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Original Article

Sudden infant death syndrome: How much mothers and health professionals know

Hulya Yikilkan,[1] Pemra Cobek Ünalan,[1] Erkan Cakir,[2] Refika Hamutcu Ersu,[2] Serap Cifcili,[1] Mehmet Akman,[1] Arzu Uzuner[1] and Elif Dagli[2]

[1]*Departmant of Family Medicine and* [2]*Division of Pediatric Pulmonology, Marmara University, Istanbul, Turkey*

Abstract ***Background***: Behavioral risk factors are associated with sudden infant death syndrome (SIDS). Education about the risk factors of SIDS is important for prevention. Our aim was to determine the knowledge and attitude of parents and health professionals about SIDS.

Methods: A total of 174 health professionals and 150 mothers were enrolled in this study. Mothers' data were collected by telephone interview and health-care professionals were interviewed by the same investigator.

Results: Only 39% of mothers were aware of SIDS. Forty-six percent of the mothers preferred a supine sleeping position for their infant and 16% of the parents were bed-sharing with their infants. Seventy-three percent of health professionals selected side, 17% supine and 10% prone sleeping position as the safest sleeping position. Frequencies for awareness of risk factors were: bed-sharing (75%), soft bedding (70%), pillow use (52%), toys in bed (90%), high room temperature (67%) and smoking (88%). Total knowledge score of health professionals who selected supine sleeping position as the safest was significantly higher ($P < 0.001$).

Conclusion: Most of the mothers were unaware of SIDS and less than half preferred a supine sleeping position for their infant. Only 72% of health professionals recommended a certain sleeping position during family interviews. Health professionals are more often recommending the side sleeping position or prone. Education of families and health professionals for the risk factors of SIDS may reduce the number of deaths from SIDS in Istanbul.

Key words bed-sharing, child, sleep, sleeping position, sudden infant death syndrome.

Sudden infant death syndrome (SIDS) is defined as the sudden death of an infant under 1 year old that is unexpected and unexplained after a thorough postmortem examination. SIDS is the only cause of death derived by exclusion of other causes.[1] Despite declines in prevalence during the past two decades, SIDS continues to be one of the leading causes of infant mortality in the post-neonatal period.[2–5] SIDS is a complex, multifactorial disorder, the cause of which is still not fully understood. Behavioral risk factors identified in epidemiological studies include prone and side sleeping positions, smoke exposure, soft bedding, and overheating.[5–10]

Although there is widespread agreement among SIDS researchers for many of the SIDS risk factors, there is still a continued debate as to whether pacifiers are protective and whether it is bed-sharing itself or the particular way families bed-share that put infants at risk.[11–15]

Although SIDS affects infants from all social strata, lower socioeconomic status, younger maternal age, inadequate prenatal care and lower maternal education level are consistently associated with an increased risk of SIDS.[2,6,16] Emerging evidence also substantiates an expanding number of genetic risk factors.[17] There is a major association between sleeping position and SIDS. The prone sleeping position increases the risk of SIDS.[18] Studies indicate that the side sleeping position is twice as risky as the supine sleeping position; infants who lie on their side may turn to the prone sleeping position.[19,20] The supine sleeping position is recommended by the American Pediatric Academy for all healthy infants, except those with craniofacial anomalies and gastroesophageal reflux. The "Back to sleep" campaign reduced the incidence of SIDS in developed countries during the period of 1985–99.[21–23] In a multicenter study performed in 1995–1996 including Turkey, the prevalence of SIDS ranged from 0.1–1.4 per 1000 live births, but in this report Turkish prevalence was not mentioned.[5] Unfortunately, SIDS prevalence of Turkish infants is still unknown because autopsy cannot be widely performed. Education of parents and health professionals about the risk factors of SIDS is important for prevention. As infant deaths from lower respiratory tract infections and gastroenteritis are still frequent in our country, education is much more focused on these issues and preventive measures for SIDS are not emphasized. While the rate of prone sleeping position has decreased in Western countries, this rate is still unclear in developing countries. Similarly, there are few data concerning the knowledge and attitude of parents

Correspondence: Erkan Cakir, MD, Sumko Sitesi M 1 B Blok D: 22 Kozyatagi/Kadikoy, Istanbul 81090, Turkey. Email: erkancakir1@yahoo.com

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and health professionals about SIDS in our country.[5,24–27] Our aim was to determine the knowledge and attitude of parents and health professionals about SIDS and associated risk factors.

Methods

This is a descriptive, cross-sectional study. The data were collected from Mother & Child Health-care Centers in Istanbul. These health centers are funded by the government and provide free care for the mothers and infants. We planned to reach two-thirds ($n = 21$) of the Mother & Child Health-care Centers among 34 centers in Istanbul. We reached 174 of 192 health professionals (91%) in 21 randomly selected Mother & Child Health-care Centers. These centers follow 529 mothers with infants aged 0–6 months. The phone numbers of the mothers were obtained from the records of the Mother & Child Health-care Centers and 150 mothers out of 529 were reached. Mothers were questioned about their infant care practices associated with SIDS by telephone interview by the same investigator. Data regarding children's ages and gestational age at birth were collected from the follow-up cards at the centers and these data were confirmed with the mothers during the interviews.

All the mothers accepted the interview except one. Health-care professionals were interviewed face-to-face by the same investigator. Their knowledge about SIDS risk factors was evaluated by a test comprised of ten SIDS-related questions about sleeping position, bed-sharing, pillow use, soft bedding, baby's room temperature and smoking. One point was allocated for each correct answer resulting in a score from 0 to 10 and total knowledge score was calculated for each respondent. Furthermore, health-care professionals were asked whether they recommend a sleeping position to the mothers and which position they recommend.

Table 1 Demographic characteristics of the parents and infants

Parents		*n* (%)
Mother's age (years)	17–25	52 (34.7)
Mean: 27 ± 5.3	26–35	84 (56.0)
(Range 17–42)	36–42	14 (9.3)
Maternal educational level (years)	0	12 (8.0)
Mean: 7 ± 3.9	1–5	76 (50.7)
(Range 0–15)	6–11	45 (30.0)
	12–15	17 (11.3)
Father's age (years)	19–25	19 (12.7)
Mean: 32 ± 6.3	26–35	89 (59.3)
(Range 19–59)	36–59	42 (28.0)
Paternal educational level (years)	1–5	63 (42.0)
Mean: 8 ± 3.9	6–11	60 (40.0
(Range 1–15)	12–15	27 (18.0)
Mother's age at first birth	<20	51 (34.0)
	≥20	99 (66.0)
Infants		
Sex	Female	68 (45.3)
	Male	82 (54.7)
Age (months)	0–2	11 (7.3)
Mean: 4 ± 1 month	3–4	71 (47.3)
(Range 2–6 months)	5–6	68 (45.3)
Gestation	Preterm	9 (6.0)
	Term	141 (94.0)

Table 2 Frequency of the mentioned sudden-infant-death-syndrome-related risk factors

Risk factors	*n* (%)
Sleeping position	
Supine	70 (47)
Side	69 (46)
Prone	11 (7)
Bed-sharing	24 (16)
Soft bedding	48 (32)
Using pillow	116 (77)
Toys in baby's bed	19 (13)
Using pacifier	73 (49)
Smoking during pregnancy	27 (18)
Passive smoking at home	90 (60)

Ethical approval was obtained from the Marmara University School of Medicine Ethical Committee (No: B.30.2.MAR. 0.01.00.02/AEK-218). Informed consent was obtained at the time of the phone interview with the mothers and face-to-face interviews with the health professionals.

Data analysis

Statistical analyses were performed using SPSS for Windows 11.0. Numerical parameters were described with mean and standard deviation values, while distributions of the categorical measurements were expressed as frequency and percentages. The independent samples *t*-test (t) was used for evaluation of numerical parameters with normal distribution and the Mann–Whitney *U*-test was used for evaluation of parameters that were not distributed normally. The χ^2-test was used for univariate assessment. Multivariate analysis was used for dependent variations. A *P*-value less than 0.05 was considered statistically significant.

Results

Results of babies and parents

Demographic features of the infants and parents are shown in Table 1. Only 58 mothers (39%, 95%CI 31–47) were aware of SIDS and 36 (62%) of them were informed by the media. Eighty-two percent of the mothers ($n = 123$) claimed that they had never been advised on sleeping position by the health professionals. Seventy of the mothers preferred a supine sleeping position for their infant (47%, 95%CI 39–55). Sixteen percent of the parents were bed-sharing with their infants ($n = 24$). SIDS-related risk factors of the infants are shown in Table 2.

There was no significant difference between the independent variables of the mothers, such as age, education level, working status, smoking and the preference of sleeping position (Table 3). Bed-sharing was more frequent among mothers younger than 20 years of age at their first birth ($P = 0.023$). Education of the mothers did not affect bed-sharing. Pillow use was more frequent among parents with fewer than 5 years of education ($P = 0.002$).

Eighty-two percent of the mothers had regular follow up during pregnancy. There was no difference between mothers with or without regular follow up concerning preference of sleeping

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Table 3 Supine position frequency by mothers' and health professionals' characteristics

		Supine (%)	*P*-value*
Mothers' characteristics			
Age	<20 years	34.3	$P = 0.95$
	≥20 years	65.7	
Working	Yes	24.3	$P = 0.09$
	No	75.7	
Education	0–5 years	57.1	$P = 0.72$
	>5 years	42.9	
Smoking	Yes	14.3	$P = 0.14$
	No	85.7	
Heard of sudden infant death syndrome	Yes	37.1	$P = 0.72$
	No	62.9	
Informed by health workers	Yes	12.9	$P = 0.12$
	No	87.1	
Health professionals' characteristics			
Sex	Female	84.2	$P = 0.72$
	Male	15.8	
Experience	1–11 years	15.8	$P = 0.76$
	>11 years	84.2	
Previously met or interviewed the parents of SIDS cases	Yes	26.3	$P = 0.14$
	No	73.7	
Occupation	Physician	68.4	$P = 0.14$
	Nurse	31.6	

*Pearson's χ^2-test.

position. However, mothers with regular follow up were less frequently bed-sharing ($P < 0.001$) and they were also more likely to receive a recommendation about sleeping position ($P = 0.007$). Frequency of smoking during pregnancy and current smoking was 18% ($n = 27$) and 19% ($n = 29$), respectively. Bed-sharing was 14% among current smokers. There was no statistical difference concerning bed-sharing between current smokers and non-smokers. Sixty percent ($n = 90$) of the infants were exposed to passive smoking at home. Fifty-five percent of the infants were exclusively breast-fed and 43% of those used a pacifier. Forty-five percent of the infants were receiving supplemental feeding and 61% of those used a pacifier. Frequency of exclusive breast-feeding was significantly less among pacifier users ($P = 0.030$).

Health professional data

Demographic features of the health-care professionals are shown in Table 4. Mean age was 39 ± 6.1 (range: 25–61) years and mean years of job experience was 16.8 ± 5.5 (range: 2–31) years. Seventy-three percent of health professionals ($n = 127$) selected side, 17% ($n = 29$) supine (95%CI 11–23) and 10% ($n = 17$) prone sleeping position as the safest sleeping position. There was no statistical difference in terms of age, gender, and experience of health professionals for preference of supine sleeping position (Table 3). Incidence of awareness of risk factors for SIDS was as follows: bed-sharing (75%), soft bedding (70%), pillow use (52%), toys in bed (90%), high room temperature (67%) and smoking (88%).

Mean total knowledge score of health professionals was 4.2 ± 2.1 (95%CI 3.9–4.5). The mean knowledge score of health professionals who preferred a supine sleeping position was significantly higher ($P < 0.001$, $t = 3.95$). Medical doctors' scores were higher than the nurses' ($P = 0.013$).

Eighty-one percent of health-care professionals rated recommendation of sleeping position as absolutely necessary, 8.6% as necessary and 10.3% as unnecessary. The mean knowledge score of these three health professional groups were 8.8 ± 1.7, 8.9 ± 2.0 and 7.0 ± 4.0, respectively (ANOVA $P < 0.001$). Multivariate analysis (Tukey) indicated that this difference resulted from the group with a reduced knowledge score ($P = 0.025$).

Seventy-two percent of health professionals reported that they recommended a certain sleeping position during family interviews. Among those, 78% recommended side, 7% recommended prone while only 15% recommended a supine sleeping position. There was no association between recommending a supine sleeping position and age or job experience. Twenty-three percent of health professionals ($n = 41$) previously met or interviewed the parents of SIDS cases and they more frequently recommended a sleeping position ($P = 0.018$).

Table 4 Demographic characteristics of the health professionals

		n (%)
Sex	Female	149 (85.6)
	Male	25 (14.4)
Occupation	Family physician	29 (16.7)
	Pediatrician	17 (9.8)
	General practitioner	36 (20.7)
	Nurse	56 (32.2)
	Midwife	36 (20.7)
Work experience	≤11 years	24 (13.8)
	>11years	150 (86.2)
Previously met or interviewed the parents of SIDS cases	Yes	41 (23.6)
	No	133 (76.4)

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Discussion

There are limited data about SIDS from developing countries.[2–5] This is one of the few extensive SIDS studies performed in Turkey. In our study, one of the most important findings suggests that most of the mothers were unaware of SIDS and fewer than half of the mothers preferred a supine sleeping position for their infant. Additionally, 72% of health professionals recommended a certain sleeping position but they lacked knowledge about which sleeping position should be recommended to prevent SIDS.

SIDS prevalence in Turkish infants is still unknown. Most of the SIDS articles related to Turkish people were conducted within the Dutch–Turkish minority. According to the retrospective analysis of 211 infant death certificates between 1979 and 1993, the prevalence of SIDS was 1.65, 0.40, and 1.40 per 1000 live births in Turkish, Moroccan and Dutch infants, respectively.[28] The other study found that Turkish and Dutch SIDS rates decreased during the period of 1996–2000 (0.24, 0.28 and 0.16 per 1000 live births in Turkish, Moroccan, and Dutch, respectively).[29]

Prone sleeping is the most important risk factors for SIDS.[6,7] In our study, a supine sleeping position was used in 46.7% and a prone position was used in 7% of infants. According to a multicenter study performed ten years ago, 41% of mothers living in Turkey preferred a supine sleeping position for their infant and 20% preferred a prone sleeping position.[5] The rate of prone sleeping position seems to have decreased from 20% to 7% in the last 10 years in our country. However this rate is still high in comparison to developed countries reporting the prone sleeping position as 4%.[30] Pillow use and use of soft bedding are the other risk factors for SIDS.[10,18] In our study, pillow use was 77.3% and use of soft bedding was 32%.

Maternal smoking is one of the most important risk factors for SIDS.[31] In our study, 18% of the mothers smoked during pregnancy and 20% of them were current smokers. One study showed that the prevalence of reported smoking during pregnancy was 18% and current smoking was 24% in Turkish mothers living in Turkey.[5] It seems that the smoking rate remained unchanged during the last 10 years among Turkish mothers. Smoking rates in developed countries are high in comparison to developing countries[5] and this shows that even in developed countries there are still things to do about SIDS and its risk factors.

Gessner *et al.* investigated 115 infants who died from SIDS between 1992 and 1997; 113 (98%) of these 115 infants slept in a prone position or were bed-sharing.[18] The rate of bed-sharing was 16% in our study. It was more frequent among mothers younger than 20 years at their first birth and regular follow up during pregnancy was protective for bed-sharing. Regular follow up during pregnancy is a chance to inform mothers about SIDS.

There is still a continued debate as to whether pacifiers are protective for SIDS.[11–14] Pacifier use is associated with a decreased rate of breast-feeding. In this study, the frequency of pacifier use was 51.3% and frequency of exclusive breast-feeding was significantly less in pacifier users. Prospective studies are required to recommend pacifier use to prevent SIDS.

A study investigating the behavior of mothers about SIDS identified the educational level of the mother as the single most significant independent factor.[16] In our study, pillow use was more frequent among mothers with less than 5 years of education and regular follow up during pregnancy was preventive for bed-sharing. Age of the mother, age at the time of first birth, duration of education, and working situation of the mother did not have an effect on the sleeping position.

In this study, more than half of the mothers were unaware of SIDS. Almost all of the mothers who were aware of SIDS heard it from the media. This study suggests that families might be informed effectively about SIDS by way of the media.

A pilot study performed in Istanbul, Turkey, including seven hospitals and 134 pediatricians, found that 95.5% of the medical doctors define SIDS correctly, but only 75.9% of them recommended a certain sleeping position to mothers.[27] In our study, only 17% of the health professionals preferred a supine sleeping position as the safest sleeping position and 72% of the health professionals recommended sleeping position during family interviews. There are conflicting results between parental and health-care professional data regarding the advice on sleeping position; health-care professionals may overestimate the advice they give to the parents or parents do not remember all the new information they receive during their visit. Health professionals lack knowledge about which sleeping position should be recommended to prevent SIDS. The mean knowledge score of health professionals who preferred a supine sleeping position was significantly higher than that of others. Thus, health professionals should be educated concerning the correct sleeping position and factors associated with SIDS. As medical doctors' scores were higher than nurses', nurses who have more communication with the families should also be aware of factors associated with SIDS.

Although our study is one of the few extensive SIDS studies performed in Turkey, it has some limitations. Such a sample size of the mothers and health professionals cannot represent the maternal and health professionals' population in Istanbul or Turkey. The data were collected only from Mother & Child Health-care Centers in Istanbul. These health centers are funded by the government and provide free care for mothers and infants. Private health-care centers were not enrolled in the study. Only house-keeping mothers could be interviewed while working mothers could not be reached because they were not at home at the time of the interview. Thus mothers with higher socioeconomic status could not be enrolled in the study. This study should also have included other cities in order to represent Turkey.

In conclusion, most of the mothers were unaware of SIDS and less than half of the mothers were putting their infants to sleep in a supine sleeping position. Educational levels of the parents were preventive for pillow use and regular pregnancy follow up was preventive for bed-sharing. Mothers under 20 years old were more likely to share their beds with their babies. SIDS and associated factors should be part of the curriculum in medical schools and health-care professionals taking care of pregnant women and infants might benefit from postgraduate medical education. Media is a way of communicating to mothers about SIDS and associated risk factors, particularly prone sleeping position, bed-sharing and smoking.

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