

# Evaluation of Baby Sleep Position Practices and Sleep Environment

## Bebek Uyku Pozisyonu Uygulamalarının ve Uyku Ortamının Değerlendirilmesi

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### ABSTRACT

**Objective:** The aim of this current study was to determine mothers' infant sleep position practices and their awareness of a safe sleeping environment.

**Material and Methods:** This descriptive survey was conducted with 418 mothers who had infants aged 0-6 months and who agreed to participate in pediatric outpatient polyclinics of two hospitals. Data were collected between January-December 2020 via-structured questionnaires by face-to-face interview.

**Results:** Of the 418 mothers; 28% placed their babies in the supine sleeping position, 59.6% used a pillow when they put their babies in bed and 76.8% used a soft mattress. 42.3% of mothers covered their babies' faces during sleep; primary school graduate mothers were more intended on covering their babies' faces than high school and university graduates ( $p<0.001$ ). 4.1% of mothers smoked during pregnancy, 9.8% during the lactation period and 15.3% were exposed to household smoke. All of the mothers shared a room with their babies without sharing a bed. There was also a positive correlation between the number of prenatal visits of mothers and their preference to put their babies to sleep in the supine position ( $p=0.010$ ).

**Conclusion:** Most of the mothers placed their babies in a side sleeping position. Mothers' avoiding sharing beds and smoking cigarettes and prone positioning their children at a very low frequency were pleasing measures. Mothers who had more prenatal visits were found to place their babies more in the supine sleep position. Increasing the awareness of healthcare providers and other secondary caregivers about a safe sleeping environment and baby sleep position during pre and postnatal visits would make right practices become widespread.

**Key Words:** Infant, Mothers, Sleep, Sudden infant death syndrome

### ÖZ

**Amaç:** Bu çalışmanın amacı, annelerin bebek uyku pozisyonu uygulamalarını ve güvenli uyku ortamı farkındalıklarını belirlemektir.

**Gereç ve Yöntemler:** Tanımlayıcı tipte olan bu araştırma, iki hastanenin çocuk polikliniklerine çalışmaya katılmayı kabul eden 0-6 aylık bebeği olan 418 anne ile yapıldı. Veriler, Ocak-Aralık 2020 tarihleri arasında yapılandırılmış anket yoluyla yüz yüze görüşme yoluyla toplanmıştır.



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**Ethics Committee Approval / Etik Kurul Onayı:** This study was conducted in accordance with the Helsinki Declaration Principles. The study protocol was approved by Bozok University Faculty of Medicine Ethics Committee (dated 11.12.2019, ID: 2019-12-294).

**Contribution of the Authors / Yazarların katkısı:** **CATAKLI T:** Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the Conclusions, Organizing, supervising the course of progress and taking the responsibility of the research/study, Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar. **SENEL S:** Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the Conclusions, Organizing, supervising the course of progress and taking the responsibility of the research/study, Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar.

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**Bulgular:** 418 annenin %28'i bebeklerini sırtüstü pozisyonda yatırırken, %59.6'sı yastık ve %76.8'i yumuşak yatak kullanmış, %42.3'ü uykuda iken bebeklerinin yüzünü örtmüşlerdir. İlkokul mezunu anneler, lise ve üniversite mezunlarına göre daha fazla bebeklerinin yüzünü örtmeye eğilimli idiler ( $p<0.001$ ). Annelerin %4.1'i gebelikte, %9.8'i emzirme döneminde sigara içmişler ve %15.3'ü ev içi sigara dumanına maruz kalmıştı. Annelerin tamamı yatak paylaşımı olmaksızın bebekleriyle aynı odayı paylaşıyordu. Annelerin doğum öncesi ziyaret sayısı ile bebeklerini sırt üstü yatırma tercihleri arasında pozitif yönde ilişki bulundu ( $p=0.010$ ).

**Sonuç:** Annelerin çoğu bebeklerini yan yatış pozisyonuna yerleştirmişlerdir. Annelerin yatak paylaşımından, sigara içmekten kaçınmaları ve çocuklarını çok düşük sıklıkta yüzüstü pozisyonda uyutmaları sevindirici önlemlerdi. Doğum öncesi ziyaretleri daha fazla olan annelerin bebeklerini daha çok sırt üstü yatış pozisyonuna yerleştirdiği saptandı. Doğum öncesi ve sonrası ziyaretlerde sağlık hizmeti sunucuları ve diğer ikincil bakıcıların güvenli uyku ortamı ve bebek uyku pozisyonu konusunda bilinçlendirilmesi doğru uygulamaların yaygınlaşmasını sağlayacaktır.

**Anahtar Sözcükler:** Bebek, Anneler, Uyku, Ani bebek ölümü sendromu

## INTRODUCTION

Baby caring practices of mothers are important determinants of infant mortality and morbidity (1). Making the baby sleep in a safe environment and sleeping position is one of the most important practices that will reduce the risk of sudden infant death syndrome (SIDS). Sudden Infant Death Syndrome (SIDS) is defined as the sudden unexpected death of an infant of <1 year, occurring during sleep, that remains unexplained after a whole investigation (2). The exact etiology of SIDS is not clear. Studies suggest that SIDS is associated with suboptimal physiologic responses to hypoxemia and hypercarbia and a combination of several intrinsic and extrinsic factors. The most important preventable SIDS risk factor is a supine sleeping position. Acknowledging prone sleeping as a means of preventing SIDS has resulted in advocacy that significantly decreased SIDS deaths. The incidence of SIDS declined by more than 50 percent in the United States after physicians began to promote "On the back to sleep" (3,4). The American Academy of Pediatrics (AAP) recommends a safe sleeping environment to reduce the risk of SIDS. Recommendations for a safe sleeping environment include supine positioning, the use of a firm sleeping surface, room-sharing without bed-sharing, and the avoidance of soft bedding and overheating. Additional recommendations to reduce SIDS include the avoidance of exposure to smoke, alcohol, and illicit drugs; breastfeeding; routine immunization; and the use of a pacifier. Despite campaigns recommending the avoidance of prone sleeping, mothers in different countries place their babies in unsafe sleeping positions (5,6). There is no national data on the frequency of SIDS, also known as "crib death" in our country. The Data on SIDS were generally derived from the studies exploring the causes and frequency of infant deaths, which were carried out on provincial scales. Turkey Statistical Institute data, crude birth rate was 15.3 per thousand and the infant mortality rate was 9.3 per thousand. It has been reported that 1.2% to 2.5% of these deaths are associated with SIDS (7). Although research in Turkey are province specific, they indicate, in approximately 1.250.000 live births 750-1200 infants die because of SIDS, which is considered a preventable death cause. There has been no national campaign on the safe sleeping position of babies in our country. The aim of this

current study was to determine mothers' infant sleep position practices and their awareness of a safe sleeping environment.

## MATERIALS and METHOD

This descriptive survey was conducted in pediatric outpatient clinics of two hospitals, one of which was a private hospital located in Ankara, the capital city of Turkey and the other was a public university hospital located in the central district of Yozgat. The research was conducted between January and June 2020 with 418 mothers of children aged 0-6 months-old who were admitted to outpatient clinics either as well-child or sick visits and who agreed to participate in the study were included. Parents of children with physical and developmental disabilities and neurological disorders were excluded from the study. Only mothers were included in the study.

The investigators collected data using a semi structured questionnaire (Supplement 1). The questionnaire was prepared by the researchers based on information in the literature (8-10). There were questions on the form related to the mothers characteristics (mother's age and educational level, monthly family budget) and descriptive characteristics of infants (gender, gestational weeks, birth weight, infant age, breastfeeding status, pacifier use), sleep position and potentially risky behaviors of mothers (sleeping mattresses, covering their babies' faces, not using pacifiers, smoking during pregnancy, smoking during pregnancy and/or lactation smoking during lactation, bed-sharing, not monitoring the temperature, etc.) and counseling about infant sleeping position and heard of sudden infant death syndrome. Mothers were informed about the purpose of the research and written informed consent to participate in this study was obtained. One of the authors (TC) read the questions to the mothers and wrote their answers on the questionnaire, which took approximately 10-12 min to complete. After obtaining these data, researchers instructed the mothers about safe sleeping environments and SIDS prevention measures. The study protocol was approved by Bozok University Faculty of Medicine Ethics Committee (dated 11.12.2019, ID: 2019-12-294).

## Statistical analysis

Data were analyzed using SPSS (Statistical Package for Social Sciences) for Windows 17 version 20 (Chicago, USA). Categorical variables were compared using the chi-square test. The level of statistical significance was set at  $p < 0.050$ .

## RESULTS

Of the 418 mothers; 45.2% (n=189) were between 31-37 years of age. 41.6% (n=174) had graduated from high school. The demographic characteristics of the mothers are shown in Table I. Of the 418 infants; 46.7% (n=195) were female, 49.5% (n=207) were aged between 1-3 months, 88.3% had a birth weight of  $>2500$  g and 68.9% (n=288) were breastfed (Table II).

Of the 418 mothers; 28% (n=117) placed their babies in the supine sleeping position, 72% (n=301) in a non-supine position. Of the infants in non-supine positions; 59.4% (179/301) were right or left-sided, 5.6% (n=17) were prone, and 34.8% (n=105) were in either two or three positions.

Examining the relation between the maternal educational level and the sleeping position revealed that high school

**Table I: Demographic characteristics of mothers**

Characteristics	Number (n)	Percent (n/418)
Mother's age		
Age < 20	24	5.7
Age 20-30	154	36.8
Age 31-37	189	45.2
Age > 37	51	12.2
Parity		
1	115	27.5
$\geq 2$	303	72.5
Mothers' education level		
Primary school	102	24.4
High school	174	41.6
University	142	34.0
Monthly household income		
Less than expenses	44	10.5
Equal to expenses	286	68.4
Higher than expenses	88	21.1
Profession		
Housewife	254	60.8
Having a job	164	39.2
Family type		
Nuclear	374	89.5
Extended	44	10.5
Type of public prenatal care service		
Public	239	57.2
Private	179	42.8
Method of delivery		
Vaginal	143	34.2
Cesarean	275	65.8

**Table II: Descriptive characteristics of infants**

	Number (n)	Percent (n/418)
Gender		
Female	195	46.7
Male	223	53.3
Gestational weeks		
$\leq 37$ week	63	15.1
$> 37$	355	84.9
Birth weight		
$\leq 2500$ g	49	11.7
$> 2500$ g	369	88.3
Infant age (month)		
<1	99	23.7
1 to 3	207	49.5
4 to 6	112	26.8
Feeding		
Currently breastfed	288	68.9
Never breastfed	11	2.6
Breast milk+formula	119	28.5

and university graduate mothers placed their children more frequently in supine position than primary school graduates ( $p=0.001$ ) (Table III).

Of the mothers; 4.1% (n=17) smoked cigarette during gestation, and 9.8% (n=41) smoked cigarette during lactation. 15.3% (64/418) were exposed to household smoke. All mothers shared their rooms with their babies. None of them shared the same bed.

59.6% (249/418) of mothers used a pillow for their babies. Using infant soft bedding was reported by 76.8% (n=321) of mothers (Table III). There was no significant relationship between the maternal educational level and the use of a pillow and soft bedding ( $p = 0.772$ ).

42.3% (177/418) of mothers covered their babies' faces during sleep. 'Not to be disturbed by light' was the most frequent 51.9%, (92/177) reason for covering faces. 'Not to have cold in the face' 23.2%, (41/177), 'fast recovery of neonatal jaundice' (15.8%, 28/177), and 'to avoid the evil eye' 9.0%, (16/177) were the other reasons, respectively. Primary school graduate mothers were more intent on covering their babies' faces than high school and university graduates ( $p < 0.001$ ). 54.8% (229/418) of mothers used pacifiers to help their babies sleep easily. 74.6% (319/418) of mothers monitored the 'baby's breathing' during.

When the relationship between the number of prenatal visits the mothers had and their preference for the sleeping positions of their babies is examined, it was found that 22.2% (26/117) of mothers who put their babies to sleep in supine position had 1-5 prenatal visits and 77.8% (91/117) of them had  $\geq 6$  prenatal visits. There was also a significant relation between the supine position and the number of prenatal visits ( $p=0.010$ ).

There were no significant relations between the sleeping position and the type of hospital where the delivery was made,

**Table III: Infant sleeping practices of mothers**

Characteristics	Position the Baby Sleep			p
	Supine (n/117)	Non Supine( Prone/Lateral ) (n/301)	Total n (n/418)	
Maternal age				
<20 year	12 (10.3)	2 (4)	24 (5.7)	0.073
20-30 year	38 (32.5)	116 (38.5)	154 (36.8)	
31-37 year	50 (42.7)	139 (46.2)	189 (45.2)	
>37 year	17 (14.5)	34 (11.3)	51 (12.2)	
Level of education				
Primary	16 (13.7)	86 (28.6)	102 (24.4)	0.001
High school	64 (54.7)	110 (36.5)	174 (41.6)	
University	37 (31.6)	105 (34.9)	142 (34.0)	
Type of prenatal care service				
Public	75 (64.1)	164 (54.5)	239 (57.2)	0.074
Private	42 (35.9)	137 (45.5)	179 (42.8)	
Getting knowledge about sleep position				
Health care professional	68 (58.1)	145 (48.2)	213 (51.0)	0.068
Other(grandmother, self-experience )	49 (41.9 )	156 (51.8)	205 (51.0)	
Infant's sleep surface				
Soft	102 (87.2)	219 (72.8)	321 (76.8)	0.223
Don't pay attention	15 (12.8 )	82 (27.23)	97 (32.2)	
Pillow use				
Yes	71 (60.7)	178 (59.1)	249 (59.6)	0.772
No	46 (39.3)	123 (40.9 )	169 (40.4)	
Using pacifiers				
Yes	70 (59.8)	159 (52.8)	229 (54.8)	0.196
No	47 (40.2)	142 (47.2)	189 (45.2)	
Covering infant's face				
Yes	44 (37.6)	133 (44.2)	177 (42.3)	0.222
No	73 (66.4)	168 (55.8)	241 (57.7)	
Smoking during pregnancy				
Yes	1 (0.9)	16 (5.3)	17 (4.1)	0.038
No	116 (99.1)	285 (94.7)	401 (95.9)	
Smoking during lactation				
Yes	12 (10.2)	29 (9.6)	41 (9.8)	0.031
No	105(89.7)	272 (90.3)	377 (90.1)	
Smoking in house				
Yes	15 (12.8 )	49 (16.2 )	64 (15.3)	0.378
No	102 (87.2 )	252 (83.7)	354 (84.7)	
Number of prenatal visits				
1-5	26 (22.2)	106 (35.2)	132 (31.6)	0.010
≥ 6	91 (77.8)	195 (64.8)	286 (68.4)	

number of births, gestational age, birth weight, breastfeeding, family type and monthly income ( $p > 0.050$ ).

52.4% (n=219) of mothers had heard about SIDS but there was no history of SIDS in the family or among the relatives of any mother. There was no significant relation between the mothers' knowledge of SIDS and the sleeping position ( $p=0.419$ ).

58.1% of mothers who placed their babies in a supine position, and 48% of those who placed them in non-supine positions had received prior knowledge about sleeping positions from healthcare professionals. There was no significant relation between the choice of sleep position and the source of information ( $p > 0.050$ ).

## DISCUSSION

The American Academy of Pediatrics recommends that infants should be put to sleep in a supine position to reduce the risk of SIDS (2). In this study, only 28% of mothers placed their infants to sleep in the supine position, which is recommended as a safe sleeping position. Most of the mothers (59.4%) placed their babies in right or left side sleeping positions. Mothers justified their avoidance of supine positioning as to avoid choking in case of vomiting, make breastfeeding easier, and avoid occipital flattening. Different studies also reported choking in case of vomiting as the common concern of parents who do not prefer supine positioning (8,10-14). Despite these concerns

of the parents, it was reported that the supine position did not increase the risk of suffocation and aspiration even in infants with gastroesophageal reflux of the protective airway, and there was no increase in the incidence of aspiration after switching to supine sleep recommendations (15). Another concern of the mothers was that supine sleeping position would cause occipital flattening. Flat head syndrome is also called positional plagiocephaly; one out of every five babies who were put to sleep in supine position were reported to have occipital flattening and that this difference was remedied approximately in the 18<sup>th</sup> month (16). This concern of the mothers was thought to be compatible with the findings in the literature.

The prone sleeping positions are strong risk factors for SIDS (6). In our study, 5.6% of the mothers declared that they preferred a prone sleeping position together with the other positions during daytime. They believed that this position would have decreased infantile colic. Mothers' frequency to prefer a prone sleeping position is lower than the results of similar studies conducted in our country (8,11,13,17). Research reported that more educated mothers prefer supine sleeping position for their babies, which was recommended as the correct sleeping positioning (9,18). In this study it was detected that high school graduate mothers prefer supine sleeping positions more than primary and secondary school graduate mothers. However, it was not different from university graduate mothers. This was explained by the small number of university graduate mothers.

AAP primarily recommends room sharing without bed sharing for a safe sleep (6). In this study all mothers were sleeping with their babies in the same room without bed-sharing. Özbörü Aşkan et al. (11) reported in their study that 86.4% of parents sleep in the same room with their babies without sharing the same bed. In our country it is a traditional practice that mothers have their babies sleep in a crib beside their bed in their bedrooms. This provides them with easier breastfeeding and better safety control. These practices of the mothers were thought to be compatible with the recommendations on successful breastfeeding and safe sleep.

Pillow use and use of soft bedding were reported to be the other risk factors for SIDS (6). In this study 59.6% of mothers used a soft pillow and 76.8% a soft bedding. There was no relation between the use of pillows or soft bedding and the level of maternal education. Research revealed that parents usually use soft pillows and soft beds as they think these would make their babies sleep in a warmer and comfortable setting (8,10,11,20-23).

Covering the face during sleep is considered to be a factor that increases the risk of SIDS (6). In this study, 42.3% of mothers covered their babies' faces while they were sleeping. Reasons for covering their babies' faces were declared as "avoiding disturbance by light", "protecting his/her face from cold", "recovering from jaundice soon" and "avoiding evil eye" by the mothers. One of the traditional practices in our country is to

cover the face of the newborn baby with yellow cheesecloth, with the thought that jaundice will pass more quickly (22). This attitude may increase the risk of SIDS as well as delay in the detection and treatment of neonatal jaundice. In studies conducted in our country, it has been reported that parents cover their babies' faces with similar concerns (8,23,24). It has been reported that traditional practice preferences decrease as maternal education level increases (20). In the current study, primary school graduate mothers were significantly more intent on covering their babies' faces than high school and university graduates.

It has been reported that breastfeeding has a protective effect against SIDS in addition to the several benefits in terms of mother and infant health (6). During our study, 73.2% of infants aged 0-3 months were exclusively breastfed, and this rate was higher than the 2018 Turkish Statistical Institute data (25). Breastfeeding practices of mothers are pleasing in terms of reducing infant morbidity and mortality.

AAP suggests offering pacifiers to infants at the onset of sleep to reduce the risk of SIDS but recommends avoiding pacifier use until breastfeeding is well established (6). More than half of the mothers in this study used a pacifier to calm their babies and help them sleep. The reasons for mothers to use pacifiers are similar to the results of other studies (9,11,13). It is good that the traditional practice of mothers using pacifiers are among the SIDS preventing measures.

Maternal smoking is one of the most important risk factors for SIDS. Maternal smoking during pregnancy increases the risk of SIDS with an estimated 22% of SIDS directly attributable to smoking (6, 26). In this study 4.1% of the mothers smoked cigarettes during pregnancy, 9.8% smoking during lactation. The smoking frequency of mothers during pregnancy was found to be lower than the results of similar studies in our country (8,10, 27).

One of the risk factors for SIDS is smoking in the house in which the infant lives (6). In our study, the proportion of smoking in the house in which the infant lived was found to be 15.3%. Mothers stated that smoking was not allowed in the baby's room, but on the balcony or at the window opening to the outside of the house. In our study, the rate of smoking at home was found to be lower than the results of similar studies conducted in our country (8, 24).

Prenatal visits allow mothers to inform about healthy infant care practices. It has been reported that the risk of SIDS is lower in babies whose mothers receive regular prenatal care (28). To reduce maternal and infant mortality in Turkey, mothers and their babies are observed at least four times during pregnancy, six times during the puerperium, three times after delivery in the hospital and three times at their home (29). In this study mothers who had more prenatal visits were found to place their babies more in the supine sleep position. Differing from the findings of our study, Cesar et al reported that the number

of prenatal visits did not have an effect on the mothers' infant sleeping position practices (9).

Mothers' decisions about sleeping positions and the environment may be influenced by guidance provided by infants' grandmothers. In this study, approximately half of the mothers declared that they determined the sleeping positions of their babies upon the recommendations of grandmothers of their babies (particularly maternal grandmothers). Similarly, Aitken et al reported that grandparents who look after their grandchildren younger than six months-old prefer supine position less as they think this position would increase the risk of choking (30).

More than half of the mothers stated that they received advice from the midwife/nurse or pediatrician of the hospital where they gave birth. Despite this, it was observed that most of the mothers in our study preferred to sleep their babies in the side sleeping position. In some studies conducted, it has been reported that healthcare professionals recommend the side sleeping position as the 'correct' baby sleeping position (10,31-33).

In this study half of the mothers had heard about "crib death" (SIDS) but there was no history of SIDS in the family or among the relatives of any mother. The practice of sleeping positions was similar between mothers with and without crib death information. In our study, nearly two-thirds of the mothers stated that they monitor their babies' breathing at regular intervals during sleep. Although they generally prefer a side sleeping position for their babies, this attitude of the mothers can be related to the traditional behavior to protect babies from "cradle death".

The relatively low sample size may be considered as a limitation of our study and the results do not reflect the whole country. Nevertheless, the results provide valuable data about infant sleeping practices among young mothers in two Anatolian cities despite these limitations.

## CONCLUSION

Mothers mostly placed their babies in a "side sleeping position. Risky sleeping attitudes such as covering the babies' faces, using pillows and soft bedding were detected at high rates but fortunately, they avoided sharing beds and smoking cigarettes and putting their babies in a prone position at a very low frequency was pleasing.

Mothers who had more prenatal visits were found to place their babies more in the supine sleep position. Increasing the awareness of healthcare providers and other secondary caregivers about safe sleeping environments and baby sleep position during pre and postnatal visits would make right practices becoming widespread.

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**Supplement 1: Evaluation of Baby Sleep Position Practices and Sleep Environment**

**Questionnaire (Survey answered by only mother)**

Demographic characteristics of mothers			
Mother's age			
Parity			
Mothers' education level	Primary school	High school	University
Monthly household income	Less than expenses	Equal to expenses	Higher than expenses
Profession	Housewife	Having a job	
Family type	Nuclear	Extended	
Type of public prenatal care service	Public	Private	
Method of delivery	Vaginal	Caesaria	
Descriptive characteristics of infants			
Gender	Female	Male	
Gestational weeks			
Birth weight			
Infant age (month)			
Breastfeeding	Formula	Breastmilk+formula	
Infant sleeping practices of mothers			
Getting knowledge about sleep position	Health care professional	Other	
Infant's sleep surface	Soft	Don't pay attention	
Pillow use	Yes	No	
Using pacifiers	Yes	No	
Covering infant's face	Yes	No	
Smoking during pregnancy	Yes	No	
Smoking during lactation	Yes	No	
Smoking in house	Yes	No	
Number of prenatal visits	1-5	≥ 6	