

ORIGINAL ARTICLE

Assessment of mothers' knowledge and practices about the prevention of sudden infant death syndrome

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ABSTRACT

Background: Sudden infant death syndrome (SIDS) remains a major cause of mortality among infants under 1 year of age. Despite advances in prevention, its underlying mechanisms remain poorly understood, and caregiver practices continue to play a critical role in risk reduction. Mothers, as primary caregivers, are central to implementing safe sleep recommendations and minimizing preventable risks.

Methods: A cross-sectional study was conducted among Saudi mothers attending the pediatric emergency department of the maternity and children's hospital in Al-Qassim, Saudi Arabia, between June and July 2025. Participants completed an online self-administered questionnaire assessing sociodemographic characteristics, health status, and knowledge and practices related to SIDS. Descriptive statistics were used to summarize responses, and associations between maternal factors and safe sleep practices were examined using chi-square tests. Statistical analyses were performed using SPSS (version 26.0; IBM Corp., Armonk, NY).

Results: A total of 1,094 mothers participated. Of these, 39% were >35 years, and 45.5% held a university degree or higher. Approximately 57% had heard of SIDS, primarily through media and community sources. Overall, 56.7% demonstrated good knowledge, while 49.5% reported good preventive practices. Higher knowledge was associated with older age, higher education, and higher income, whereas better practices were more common among rural residents, mothers living in rented homes, and those with infants who had congenital disorders.

Conclusion: Although many mothers were aware of SIDS, this knowledge did not consistently translate into safe sleep behaviors. Targeted, culturally tailored interventions are needed to strengthen both awareness and adherence to recommended preventive practices.

Keywords: Sudden infant death syndrome, knowledge, practice, mothers.

Introduction

Sudden infant death syndrome (SIDS) continues to be a major contributor to infant mortality worldwide, with an estimated 38.4 deaths per 100,000 live births in 2020 [1,2]. The Centers for Disease Control and Prevention defines SIDS as the sudden and unexplained death of an infant under 1 year of age following a comprehensive investigation that includes scene assessment, medical history review, and autopsy [3]. The precise etiology of SIDS remains unknown; however, current evidence suggests that multiple factors contribute to its occurrence. These factors include the body's response to elevated carbon dioxide or reduced oxygen, individual

vulnerabilities, and associated environmental risks. Known risk factors are sleeping on the stomach or side, soft bedding, sharing a bed, maternal substance use, tobacco exposure, overheating, being born prematurely,

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and genetic predisposition [4-6]. Recent studies indicate that poor indoor air quality may elevate the risk of SIDS [7].

Creating a safe sleep space for your baby is the best way to help prevent SIDS. Experts recommend putting babies to sleep on their backs, keeping cribs free of soft objects and loose bedding, supporting breastfeeding, offering a pacifier, and having your baby sleep in your room, not in your bed. They also recommend avoiding tobacco and drug exposure and keeping vaccinations current [8,9]. However, cultural beliefs and unclear information can lead caregivers to question or overlook these guidelines, especially if they conflict with traditional customs. In Saudi Arabia, post-mortem examinations are not permitted, which makes it more difficult to confirm SIDS cases and limits prevention efforts [10]. Effective and culturally appropriate educational programs require an understanding of community perspectives on SIDS and caregiver responses [11].

Research in Saudi Arabia shows that many mothers are not aware of or do not follow safe sleep practices. In Al-Ahsa, almost 80% of those surveyed were not aware of SIDS [12], and only 26.8% of mothers in Riyadh had heard of it [13]. Similar results have been found in other regions [14,15], but a national survey reported a higher awareness rate of 54% [16]. Awareness also varies by group, with non-Saudi mothers generally knowing more about SIDS than Saudi mothers [17]. Factors such as a mother's age, number of children, previous infant loss, and education level are linked to SIDS knowledge [18]. Employment, place of residence, and income also influence how much mothers know about safe sleep [16,19].

Taken together, these gaps in awareness and variability in safe sleep practices highlight the need for targeted, culturally informed educational interventions to improve maternal knowledge and reduce the risk of SIDS in Saudi Arabia. Hence, this study aimed to measure the knowledge and awareness of SIDS and its associated risk factors among Saudi mothers attending the pediatric emergency department of the maternity and children's hospital in Al-Qassim.

Methods

Study design

A descriptive cross-sectional study was conducted to evaluate maternal awareness of SIDS and related safe sleep practices. This design was selected to obtain a snapshot of knowledge and behaviors among mothers attending a pediatric emergency department within a defined period.

Study setting and population

This study was conducted in the pediatric emergency department at the Maternity and Children's Hospital in Al-Qassim, Saudi Arabia. Data were collected from June to July 2025. The hospital treats many mothers from different backgrounds who need urgent pediatric

care, which makes it a good place to study awareness of SIDS and ways to reduce its risks. The study population consisted of Saudi mothers who visited the pediatric emergency department during the study period. Eligible participants were Saudi nationals aged 18 years and older who were the primary caregivers of infants. Mothers who declined participation or were unable to complete the questionnaire were excluded.

Sampling technique and sample size

Convenience sampling was used to recruit eligible Saudi mothers attending the pediatric emergency department during the study period. The minimum required sample size was calculated using the single-proportion formula $n = Z^2 p(1-p)/d^2$, where a 95% confidence level was applied ($Z = 1.96$), the assumed prevalence of SIDS awareness was set at $p = 0.71$ based on findings from a national Saudi study by Sankari et al. [16], and the desired margin of error was $d = 0.028$. Substituting these values yielded an estimated minimum sample size of approximately 1,000 participants. To account for an anticipated 10% non-response rate and to enhance the precision of the study estimates, the final target sample size was increased to 1,100 mothers. Only fully completed questionnaires were included in the final analysis.

Data collection and instruments

We collected data with a structured questionnaire based on a previously published tool [13]. The questionnaire gathered information on socio-demographic details, maternal practices, preferred infant sleeping positions, and views on the home environment, including smoking exposure. Four experts from related fields reviewed the questionnaire for face and content validity. We piloted and retested the tool with 40 participants to check its clarity, reliability, and practicality. We also ran a pretest with 10 participants to improve the question order and ensure that they were easy to understand. The final questionnaire was administered through an interviewer-led, paper-based survey.

Sources of SIDS information

Mothers were also asked about their exposure to SIDS-related information. Educational channels commonly used in previous studies include media sources, community-based courses, and routine health education provided by healthcare teams before discharge and during clinic visits [20-22]. These channels were considered when designing the questionnaire items related to awareness and information sources.

Questionnaire criteria

Mothers' knowledge of SIDS prevention was measured using a 7-item questionnaire. Each question used a 3-point Likert scale, from "Disagree" (1) to "Agree" (3). Adding the seven items, the total generated scores range from 7 to 21, with higher scores indicating greater understanding. Based on Elbilgahy et al. [23], a score of 60% or higher was considered good knowledge, while scores below 60% were considered poor [23]. The questionnaire's

reliability, measured by Cronbach's alpha, was 0.678, indicating acceptable internal consistency.

Similarly, the assessment of maternal practices for the prevention of SIDS used a six-item questionnaire with a four-point Likert scale, with response options ranging from "Never" (coded as 1) to "Mostly" (coded as 4). The total practice score was calculated by summing responses to all six items, yielding a possible score of 6 to 24. Higher scores reflected greater adherence to recommended practices. Practice levels were classified as poor for scores below 60% and good for scores of 60% or higher [23]. The reliability of the practice items was supported by a Cronbach's alpha of 0.786, indicating good internal consistency.

Statistical analysis

We presented categorical variables as numbers and percentages, and continuous variables as means and SDs. To analyze the relationship between knowledge and practice scores and mothers' socio-demographic characteristics and health information, we used the Mann-Whitney *U* test. We checked for normality with the Kolmogorov-Smirnov test. The Spearman correlation coefficient helped us assess the link between knowledge and practice scores. The plots showed that both knowledge and practice scores did not follow a normal distribution, so we used non-parametric tests. We considered results statistically significant at $p < 0.05$. All analyses were done using SPSS version 26 (IBM Corp, Armonk, NY).

Ethical considerations

Participation in the study was voluntary, and confidentiality was strictly maintained. We did not collect any identifying information, and only our research team could access the enrollment logs and study materials. We stored all data securely on a network file server accessible only by authorized personnel. User permissions were set up to prevent unauthorized access, even within the server. The server was protected by a firewall, kept in a locked facility for designated IT staff, and backed up every day. We analyzed all data anonymously and reported results in aggregate to protect participant privacy.

Results

A total of 1,094 mothers participated in this study. Table 1 summarizes their socio-demographic and health characteristics. Of the participants, 39% were over 35 years old. Mothers with a university degree or higher comprised 45.5% of the sample. The majority (68.2%) were married, and 29.3% reported a monthly income between 5,000 and 10,000 Saudi Riyals (SAR). Most participants resided in urban areas (69.5%), and 64.2% reported home ownership. Additionally, 32.9% of mothers had four or more children, and 32.9% had given birth to twins or more. The prevalence of mothers with infants diagnosed with congenital disorders was 30.3%, while 32% reported having a chronic health condition. Furthermore, 66.2% of mothers indicated employing a housemaid. Among those with a housemaid ($N = 724$),

Table 1. Socio-demographic characteristics and health information ($n = 1094$).

Study variables	N (%)
Age group	
• 18-25 years	144 (13.2)
• 26-30 years	253 (23.1)
• 31-35 years	270 (24.7)
• >35 years	427 (39.0)
Educational level	
• Primary school	101 (09.2)
• Secondary school	285 (26.1)
• High school	210 (19.2)
• University degree or higher	498 (45.5)
Marital status	
• Married	746 (68.2)
• Divorced or widowed	348 (31.8)
Monthly family income (SAR)	
• <5,000	143 (13.1)
• 5,000-10,000	321 (29.3)
• 10,001-15,000	316 (28.9)
• >15,000	314 (28.7)
Residence	
• Urban	760 (69.5)
• Rural	334 (30.5)
Housing status	
• Owned	702 (64.2)
• Rented	392 (35.8)
Number of children	
• One	180 (16.5)
• Two	284 (26.0)
• Three	271 (24.8)
• Four or more	359 (32.8)
Was your infant born as?	
• Single birth	734 (67.1)
• Twins or more	360 (32.9)
Does your infant have any congenital disorders?	
• Yes	332 (30.3)
• No	762 (69.7)
Do you have any chronic health conditions (eg, diabetes, hypertension)?	
• Yes	350 (32.0)
• No	744 (68.0)
Do you have a housemaid?	
• Yes	724 (66.2)
• No	370 (33.8)
If yes, is your maid responsible for childcare? ($n=151$)	
• Yes	362 (50.0)
• No	362 (50.0)

50% reported that the housemaid was responsible for childcare.

Figure 1 shows that 57% have heard of SIDS; the rest (43%) have not.

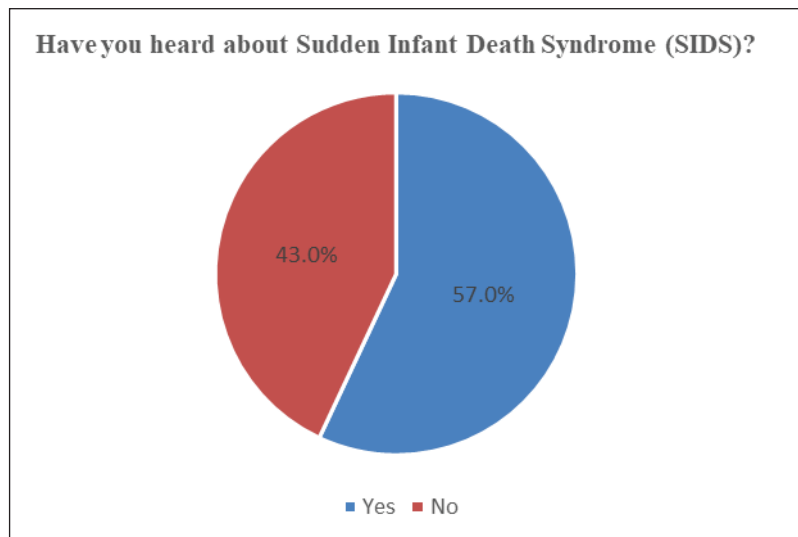


Figure 1. General awareness about SIDS.

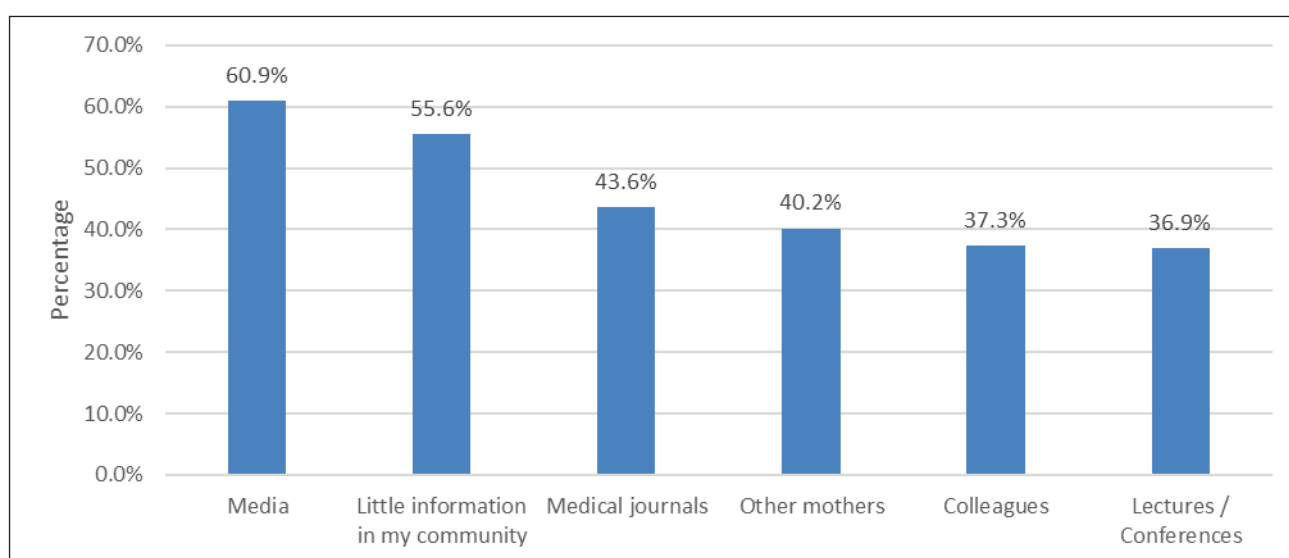


Figure 2. Sources of SIDS information.

Figure 2 shows that among those who have heard of SIDS, the most common source of information was the media (60.9%), followed by limited information in the community (55.6%) and medical journals (43.6%).

Figure 3 illustrates that the proportion of mothers who previously attended an awareness program on SIDS was 18.4%.

Figure 4 illustrates that 33.3% of the mothers were practicing infant sleep position on the back, 29% on the side with rolls, and 26.8% on the side only.

Analysis of smoking exposure (Table 2) showed that 36.8% of mothers reported a family member smoked at home. Of these, 17.4% reported daily smoking. The most frequently reported response to smoking near an infant was relocating the infant, cited by 49.3% of mothers. Additionally, 50.7% of mothers stated that smokers never carried their infant, and 43% reported that a smoker never kissed their infant.

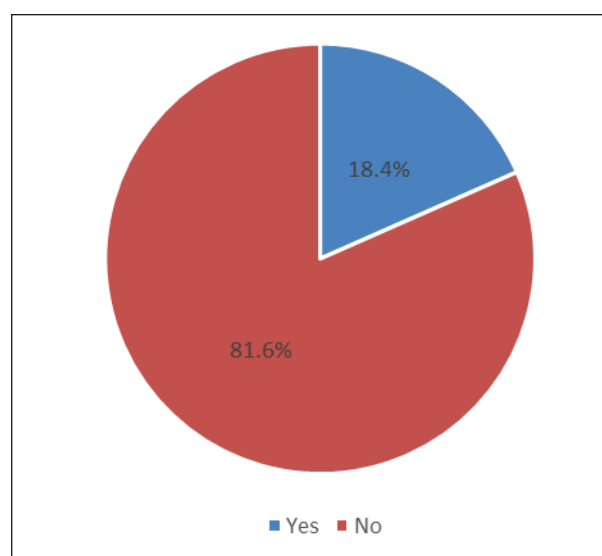


Figure 3. Have you attended any awareness programs on SIDS in the last year?

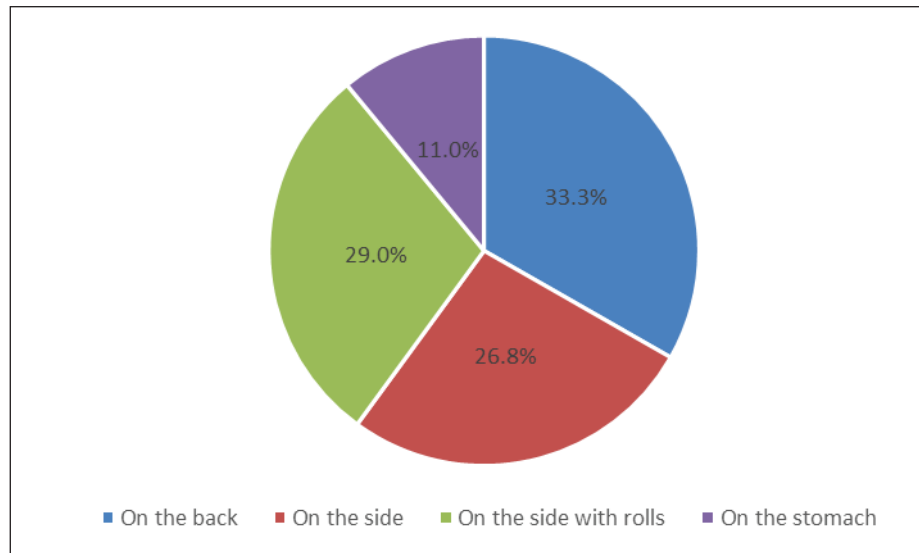


Figure 4. Pattern of infant sleep position.

Table 2. Smoking exposure (n = 1094).

Variables	N (%)
Does anyone smoke in your home?	
• Yes	403 (36.8)
• No	691 (63.2)
If yes, how often is your infant exposed to smoke? (n = 403)	
• Daily	70 (17.4)
• Weekly	113 (28.0)
• Sometimes	114 (28.3)
• Never	106 (26.3)
What do you usually do if someone smokes near your infant?	
• Move the infant away	539 (49.3)
• Ask the smoker to stop	416 (38.0)
• Ignore the situation	139 (12.7)
Has your infant ever been carried by someone who was smoking?	
• Never	555 (50.7)
• Rarely	224 (20.5)
• Sometimes	207 (18.9)
• Mostly	108 (9.9)
Does anyone kiss your infant after smoking?	
• Never	470 (43.0)
• Rarely	265 (24.2)
• Sometimes	257 (23.5)
• Mostly	102 (9.3)

Regarding the assessment of knowledge (Table 3), the top three highest rated items were “Infants should sleep near parents but in a separate bed” (mean score: 2.28), “Pillows, blankets, and wedged objects should be removed from the infant’s sleeping area” (mean score: 2.27), and “Smoking in the home increases the risk of SIDS” (mean score: 2.14). Based on the above knowledge items, the total mean knowledge score was 14.2 (SD 3.16). Accordingly, poor and good knowledge

levels were seen in 43.3% and 56.7%, respectively. Regarding the assessment of the practice, the top three highest rated items were “Do you breastfeed your infant during sleep?” (mean score: 2.64), followed by “Do you put pillows under your infant’s head while sleeping?” (mean score: 2.60), and “Do you use a head cap for your infant during sleep in winter?” (mean score: 2.54). The total mean practice score was 14.3 (SD 3.0), with poor and good practice found in 50.5% and 49.5% of cases, respectively.

Figure 5 shows an inverse correlation between the knowledge and practice scores ($r_s = -0.219$; $p < 0.001$), indicating that mothers with higher awareness of SIDS recommendations were paradoxically less likely to follow them. This pattern reflects a complex behavioral gap in which knowledge does not automatically translate into safer infant-care routines.

Measuring the association between the knowledge score and the socio-demographic characteristics and the health information of the mothers found that increasing knowledge scores were associated with increasing age ($Z = 8.063$; $p < 0.001$), increasing level of education ($Z = 14.622$; $p < 0.001$), being married ($Z = 13.285$; $p < 0.001$), increasing monthly income ($Z = 5.196$; $p < 0.001$), living in the urban ($Z = 12.358$; $p < 0.001$), having more children ($Z = 4.262$; $p < 0.001$), single birth ($Z = 12.268$; $p < 0.001$), without having infant with congenital disorders ($Z = 13.490$; $p < 0.001$), without chronic disease ($Z = 10.406$; $p < 0.001$), not heard of SIDS ($Z = 4.365$; $p < 0.001$), not attending awareness program regarding SIDS ($Z = 8.748$; $p < 0.001$), and smoking family member ($Z = 7.164$; $p < 0.01$) (Table 4).

Exploring the association between practice score and the socio-demographic characteristics and health information of the mothers revealed that higher practice scores were associated with being younger ($Z = 4.115$; $p < 0.001$), having lower educational levels ($Z = 6.937$; $p < 0.001$), being divorced or widowed ($Z = 3.708$; $p < 0.001$), living in rural areas ($Z = 3.851$; $p < 0.001$), renting house ($Z =$

Table 3. Assessment of the knowledge and practices of mothers regarding SIDS (*n* = 1094)

Knowledge item	Mean $\pm$ SD
1. Infants should sleep on their backs to reduce SIDS risk	1.91 $\pm$ 0.86
2. Infants should sleep near parents but in a separate bed	2.28 $\pm$ 0.87
3. Pillows, blankets, and wedged objects should be removed from the infant's sleeping area	2.27 $\pm$ 0.88
4. Pacifier use can help prevent SIDS	1.91 $\pm$ 0.81
5. Breastfeeding reduces the risk of SIDS	2.02 $\pm$ 0.84
6. Infants should wear multiple layers of clothing to stay warm during sleep	1.66 $\pm$ 0.84
7. Smoking in the home increases the risk of SIDS	2.14 $\pm$ 0.84
Total knowledge score	14.2 $\pm$ 3.16
Level of knowledge	
• Poor	474 (43.3%)
• Good	620 (56.7%)
Practice item	
1. Do you put pillows under your infant's head while sleeping?	2.60 $\pm$ 1.02
2. Do you co-sleep with your infant?	2.28 $\pm$ 1.05
3. Do you use multiple quilts or blankets during sleep?	2.22 $\pm$ 1.02
4. Do you cover your infant's head with a quilt or blanket during sleep?	2.04 $\pm$ 1.07
5. Do you use a head cap for your infant during sleep in winter?	2.54 $\pm$ 1.06
6. Do you breastfeed your infant during sleep?	2.64 $\pm$ 1.05
Total practice score	14.3 $\pm$ 3.00
Level of practice	
• Poor	553 (50.5%)
• Good"	541 (49.5%)

Knowledge items have a 3-point Likert scale categories ranging from "Disagree" coded with 1 to "Agree" coded with 3. Practice items have 4-point Likert scale categories ranging from "Never" coded with 1 to "Mostly" coded with 4.

4.675; $p < 0.001$), having infant born as twins or more ($Z = 4.091$; $p < 0.001$), having infant with congenital disorders ($Z = 4.613$; $p < 0.001$), having associated chronic disease ($Z = 2.121$; $p = 0.034$), attendance with awareness program regarding SIDS ($Z = 3.574$; $p < 0.001$); and having family member who smoked at home ($Z = 2.608$; $p = 0.009$). No significant differences were observed in practice scores concerning monthly income, number of children, having a housemaid, and having heard of SIDS ($p > 0.05$) (Table 5).

Discussion

Sudden infant death remains a major contributor to infant mortality worldwide, and understanding maternal knowledge and behaviors is essential for prevention. In this large cross-sectional study of 1,094 Saudi mothers, more than half demonstrated good knowledge of SIDS, yet fewer than half adhered to recommended safe sleep practices. Several regional studies have found a consistent gap between what people know and how they act, highlighting how difficult it is to translate knowledge into practice [12-15,17,19].

Comparative international analyses highlight the magnitude of this discrepancy. In high-income countries, including the United States, Australia, and several European nations, adherence to supine sleep positioning frequently exceeds 70%-80%, facilitated by established national campaigns and consistent provider counseling [8,9]. In contrast, only 33.3% of mothers in our study placed infants on their backs. Comparable patterns of unsafe sleep behaviors, including co-sleeping, pillow use, and side-sleeping, have been documented in Zambia, Egypt, and Palestine. These findings indicate that cultural norms and household routines significantly influence infant sleep practices in various non-Western contexts [7,14,15].

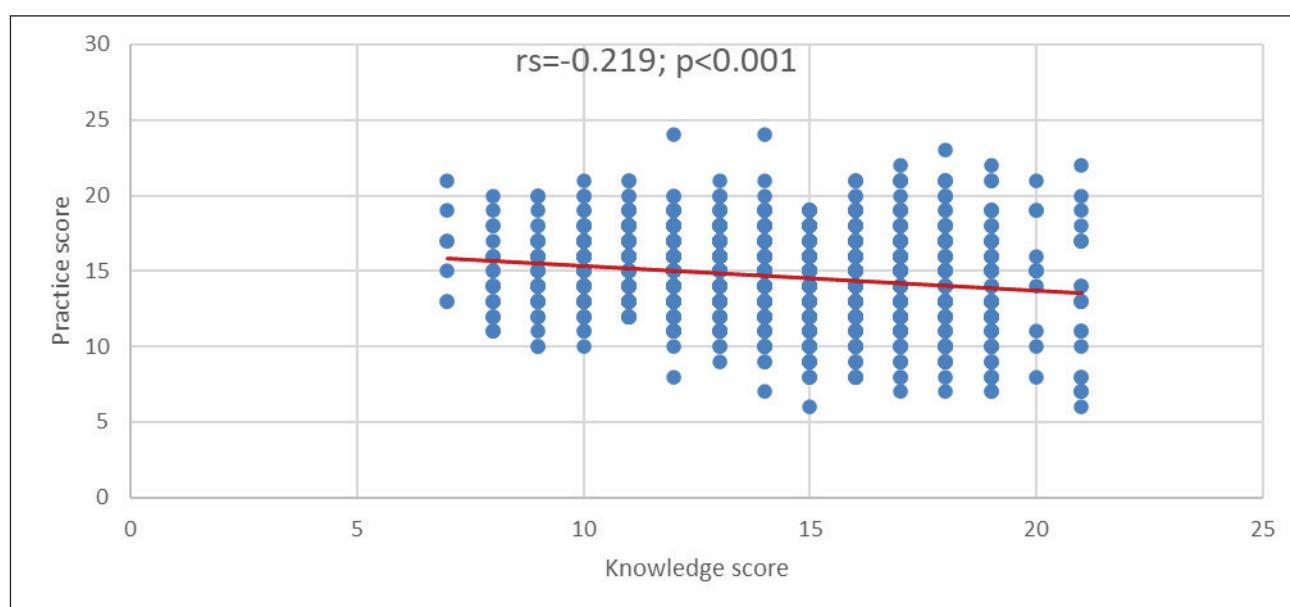


Figure 5. Correlation between knowledge and practice scores.

Table 4. Association between knowledge score and the socio-demographic characteristics and health information of mothers (n = 1094).

Factors	Knowledge Score (21) Mean $\pm$ SD	Z-test	p value*
Age group			
• ≤ 30 years	13.2 $\pm$ 3.01	8.063	<0.001**
• >30 years	14.8 $\pm$ 3.11		
Educational level			
• High school or below	12.9 $\pm$ 2.86	14.622	<0.001**
• University degree or higher	15.7 $\pm$ 2.85		
Marital status			
• Married	15.0 $\pm$ 3.07	13.285	<0.001**
• Divorced or widowed	12.4 $\pm$ 2.55		
Monthly family income (SAR)			
• $\leq 10,000$	13.6 $\pm$ 3.15	5.196	<0.001**
• >10,000	14.6 $\pm$ 3.09		
Residence			
• Urban	14.9 $\pm$ 3.13	12.358	<0.001**
• Rural	12.5 $\pm$ 2.45		
Housing status			
• Owned	14.8 $\pm$ 3.06	8.131	<0.001**
• Rented	13.2 $\pm$ 3.08		
Number of children			
• 1-2	13.8 $\pm$ 3.22	4.262	<0.001**
• >2	14.5 $\pm$ 3.08		
Was your infant born as?			
• Single birth	15.0 $\pm$ 3.10	12.268	<0.001**
• Twins or more	12.5 $\pm$ 2.58		
Does your infant have any congenital disorders?			
• Yes	12.3 $\pm$ 2.47	13.490	<0.001**
• No	15.0 $\pm$ 3.07		
Associated chronic disease			
• Yes	12.8 $\pm$ 2.71	10.406	<0.001**
• No	14.9 $\pm$ 3.14		
Do you have a housemaid?			
• Yes	14.2 $\pm$ 3.09	0.357	0.721
• No	14.3 $\pm$ 3.29		
Heard of SIDS			
• Yes	13.8 $\pm$ 3.18	4.365	<0.001**
• No	14.7 $\pm$ 3.08		
Attended an awareness program regarding SIDS			
• Yes	12.5 $\pm$ 2.72	8.748	<0.001**
• No	14.6 $\pm$ 3.13		
Does anyone smoke in your home?			
• Yes	13.3 $\pm$ 2.96	7.164	<0.001**
• No	14.7 $\pm$ 3.16		

*p value has been calculated using Mann-Whitney Z-test.

**Significant at $p < 0.05$ level.

One important result from this study is that as knowledge increases, practice tends to decrease ($r_s = -0.219$). Mothers with more education, higher income, and who live in urban areas scored higher on knowledge, but these groups did not always follow safer sleep practices.

This suggests that knowledge alone does not drive behavior and that cultural norms, comfort-driven sleep routines, and reliance on secondary caregivers may override awareness of SIDS guidelines. There are several possible reasons for this unexpected result. For example,

Table 5. Association between practice score and the socio-demographic characteristics and health information of mothers (n = 1094).

Factor	Practice Score (24) Mean $\pm$ SD	Z-test	p value*
Age group			
• ≤ 30 years	14.8 $\pm$ 2.79	4.115	<0.001**
• >30 years	14.0 $\pm$ 3.09		
Educational level			
• High school or below	14.9 $\pm$ 2.67	6.937	<0.001**
• University degree or higher	13.6 $\pm$ 3.23		
Marital status			
• Married	14.1 $\pm$ 3.18	3.708	<0.001**
• Divorced or widowed	14.8 $\pm$ 2.51		
Monthly family income (SAR)			
• $\leq 10,000$	14.5 $\pm$ 2.84	1.219	0.223
• >10,000	14.2 $\pm$ 3.12		
Residence			
• Urban	14.1 $\pm$ 3.18	3.851	<0.001**
• Rural	14.9 $\pm$ 2.47		
Housing status			
• Owned	14.0 $\pm$ 3.07	4.675	<0.001**
• Rented	14.9 $\pm$ 2.79		
Number of children			
• 1-2	14.3 $\pm$ 2.97	0.140	0.888
• >2	14.3 $\pm$ 3.03		
Was your infant born as?			
• Single birth	14.0 $\pm$ 3.17	4.091	<0.001**
• Twins or more	14.9 $\pm$ 2.54		
Does your infant have any congenital disorders?			
• Yes	14.9 $\pm$ 2.62	4.613	<0.001**
• No	14.0 $\pm$ 3.12		
Associated chronic disease			
• Yes	14.6 $\pm$ 2.42	2.121	0.034**
• No	14.2 $\pm$ 3.23		
Do you have a housemaid?			
• Yes	14.3 $\pm$ 2.99	0.340	0.734
• No	14.4 $\pm$ 3.03		
Heard of SIDS			
• Yes	14.3 $\pm$ 3.05	0.656	0.512
• No	14.3 $\pm$ 2.95		
Attended an awareness program regarding SIDS			
• Yes	14.9 $\pm$ 2.54	3.574	<0.001**
• No	14.2 $\pm$ 3.08		
Does anyone smoke in your home?			
• Yes	14.6 $\pm$ 2.84	2.608	0.009**
• No	14.1 $\pm$ 3.09		

*p value has been calculated using Mann-Whitney Z-test.

**Significant at $p < 0.05$ level.

behavioral research shows that knowledge by itself rarely changes behavior, especially when habits are shaped by culture [11]. Second, highly educated mothers may rely on diverse information sources - including social media, peer networks, and non-evidence-based parenting advice - that sometimes promote practices such as co-sleeping

or side-sleeping [1]. Third, caregiving dynamics may play a role: in our sample, 66.2% of mothers employed housemaids, and half relied on them for childcare. Prior studies suggest that when infant care is delegated, recommended practices may not be consistently implemented [13]. Mothers who attended awareness

programs had significantly lower knowledge scores, suggesting that these programs may be reaching mothers with pre-existing knowledge gaps rather than enhancing the knowledge of already informed mothers. This pattern indicates that awareness programs are functioning as remedial interventions rather than universal educational tools.

Cultural factors play a strong role in shaping how mothers care for their babies in Saudi Arabia. Co-sleeping is a long-standing tradition in Gulf culture and is often seen as important for bonding and making breastfeeding easier, even though it has known risks [10,12]. Many families also think that babies need to be kept very warm and cushioned, which leads to the common use of pillows, quilts, and head coverings. These practices are also found in Egypt and Palestine [14,15]. Grandmothers and other extended family members often influence decisions about infant care, and their advice can sometimes go against current safe sleep guidelines [11].

International research also shows that cultural and educational factors shape maternal behavior. Studies in Brazil and France found that mothers' knowledge is closely linked to their socioeconomic status and to their access to structured health education programs [24,25]. Researchers in Belgium found that although most people were aware of SIDS, many still misunderstood bedding and sleep environments. This shows that clear public health messages are still needed [26]. This study confirms earlier findings that mothers' awareness of safe sleep guidelines does not always lead to adherence.

Another key finding is that 36.8% of households have smoking exposure. This is higher than recent rates in the U.S. and Europe, where smoke-free home efforts have lowered infant exposure [5]. Since tobacco exposure is strongly linked to SIDS risk, this should be a main focus for intervention.

Overall, these results highlight the need for educational strategies that focus on behavior and fit the local culture, instead of just sharing information. Healthcare providers in maternity wards, pediatric emergency rooms, and primary care can offer clear and practical advice. Research shows that structured educational programs, when adapted to the culture, can significantly improve mothers' knowledge and actions [22,23]. Future studies should use qualitative methods to better understand the social, cultural, and family factors that shape how mothers in Saudi Arabia decide about infant sleep.

Study limitations

Several limitations should be considered when interpreting the findings of this study. First, the scope of the assessment is limited because the survey instrument may not address all relevant aspects of SIDS prevention, potentially leading to the omission of significant factors. Second, the absence of objective verification, such as direct observation or the use of objective measures, may reduce the accuracy of self-reported practices. Third, ethical and privacy concerns about the topic's sensitivity may affect participants' willingness to provide accurate information, thereby limiting the depth of the collected data. Finally, the cross-sectional study design, which

collects data at a single point in time, precludes assessing causality or changes in knowledge and practices over time. These limitations may influence the validity, reliability, and generalizability of the study's results.

Conclusion

The study found that although many mothers are aware of SIDS prevention, this knowledge does not always lead to safe sleep practices. Older mothers, those with higher educational attainment, and those with more children generally demonstrated greater knowledge. In contrast, mothers living in rural areas and those caring for infants with congenital disorders were more likely to follow safer sleep practices. The observation that increased knowledge does not consistently result in safer behavior indicates that cultural norms, caregiving responsibilities, and related practices are equally significant as awareness. These results highlight the need for educational programs that align with local culture, focus on practical skills, and include regular reminders of best practices. Improving routine counseling in maternity and pediatric care could help close the gap between what mothers know and what they do, making sleep safer for infants.

List of Abbreviations

CDC	Centers for Disease Control and Prevention
CI	Confidence interval
N	Number of participants
PHC	Primary Health Care
PSMMC	Prince Sultan Military Medical City
SAR	Saudi Riyal
SD	Standard Deviation
SIDS	Sudden Infant Death Syndrome
SPSS	Statistical Package for the Social Sciences
Z	Z-statistic (Mann-Whitney U test)

Conflict of interest

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