



## Investigation of Breast Milk Use in Early Childhood and Its Psychobiochemical Effects

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### ABSTRACT

**Aim:** The periods in which the infant is fed only by breast-feeding (food: breast milk), and the period in which the infant can stay in contact with breast milk (nutrient: breast milk + food X) maximum by breast-feeding, and KSS score distributions in these periods were investigated.

**Material and Methods:** In the research; Individuals between the ages of 18-25 were asked questions about the early childhood-infancy periods, to determine the duration of breast milk intake and breastfeeding, and the distribution of the scores they received was examined by applying the KSS. The Cronbach Alpha coefficient (0.723) was calculated to determine the Turkish validity and reliability of the Kerns Secure Scale. The data were collected digitally, and the minimum sample size was determined as 176 people with the G\*Power (v3.1.9.7) program. In the research, data belonging to 209 people were studied, and SPSS 26 statistical program was used to determine the data.  $p < 0.05$  was considered statistically significant in the analyses.

**Results:** In our findings, although only breast milk intake is less than 6 months, breastfeeding at the age of 3-4 months has a positive effect on KSS (Mean: 47.38). When the breastfeeding period is 6 months or more, the rate of feeding only with breast milk is 47.7%. According to these data, the longer the breastfeeding period; breast milk intake is reduced, but mother-infant contact is maintained.

**Conclusion:** The application of this content, not the breast milk content alone, through breastfeeding and not less than 6 months, supports secure attachment.

**Keywords:** Breast milk; Kerns Secure Scale; breastfeeding; infant-child feeding; protective nutrition.

## Erken Çocukluk Döneminde Anne Sütü Kullanımı ve Psikobiyokimyasal Etkilerinin İncelenmesi

### ÖZ

**Amaç:** Bebek beslenmesinin sadece emzirilerek (besin: anne sütü) yapıldığı dönemler ile bebeğin emzirilerek anne sütü (besin: anne sütü+ X besini) ile maksimum hangi döneme kadar temasta kalabildiği ve bu dönemlerdeki KSS skor dağılımları araştırılmıştır.

**Gereç ve Yöntemler:** Araştırmada; 18-25 yaş arası bireylere erken çocukluk-bebeklik dönemleri ile ilgili, anne sütü alımı ve emzirilme sürelerini tespit edilmesini sağlayacak sorular yöneltilmiş ve KSS ölçeği uygulanarak, aldıkları skorların dağılımları incelenmiştir. Kerns Secure Scale'in Türkçe geçerlilik ve güvenilirliğini belirlemek için Cronbach Alpha katsayısı (0,723) hesaplanmıştır. Veriler dijital ortamda toplanmış, minimum örneklem sayısı G\*Power (v3.1.9.7) programı ile 176 kişi olarak tespit edilmiştir. Araştırmada, 209 kişiye ait veri ile çalışılmış, verilerin tespitinde SPSS 26 istatistik programı kullanılmıştır. Analizlerde  $p < 0,05$  istatistiksel olarak anlamlı kabul edilmiştir.

**Bulgular:** Bulgularımızda, sadece anne sütü alımının 6 ay'dan az olmasına rağmen, anne sütünün 3-4 ay'lık iken emzirme yolu ile verilmesi KSS skorlarına (Ort. 47,38) olumlu yansımıştır. Emzirilme süresi 6 ay ve üstü olduğunda, sadece anne sütü ile beslenmenin oranı %47,7'dir. Bu verilere göre emzirilme süresi uzadıkça anne sütü alımı azalmakta, fakat anne bebek teması korunmaktadır.

**Sonuç:** Tek başına anne sütü içeriğinin değil ama bu içeriğin emzirme aracılı ve 6 aydan az olmamak üzere uygulanması güvenli bağlanmayı desteklemektedir.

**Anahtar Kelimeler:** Anne sütü; Kerns güvenli bağlama ölçeği; emzirme; bebek-çocuk beslenmesi; koruyucu beslenme.

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## INTRODUCTION

Breast milk provides a complete source of nutrition for infants under 6 months of age and contains many components whose function and benefit are still under investigation, such as hormones, stem cells, complex sugars, nucleic acids (1-3).

Breastfeeding is the most convenient method of feeding babies. Breast milk provides almost all essential nutrients, growth factors and immunological components. Other advantages of breastfeeding are; reduction of cases and severity of infections, prevention of allergies, possible improvement of cognitive development (4,5).

Breastfeeding should be started immediately after birth, preferably within the first half hour after birth (6-8). In this process, health professionals have an important role in promoting and protecting breastfeeding.

Supported by research and recommended by health professionals, Babies should be fed only breast milk for the first 6 months. Breastfeeding should be continued by adding additional food for at least the first 12 months and breastfeeding should be continued as long as the mother and baby mutually desire (9). Breastfeeding should be encouraged during the first two years of life (10).

Social-emotional development begins with the bond that the parent establishes with the child. This bond ensures that the child's needs are responded to in a timely manner and that the newborn baby is calmed. constant availability of the mother or caregiver; In the first year of life, it leads to the development of trust towards the mother/caregiver. This allows the baby to call the parents or caregiver in times of stress, known as attachment. Parents are the first beacons of emotion regulation (11).

For this reason, it is considered that from the beginning of life, mothers/caregivers help babies keep their emotions within acceptable limits. In this way, strong, negative emotions in the baby are softened and positive ones are expanded (12).

Babies first learn to communicate through emotions. From birth, they meet three different emotions that appear with universal facial expressions; anger, joy and fear. At this stage, cognitive input is not yet required for emotional response.

Attachment is very important in a person's emotional development. It lays the foundation for a child's safety, builds self-esteem, and develops emotional regulation and self-control skills.

Social distancing and insecure attachment by health professionals; it is now seen as a risk factor that surpasses smoking, malnutrition, obesity and lack of exercise (13).

Breastfeeding, which is the process immediately after birth; This is the best time to initiate a positive mother-infant relationship, which will affect the relationship models that will be established in the future.

In our study, the effect of infancy milk intake route, duration and frequency on secure attachment was evaluated with Kerns secure attachment scale. In addition to the chemical composition of breast milk, the effect of mother-mediated/unmediated delivery of this composition to the infant's overall health was investigated.

## MATERIAL AND METHODS

### Research and sample selection

Inclusion criteria of the participants in the study; It was determined that the participants were between the ages of

18-25, not married, not having any psychiatric disease or disability, and being accompanied by a biological or voluntary family responsible for their care during childhood and adolescence. Participants who did not meet these criteria were not included in the study.

### Data collection and evaluation

The research is a descriptive study and the data of the early childhood periods of the participants were collected in digital environment between January and March 2021. To increase the possibility of accurate and reliable data collection; minimum sample size was determined with G\*Power (v3.1.9.7) program as 176 and the effect value was determined by calculating eta squared. In order to ensure data security, it was studied with 209 participants (14,15).

In the study, participants will answer the Kerns Secure Attachment Scale by themselves, and they will answer information about breast milk use through parents.

### Kerns Secure Scale

Kerns Secure Scale was translated into Turkish and then it was edited and finalized (16,17). To increase the possibility of accurate and reliable data collection; The Cronbach Alpha coefficient (0.723) was calculated to determine the Turkish validity and reliability of the Kerns Secure Scale. This scale consists of a total of 15 items and aims to measure the level of secure attachment of children towards their parents. There are two contradictory statements for each item in the scale (some children" but" some children). Participants are first asked to decide which of the two types of children described just to the right and left of the box that says "but" is more similar. Then she/he is asked to go to the side she/he chose and indicate how similar she/he is to the child described.

4-point Likert scale was used. The highest score that can be obtained from the scale is 60, and the lowest score is 15 (1=very similar to me - 4=but very similar to me). In our study, the scale was evaluated over the total score. High scores correspond to secure attachment to parents.

### Ethical considerations

A voluntary "Informed Consent" form was obtained from all participants in the study. The study was approved by the Istanbul Esenyurt University Ethics Committee, numbered E-12483425-199-259, dated 12.01.2021

### Statistical Analysis

SPSS 26 program was used for statistical analysis of the data in the study. Independent sample t test was used for pair group comparisons, and one-way ANOVA test was used for multiple group comparisons. Bonferroni and Tukey tests were performed for the correlation of significant groups and  $p < 0.05$  was considered statistically significant

## RESULTS

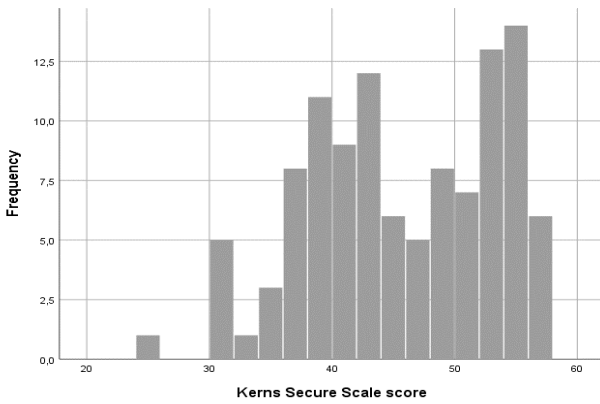
In our research; The periods in which the infant is fed only by breast-feeding (food: breast milk) and the period in which the infant can stay in contact with breast milk (nutrient: breast milk + food group X) by breastfeeding were compared. and KSS distributions were calculated. The mean, standard deviation and minimum/maximum values of the scores of the participants from the Kerns Secure Scale were determined (Table 1).

**Table 1.** Descriptive information of Kerns Secure Scale (KSS)

Scale	n	Min-Max	Mean	Std. Deviation
KSS	209	25-57	45,28	4,66

The lowest score obtained from the Kerns Secure Scale is 25, while the highest score is 57. It was determined that the average score of the participants from the scale was 45.28 and their standard deviation was 7.66.

When the KSS graph of the participants is examined, it is seen that the clustering is above the average. Although there is no cut-off value for KSS evaluation, it has been declared in the test that high scores indicate a positive correlation for secure attachment. For this reason, when the cumulative percentages of KSS were evaluated, it was determined that 51.4% of them were above the average. In general, it is possible to say that the participants are on the score that supports secure attachment (Figure 1).

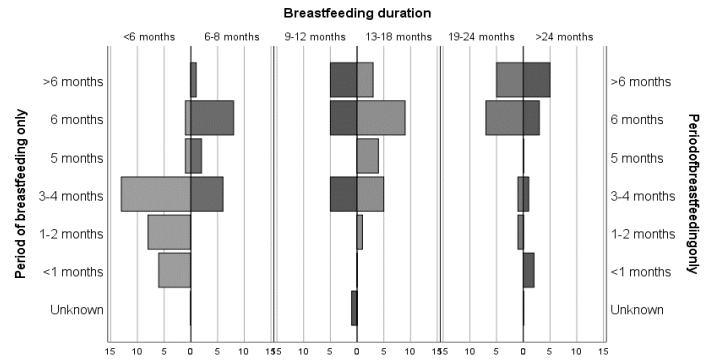


**Figure 1.** Kerns Secure Scale score

In another step of our work; It has been determined that the periods in which the infant is fed only by breastfeeding (food: breast milk) and the maximum period in which the baby can stay in contact with breast milk (food: breast milk + food group X) by breastfeeding (Table 2) and the values were compared (Figure 2).

**Table 2.** Descriptive information of breastfeeding duration & period of breastfeeding only

Descriptive information of breastfeeding duration		
Duration	Valid Percent	Cumulative Percent
<6 months	26,6	26,6
6-8 months	15,6	42,2
9-12 months	14,7	56,9
13-18 months	20,2	77,1
19-24 months	12,8	89,1
>24 months	10,1	100
Descriptive information of period of breastfeeding only		
Duration	Valid Percent	Cumulative Percent
<1 month	7,3	8,3
1-2 months	9,2	17,4
3-4 months	28,4	45,9
5 months	6,4	52,3
6 months	30,3	82,6
>6 months	17,4	100
Unknown	0,9	0,9



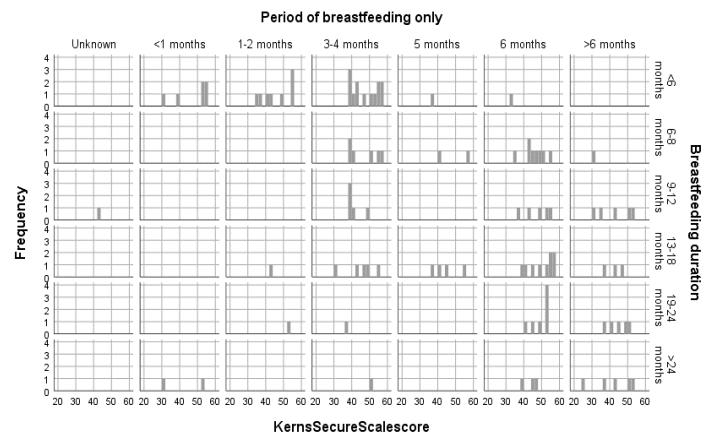
**Figure 2.** Matching breastfeeding duration & period of breastfeeding only

According to our research data, it was determined that only 51.3% of those who were breastfed for less than the first 6 months were breastfed. This rate means that infant nutrition is supported with supplementary food in the very early stages. The most common period of breast milk use was determined as the first 3-4 months.

When the breastfeeding period is 6 months or more, the rate of feeding only with breast milk is 47.7%. According to these data, as the duration of breastfeeding increases, breast milk intake decreases, but mother-infant contact is maintained. It is striking that the participants who declared that they took breast milk for the first 6 months were between 6-8 months and 13-18 months when the duration of breastfeeding was considered.

The total KSS of those who were breastfed for the first 6 months and who were breastfed for 6-8 months and 13-18 months were found to be 45.38±5.99 and 49.0±6.61, respectively. Statistically, since p=0.270, there was no statistically significant difference between them. These findings show that the duration of breastfeeding from 6-8 months to 13-18 months increased the KSS, but did not make a statistically significant difference.

The KSS distributions of the participants who were breastfed for less than the first 6 months and whose breast milk intake was <1 month, 1-2 months, 3-4 months and 5 months during this period were determined. The score of those who were breastfed for less than 1 month: 47.16; The score of those who were breastfed for 1-2 months: 45.87; The score of those who were breastfed for 3-4 months: 47.38; The score of those who were breastfed for 5 months was calculated as 36 (Figure 3).



**Figure 3.** Distributions of KSS-breastfeeding duration-period of breastfeeding only

The value of KSS in participants who were breastfed for less than the first 6 months and were breastfed for only 5 months during this period was significantly lower than all other groups (< 1month  $p=0.044$ ; 1-2 months  $p=0.037$ ; 3-4 months  $p=0.01$ ).

## DISCUSSION

It is very critical for the holistic health of the baby that breastmilk is offered to the baby by breastfeeding, so that the mother-infant relationship begins as soon as possible (as soon as possible after birth) and that it is left in the ideal time (around 24 months) with mother-infant approval (18-20).

In a behavioral study conducted by psychologist Harry Harlow in the early 1960s; Infant monkeys of the Rhesus genus were given preference in "mother deprivation" cages. Babies' approaches were evaluated against a plush toy that would model the mother figure and an apparatus holding a bottle in their hands. Rhesus baby monkeys rejected the wired device holding a bottle, preferring the mother figure without a bottle instead, and cuddled up (21-23). In the light of these data, is the reason why breast milk is preferred by the baby other than its chemical content, is the bond between the mother/caregiver and the baby's intention to establish? question constituted one of the important steps of our study.

Breastfeeding is considered the best option for infant nutrition (24). It is one of the recommendations that the World Health Organization aims to increase by 50% by 2025 (25). Exclusive breastfeeding for at least the first 6 months after birth is recommended by all health professionals around the world (26, 27).

In our findings, the fact that only breastmilk intake is less than 6 months and especially that this breast milk is given by breastfeeding when it is 3-4 months is reflected in the KSS. Breastfeeding continued from 5 months onwards, the baby was not deprived of chemical content, but the route of administration was not breastfeeding, which we can detect from the sudden decrease in KSS.

Sara A. Quandt's 1985 study examined the duration of exclusive breastfeeding of infants in a sample of American women. It has been reported that from 1971 to 1981, the percentage of breastfed infants nationwide increased from 25% to 58%. It was shared that this rate increased from 6% to 27% for 5- and 6-month-old babies (28). When current data are evaluated, these rates have been shared as 40% in babies fed only with breast milk for 3 months and 17% in babies who are breastfed for 6 months (29).

In 2018 data of the Turkey Demographic and Health Survey (TNSA), it was stated that 41% of children younger than 6 months were exclusively breastfed. The proportion of children who are exclusively breastfed decreases rapidly with age; It has been reported that it decreased from 59% among 0-1 month old children to 45% among 2-3 month old children and 14% among 4-5 month old children. It is also among the data presented in the report that 23% of children younger than six months receive other non-breast milk and 12% take additional foods to breast milk (30).

When we look at the world in general, it has been reported that the rate of babies fed only with breast milk during the first 6 months is 38% (31).

Another data was presented to the field through the study conducted by Warren TK Lee et al. in Hong Kong in 2007.

The focus is on factors that contribute to early discontinuation of breastfeeding in infants younger than 6 months of age (19).

In another mother-infant study conducted by Barry M. et al., whether the infants had ever been breastfed before, the percentage of feeding from the mother's breast versus the percentage of bottle feeding, and the age of the infant at the time of termination of breastfeeding were questioned. A high breastfeeding group was formed from mothers who breastfed their babies continuously for the first 5 months, and a less breastfed group was formed from mothers who did not breastfeed at all or who stopped breastfeeding at 3 weeks of age. It has been determined that the stress responses of babies who are breastfed for 5 months are reduced compared to babies who are not breastfed. They stated that they reached these results epigenetically by decreasing methylation of stress promoter gene regions in response to decreased cortisol levels (31).

When all the data are evaluated, it has been determined that although the geography and populations have changed in general, and the time interval has come from the 1980s to the 2000s, the almost unchanged breast milk intake of less than 6 months and the avoidance of breastfeeding are reflected in the KSS values at a statistically significant level.

This study consists of participants who come to Istanbul from the periphery for university education and/or who have middle-low demographic status in Istanbul. Although sufficient numbers were reached in this sample to evaluate the results of the study, the effect of different demographic conditions on the process can be investigated in another study.

## CONCLUSION

The use of breast milk for less than 6 months in mother-baby nutrition is a common nutritional problem in the world and in our country. The fact that only breast milk use is reduced to 14% in babies aged 4-5 months in our country shows that breast milk and breastfeeding, which alone perfectly meets the physiological and psychosocial needs of infants, are deprived.

In this study, which was carried out by evaluating the KSS total scores, we tried to emphasize the necessity of giving breast milk to the baby by breastfeeding, which plays an important role in establishing the bond between the mother and the baby. The data were converted into quantitative values supported by statistical analyzes, and noticeable significance was noted.

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## REFERENCES

1. Casavale KO, Ahuja JKC, Wu X, Li Y, Quam J, Olson R, et al. NIH workshop on human milk composition: Summary and visions. *Am J Clin Nutr.* 2019; 110(3): 769-79.

2. Cope MB, Allison DB. Critical review of the World Health Organization's (WHO) 2007 report on 'evidence of the long-term effects of breastfeeding: systematic reviews and meta-analysis' with respect to obesity. *Obes Rev.* 2008; 9(6): 594-605.
3. Ip S, Chung M, Raman G, Chew P, Magula N, DeVine D, et al. Breastfeeding and maternal and infant health outcomes in developed countries. *Evid Rep Technol Assess.* 2007; 153(153): 1-186.
4. Leung AK, Sauve RS. Breast is best for babies: Part 1. *Can J Diagn.* 2000; 18: 69-70.
5. Binns C, Lee M, Low WY. The long-term public health benefits of breastfeeding. *Asia Pac J Public Health.* 2016; 28(1): 7-14.
6. Leung AK, Sauve RS. Breast is best for babies: Part 2. *Can J Diagn.* 2001 b; 18: 65-73.
7. Duerbeck NB. Breast-feeding. What you should know so you can talk to your patient. *Comp Ther.* 1998; 24: 310-18.
8. WHO/UNICEF. Protecting, promoting and supporting breastfeeding: the special role of maternity services. A joint WHO/UNICEF statement. *Int J Gynaecol Obstet.* 1990; 31: 171-83.
9. Work Group on Breastfeeding, American Academy of Pediatrics. Breastfeeding and the use of human milk. *Pediatrics.* 1997; 100: 1035-39.
10. Piovonetti Y. Breastfeeding beyond 12 months: an historical perspective. *Pediatr Clin North Am.* 2001; 48: 199-206.
11. Duschinsky R. Disorganization, fear and attachment: working towards clarification. *Infant Ment Health J.* 2018; 39(1): 17-29.
12. Kathleen R, Delaney. Following the affect: learning to observe emotional regulation. *J Child Adolesc Psychiatr Nurs.* 2006 ;19(4): 175-81.
13. Meg Jordan. The power of connection: Self-care strategies of social wellbeing. *Journal of Interprofessional Education & Practice.* 2023; 31: 1-6.
14. Cohen, J. The t test for means. *Statistical power analysis for the behavioral sciences.* 1988.
15. Arslan K. SPSS'de T-testi için etki değerini (effect size) hesaplama. 2019.
16. Kerns K A, Klepac L, Cole A. Security Scale. *APA PsycTests.* 1996.
17. Sümer N, Anafarta-Şendağ M. Orta çocukluk döneminde ebeveynlere bağlanma, benlik algısı ve kaygı. *Türk Psikoloji Derg.* 2009; 24: 86-101.
18. Warren T K Lee, Eric Wong, Susan S H Lui, Veronica Chan, Joseph Lau. Decision to breastfeed and early cessation of breastfeeding in infants below 6 months old – a population-based study of 3,204 infants in Hong Kong. *Asia Pac J Clin Nutr.* 2007; 16(1): 163-71.
19. World Health Organization. Global Strategy for Infant and Young Child Feeding. 54th World Health Assembly Geneva, World Health Organization, 2001.
20. Meg Jordan. The power of connection: self-care strategies of social wellbeing. *Journal of Interprofessional Education & Practice* 31. 2023; 100586.
21. Harlow H F, Dodsworth R O, Harlow M K. Total social isolation in monkeys. *Proceedings of the National Academy of Sciences of the United States of America.* 1965; 54(1); 90-7.
22. Harlow H F, Zimmermann R R. The development of affective responsiveness in infant monkeys. *Proceedings of the American Philosophical Society.* 1958; 102: 501 -9.
23. Lawal A M, Idemudia E S. Examining maternal age, breastfeeding self efficacy and health locus of control in psychological wellbeing of mothers. *Psychology, Health and Medicine.* 2017; 22(10): 1230-8.
24. World Health Organization. Global nutrition targets 2025: low birth weight policy brief. World Health Organization. 2017.
25. Mehta A, Rathi A K, Kushwaha K P, Singh A. Relactation in lactation failure and low milk supply. *Sudan J Paediatr.* 2018; 18(1): 39-47.
26. Kaur J, Sodhi M K, Mahajan S, Singh K, Kumar A, Kaur A, et al. Evaluation of utility of various interventions related to relactation and assessment of outcomes of relactation practice in mothers with infants up to 6 months of age. *Perinatology.* 2020; 21(3): 105-11.
27. Sara A. Q. Biological and behavioral predictors of exclusive breastfeeding duration. *Med Anthropol.* 1985; 9: 139-51.
28. Maternal, infant, and child health. *Healthy People 2020.*
29. Türkiye Nüfus ve Sağlık Araştırması 2018. Hacettepe Nüfus Etütleri Enstitüsü. Ankara: Türkiye, 2019.
30. Gamze Y. Investigation of nutrition patterns of 0-24 months babies. *Gümüşhane University Journal of Health Sciences.* 2019; 8(4): 343-52.
31. Lester BM, Conrard E, LaGasse LL, Tronick EZ, Padbury CF, Marsit CJ. Epigenetic programming by maternal behavior in the human infant. *Pediatrics.* 2008; 142: 1-8.