

# Creating a safe sleep environment for babies: what are the practices performed by mothers?

Creating  
a safe sleep  
environment

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## Abstract

**Purpose** – This study aims to determine the practices performed by mothers to create a safe sleep environment for their babies.

**Design/methodology/approach** – This cross-sectional study was conducted at Family Health Centers (FHCs), the Central Anatolian Region of Turkey. The study sample consisted of 455 mothers who had 0–12-month-old babies. The data were collected via a questionnaire to ascertain the descriptive characteristics and means of creating a safe sleeping environment.

**Findings** – Mothers performed unsafe/risky practices as well as safe practices. Unsafe practices of mothers included 92.3% preferring soft mattresses, 87.0% placed a pillow under the baby's head, 17.8% preferred a prone sleep position for their baby, 16.9% covered the baby's face with a piece of thin cloth, 14.3% kept the sheet on the mattress loose, 6.8% of the mothers shared the same bed, 2.4% reported smoking in the environment where the baby slept.

**Originality/value** – Based on our findings, it is recommended that nurses should provide information on creating a safe sleep environment to mothers during FHC visits, and at-risk practices should be identified through home visits.

**Keywords** Safe sleep environment, Baby, Mothers, Practices Turkey

**Paper type** Research paper

## Introduction

A large majority of infant deaths occur due to sudden unexpected infant deaths (SIDS), which generally occurs during sleep and mostly due to an unsuitable sleep environment, within the first year of life [1–3]. In the USA, nearly 3,500–4,000 babies die due to sleep-related SIDS each year [4–7]. The Center for Disease Prevention and Control reported that SIDS is among the top three causes of infant deaths, and in 2018, approximately 1,300 infant deaths occurred due to SIDS, 1,300 due to unknown causes and 800 due to accidental suffocation and strangulation in bed [8]. Data on the incidence of SIDS in Turkey are inadequate; however, the rate of sleep-related SIDS is reported to vary between 1.2 and 9.9% in studies conducted in different provinces [9–11].

As newborns and infants spend most of the day sleeping, creating a safe sleep environment for them is extremely important [12, 13]. In line with studies on the subject, a safe

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sleep environment can be defined as the arrangement of the baby's sleep environment in such a way as to protect the baby from risky situations such as accidental suffocation or SIDS during sleep [14–16]. To create a safe sleep environment, the American Academy of Pediatrics (AAP) recommended that the baby should sleep in a supine position, using a firm sleeping surface, avoiding the use of a soft mattress, sharing a room with the baby without sharing the bed, keeping soft objects away from the cradle, using a pacifier during nap-time, avoiding an excessively warm environment, placing the baby in bed so that the baby's feet touch the bottom edge of the bed (mattress), keeping the sheet on the mattress tight and placing the blanket below the baby's armpits [16–18].

To prevent negative consequences during sleep, parents must assume important responsibilities to eliminate risk factors related to the sleep environment. As the primary responsibility for baby care lies with mothers, evaluating their awareness of safe sleep and risky behaviors is of great importance in terms of reducing sleep-related infant deaths and directing the healthcare professionals' educational activities regarding the issue [5, 16]. This study aimed to determine the safe and unsafe practices performed by mothers and the effect of sociodemographic characteristics on mothers' unsafe practices.

## Methodology

### *Study design*

This cross-sectional study was conducted in family health centers (FHCs) in a city center in the Central Anatolian Region of Turkey between February and September 2017. FHCs are health institutions that are responsible for the provision of primary healthcare services, and within this context, preventive health services, primary care diagnosis, treatment, rehabilitation and consultancy services are performed in FHCs.

### *Participants*

In the central district of the province, there are 11 FHCs. Of these, two were excluded from the study because they had only recently begun to provide health services, and thus, there were not many patients registered with them. Therefore, the study included nine FHCs.

Of the mothers who presented to the FHCs between the aforementioned dates, those who had 0–12-month-old babies, had no communication and language problems, had babies with no health problems requiring special care (e.g. chronic diseases or congenital anomalies) and agreed to participate were included in the study. The total sample size was 455 mothers, calculated using the power analysis of the Minitab program with a deviation rate of 5% and a confidence interval of 99%.

### *Data collection*

The descriptive characteristic questionnaire for the mother and baby and creating a safe sleeping environment questionnaire was used to collect the data.

*Descriptive characteristic questionnaire for the mother and babies.* The questionnaire consisted of items about the participating mothers' and babies' sociodemographic characteristics.

*Creating a safe sleeping environment questionnaire.* The researchers prepared this questionnaire by reviewing pertinent literature. It included questions on the practices performed by mothers to create a safe sleep environment, the properties of the materials they use in creating a safe sleep environment and the baby's sleeping position [1, 5, 15, 17–19].

### *Administration of the questionnaires*

Personnel working in FHCs were informed about the purpose and scope of the research. The questionnaires were filled out in a room in the FHCs allocated for the interviews after the babies were examined. The interview rooms were free from interruptions and outside noise, which enabled the researchers to communicate with the participants comfortably. The data were collected using the descriptive characteristic questionnaire and creating a safe sleeping environment questionnaire. The questionnaires were completed face to face for an average of 20 min.

### *Ethical issues*

Before the study was conducted, necessary permissions were obtained from the Public Health Institution and Bozok University Non-invasive Clinical Research Ethics Committee (2017-02/03). Additionally, written consent of the mothers included in the study was obtained.

### *Data analysis*

Data were analyzed using the IBM SPSS Statistics 25.0 (IBM Corp., New York, USA). Descriptive statistics were given in numbers ( $n$ ) and percentages (%). Binary logistic regression with backward elimination analysis was used to determine sociodemographic factors affecting mothers' unsafe practices. For all applications, age, educational status, economic status, family type, number of children and employment status were modeled. Factors with  $p < 0.10$  were included in the final model, and  $p < 0.05$  was considered statistically significant.

## **Results**

About 47.9% were in the age group of 26–35 years, and 39.5% were senior high-school graduates. Two-thirds of the mothers were housewives and did not work, and the majority had a core family and defined their family's economic status as "income equal to expenses." Half of them had one child. Of the babies, 55.2% were females, 60.2% were delivered by natural childbirth and 53.2% were exclusively breastfed (Table 1).

### *The safe and unsafe practices performed by mothers*

In Table 2, of the mothers, 95.4% shared the same room with their baby, 98.7% kept the temperature of the room where the baby slept at an appropriate level (20–24 °C), 85.7% kept the sheet on the mattress tight, 36.9% preferred the supine sleep position for their baby and 3.3% swaddled their baby during sleep. Moreover, 83.1% did not cover the baby's face with a piece of thin cloth while the baby was asleep, 97.6% did not smoke, 13.0% did not use a pillow under the baby's head (safe practices). On the other hand, 92.3% of the mothers preferred soft sleep surface/mattress, 87.0% placed a pillow under the baby's head, 16.9% covered the baby's face with a piece of thin cloth while the baby was asleep, 14.3% kept the sheet on the mattress loose, 6.8% shared the same bed with the baby and 2.4% reported smoking in the environment where the baby slept (unsafe/risky practices).

### *The sociodemographic characteristics affecting the mother's unsafe practices*

In Table 3, no statistically significant variable was found for the sleep surface/characteristic of the mattress used in the baby's cradle and the applications of using pacifiers during sleep. It has been determined that the mother's economic situation affects bed-sharing. Accordingly, the unsafe application rate of those whose income is less than their expenses is 5.129 times

Characteristics	<i>n</i>	%
Mothers' age (years) ( $\bar{x} \pm SD$ )		28.3 ± 6.4
16-25	161	35.4
26-35	218	47.9
36-44	76	16.7
<i>Mothers' educational status</i>		
Primary school	116	25.5
Junior high school	65	14.3
Senior high school	180	39.5
University	94	20.7
<i>Mothers' occupation</i>		
Housewife	337	74.1
Worker	41	9.0
Officer	77	16.9
<i>Mothers' occupational status</i>		
Employed	132	29.0
Not employed	323	71.0
<i>Family type</i>		
Nuclear	367	80.7
Extended	76	16.7
Fragmented	12	2.6
<i>Family's socioeconomic status</i>		
Income less than expenses	89	19.6
Income equal to expenses	356	78.2
Income more than expenses	10	2.2
<i>The number of children in the family</i>		
1	251	55.2
2	108	23.7
≥3	96	21.1
<i>Gender of the babies</i>		
Female	251	55.2
Male	204	44.8
<i>Baby's age (months)</i>		
0-6	330	72.5
7-12	125	27.5
<i>Delivery type</i>		
Natural birth	274	60.2
Caesarean birth	181	39.8
<i>Feeding method</i>		
Breast milk	242	53.2
Formula	16	3.5
Breast milk + formula	197	43.3

**Table 1.**  
Descriptive characteristics of the mothers and babies (*N* = 455)

higher than those whose income is equal to their expenses. It was determined that the number of children had an effect on the unsafe practice of using loose sheets. An increase in the number of children owned increases the risk of an unsafe application by 1.519 times. The family type was found to influence pillow use. The rate of unsafe practices of those who had

Practices	<i>n</i>	%
<i>Room sharing</i>		
Yes	434	95.4
No	21	4.6
<i>Bed-sharing</i>		
Yes	31	6.8
No	424	93.2
<i>Sleep surface/feature of the mattress used</i>		
Firm	35	7.7
Soft	420	92.3
<i>The way the sheet is placed</i>		
Tight	390	85.7
Loose	65	14.3
<i>Pillow use</i>		
Yes	396	87.0
No	59	13.0
<i>Covering the baby's face with a piece of thin cloth</i>		
Yes	77	16.9
No	378	83.1
<i>Baby's frequent sleeping position</i>		
Supine position	168	36.9
Prone position	81	17.8
Lateral position	206	45.3
<i>Smoking in the baby's sleep environment</i>		
Yes	11	2.4
No	444	97.6
<i>Using a pacifier while the baby falls asleep</i>		
Yes	304	66.8
No	151	33.2
<i>Swaddling</i>		
Yes	15	3.3
No	440	96.7
<i>Temperature of the room where the baby sleeps</i>		
Cool (18 °C)	4	0.9
Normal (22–24 °C)	449	98.7
Hot (> 24 °C)	2	0.4

**Table 2.** Practices performed by mothers to create a safe sleep environment (*N* = 455)

extended families was 3.105 times higher than those who lived as a nuclear family. Those with a fragmented family type were similar to those with a nuclear family type.

Mothers' occupational status was effective on the application of covering the baby's face while sleeping. The misapplication risk of unemployed mothers was 2.262 times higher than that of employed mothers. It has been determined that the number of children and socioeconomic status affected smoking in the baby's sleeping environment. An increase in the number of children increased the risky application rate by 1.924 times. The rate of making risky applications was 9.615 times higher for those whose income was less than their expenses.

	$\beta$	SE	Wald statistics	$p$	Exp( $\beta$ )	95% CI for exp( $\beta$ )	
						Lower	Upper
<i>Bed-sharing</i>							
Constant	3.153	0.264	142.986	<0.001	0.043	–	–
<i>Socioeconomic status</i>							
Income equal to expenses	1						
Income less than expenses	1.635	0.382	18.343	<0.001	5.129	2.427	10.838
<i>Smoking in the baby's sleep environment</i>							
Constant	-6.150	0.825	55.561	<0.001	0.002	–	–
The number of children	0.654	0.235	7.723	0.005	1.924	1.213	3.052
<i>Socioeconomic status</i>							
Income equal to expenses	1						
Income less than expenses	2.263	0.705	10.309	0.001	9.615	2.415	38.280
<i>The way the sheet is placed</i>							
Constant	-2.593	0.280	86.048	<0.001	0.075	–	–
The number of children	0.418	0.118	12.622	<0.001	1.519	1.206	1.913
<i>Pillow use</i>							
Constant	1.757	0.147	142.208	<0.001	5.796	–	–
<i>Family type</i>							
Nuclear	1						
Extended	1.133	0.534	4.496	0.034	3.105	1.089	8.852
Fragmented	0.641	1.055	0.369	0.544	1.898	0.240	15.000
<i>Covering the baby's face with a piece of thin cloth</i>							
Constant	-2.214	0.292	57.457	<0.001	0.109		
Occupational status employed	1						
Not employed	0.816	0.324	6.356	0.012	2.262	1.199	4.266
<i>Sleeping position</i>							
Constant	-2.398	1.044	5.271	0.022	0.091		
<i>Family type</i>							
Fragmented	1						
Nuclear	3.059	1.050	8.481	0.004	21.296	2.718	166.832
Extended	2.716	1.070	6.445	0.011	15.125	1.857	123.162

**Table 3.** Sociodemographic characteristics effect of the mother's unsafe practices

### Discussion

Providing the safest environment for infants every time they sleep is a global public health priority [20, 21]. We aimed to determine mothers' practices for establishing a safe sleep environment and related factors in the first year of life. As this is a risky period for sleep-related deaths among babies, we hoped to raise awareness of risky parent groups and practices.

#### *Safe and unsafe practices performed by mothers*

The AAP reported that sharing the same room with the baby without sharing the same bed prevents SIDS [17]. The rate of sharing the same room with the baby was quite high (95.4%) compared with the study of Özbörü Aşkan *et al.* [22] at 88%.

In the present study, the rate of sharing the same bed with the baby was 6.8%. Bed-sharing increases the risk of sudden infant deaths [17, 23]. A study by Erdoğan [15] revealed that 28.5% of the mothers shared the same bed with the baby while they were sleeping A

study by Cunningham *et al.* [21] reported a rate of 44.7%, Stromberg Celind *et al.* [24] at 44.2% and Bombard *et al.* [25] at 61.4%. In a study by Cunningham *et al.* [21], one factor causing the mothers to share the bed was breastfeeding. A study conducted in the USA reported that bed-sharing could not be prevented. It revealed that 55% of the mothers breastfed their babies at night in a breastfeeding chair, chair or couch, and that 44% of them fell asleep while breastfeeding in bed [26]. The AAP recommends that the baby may be allowed to sleep in a bed for a while if the baby is taken to bed for breastfeeding and has slept while breastfeeding, but it should be put back in the cradle while the mother is asleep [17]. In our study, the rate of bed-sharing was lower than in other relevant studies, which can be explained by the effectiveness of the training provided. It is recommended that reasons for mothers' sharing beds with their babies should be investigated in future studies.

Having a baby sleep on a soft sleep surface/mattress, not keeping the sheets tight, using soft objects and covering the baby's face with a piece of cloth increase the risk of SIDS due to suffocation [17]. In this study, almost all the mothers slept their babies on soft mattresses. Mathews *et al.* [27] reported that 72.9% of the mothers preferred soft mattresses for their babies, and Bombard *et al.* [25] found that 38.5% of the mothers used soft mattresses. However, contrary to the aforementioned findings, 54.1% of the mothers had their babies sleep on firm mattresses in Canbal's study [20]. It was thought that mothers preferred soft mattresses, because they may have thought that their babies would be more comfortable. However, the reasons can be a topic of investigation in another study.

In this study, 16.9% of the mothers covered their baby's face with a piece of thin cloth during sleeping, compared with 52.3% in Canbal's study [20]. In Turkish society, traditionally, the baby's face is covered with a piece of thin cloth due to the false belief that it can prevent the baby from developing jaundice [28]. Because such practices could put the baby's sleep safety at risk and lead to suffocation, identification of such traditional false beliefs could be a topic of future studies.

Keeping soft objects such as toys, blankets and pillows in the sleep environment is not recommended because of the risk of airway obstruction in the baby [17]. In this study, most mothers used pillows. Gaw *et al.* [29] reported that pillows were the most common objects leading to accidental suffocation in infants. Erdoğan [15] revealed that 65.8% of the mothers placed a pillow under the baby's head, whereas Özbörü Aşkan *et al.* [22] reported that half of the mothers placed a pillow under the baby's head while their babies were sleeping during the first six months. In Erdoğan and Turan's study [16], 63% of the mothers placed a pillow under the baby's head.

Although most parents are aware that sleep in the supine position is the safest sleep position, only a few of them had their babies sleep in the correct position [30]. Only one-third of the mothers preferred the supine sleeping position for their babies, and the lateral position was the most preferred. Studies conducted in different countries revealed that the ventral/lateral position was preferred by 82.1% of the participants in Brazil, while the supine position/lying on their back was preferred by 72.4% in The Netherlands, and 89% in Georgia [7, 31, 32]. Similar to these findings, 77.3% of the mothers preferred the supine sleep position in Colson *et al.*'s study [33].

Some methods can be used to calm the baby. In our study, more than half of the mothers gave pacifiers to their babies to put them to sleep. Our result was consistent with the rate reported by Özbörü Aşkan *et al.* at 55.8% [22]. In this study 3.3% of mothers swaddled their babies. Swaddling or wrapping is considered a common and traditional practice for settling and soothing the infant. Swaddling or wrapping the infant in a light blanket is often used as a strategy to calm the infant and encourage sleep in the supine position. There is a high risk of death if a swaddled infant is placed in or rolled to the prone position. However, mothers must ensure that the baby is always on his or her back when swaddled. The swaddle should not be too tight or made too hard

for the baby to breathe or move his or her hips [17]. In Cunningham *et al.*'s study [21], 77.2% of the mothers responded "yes" to the question "Do you usually wrap your baby?"

In terms of sleep safety, some situations require attention in the environment where the baby sleeps [17]. In this study, almost all the mothers kept the temperature of the room where their babies slept at normal (20–24 °C). It is stated that overheating the baby puts it at risk of SIDS; therefore, the baby should be allowed to sleep at normal room temperature, and excessive clothing should be avoided [17]. In this study, 2.4% of mothers reported that they smoked cigarettes in the baby's sleep environment, which is an unsafe practice. One of the risk factors for SIDS is smoking in the house in which the infant lives. In Erdoğan's study [15], the proportion of smoking in the house in which the infant lived was 40.8%.

#### *The effect of the sociodemographic characteristics on the mothers' unsafe practices*

It was determined that the socioeconomic status affects bed-sharing practice ( $p < 0.05$ ). Bed-sharing was common in the participants who had low income. In Canbal's study [20], the bed-sharing rate was higher in mothers whose income was lower than their expenses than in other mothers. This finding was consistent with that of our study. Furthermore, sociodemographic factors did not have a significant effect on the characteristic of the mattress used in the baby's sleeping environment ( $p > 0.05$ ). Contrary to the findings of our study, Alparslan and Uçan [34], found that the rate of laying babies on the soft bed surface significantly increased in large families.

It has been observed that the number of children in the household affects the child's use of loose bedsheets from unsafe practices in the environment where the baby is sleeping and this risk increases as the number of children increases. It was thought that the reasons for the increase in the number of children and the rate of using soft sheets were the increasing care burden. The family type was found to have an effect on pillow use. The risky application is 3.105 times higher for those with extended families than those with nuclear families. In the study of Erdoğan [15], it was found that mothers with an extended family structure were more likely to use pillows to put their babies to sleep. It is thought that this situation is because traditional practices of family elders influenced mothers with an extended family structure in the care of their babies. Similar to our findings, in another study on the subject, there was a relationship between pillow use and family type, and also income level [20].

It has been determined that the number of children and socioeconomic status had an effect on smoking in the baby's sleeping environment. An increase in the number of children in the family increases the risk of misapplication by 1.924 times. The misapplication risk of those whose income was less than their expenses was 9.615 times higher than the reference group. In contrast to our findings, Alparslan and Uçan [34] found no relationship between the baby's exposure to passive cigarette smoke and demographic characteristics .

In this study, it was determined that mothers' occupational status on the application of covering the baby's face while sleeping had an effect, and that unemployed mothers had a higher risk for unsafe application than employed mothers. This may be due to the low education level of most unemployed mothers. Other sociodemographic characteristics were found to have no effect. In Erdoğan's study [15], the rate of the application of covering the baby's face was highest in mothers who were primary school graduates and lowest in university graduates. Alparslan and Uçan [34] found that sociodemographic characteristics were not determinative in covering the baby's face. Meanwhile, Canbal's study [20] reported that the same practice was most frequently performed by mothers under the age of 20 years and least frequently by mothers with a core family and high income.

One of the leading risk factors that increases the possibility of SIDS is the sleep position, although it is a preventable risk factor [17]. In this study, it was determined that only family



type affects the risky practice of laying the baby in the prone position, which is one of the unsafe practices related to sleeping position. In a study conducted on the same issue, mothers having a core family preferred sleeping their babies in the lateral position [15]. Other sociodemographic characteristics were found to have no effect. Contrary to our findings; Cesar *et al.* [31] found that the lower the schooling of the mothers and the greater the number of people per bedroom and number of children, the greater the probability of women choosing an unsafe baby sleeping position. Colson *et al.* [33] found that babies of mothers who did not complete high school were more likely to use the prone position.

*Limitations of the study.* The results of the study apply only to the mothers who had 0–12-month-old babies registered with FHCs in Yozgat city center and are limited to the responses given to the questionnaires by these mothers.

*Conclusion.* It was determined that mothers applied unsafe practices such as sharing a bed with their baby, having the baby sleep on a soft mattress, using pillows, covering the baby's face with a piece of thin cloth during sleep, smoking in the baby's sleep environment and sleeping the baby in a prone position. It was determined that the factors affecting the unsafe practices of mothers were the number of children, family type, working status and socioeconomic status.

It is recommended that nurses should provide information on creating a safe sleep environment to mothers during prenatal pregnancy follow-ups, during their stay in postnatal maternity services or neonatal units and especially during their visits to FHCs in terms of preventing the risk factors of SIDS because they are most eager to get information during these periods. In addition, risky groups should be identified through home visits; babies' sleep environments should be evaluated, and attempts to prevent risky practices should be made through repeated training. Future research can focus on the further exploration of mothers' beliefs, knowledge and practices regarding risk-reduction recommendations and the impact of cultural practices to create a safe sleeping environment.

Conflict of Interest: None

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