

Awareness of sudden infant death syndrome and its associated risk factors among Saudi mothers attending well-baby clinics at PHC, PSMMC, Riyadh, Saudi Arabia: A cross-sectional study

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ABSTRACT

Introduction: Sudden infant death syndrome (SIDS) is a leading cause of infant mortality all over the world. Mortality due to SIDS can be averted by educating families and caretakers about safe practices for putting infants to sleep. However, the knowledge, attitude, and practices of mothers while putting the infant to sleep is a gray areas in literature. **Aims and Objectives:** The objectives of the study were to measure the knowledge and awareness about SIDS and its associated risk factors practiced among Saudi mothers attending well-baby clinics in Saudi Arabia to develop appropriate educational program-based interventions for safe practices of infant care. **Methods:** This cross-sectional study was carried out among 385 mothers attending well-baby clinics of primary health care (PHC) and prince sultan military medical city (PSMMC) in Riyadh Saudi Arabia. Information was captured on sociodemographic characteristics, the health status of mothers and infants, knowledge, attitude, and practice followed by mothers while putting infants to sleep. **Results:** From a total number of 385 responses, 350 participants were eventually included in the final sample due to the incompleteness of the questionnaire of 350 mothers; only 26% ($n = 93$) mothers had heard of SIDS. However, 259 mothers were willing to attend the awareness session. Only 94 mothers had knowledge as well as practicing the correct behavior of putting the infant to sleep on the back referred to as “good behavior concordant pairs.” Similarly, other good practices include not co-sharing a bed with the infant, removing pillows, blankets, and other wedged objects, using a pacifier, breastfeeding the infant during sleep, not using multiple quilts, not covering the infant’s head with a quilt, not using a head cap. The number of good behavior concordant pairs (in green) were 124, 38, 56, 98, 18, 117, and 68 respectively. **Conclusions:** The rate of knowledge and practice for good behavior regarding SIDS was low among Saudi mothers in Riyadh Saudi Arabia. SIDS-related deaths can be averted by improving the understanding of SIDS risk reduction practices among mothers by using health promotion strategies.

Keywords: Bed sharing, family, infant, mothers, sudden infant death syndrome, unsafe sleeping

Introduction

In many countries, sudden infant death syndrome (SIDS) is the leading cause of infant death. Willinger, James, and Catz define

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SIDS as “sudden death of an infant under one year of age, which remains unexplained after thorough case investigation”.^[1] This definition is accepted in standard medical practice, including the American Academy of Pediatrics and the Canadian Pediatric Society.^[2] SIDS is the most common type of sudden unexpected infant death.^[3] Unsafe infant sleeping practices exhibited by mothers such as head covering, blankets, and bed sharing are major causes of SIDS.^[4] Furthermore, wrong infant sleeping

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position is still common.^[5] Various studies showed that SIDS prevalence varies significantly from country to country and from one ethnicity to another. For instance, in 2003, there were approximately 2.08 SIDS deaths per 1000 births among African Americans compared to a rate of 0.65 for non-African Americans in general.^[6] Although most countries have seen a significant drop in SIDS in the late 1980s and 1990s, due to education campaigns like Back to Sleep Campaign in the United States,^[7] SIDS is still one of the leading causes of infant death in the United States.^[8]

Material and Methods

Study population

This study was carried by using cross-sectional design among Saudi mothers attending the well-baby clinics of PSMMC in Riyadh, Saudi Arabia during March–July 2019.

Sample size

Considering the prevalence of awareness among mothers regarding SIDS and its risk factors to be 71% from the existing literature at 95% confidence interval and 5% relative error, a total of 385 mothers were enrolled for the survey, and 35 mothers were removed due to incompleteness of the questionnaire. The sample size was estimated by using one proportion qualitative equation ($\sum z^2 p(1-p)/\delta^2 + 10\%$) where extra 10% was added to counter for nonresponse rate.

Study tool

The questionnaire was adapted from a previously published study and was modified.^[9] The questionnaire includes sections on participants' sociodemographic information, practices, and opinions of infants' sleeping positions as well as opinions related to the home environment such as smoking exposure. The questionnaire, which was developed, required the validation process, including face and content validity by four expert consultants from different specialties. A pilot study in addition to test and retest were done on 40 participants to assure clarity and feasibility.

This tool captured information on participants' sociodemographic information along with practices and opinions on infants' sleeping positions and in addition to the home environment (exposure to smoking). Pretesting of the tool was done on 10 participants to check for the sequence of questions and to check whether they are easily understandable. The tool was administered by the interviewer by using a paper survey methodology.

Statistical analysis

The data were entered in Microsoft Excel 2007 for analysis using SPSS version 25. As a first step, descriptive analysis was done for sociodemographic characteristics, information on mother and child's health status, knowledge, opinions, and practice about SIDS and its risk factors to express them as the number and

its percentages. Chi-square test of significance was used to test the association between sociodemographic factors, the health status of mother and child with knowledge and attitude toward awareness regarding SIDS. Further, cross-tabulation was done between the opinions of mothers regarding sleeping positions and smoking behavior with the practice they followed for these aspects. This was helpful in reflecting the gaps between the knowledge and practice of mothers for themes like sleeping position of baby, use of head caps and blankets for covering infant, and risk of smoking associated with SIDS. However, to check the reliability of the study tool, the researcher used Alpha Cronbach's stability coefficient. The total stability coefficient value (alpha) amounted to (0.846), which is a high degree of reliability.

Results

Sociodemographic, family, and health status of mothers

The mean age of participants was found to be 30.8 ± 6.7 years [Table 1]. Out of 350 participants, 43.4% of mothers were educated till high school, and 97.1% were married. The monthly family income of 46% of participants was more than 10000 SR, and 97.7% of mothers were from the urban areas. A little more than half of the participants ($n = 188$, 53.7%) were living in rented accommodation at the time of the survey [Table 1]. Other child- and mother-related attributes are shown in Table 2.

Table 1: Sociodemographic characteristics of mothers attending Well-Baby Clinics (n=350)

Sociodemographic characteristics	Frequency (n=350)	Percentage
Age of the participant		
≤25 years	80	22.9
26–30 years	114	32.6
31–35 years	78	22.3
36 years and above	78	22.3
Education		
Primary school	10	2.9
Secondary school	18	5.1
High school	124	35.4
Other	198	56.6
Marital status		
Married	340	97.1
Divorced/widowed	10	2.9
Monthly income		
≤SR 5,000	73	20.9
>SR 5,000–10,000	116	33.1
>SR 10,000–15,000	97	27.7
≥SR 15000	64	18.3
Locality		
Urban	342	97.7
Rural	8	2.3
Status of house acquisition		
Rented accommodation	188	53.7
Owned accommodation	162	46.3

General awareness and attitude toward SIDS

It was found that around 26.6% of mothers ($n = 93$) had heard about the SIDS, thus indicating the awareness level of mothers. Of these 93 mothers, the majority of them had heard about SIDS through the media ($n = 44, 47.3\%$), followed by the medical journals ($n = 24, 25.8\%$) as shown in Figure 1. Around 67% of participants had heard about SIDS from just one source ($n = 63$), and only four participants (1.1%) had actually been to an awareness program on SIDS within one year from the time of survey.

Three-fourths of the participants ($n = 259, 74\%$) expressed their willingness to attend an awareness session on SIDS, reflecting their attitude for willingness to gain knowledge about this syndrome.

Knowledge/Opinion of mothers on risk factors associated with SIDS

More than 90% of mothers considered that the infants should sleep near the parents but in a separate bed, which was a good

indicator to prevent SIDS. Only 41% of mothers knew that putting an infant in the supine position was considered safer than the side position to prevent SIDS. Less than 50% mothers knew that the pillows, blankets, and wedged objects should be removed, and 72% mothers did not know that infants should wear one layer more than adult in the same room according to back to sleep campaign.

The malpractice of using multiple blankets and hats for keeping infant warm was agreed by 39% mothers while 27.4% of mothers were unaware of the fact that smoking at home increased the risk of SIDS. Similarly, 58% mothers agreed that breastfeeding can reduce the risk of SIDS while putting infants to sleep [Table 3].

Practices performed by mothers while putting the infant to sleep

One hundred and thirty-eight (39.4%) participants claimed to put their infant to sleep on the back; an equal number reported that they put the infant to sleep on the side with rolls to stabilize the baby. Only 2% ($n = 6$) put their infant to lie in a prone position (infant's stomach facing bed surface) [Figure 2].

Most of the participants reported that they would mostly put pillows under the head for sleeping infant ($n = 217, 62\%$), put wedged objects on infant's bed ($n = 177, 50.6\%$), use multiple quilts for sleeping infant during winters ($n = 241, 68.9\%$), cover the infant's head with a cap while sleeping ($n = 178, 50.9\%$), never used quilt edge to cover baby's head ($n = 156, 44.6\%$), or share the bed with the infant during sleep ($n = 132, 37.7\%$) or used pacifiers to help infant sleep ($n = 157, 44.9\%$). Breastfeeding the infant during sleep most of the time was being practiced by 42.6% of mothers ($n = 149$) [Figure 3].

One hundred and four participants (29.7%) reported that the father of the infant was a smoker [Figure 4]; though the practice of carrying the infant while smoking, putting cigarette in infant's mouth, and kissing the infant while smoking were not at all performed by nearly three-fourths of fathers who were smoking [Table 4].

Table 2: Child- and mother-related attributes

Variable	Frequency (n=350)	Percent
Number of children of participant		
One	99	28.3
Two	103	29.4
Three	73	20.9
More than three	75	21.4
Infant count at birth		
More than one (twins or more)	22	6.3
Only one infant	328	93.7
Infant suffering from congenital disorders		
Yes	26	7.4
No	324	92.6
Disease status of mother		
Diseased	74	21.1
Non- diseased	276	78.9
Provision of housemaid		
a. Having a maid at home	58	16.6
b. Infant care by maid (n=58)	26	7.4

Table 3: Knowledge/Opinion of mothers on risk factors associated with SIDS

Attribute	Distribution of responses					
	Agree		Disagree		Don't know	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Putting the infant on back to sleep is safer than side position	144	41.1	165	47.1	41	11.7
Infant should sleep near parents but in a separate bed	316	90.3	30	8.6	4	1.1
Pillows, blankets, and wedged objects should be removed from infant's bed when sleeping	170	48.6	127	36.3	53	15.1
Use of a pacifier when sleeping helps keep the airway open	63	18.0	193	55.1	94	26.9
Infants should wear more cloths compared to adults for more warmth	254	72.6	82	23.4	14	4.0
Best ways to keep the infant warm in a bed is the use of multiple blankets and hats	135	38.6	191	54.6	23	6.6
Smoking at home increases SIDS	224	64.0	30	8.6	96	27.4
Breastfeeding decreases the risk of SIDS	204	58.3	16	4.6	130	37.1

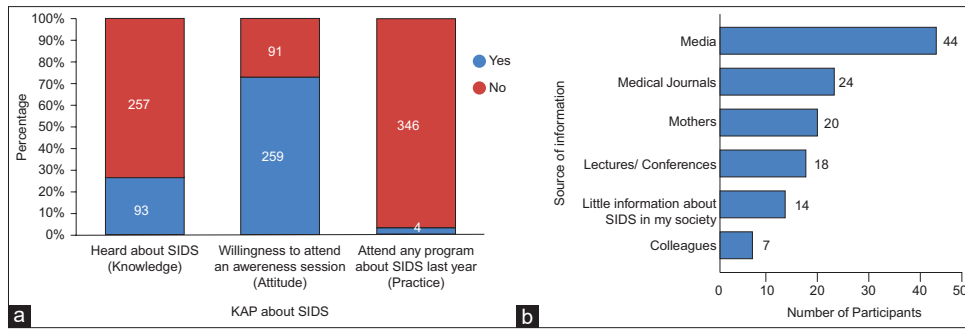


Figure 1: (a) General awareness, attitude, and willingness of mothers toward SIDS (b) Sources of information about SIDS



Figure 2: Practices regarding sleeping positions followed by mothers while putting their infants to sleep

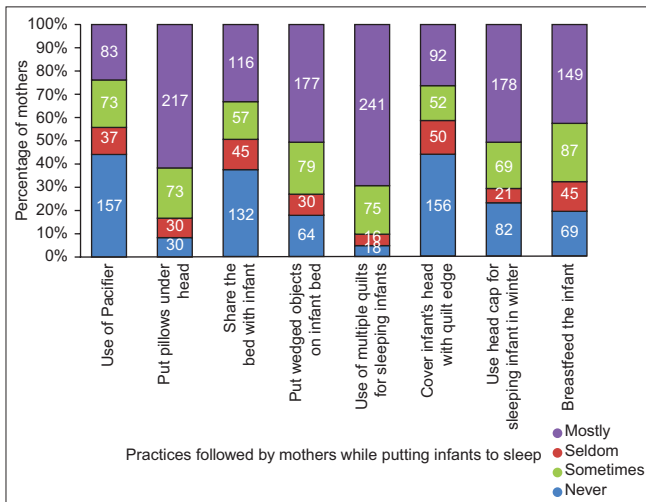


Figure 3: Practices performed by mothers while putting their infants to sleep

When asked about their reaction to someone smoking next to the child, 240 participants (70%) reported that they would take their infant to a smoke-free place. Around one-fourth of the participants ($n = 90$, 25.7%) claimed that they told the smoker to stop smoking next to the child. Nearly 4.3% had an ignoring attitude toward the same.

Around 12% of participants' infants ($n = 42$) were being exposed to smoking once or twice a week. Eight participants (2.3%)

reported that their infant was being exposed to the smoke for about 2 hours daily [Figure 5].

Gaps in knowledge and practical application of awareness regarding SIDS

The gaps in knowledge/opinion and its practical application have been presented in Table 5. To analyze these data, the first thing we did was to reframe all statements in the questionnaire in the form of good practices, which ideally should be followed to prevent SIDS. The second step we took was to create the categories of Likert scale for capturing information on opinions/knowledge. We merged two categories that are “disagree” and “don't know” as one category under disagree by considering the fact that mothers who did not have any opinion on the behavior were equivalent in knowledge to the people who responded as “disagree” to the good practice. Similarly, we merged the categories of “seldom and sometimes” to “No” because even a single episode of neglect can lead to the death of the infant.

After analyzing the data, we found that there were four categories of mothers. The one highlighted in green indicated the mother was aware of good practice and followed it also while putting the infant to sleep. The red color category indicated the mothers who were aware of the good practice but were not following them. The orange color category consisted of mothers who disagreed with the good practice but followed it knowingly or unknowingly. The last category of yellow color mothers was neither aware of the good practice nor following it [Table 5].

Based on these findings, there is a need to frame the intervention programs, as discussed in the next section to address different categories of mothers.

Factors influencing knowledge about SIDS

Sociodemographic factors, including the education status of the mother, monthly family income, and locality, were statistically significantly associated with the knowledge about SIDS among study participants (Chi-square, P value < 0.05) [Table 6]. The number of children of participants during the time of the survey was also found to be statistically significantly associated with knowledge about SIDS among the study participants [Table 7].

A regression model was tested for the statistically significant associations found in bivariate analyses. It was found that after

Table 4: Smoking practices followed by parents (n=104)

Smoking practices followed by parents (n=104)	Never	Rarely	Sometimes	Mostly
The father or I smoke at home with our infant	62	16	14	12
The father or I carry our infant when smoking	79	8	6	11
The father or I kiss our infant when smoking	76	10	12	6
The father or I put cigarette in our infant's mouth for fun	92	4	6	2

Table 5: Gaps in knowledge and practical application of awareness regarding SIDS

Practice followed by mothers while putting infant to sleep	Attributes	Opinion of mothers on good practices related to SIDS		
		Agree	Disagree/don't know	Total
Putting infant on back to sleep is safer than side position	Yes	94	44	138
	No	50	162	212
Should not share the bed	Yes	124	8	132
	No	192	26	218
Pillows, blankets, and wedged objects should be removed	Yes	38	26	64
	No	132	154	286
Use of a pacifier is safe	Yes	56	137	193
	No	7	150	157
Breastfeeding while putting the infant to sleep	Yes	98	51	149
	No	29	95	124
Should not use multiple quilts for sleeping infant	Yes	18	0	18
	No	197	135	332
Should not covers infant's head with quilt edge	Yes	117	39	156
	No	98	96	194
Should not Use a head cap for sleeping infant	Yes	68	14	82
	No	147	121	268

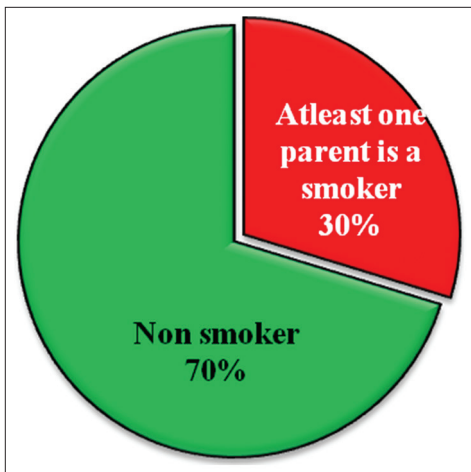


Figure 4: Smoking status of parents

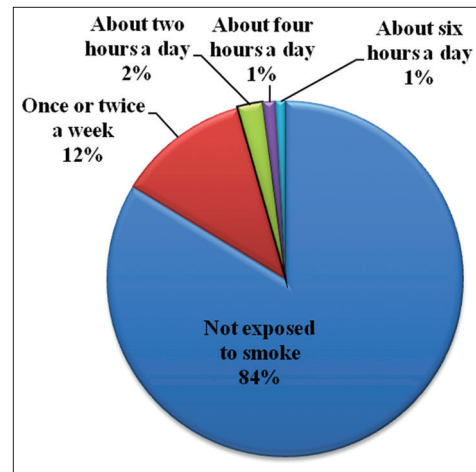


Figure 5: Duration of exposure to smoking by the infant

controlling for each variable, qualification of the mother, their monthly family income, and locality remained significantly associated with the knowledge about SIDS. Though the odds ratio showed increasing trends for all the above-mentioned variables, the difference in odds within-group categories was not found to be statistically significant for knowledge about SIDS among study participants in various strata [Table 8].

Factors affecting attitude or willingness of mothers to know about SIDS

Sociodemographic factors including education status of the mother and maternal attribute including knowledge about

SIDS were found to be statistically significantly associated with the attitude of study participants, which was determined by their willingness to attend an upcoming program on SIDS [Tables 9 and 10].

When a regression model was tested with the above-mentioned variables, a statistically significant association was confirmed. It was also found that the within-group odds ratio for various levels of education of study participants were also statistically significant, with odds ratio <1 for both high school and higher (other) levels of education as compared to low education status. As far as the knowledge about SIDS is concerned, the

participants who were aware of SIDS were 3.2 times (odds ratio: 3.291, 95% CI: 1.872–5.783) more willing to attend a session on SIDS [Table 11].

Discussion

The present study was conducted among Saudi mothers of infants attending the well-baby clinics of Prince Sultan Military Medical City in Riyadh, Saudi Arabia during March–July 2019. The objective was to determine the percentage of mothers who

were aware of SIDS. The secondary objective was to measure the gaps in the knowledge, attitude, and practice of mothers regarding the risk factors of SIDS.

In our sample, more than 50% of mothers were aged 30 years or less, with 43% of mothers educated to the level of high school or less. Most of these women were married, staying in the urban community, and 46% belonged to the family having monthly income more than 10,000 SR. Of these, 21% women had more than three children, and the same number of women had a history of some disease like thyroid, hypertension, diabetes, etc. Only 16.6% of households had a maid, and about 44% of maids were involved in childcare work. These studies are similar to those conducted by “Lahr, Rosenberg, and Lapidus” whose outcome demonstrated that parents with low annual income less than \$30,000 and single mothers expose their infants to ineffective sleeping practices such as bed sharing, which maximizes the chances of SIDS.^[9] The outcomes, therefore, demonstrate the disparity created by low income as regards SIDS.

Only 26% ($n = 93$) mothers had ever heard about SIDS indicating the low percentage of mothers having awareness regarding SIDS. The outcome is consistent with “Willinger, James, and Catz’s” study.

Further, we tried to explore the gaps between knowledge and practice of these mothers by asking them a few themes based questions related to common high-risk factors associated with SIDS. As depicted in Table 5, only 94 mothers had knowledge as well as practicing the correct behavior of putting the infant to sleep on back referred to as “good behavior concordant pair.” This outcome contradicts with the research conducted by Yikilkan *et al.*,^[10] which indicated that only 39% of the mothers where aware of SIDS. Similarly, for other good practices like not co-sharing bed with the infant, removal of pillows, blankets and other wedged objects, use of pacifier, breastfeeding the infant, not using multiple quilts, and not covering infant’s head with quilt and not using the head cap, the numbers of good behavior concordant pairs (in green) were 124, 38, 56, 98, 18, 117, and 68

Table 6: Sociodemographic factors influencing knowledge of mothers about SIDS

Sociodemographic factor	Knowledge about SIDS ($n=350$)				Chi- square P
	Yes		No		
	n	%	n	%	
Education status					
Secondary school	2	0.6	26	7.4	0.001
High school	24	6.9	100	28.6	
Other	67	19.1	131	37.4	
Marital status					
Divorced/Widowed	4	1.1	6	1.7	0.46
Married	89	25.4	251	71.7	
Income					
≤INR 5000	18	5.1	55	15.7	0.003
INR 5000-10000	19	5.4	97	27.7	
INR 10000-15000	30	8.6	67	19.1	
≥INR 15000	26	7.4	38	10.9	
Locality					
Urban	88	25.1	254	72.6	0.03
Rural	5	1.4	3	0.9	
Status of house acquisition					
Rented accommodation	51	14.6	137	39.1	0.810
Owned accommodation	42	12.0	120	34.3	
Age of the participant ($n=350$)					
≤25 years	21	6.0	59	16.9	0.201
26–30 years	38	10.9	76	21.7	
31–35 years	16	4.6	62	17.7	
36 years and above	18	5.1	60	17.1	

Table 7: Sociodemographic factors influencing knowledge of mothers about SIDS

Attribute	Knowledge about SIDS ($n=350$)				Chi- square P
	Yes		No		
	n	%	n	%	
Infant suffering from congenital disorders					
Yes	7	2.0	19	5.4	1.00
No	86	24.6	238	68.0	
Disease status of mother					
Non-diseased	77	22.0	199	56.9	0.303
Diseased	16	4.6	58	16.6	
Number of children of the participant					
One	32	9.1	67	19.1	0.018
Two	34	9.7	69	19.7	
Three	16	4.6	57	16.3	
More than three	11	3.1	64	18.3	

Table 8: Regression model to test influence of various factors on the knowledge of mothers with infants

Variable	OR adjusted	CI lower	CI upper	P
Qualification				0.024
Up to Secondary school		Reference		
High school	2.437	0.498	11.926	0.272
Other	4.725	0.975	22.909	0.054
Income				0.017
≤INR 5,000		Reference		
INR 5,000–10,000	0.531	0.246	1.144	0.182
INR 10,000–15,000	1.243	0.585	2.641	0.415
≥INR 15,000	1.697	0.756	3.809	0.123
Locality				
Rural		Reference		
Urban	5.327	1.086	26.128	0.039
Number of children				0.056
One		Reference		
Two	1.043	0.559	1.947	0.896
Three	0.566	0.265	1.209	0.142
More than three	0.393	0.173	0.896	0.026

Table 9: Sociodemographic factors affecting the attitude regarding SIDS among the infant carrying mothers

Sociodemographic factor	Attitude/willingness about SIDS (n=350)				Chi- square P
	Yes		No		
	n	%	n	%	
Education status					
Up to Secondary school	16	4.6	12	3.4	0.001
High school	82	23.4	42	12.0	
Other	161	46.0	37	10.6	
Marital status					
Divorced/Widowed	6	1.7	4	1.1	0.293
Married	253	72.3	87	24.9	
Income					
≤INR 5,000	55	15.7	18	5.1	0.381
INR 5,000–10,000	80	22.9	36	10.3	
INR 10,000–15,000	77	22.0	20	5.7	
≥INR 15,000	47	13.4	17	4.9	
Locality					
Rural	253	72.3	89	25.4	1.00
Urban	6	1.7	2	0.6	
Status of house acquisition					
Rented accommodation	137	39.1	51	14.6	0.627
Owned accommodation	122	34.9	40	11.4	
Age of participant (n=350)					
≤25 years	63	18.0	17	4.9	0.482
26–30 years	82	23.4	32	9.1	
31–35 years	60	17.1	18	5.1	
36 years and above	54	15.4	24	6.9	

respectively. The outcome is consistent with Yikilkan *et al's*^[10] study, which reports that side sleeping was the most preferred as a safest, to SIDS by 73% of health professionals, while mothers practiced good sleeping behaviors of their infants even though most of them were not aware of SIDS.

The second category was of the mothers who were not following good practices despite having agreed opinion. This category was referred to as “bad practice discordant pairs” in red color. These mothers need to be addressed by behavior change strategies in addition to solely providing them knowledge and awareness. For this, first, the factors which are preventing them from following good practices need to be explored despite having awareness. A study by Chung-Park, however, dismisses this outcome by asserting that 85% of the mothers are aware of the safety sleeping practices, and 65% of them put this knowledge into practice.^[11] Overall, educating mothers about good sleeping behaviors and practices is significant in overcoming this crisis.

The third category pertains to mothers who did not agree with good practices but were following them as depicted in orange color referred to as “good practice discordant pair.” As they are practicing good behavior to prevent SIDS in the absence of knowledge, their behavior might not stay longer. Similar outcomes were evident in one survey study by Chung-Park, whose outcome indicated that 40% of the parents were aware of sleep facts for infants, with 85% believing supine position was the safest, with only 65% of them putting this knowledge into practice.^[11] With this outcome, reinforcement with proper knowledge is necessary.

The last category is of mothers who neither had the knowledge nor was practicing ideal behavior (marked in yellow) referred to as “bad practice concordant pair.” Here, knowledge is to be supplemented with back to sleep campaign strategies to achieve the desired results. Other studies have also investigated the mothers lacking knowledge about SIDS. Kemp, Harris, and Chavez, for instance undertook a research, whose outcome indicated that only 51.5% of mothers would identify two or more mechanisms that would reduce SIDS.^[10] The study, however, acknowledges that women in developed countries are more aware of safety sleeping practices than those from emerging economies.

It was found that the qualification of the mothers, their monthly family income, and locality were significantly associated with the knowledge about SIDS. Sociodemographic factors including education status of the mother and maternal attribute including knowledge about SIDS were found to be statistically significantly associated with the attitude of study participants, which was determined by their willingness to attend an upcoming program on SIDS. The result coincides with Unger *et al.* study,^[6] whose outcome indicated that 67% of the infants succumbing to SIDS are African Americans, and 75% of those die on nonstandard sleeping services. The study also indicates that low income and educational disparities account for 49% deaths as a result of bed sharing. These findings are like many other such studies that have tried to find out factors affecting knowledge and attitude regarding SIDS.^[12,13] These factors need to be taken care of while designing community interventions to generate awareness regarding good practices to prevent SIDS.

Table 10: Maternal- and child-related attributes affecting attitude regarding SIDS among infant carrying mothers

Attribute	Attitude about SIDS (n=350)				Chi- square P
	Yes		No		
	n	%	n	%	
Infant suffering from congenital disorders					
Yes	20	5.7	6	1.7	0.820
No	239	68.3	85	24.3	
Disease status of the mother					
Non- diseased	203	58.0	73	20.9	0.767
Diseased	56	16.0	18	5.1	
Number of children of the participant					
One	82	23.4	17	4.9	0.069
Two	75	21.4	28	8.0	
Three	53	15.1	20	5.7	
More than three	49	14.0	26	7.4	
Knowledge about SIDS					
Unaware	202	57.7	55	15.7	0.002
Aware	57	16.3	36	10.3	

Table 11: Regression model to test influence of various factors on the attitude of mothers with infants about SIDS

Variable	OR adjusted	CI lower	CI upper	P
Qualification				0.000
Up to Secondary school		Reference		
High school	0.201	0.084	0.485	0.000
Other	0.350	0.201	0.609	0.000
Knowledge about SIDS				0.000
Unaware		Reference		
Aware	3.291	1.872	5.783	0.896

The willingness of the mothers, the anonymity of the survey, and the self-administered questionnaire approaches are all the strengths of this study from a methodological point of view. It is the first study that has analyzed the data to explore the gaps between knowledge and practices in such a way as described in [Table 5]. Such an analysis is extremely useful from a policy point of view as well for the formulation of the intervention program.

Limitations

In this study, we could not explore the reasons for the gap in the knowledge and practices of mothers due to the constraint of resources, which may be considered as a limitation. Another limitation may be its hospital-based design, which may have led to over-reporting of the knowledge level of mothers. To address these limitations, we propose a community-based survey or a case-control study design to explore the reasons for gaps between knowledge and practices regarding SIDS.

Conclusion and Recommendation

To conclude, the rate of knowledge and practice for good behavior regarding SIDS was low among Saudi mothers in Riyadh, Saudi Arabia. SIDS-related deaths can be averted by

improving the understanding of SIDS risk reduction practices among Saudi mothers. However, knowledge alone will not be enough, especially for the category of bad practices discordant pairs. For them, health promotion strategies need to be used for effective behavior change.

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Ethical considerations

The permission for this study was granted by the Ministry of Defense, doctor in-charge of Wazarat primary care center and the doctor In- charge of well-baby clinics. The ethical approval was taken from the Ethical Committee of the Institute and Institutional Review Board. Written informed consent was taken from the participants. The purpose of the study was explained, and they had the option to drop out of the study at any time. Confidentiality was assured by assigning each mother with a serial number, and the data did not contain any information which could directly reveal the identity of individuals. It was explained to the participants that the data would be used for research purposes only.

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Conflicts of interest

There are no conflicts of interest.

References

1. Willinger M, James LS, Catz C. Defining the sudden infant death syndrome (SIDS): Deliberations of an expert panel convened by the National Institute of Child Health and Human Development. *Pediatr Pathol* 1991;11:677-84.

2. Ateah CA, Hamelin KJ. Maternal bedsharing practices, experiences, and awareness of risks. *J Obstet Gynecol Neonatal Nurs* 2008;37:274-81.
3. Hamadneh S, Kassab M, Hamadneh J, Amarin Z. Sudden unexpected infant death in Jordan and the home environment. *Pediatr Int* 2016;58:1333-6.
4. Sophie J. Sudden infant death syndrome prevention. *BMC Pediatr* 2021;21(Suppl 1):320.
5. Kemp L, Harris E, Chavez R. Knowledge of sudden infant death syndrome prevention strategies in a multicultural, disadvantaged community. *J Paediatr Child Health* 2006;42:441-4.
6. Unger B, Kemp JS, Wilkins D, Psara R, Ledbetter T, Graham M, *et al.* Racial disparity and modifiable risk factors among infants dying suddenly and unexpectedly. *Pediatrics* 2003;111:e127-31.
7. Rollins JA. Sharing a room: Updated recommendations for a safe infant sleeping environment. *Pediatr Nurs* 2017;43:7-14.
8. Goldberg N, Rodriguez-Prado Y, Tillery R, Chua C. Sudden infant death syndrome: A review. *Pediatr Ann* 2018;47:e118-23. doi: 10.3928/19382359-20180221-03.
9. Lahr MB, Rosenberg KD, Lapidus JA. Maternal-infant bedsharing: Risk factors for bedsharing in a population-based survey of new mothers and implications for SIDS risk reduction. *Matern Child Health J* 2007;11:277-86.
10. Yikilkan H, Ünal PC, Cakir E, Ersu RH, Cifcili S, Akman M, *et al.* Sudden infant death syndrome: How much mothers and health professionals know. *Pediatr Int* 2011;53:24-8.
11. Chung-Park MS. Knowledge, opinions, and practices of infant sleep position among parents. *Mil Med* 2012;177:235-9.
12. Hamadneh SM, Omari AL, Omar M, Hamadneh JM, Bashtawi M, Alkhatib AJ, *et al.* Sudden infant death syndrome in the Middle East: An exploration of the literature on rates, risk factors, high risk groups and intervention programs. *Res J Med Sci* 2016;10:199-204.
13. Efe E, Sarvan S, Kukul K. Sleep practices and environment and the risk of sudden infant death syndrome in Turkey. *J Spec Pediatr Nurs* 2007;12:253-63.