ORIGINAL ARTICLE

# Knowledge, awareness, and practices regarding shaken baby syndrome among parents in Rabigh Governorate, Saudi Arabia: a cross-sectional study

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## ABSTRACT

**Background:** Shaken baby syndrome (SBS), a form of abusive head trauma, is preventable yet can cause death or lifelong disability. Data from outside major Saudi cities are scarce. This study assessed SBS knowledge, awareness, and caregiving practices among parents in Rabigh Governorate, Saudi Arabia, and compared knowledge between Rabigh city and its suburbs.

**Methods:** A cross-sectional survey was conducted from February to December 2024 using a validated bilingual (Arabic/English) questionnaire distributed online through snowball sampling. An eight-item knowledge score was calculated, and scores above the middle score of 4 were classified as good knowledge. Associations were tested using the chi-square test.

**Results:** 388 parents responded; 309 (79.6%) were women, and 298 (76.8%) lived in Rabigh city. Overall, 254 participants (65.5%) had good knowledge, although 237 (61.1%) had never heard the term SBS. Good knowledge was more common among women than men (69.9% *vs.* 48.1%; $p < 0.001$) and among city than suburban residents (68.1% *vs.* 56.7%; $p = 0.045$). Overall, 213 parents (54.9%) calmed a crying infant by shaking, and 97 (25.0%) had shaken their baby vigorously. Parents with poor knowledge more often tossed their child in the air and shook their baby vigorously, whereas shaking to calm crying was more frequent with good knowledge (58.3% *vs.* 48.5%).

**Conclusion:** Although most parents had good knowledge, many, particularly fathers and suburban residents, were unaware of SBS, and harmful practices persisted even among knowledgeable parents. Education on safe soothing during pregnancy and pediatric visits is needed.

**Keywords:** Shaken baby syndrome, abusive head trauma, child abuse, parental knowledge, caregiving practices, Saudi Arabia.

## Introduction

Shaken baby syndrome (SBS) is a preventable form of child abuse that results from the violent shaking of an infant, typically triggered by caregiver frustration or anger, and is also termed abusive head trauma (AHT) [1]. The rapid acceleration–deceleration and rotational forces generated by shaking cause the brain to move within the skull, producing severe head injuries in infants and young children [2] that may be fatal or result in long-term neurological disability [3,4]. SBS is recognized as the most common type of maltreatment associated with fatal outcomes in infancy [5], and child abuse more broadly

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remains a global public health problem with profound consequences for individuals, families, and communities [4].

These injuries occur within seconds of shaking and carry high morbidity and mortality owing to rupture of bridging veins, retinal blood vessels, and nerve fibers surrounding the brain [6]. Clinical manifestations include vomiting, irritability, respiratory compromise, lethargy, seizures, and coma. Survivors may develop cerebral palsy, cortical blindness, static encephalopathy, intellectual disability, or learning difficulties [2], and in some cases, the full extent of injury does not become apparent until later childhood, requiring lifelong medical attention [7]. At least one in four victims dies, and more than half of survivors sustain permanent visual, neurological, or combined impairment; in the United States, approximately 1,200 children, 44% of whom were younger than one year, died as a result of abuse or neglect in a single year [8].

The global incidence of SBS in infants younger than one year has been estimated at 14–33.8 per 100,000, although population-based data on the prevalence of SBS in Saudi Arabia remain scarce [9]. Because early recognition of the dangers of shaking an infant is the primary defense against this preventable, life-threatening trauma, parental awareness is of critical importance.

Existing Saudi studies suggest that parental knowledge of SBS is generally limited. In Riyadh, only 32.1% of 577 parents surveyed had previously heard of SBS [3]. In Tabuk, approximately 70% of parents reported no prior awareness of the condition, and only 32% recognized the potential link between shaking and a fatal outcome in the first year of life and beyond [9]. However, no published study has examined SBS knowledge among parents in Rabigh Governorate, where a population spread across an urban center and surrounding suburbs may reveal awareness gaps that are not captured by studies conducted in major Saudi cities.

This study aimed to determine the level of knowledge and awareness of SBS among parents in Rabigh Governorate, Saudi Arabia, to describe their caregiving practices, and to compare knowledge by residency (Rabigh city versus the surrounding suburbs), age, gender, and other sociodemographic characteristics.

## Methods

### *Study design and setting*

This cross-sectional study was conducted in Rabigh Governorate, Saudi Arabia, between February and December 2024. Rabigh was selected because its population is distributed between an urban center (Rabigh city) and the smaller communities surrounding it (hereafter, Rabigh suburbs), allowing comparison of SBS knowledge by residency.

### *Study population*

The target population comprised parents residing in Rabigh Governorate. Parents with at least one child currently residing in Rabigh who consented to participate were included. Individuals without children and parents affiliated with Rabigh but living outside the governorate were excluded.

### *Sample size and sampling technique*

The minimum required sample size was calculated using OpenEpi, assuming a 95% confidence level and a 5% margin of error, yielding a requirement of 384 participants. Participants were recruited using a snowball sampling technique: the questionnaire link was initially distributed to reachable contacts through social media platforms (WhatsApp, Instagram, X, and Telegram), and respondents were encouraged to forward the link within their personal networks.

### *Data collection instrument*

Data were collected using a validated, structured, self-administered questionnaire made available in Arabic and English via Google Forms. The instrument was adapted from a previously validated questionnaire used in a cross-sectional study of parental SBS knowledge in Jeddah, Saudi Arabia [2], and comprised three sections: (1) sociodemographic characteristics, including age, gender, nationality, residency, marital status, education level, occupation, number of children, monthly household income, and the presence of a chronically ill child at home; (2) eight knowledge items addressing the harms, complications, lethality, and preventability of shaking an infant; and (3) attitude and practice items addressing sources and preferred timing of information about SBS and caregiving responses to infant crying.

### *Consent to participate*

Participation was voluntary; an electronic informed-consent statement was presented before access to the questionnaire, and respondents who declined exited the survey without further questions. All responses were collected and stored anonymously, and data confidentiality was maintained throughout the study. The study was conducted in accordance with the Declaration of Helsinki.

### *Operational definitions*

A knowledge score was calculated by summing correct responses to the eight knowledge items (possible range, 0–8). Participants scoring above the middle score of 4 were classified as having good knowledge; those scoring at or below the middle score were classified as having poor knowledge. For analysis, age was grouped as <20, 20–29, 30–39, and ≥40 years; number of children was grouped as 1–4 and more than 4; and sources of SBS knowledge were grouped as doctor/medical staff, social media, awareness campaign, or other.

### *Statistical analysis*

Data were analyzed using IBM SPSS Statistics, version 20 (IBM Corp., Armonk, NY, USA). Categorical variables were summarized as frequencies and percentages, and age was summarized as mean and standard deviation (SD). Associations between sociodemographic and practice-related variables and knowledge level were assessed using the chi-square ($\chi^2$) test, and mean age

was compared between knowledge groups using the independent-samples *t*-test. Exact two-sided *P* values are reported, and $P < 0.05$ was considered statistically significant.

## Results

388 parents completed the questionnaire. Table 1 summarizes the sociodemographic, knowledge, and

***Table 1.*** *Sociodemographic, knowledge, and practice characteristics of the participants (N = 388)*

| Characteristic | n (%) |
|---|---|
| **Sociodemographic characteristics** | |
| Age, years, mean (SD) | 35.3 (8.18) |
| **Gender** | |
| Female | 309 (79.6) |
| Male | 79 (20.4) |
| **Nationality** | |
| Saudi | 367 (94.6) |
| Non-Saudi | 21 (5.4) |
| **Residency** | |
| Rabigh city | 298 (76.8) |
| Rabigh suburbs | 90 (23.2) |
| **Marital status** | |
| Married | 357 (92.0) |
| Divorced | 27 (7.0) |
| Widowed | 4 (1.0) |
| **Number of children** | |
| 1–4 | 312 (80.4) |
| >4 | 76 (19.6) |
| **Chronically ill child at home** | |
| No | 369 (95.1) |
| Yes | 19 (4.9) |
| **Education level** | |
| High school or below | 120 (30.9) |
| Diploma | 42 (10.8) |
| Bachelor's degree | 212 (54.6) |
| Postgraduate | 14 (3.6) |
| **Occupation** | |
| Employed | 151 (38.9) |
| Not employed | 237 (61.1) |
| **Monthly household income (SAR)** | |
| <5,000 | 140 (36.1) |
| 5,000–10,000 | 152 (39.2) |
| >10,000 | 96 (24.7) |
| **Knowledge** | |
| **Does shaking an infant cause harm?** | |
| Yes, it harms the baby | 174 (44.8) |
| It is not harmful | 28 (7.2) |
| It may cause harm | 126 (32.5) |
| I don't know | 60 (15.5) |
| **Complications that may result from SBS[a]** | |
| Blindness | 5 (1.3) |
| Brain hemorrhage | 95 (24.5) |
| Learning difficulties | 21 (5.4) |
| Behavioral change | 41 (10.6) |
| Coma | 5 (1.3) |
| Does not cause damage | 82 (21.1) |
| More than one of the above | 139 (35.8) |

| Characteristic | n (%) |
|---|---|
| **Knows the term "shaken baby syndrome"** | |
| No | 237 (61.1) |
| Yes | 151 (38.9) |
| **If yes, source of that knowledge**[b] | |
| Books | 10 (2.6) |
| Social media | 104 (26.8) |
| The internet | 61 (15.7) |
| Doctor visit | 10 (2.6) |
| Other | 6 (1.5) |
| Did not know/not applicable | 197 (50.8) |
| **Wants to know more about SBS** | |
| No | 40 (10.3) |
| Yes | 348 (89.7) |
| **If yes, preferred source**[c] | |
| Doctor/medical staff during vaccination | 77 (19.8) |
| Internet and social media | 153 (39.4) |
| Awareness campaign | 95 (24.5) |
| Medical books and bulletins | 22 (5.7) |
| Missing | 1 (0.3) |
| **Preferred timing for receiving information** | |
| Before pregnancy | 90 (23.2) |
| During pregnancy | 170 (43.8) |
| A week after giving birth | 42 (10.8) |
| During the child's vaccination visit | 86 (22.2) |
| **Believes shaking can cause an infant's death** | |
| No | 223 (57.5) |
| Yes | 165 (42.5) |
| **Believes SBS can be prevented** | |
| No | 30 (7.7) |
| Yes | 358 (92.3) |
| **Practice** | |
| **Response when the child cries** | |
| Calms the infant by shaking | 213 (54.9) |
| Carries the infant | 68 (17.5) |
| Pats the infant's back | 95 (24.5) |
| Asks a family member/friend for help | 10 (2.6) |
| Does nothing | 2 (0.5) |
| **Plays with the child by raising them high and catching them** | |
| No | 223 (57.5) |
| Yes | 165 (42.5) |
| **Shakes the child vigorously to wake them from sleep** | |
| No | 361 (93.0) |
| Yes | 27 (7.0) |
| **Has ever shaken the baby vigorously** | |
| No | 291 (75.0) |
| Yes | 97 (25.0) |
| **Surprises the child with sudden shaking during play** | |
| No | 200 (51.5) |
| Yes | 188 (48.5) |

Data are presented as n (%) unless otherwise indicated. SAR, Saudi riyal; SBS, shaken baby syndrome; SD, standard deviation.

[a] Participants could select more than one complication; "more than one of the above" indicates that more than one complication was selected.

[b] Percentages are calculated for the full sample (N = 388).

[c] Percentages are calculated for the full sample (N = 388); as a proportion of the 348 participants who wanted more information, the figure for internet and social media is 44.0%.

practice characteristics of the participants. Most respondents were female (309; 79.6%), Saudi nationals (367; 94.6%), residents of Rabigh city (298; 76.8%), and married (357; 92.0%); the mean (SD) age was 35.3 (8.18) years. The majority were not employed (237; 61.1%), and more than half held a bachelor's degree (212; 54.6%). Most households (292; 75.3%) reported a monthly income of 10,000 Saudi riyals (SAR) or less, and 312 parents (80.4%) had between one and four children.

Overall, 237 participants (61.1%) did not know the term "shaken baby syndrome," while 151 (38.9%) were familiar with it, most commonly through social media (104; 26.8% of the full sample). When asked whether shaking harms an infant, 174 participants (44.8%) answered that it does, a further 126 (32.5%) believed it may cause harm, and 60 (15.5%) did not know. The most frequent response regarding complications was the selection of more than one complication (139; 35.8%), followed by brain hemorrhage (95; 24.5%). Most participants (348; 89.7%) wanted to learn more about SBS, most commonly through the internet and social media, and the most frequently preferred timing for receiving this information was during pregnancy (170; 43.8%).

Using the middle knowledge score as the cutoff, 254 participants (65.5%) were classified as having good knowledge of SBS. As shown in Fig. 1, good knowledge was more prevalent among women (216/309; 69.9%) than men (38/79; 48.1%; $\chi^2 = 13.23$, $p < 0.001$), and among residents of Rabigh city (203/298; 68.1%) than residents of the Rabigh suburbs (51/90; 56.7%; $\chi^2 = 4.01$, $p = 0.045$).

Table 2 presents the comparison of knowledge level across sociodemographic characteristics. Mean age did not differ between parents with good and poor knowledge (34.9 *vs*. 36.0 years; $t = 1.26$, $p = 0.208$). No other characteristic, including nationality, marital status, number of children, presence of a chronically ill child at home, education level, occupation, or monthly household income, was associated with knowledge level (all $p > 0.05$).

Regarding caregiving practices (Table 1), more than half of the participants (213; 54.9%) reported calming a crying infant by shaking, while 95 (24.5%) patted the infant's back and 68 (17.5%) carried the infant. In addition, 165 participants (42.5%) reported playing with their child by raising them high and catching them, and 97 (25.0%) had previously shaken their baby vigorously. Most participants (361; 93.0%) denied shaking their child vigorously to wake them from sleep.

Table 3 presents the association between knowledge level and caregiving practices. Knowledge level was associated with the response to a crying child ($\chi^2 = 11.67$, $p = 0.020$). Calming the infant by shaking was more frequent among parents with good knowledge than among those with poor knowledge (148/254, 58.3% *vs*. 65/134, 48.5%), whereas patting the infant's back was more frequent among parents with poor knowledge (45/134, 33.6% *vs*. 50/254, 19.7%). Conversely, parents with poor knowledge were more likely than those with good knowledge to play with their child by raising them

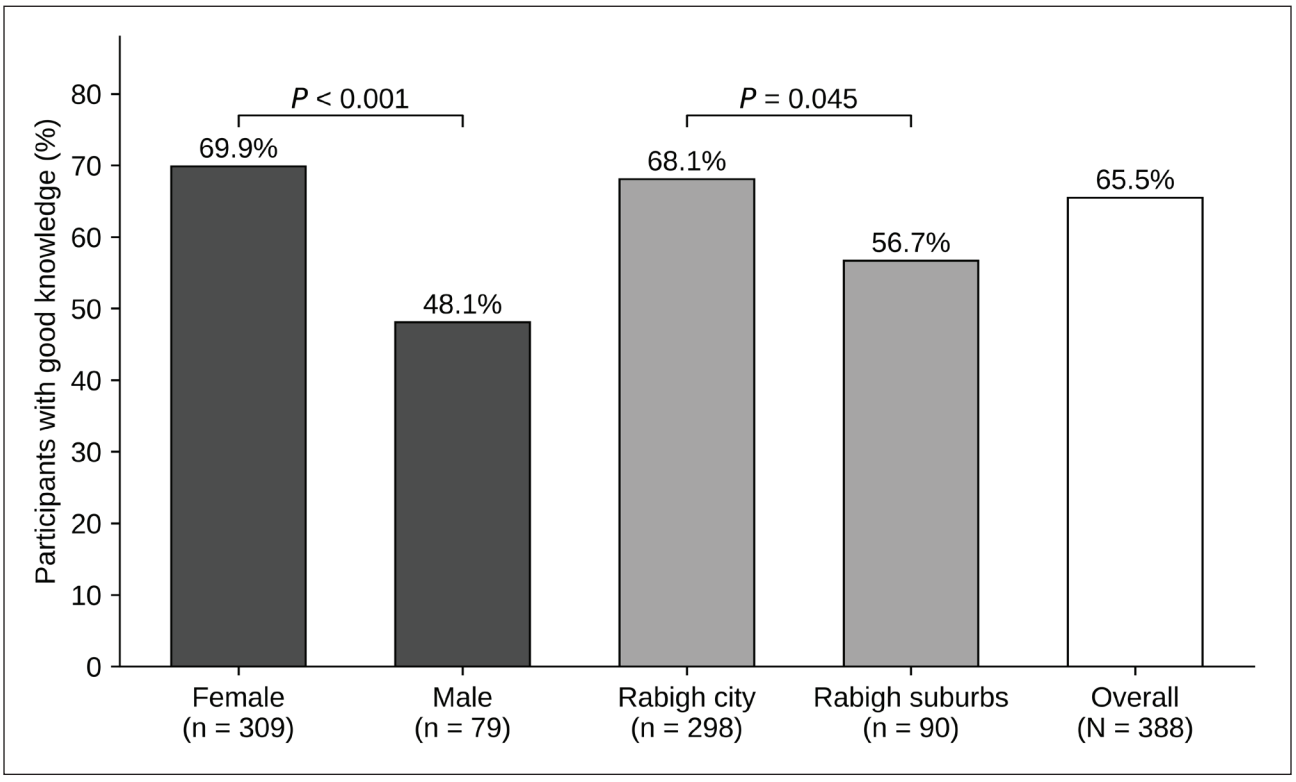


***Figure 1.*** *Prevalence of good knowledge about shaken baby syndrome by gender and residency (N = 388). Dark gray bars, gender; light grey bars, residency; white bar, overall sample. P values are from the chi-square test*

***Table 2.*** *Association between sociodemographic characteristics and knowledge level (N = 388)*

| Characteristic | Good knowledge (*n* = 254) | Poor knowledge (*n* = 134) | $\chi^2$ or t (*p* value) |
|---|---|---|---|
| **Age, years, mean (SD)** | 34.9 (8.08) | 36.0 (8.34) | *t* = 1.26 (0.208) |
| **Gender** | | | |
| Female | 216 (69.9) | 93 (30.1) | 13.23 (<0.001)* |
| Male | 38 (48.1) | 41 (51.9) | |
| **Nationality** | | | |
| Saudi | 243 (66.2) | 124 (33.8) | 1.68 (0.195) |
| Non-Saudi | 11 (52.4) | 10 (47.6) | |
| **Residency** | | | |
| Rabigh city | 203 (68.1) | 95 (31.9) | 4.01 (0.045)* |
| Rabigh suburbs | 51 (56.7) | 39 (43.3) | |
| **Marital status** | | | |
| Married | 233 (65.3) | 124 (34.7) | 0.18 (0.912) |
| Divorced | 18 (66.7) | 9 (33.3) | |
| Widowed | 3 (75.0) | 1 (25.0) | |
| **Number of children** | | | |
| 1–4 | 206 (66.0) | 106 (34.0) | 0.22 (0.637) |
| >4 | 48 (63.2) | 28 (36.8) | |
| **Chronically ill child at home** | | | |
| No | 242 (65.6) | 127 (34.4) | 0.05 (0.828) |
| Yes | 12 (63.2) | 7 (36.8) | |
| **Education level** | | | |
| High school or below | 76 (63.3) | 44 (36.7) | 0.59 (0.899) |
| Diploma | 27 (64.3) | 15 (35.7) | |
| Bachelor's degree | 141 (66.5) | 71 (33.5) | |
| Postgraduate | 10 (71.4) | 4 (28.6) | |
| **Occupation** | | | |
| Employed | 93 (61.6) | 58 (38.4) | 1.64 (0.200) |
| Not employed | 161 (67.9) | 76 (32.1) | |
| **Monthly household income (SAR)** | | | |
| <5,000 | 89 (63.6) | 51 (36.4) | 0.69 (0.709) |
| 5,000–10,000 | 99 (65.1) | 53 (34.9) | |
| >10,000 | 66 (68.8) | 30 (31.3) | |

Data are presented as n (row %) unless otherwise indicated; age was compared using the independent-samples *t*-test and all other variables using the $\chi^2$ test. SAR, Saudi riyal; SD, standard deviation.

*Statistically significant at $p < 0.05$.

high and catching them (63.4% *vs*. 31.5%; $p < 0.001$), to report having previously shaken their baby vigorously (34.3% *vs*. 20.1%; $p = 0.002$), and to surprise their child with sudden shaking during play (71.6% *vs*. 36.2%; $p < 0.001$). Knowledge level was not associated with shaking a child vigorously to wake them from sleep ($p = 0.123$).

## Discussion

This study assessed knowledge, awareness, and caregiving practices related to SBS among parents in Rabigh Governorate, Saudi Arabia. Approximately two-thirds of parents had good knowledge, yet most had never heard the term SBS, knowledge was lower among fathers and suburban residents, and potentially harmful handling practices were common. To our knowledge, this is the first report on parental SBS knowledge in this region.

Overall, 65.5% of parents in our sample demonstrated good knowledge of SBS, a considerably higher proportion than reported in Riyadh (18.7%) [3]; in Jeddah, only 32.3% of parents who were aware of SBS had good knowledge [2]. These differences should be interpreted cautiously because knowledge scores and cutoffs differed between studies; our middle-based classification is relative to the sample. Differences in sample composition may also contribute: 40.2% of the Riyadh participants were fathers [3], whereas our sample was predominantly female, and knowledge differed markedly by gender in our cohort.

Women in Rabigh city and its suburbs were more likely to have good knowledge (69.9%) than men (48.1%). This finding is consistent with previous Saudi studies: in Riyadh, mothers were more likely than fathers to have good knowledge (21.4% *vs*. 14.7%) [3], and in the Qassim Region, where 82% of respondents were

***Table 3.*** *Association between knowledge level and reported caregiving practices (N = 388)*

| Practice | Good knowledge (*n* = 254) | Poor knowledge (*n* = 134) | $\chi^2$ (*p* value) |
|---|---|---|---|
| **Response when the child cries** | | | |
| Calms the infant by shaking | 148 (58.3) | 65 (48.5) | 11.67 (0.020)* |
| Carries the infant | 50 (19.7) | 18 (13.4) | |
| Pats the infant's back | 50 (19.7) | 45 (33.6) | |
| Asks family/friend for help | 5 (2.0) | 5 (3.7) | |
| Does nothing | 1 (0.4) | 1 (0.7) | |
| **Plays with the child by raising them high and catching them** | | | |
| No | 174 (68.5) | 49 (36.6) | 36.61 (<0.001)* |
| Yes | 80 (31.5) | 85 (63.4) | |
| **Shakes the child vigorously to wake them from sleep** | | | |
| No | 240 (94.5) | 121 (90.3) | 2.38 (0.123) |
| Yes | 14 (5.5) | 13 (9.7) | |
| **Has ever shaken the baby vigorously** | | | |
| No | 203 (79.9) | 88 (65.7) | 9.50 (0.002)* |
| Yes | 51 (20.1) | 46 (34.3) | |
| **Surprises the child with sudden shaking during play** | | | |
| No | 162 (63.8) | 38 (28.4) | 44.07 (<0.001)* |
| Yes | 92 (36.2) | 96 (71.6) | |

Data are presented as n (column %).

*Statistically significant at $p < 0.05$.

mothers, only about 15% of participants overall had good knowledge [10]. Because women typically bear primary responsibility for day-to-day infant care in this cultural context, they may have more exposure to SBS-related information through antenatal and postnatal healthcare contacts, underscoring the need to actively engage fathers in future educational efforts.

In our study, 89.7% of parents expressed interest in learning more about SBS, a higher proportion than reported in Riyadh (82.5% of 577 participants) [3] and in the Eastern Province (72.5% of 403 participants) [7], but lower than that reported in Hail City (96.4% of 384 participants) [11].

In the present study, 61.1% of participants had not previously heard the term "shaken baby syndrome," a proportion slightly lower than that reported in Makkah (64.7%) [12] and broadly comparable to an Irish survey in which approximately half of participants had never heard of SBS [13]. In Hail City, only 23.9% of parents (92 of 384) had previously heard the term, which the authors attributed to the lower general education level of that sample [11]. The lack of public awareness campaigns and parent-focused educational programs was proposed to explain the low level of understanding in the Jeddah study [2], and similar gaps likely persist in Rabigh despite the relatively favorable overall knowledge scores observed here.

We found no difference in knowledge level by number of children (66.0% among parents with 1–4 children *vs.* 63.2% among those with more than four). This finding aligns with the Riyadh study, in which the number of children was not associated with SBS knowledge [3]. In contrast, a study in Hail City found that parents with fewer children (1–4) had better knowledge than those with more than four children ($p = 0.049$) [11].

More than half of our participants (54.9%) reported calming a crying infant by shaking, 25.0% reported having shaken their baby vigorously at some point, and 48.5% reported surprising their child with sudden shaking during play. Although most participants denied shaking their child to wake them from sleep (93.0%), these findings point to a persistent need for practical education on safer caregiving techniques. In Riyadh, 56.8% of participants reported that they would carry their crying infant, 22.9% would shake the infant to calm them, 15.8% would pat the infant, 3.3% would seek support from friends or family, and 1.2% would do nothing [3]. In Jeddah, the most commonly reported responses to a crying infant were carrying (54.7%), patting the infant's back (25.5%), and shaking (16.8%), and 44.8% of participants reported playfully shaking their child and 41.4% reported raising their infant high and catching them [2]. In Hail City, 45.3% of participants reported shaking their baby to calm crying, a dangerous practice that may contribute directly to SBS [11].

When caregiving practices were examined by knowledge level (Table 3), the pattern was mixed. Parents with poor knowledge were more likely to raise their child high and catch them, to have shaken their baby vigorously, and to surprise their child with sudden shaking during play, suggesting that knowledge may partly translate into safer handling during play. In contrast, calming a crying infant by shaking was more frequent among parents with good knowledge (58.3% *vs.* 48.5%), whereas parents with poor knowledge more often patted the infant's back. This finding indicates that general knowledge of the dangers of shaking does not necessarily translate into

safe soothing behavior; parents may not regard rhythmic shaking used to soothe a crying infant as harmful, or may lack practical alternatives for coping with inconsolable crying. Because the questionnaire did not distinguish gentle rocking from forceful shaking, this result should be interpreted with caution. Nevertheless, it suggests that educational interventions should go beyond raising awareness and should teach parents specific soothing techniques and strategies for coping with infant crying.

The preferred source of information about SBS was the internet and social media (39.4% of the full sample; 44.0% of the 348 participants who wanted more information), underscoring the importance of digital platforms for educational campaigns. Most participants preferred to receive this information during pregnancy (43.8%). Only 19.8% of participants cited healthcare professionals as a preferred source, indicating a potential gap in communication during routine antenatal and postnatal visits. In Makkah, 17.9% of participants had heard of SBS, and 20.8% chose to learn more about it from social media [12].

### *Limitations*

This study has several limitations. The online survey may have led to self-selection of participants who were more comfortable with social media and excluded parents without reliable internet access. Most participants lived in Rabigh city rather than the suburbs, which may limit the generalizability of the findings to other parts of the governorate. The cross-sectional design precludes causal inference between knowledge and practice, and self-reported practices are subject to social desirability and recall bias. Finally, the middle-based classification of knowledge limits direct comparison with studies that used other cutoffs.

### *Strengths*

To our knowledge, this is the first study to assess parental awareness of SBS in a Saudi governorate with a substantial suburban population, in contrast to previous Saudi studies that focused on large cities with generally higher levels of education. The sample size and high response rate (91.3%) strengthen confidence in the precision of the estimates.

### *Recommendations*

Future studies should consider interview-based data collection, particularly in suburban areas where parents may be harder to reach through social media. Based on our findings, educational efforts should specifically target fathers and residents of the Rabigh suburbs. Awareness campaigns, leaflets, and educational materials delivered through digital platforms and during antenatal care may help close the identified knowledge gaps and provide a foundation for culturally tailored, local interventions.

## Conclusion

Most parents in Rabigh Governorate (65.5%) had good overall knowledge of SBS; however, a substantial proportion, particularly fathers and suburban residents, remained unaware of the condition. Potentially harmful caregiving practices were common: more than half of the parents calmed a crying infant by shaking, and 42.5% played with their child by raising them high and catching them. Shaking to calm crying was reported even more often by parents with good knowledge, highlighting a gap between knowledge and safe caregiving practice. Targeted educational interventions are needed to teach parents safe responses to infant crying and to discourage harmful shaking. Educational programs for pregnant women and new parents, especially fathers and families in suburban areas, together with greater involvement of healthcare professionals in providing SBS education during antenatal care, routine check-ups, and vaccination visits, may help close these gaps.

### Declarations

### Consent for publication

Not applicable. This manuscript does not contain any individual person's data, images, or identifiable information.

### Availability of data and materials

The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

### Competing interests

The authors declare that they have no competing interests.


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This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.


### Abbreviations

| | |
|---|---|
| AHT | abusive head trauma |
| SAR | Saudi riyal |
| SBS | shaken baby syndrome |
| SD | standard deviation |
| SPSS | Statistical Package for the Social Sciences |

### Ethics approval

Ethical approval was granted by the Research Ethics Committee (REC) via reference number HA-02-J-008, dated: 1/2/2024.


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*Supplementary content (if any) is available online.*

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