	12	9	0.951
	No	12.40	0.38	13	9	
LRTI history	Yes	10.72	1.53	11	15	0.198
	No	12.53	0.35	13	9	
AGE history	Yes	12.16	0.55	13	11	0.836
	No	12.54	0.44	13	8	
UTI history	Yes	12.56	2.12	15	11	0.816
	No	12.39	0.35	13	9	

URTI: Upper respiratory tract infections, LRTI: Lower respiratory tract infections, AGE: Acute gastroenteritis, UTI: Urinary tract infections, IQR: Iterquartile range

DISCUSSION

The present study found that breastfeeding for at least 6 months and long-term breastfeeding (at least 12 months) in children from different segments of Türkiye was effective in reducing the rates of infectious diseases and LRTIs in children aged 1–2 years. The findings are consistent with the recommendations of the World Health Organization, Ministries of Health, and many child health organizations, which emphasize the protective effects of breastfeeding on child health^{3,8–11}.

In the study, mothers who breastfed their babies for six months and above had significantly better-perceived health of their children. This finding is in accordance with established literature showing that breastfeeding promotes overall health status and further reduces child morbidity worldwide³. There is a growing body of evidence showing that breastfeeding might play a protective role against chronic diseases such as asthma, obesity, hypertension, dyslipidemia, and type II diabetes mellitus^{12–14}. It has been suggested that the anti-inflammatory and immunomodulatory effects of breastfeeding may explain the reduced prevalence of chronic diseases¹¹. Duration-dependent protective associations have been shown between breastfeeding and chronic diseases such as childhood asthma, diabetes and rheumatoid arthritis^{2,12,14}. In our study, we have shown a similar finding that breastfeeding for less than six months was significantly associated with higher rates of chronic diseases and restrictions in daily life due to illness. While this association can be attributed to the shortness of breastfeeding duration, it can also be possible that existing chronic illness and restrictions in daily life might have limited the breastfeeding process. Nevertheless, our finding shows the importance of breastfeeding during the first six months of life in improving health outcomes.

In this study, mothers who breastfed for more than 12 months showed a higher level of perceived health status of their child. However, the observed difference was not statistically significant. The loss of statistical significance may reflect the influence of other factors, such as environmental exposures, on child health beyond the first year, which can diminish the positive view of the parents on their children's health status^{15,16}. It is also possible that mothers who have breastfed for less than six months may have more negative perceptions of their infants' health status because of the well-known recommendation of breastfeeding duration of up to two years. Breastfeeding for at least 12 months showed a similar trend towards less chronic disease and daily restriction history, with no statistical significance. A literature review revealed a paucity of studies investigating the associations between prolonged breastfeeding (>1 year) and infants' health and well-being. Therefore, further studies applying a variety of methodologies, such as prospective, mixed-method, or cross-cultural, are required to rigorously investigate the issue¹⁷.

Breast milk provides the infant with essential nutrients and immunological components that strengthen the immune system and protect the infant from various infectious diseases^{18,19}. Li et al.²⁰ showed that breastfeeding beyond six months was associated with a lower risk of infections even up to six years of age, reinforcing the importance of sustained breastfeeding for long-term health benefits. Similar findings have been reported by Victora et al.³, where longer durations of breastfeeding were associated with a lower incidence of child infection, especially in early childhood. These beneficial effects have been documented in developed and less developed countries^{10,21}. Our findings also showed a significant reduction in communicable disease history in children breastfed for at least six months. This aligns with the World Health Organization's recommendation that exclusive breastfeeding for the first six months of life enhances immune function and reduces the risk of infectious diseases¹.

LRTIs represent a significant public health concern, accounting for a considerable proportion of hospitalizations among infants and children⁴. A positive correlation has been identified in the literature between the use of the formula and an increased incidence of hospitalization due to LRTI²². In our study, extended breastfeeding was particularly associated with lower rates of LRTIs. Infants who breastfed for more than 6 months had a significantly lower rate of LRTIs than for shorter periods. In line with these findings, the study by Potharajula and Kadke²³ demonstrated a correlation between breastfeeding and a reduced risk of respiratory issues, including wheezing in children, further supporting the protective role of breast milk against respiratory infections. A study by Abdulla et al.¹⁰ investigated the association between Respiratory Syncytial virus (RSV)-associated LRTI and breastfeeding and found that not breastfeeding infants was associated with a significant risk of severe RSV associated LRTI and hospitalisation.

Although breastfeeding duration was found to be shorter in those with a history of AGE, this difference was not statistically significant in our study. The analysis revealed no association between the history of UTI and the duration of breastfeeding. It is possible that the results are influenced by the fact that the questionnaire inquired about the infection history over the past six months rather than severity such as information about hospitalizations, duration of stay in hospital etc. Nevertheless, the existing literature examining the relationship between AGE and UTI and breastfeeding focuses on hospitalizations due to these infections. It has been documented that breastfeeding contributes to a reduction in hospitalizations due to AGE and UTI^{3,8,24}.

The breastfeeding rates observed in this study are, on the whole, relatively high according to another national study, the

Türkiye Demographic and Health Survey 2018, or international rates; however, they still do not meet the global breastfeeding targets of 80 % by 2030, concerning children breastfed at 1 year of age^{6,11}. As indicated by the Global Breastfeeding Scorecard (2019), there is a need for increased commitment to breastfeeding through enhanced funding and improved policies and programmes⁵. In Türkiye, socio-economic, cultural, and systemic barriers play a significant role in the relatively low rates of exclusive breastfeeding. Maternal education, employment and support significantly influence breastfeeding duration in Türkiye, suggesting that increasing community-level support could enhance breastfeeding practices²⁵⁻²⁷. Baker et al.⁷ emphasize the role of structural supports, such as parental leave policies and public awareness campaigns, in promoting breastfeeding, which could help increase these rates in Türkiye as well. Integrating breastfeeding support into the national health strategy may help improve child health indicators by increasing exclusive breastfeeding rates and extending breastfeeding duration.

Study Limitations

Our study has certain limitations. Firstly, the cross-sectional design of the study limits the capacity of the research to assert causal relations. Secondly, the survey questionnaire was designed by the TurkStat, and the quality of the questions sometimes limited our understanding of the phenomenon under investigation. For example, the dataset included two variables that overlapped (the past 6 months' history of communicable diseases and infectious diseases). Therefore, we only used the communicable disease variable to avoid confusion. Also, we could not show a relationship based on age due to the measurement of age based on years rather than months in the dataset. Another issue with the survey was that the child questionnaire of the dataset was not linked with the household questionnaire, which also limited our analysis regarding regional or socio-economic status. Lastly, the information on disease history was based on parental reports, which may have introduced a degree of subjectivity. Nevertheless, the dataset is a representative survey of Türkiye, which is one of the strong aspects of this study.

CONCLUSION

Our study highlights the significant benefits of breastfeeding, particularly breastfeeding during the first six months of life was associated with improved infant health outcomes and the history of reduced burden of both acute and chronic diseases in early childhood. Infants breastfed for at least six months exhibited better general health, fewer chronic illness histories and restrictions in daily life, and a lower incidence of communicable and LRTI than those breastfed for shorter durations. The results align with global evidence on the

protective effects of breastfeeding, reinforcing the importance of promoting breastfeeding through public health initiatives.

Ethics

Ethics Committee Approval: Approval for the use of anonymized secondary data from the Turkish Statistical Institute Presidency, Department of Information Distribution and Communication dataset was obtained (decision no: 27964695-622.03-E.9930, date: 20.04.2018). This study was conducted under the ethical standards outlined in the Declaration of Helsinki.

Informed Consent: This study relies on the TurkStat, Türkiye Health Survey-2022 (THS-2022) data, which was collected in cross-sectional survey design research.

Footnotes

Authorship Contributions

Concept: Ö.Ö.A., Design: Ö.Ö.A., İ.K., Data Collection or Processing: İ.K., Analysis or Interpretation: Ö.Ö.A., İ.K., Literature Search: Ö.Ö.A., İ.K., Writing: Ö.Ö.A., İ.K.

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Supplementary Table. The contents of the questions and answers	
Question contents	Answers
Gender	Male/Female
Age	 (in month)
Breastfeeding duration	 (in month)
Description of the child's health in general	Very good/Good/Fair/Bad/Very Bad
Any longstanding (at least 6 months or more) illness or health problem	Yes/No
Limitation because of a health problem in activities most children of the same age usually do	Severely limited/Limited, but not severely/Not limited at all
Description of the child 's oral and dental health	Very good/Good/Fair/Bad/Very bad
History of any communicable diseases (varicella, mumps etc.) in the past six months	Yes/No
Any upper respiratory tract infection (tonsillitis, middle ear infections, pharyngitis) history in the past six months	Yes/No
Any lower respiratory tract infection (pneumonia) history in the past six months	Yes/No
Any diarrhea history in the past six months	Yes/No
Any urinary tract infection history in the past six months	Yes/No