

Evaluation of the Effect of Breastfeeding on Sleep in 6-12-Month-Old Infants



Ata Toprak Acar¹, Ayşegül Doğan Demir²,
¹Bezmialem Vakif University, School of Medicine, Istanbul, Turkey
²Bezmialem Vakif University, School of Medicine, Department of Pediatrics, Istanbul, Turkey



INTRODUCTION

Infant sleep is affected by many variables. Breastfeeding could also be one of these and the lack of consensus about this relationship motivated us to investigate the association between infant sleep and breastfeeding.

METHODS

In a period of six months, 92 infants aging from 6 to 12 months, who were brought to the pediatric outpatient clinics of Bezmialem Vakif University Medical School Hospital were included in our study. Infants with any underlying chronic disease were excluded. The parents of the infants were asked to fill the Brief Infant Sleep Questionnaire and the data collecting questionnaire after the written consents were obtained. Our data collecting questionnaire investigated some demographic data and the feeding status of the infants. The infants were compared according to their feeding status.

The power analysis of our study had been made by the biostatistics department of our university before the study started and with 95% confidence interval and for 80% power, minimum sample size for our study was calculated as 92. Categorical variables were compared using McNemar test and continuous variables were compared using Mann-Whitney test. Collected data was analysed with IBM SPSS Statistics 22.0 and $p < 0,05$ was taken as statistically significant.

RESULTS

50% ($n=46$) of the participants were male and 50% ($n=46$) of them were female. Mean age of the participants was $277,22 (\pm 6,00)$ and 55,4% ($n=51$) of them were delivered via cesarean section while 44,6% ($n=41$) were delivered vaginally. Mean (\pm SD) age of the mothers of the infants was $30,41 \pm 0,486$ and the mean (\pm SD) age of the fathers of the infants was $33,50 \pm 0,53$. 93,5% ($n=86$) of the fathers were reported to be involved in the care of their babies.

We divided the infants into 3 groups according to their feeding status and compared the results according to this classification:

| | 0-6 Months | 6-12 Months |
|--------------------|------------------|----------------------------------|
| Group 1 ($n=59$) | Mother Milk Only | Combination |
| Group 2 ($n=26$) | Combination | Combination |
| Group 3 ($n=7$) | Combination | Formula \pm Complementary Food |

Table 1: Groups that the infants were divided into, according to their nutrition patterns.

The median values of infants' total duration of sleep at night were compared and the difference did not show any statistical significance between the groups as the p value was 0,614, as can be seen on Table 2 and Figure 1.

| | |
|---------|-------------|
| Group 1 | 570 minutes |
| Group 2 | 540 minutes |
| Group 3 | 540 minutes |

Table 2: Total duration (in minutes) of sleep of infants at night, median values.

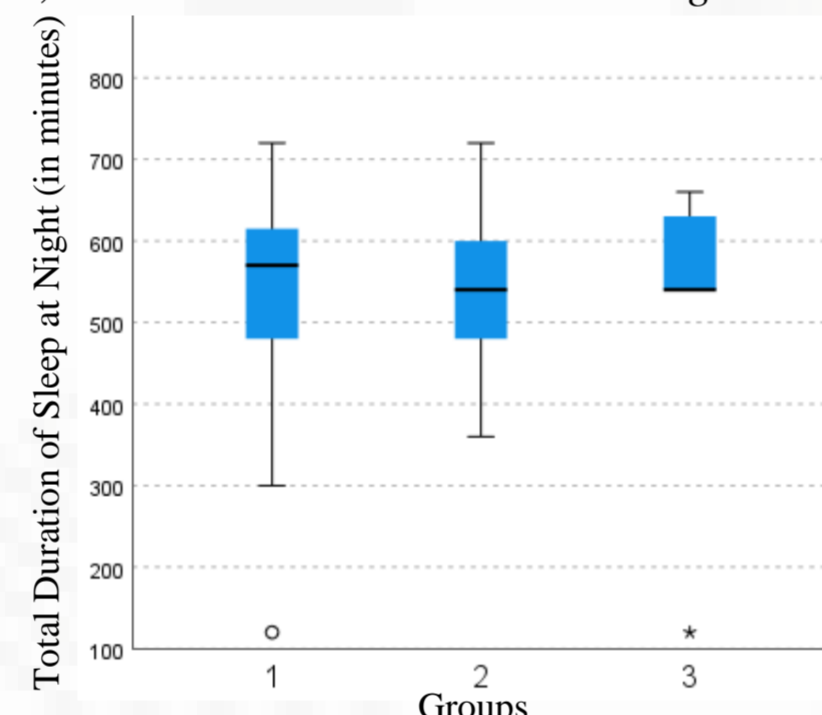


Figure 1: Total duration (in minutes) of sleep of infants at night, median values.

Parents were asked, how many times their babies woke up at a regular night and the difference was statistically insignificant ($p=0,120$). The results have been summarized on Table 3.

| | Mean (\pm SD) | Median |
|---------|------------------|--------|
| Group 1 | $2,59 \pm 1,161$ | 2,00 |
| Group 2 | $2,62 \pm 1,856$ | 2,00 |
| Group 3 | $2,00 \pm 2,769$ | 1,00 |

Table 3: The numbers of night awakenings of infants at a regular night, mean and median values.

What parents did, when their babies woke up at night was also investigated and the difference between groups was statistically significant ($p < 0,01$). The ratios of each behavior in each group have been shown on Table 4.

| Group | n |
|------------------|---------------|
| Group 1 | n = 59 |
| Breastfeed | 48 (81,4%) |
| Feed with feeder | 5 (8,5%) |
| None of these | 6 (10,2%) |
| Group 2 | n = 26 |
| Breastfeed | 12 (46,2%) |
| Feed with feeder | 12 (46,2%) |
| None of these | 2 (7,7%) |
| Group 3 | n = 7 |
| Breastfeed | 1 (14,3%) |
| Feed with feeder | 5 (71,4%) |
| None of these | 1 (14,3%) |

Table 4: What parents do, when their babies wake up at night.

Total time of sleeping and the number of naps during the day were questioned but no significant difference could be shown. Detailed information can be found on Table 5.

| | Total time of sleep during the day (median value) | Number of naps (median value) |
|-----------|---|-------------------------------|
| Group 1 | 150 min. | 2 |
| Group 2 | 142,50 min. | 2,5 |
| Group 3 | 180 min. | 3 |
| p value | 0,354 | 0,363 |

Table 5: The total time the babies sleep during the day and the number of naps they take, median values.

What time the bedtime routines of the infants started was asked to the parents and the answers were classified in 2 categories: before 10pm and after 10pm. Although comparison between group 1 and group 2 has been found statistically significant ($p=0,014$), other comparisons have not. The exact ratios have been summarized on Figure 2 and Table 6.

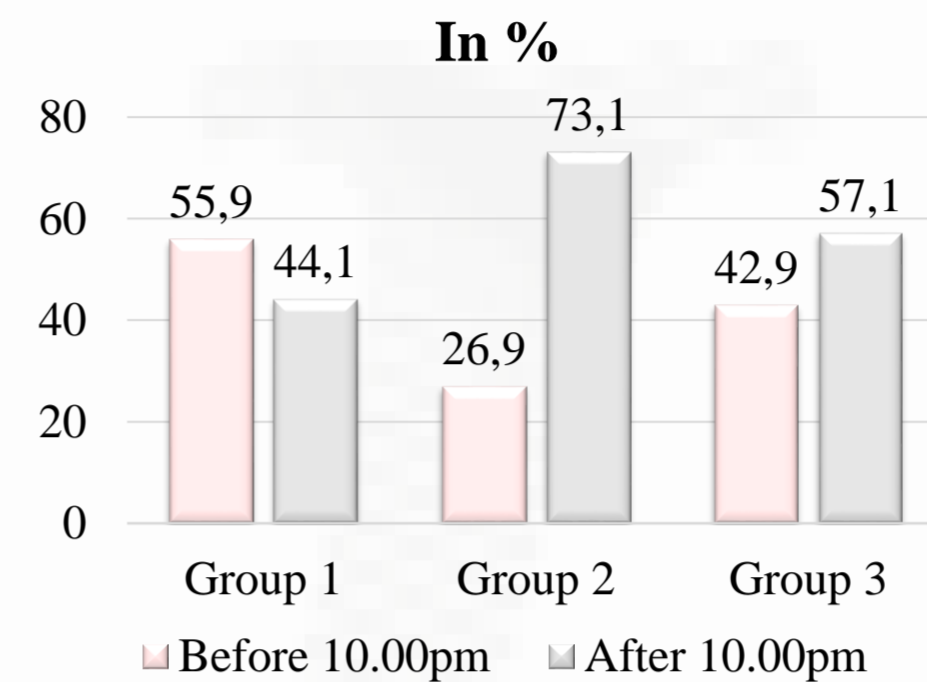


Figure 2: The starting time of the infants' bedtime routines, in percentage. Pink columns indicate «before 10 p.m.», gray columns «after 10 p.m.»

| | Before 10 p.m. | After 10 p.m. |
|-------------------|----------------|---------------|
| Group 1 $n=59$ | 33 (55,9%) | 26 (44,1) |
| Group 2 $n=26$ | 7 (26,9%) | 19 (73,1%) |
| Group 3 $n=7$ | 3 (42,9%) | 4 (57,1%) |

Group 1 vs 2: $p=0,014$ | Group 1 vs 3: $p=0,693$ | Group 2 vs 3: $p=0,646$

Table 6: The starting time of the infants' bedtime routines.

When parents were asked to evaluate the sleep of their children subjectively in a scale from 1 to 6, 1 being very well and 6 being very poorly, no statistically significant difference according to groups, sex or mode of delivery could be observed; as the median values shown on Figure 3 demonstrate.



Figure 3: The points given by parents to the sleep quality of their children in a scale from 1 to 6; compared according to groups, sex and mode of delivery; median values.

Parents were also asked to declare their thoughts about whether they saw the sleep of their babies as a problem. As demonstrated on Table 7, although there were some remarkable differences, these were statistically insignificant ($p=0,089$).

| | 1 | 2 | 3 |
|--------------------|-----------------|------------------|------------------|
| Group 1 ($n=59$) | 5,1% ($n=3$) | 44,1% ($n=26$) | 50,8% ($n=30$) |
| Group 2 ($n=26$) | 19,2% ($n=5$) | 19,2% ($n=5$) | 61,5% ($n=16$) |
| Group 3 ($n=7$) | 0% ($n=0$) | 42,9% ($n=3$) | 57,1% ($n=4$) |

Table 7: Do the parents consider the sleep of their babies as a problem? 1 = A serious problem; 2 = A small problem; 3 = Not a problem at all.

CONCLUSION

Our study showed that taking only mother milk without complementary food until six months of age is associated with an earlier start to bedtime routine. Also, we can conclude that exclusive breastfeeding in the first six months of life means for the parents more tendency to breastfeed the baby in case of a night awakening. Other parameters we investigated have failed to show any significant association with the feeding pattern of infants.

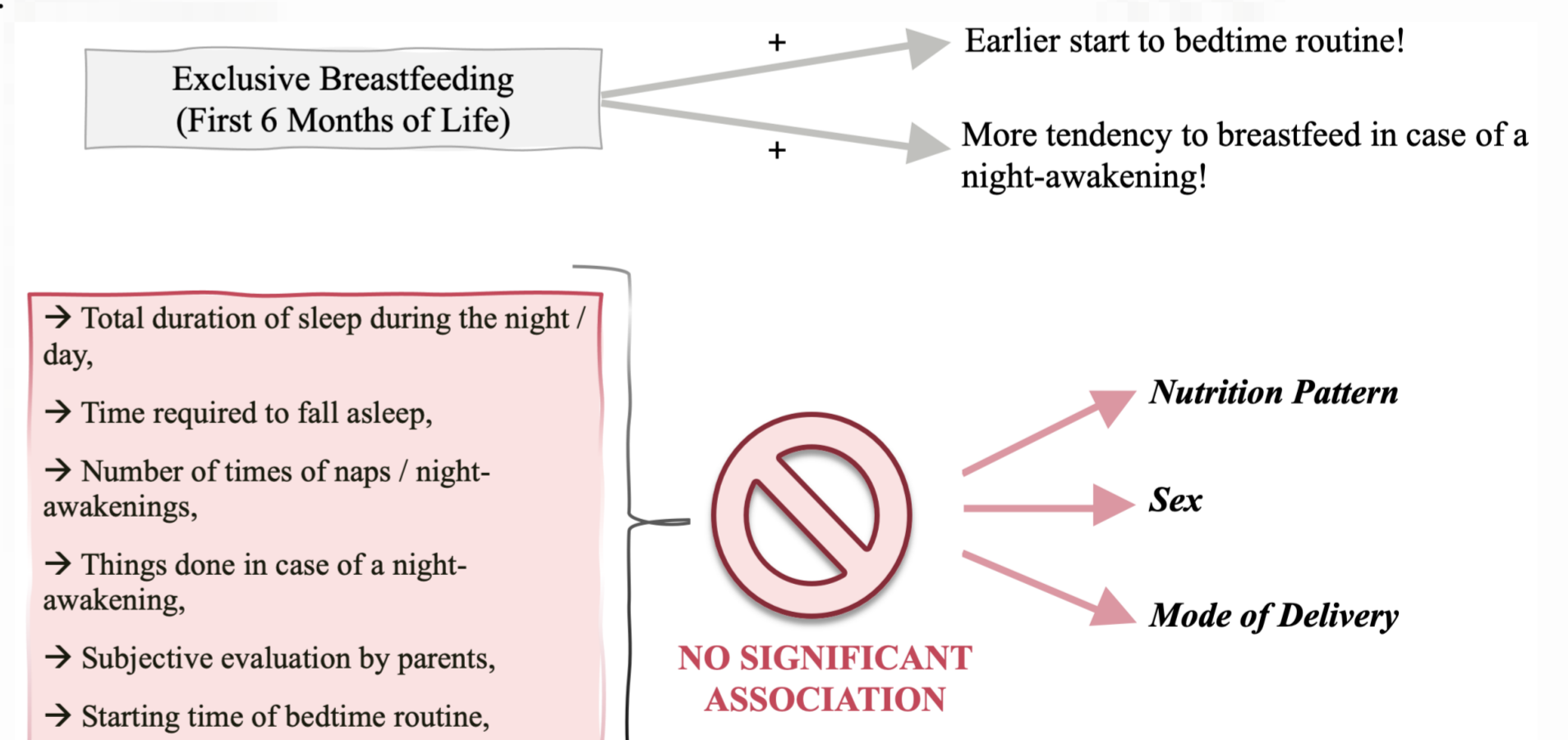


Figure 3: Summary of the conclusions of our study.

DISCUSSION

As the sleep of an infant is dependent on many factors, we think that the effect of nutrition may be concealed by other stronger determinants of infant sleep; so, we theorize that with a wider range of exclusion criteria, the results would be more significant.

Other than that, using a questionnaire has some disadvantages, for instance the answers can easily be manipulated. Also, the concentration of the participant on the questionnaire is dependant on many factors, like his/her mood, emotional stress level, available time etc. We believe that using a larger sample size would minimize such errors.

REFERENCES

- Barry ES. What Is "Normal" Infant Sleep? Why We Still Do Not Know. Psychol Rep. 2021 Apr;124(2):651-692. doi:10.1177/0033294120909447. Epub 2020 Mar 5. PMID: 32138610.
- Heraghty JL, Hilliard TN, Henderson AJ, Fleming PJ. The physiology of sleep in infants. Arch Dis Child. 2008 Nov;93(11):982-5. doi: 10.1136/adc.2006.113290. Epub 2008 Jul 24. PMID: 18653626.
- BORAN, Perran, Pınar AY, Azad AKBARZADE, Selda Küçük, and Refika ERSU. "Genişletilmiş 'Bebek Kısa Uykü Anketi'nin Türkçe'ye Çevirisi Ve Bebeklerde Uygulanması." *Marmara Medical Journal* 27, no. 3 (2014): 178. https://doi.org/10.5472/mmj.2014.03606.2
- World Health Organization. (2014). Global nutrition targets 2025: Breastfeeding policy brief. https://apps.who.int/iris/handle/10665/149022
- Huang, X., Wang, H., Chang, J., Wang, L., Liu, X., Jiang, J., & An, L. (2015). Feeding methods, sleep arrangement, and infant sleep patterns: A Chinese population-based study. *World Journal of Pediatrics*: WJP, 12(1), 66.