

ASSESSMENT OF MOTHERS' KNOWLEDGE AND PRACTICES ABOUT THE PREVENTION OF SUDDEN INFANT DEATH SYNDROME

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Abstract:

Sudden infant death syndrome (SIDS) is a common cause of infant mortality below one year, and its causes remain unknown. However, simple protective practices in infant sleep and sleep environment can dramatically reduce its incidence. **Aim:** Assess the mothers' knowledge and practices for the prevention of SIDS. **Method:** Descriptive research was conducted in postnatal department at general hospital in Kafrelsheikh city, Egypt, on 180 newly delivered mothers, free from eclampsia, chronic diseases and a delivered baby didn't have health problem as neonatal jaundice or respiratory distress syndrome. Interview questionnaire sheet was used to collect data about characteristics of mothers and their infant; mothers' knowledge and practices about SIDS. **Results:** More than three-quarters of mothers (85.00%) had poor knowledge level compared to only 10.6% and 4.4% of them had average and good knowledge level about SIDS. Besides, about half of the studied mothers (44.4%) were unsatisfactory about SIDS. **Conclusion:** More than three-quarters of the mothers didn't hear about SIDS and had poor knowledge level about SIDS. In addition, about half of the mothers demonstrated an unsatisfactory practice level about SIDS prevention. Furthermore, there was a significant positive correlation between the studied mothers' total score of knowledge and reported practices. **Recommendation:** A regular health education program should be done by a pediatric nurse in the neonatal care unit and on every health visit for the infant in his first year for improving the newly delivered mothers' knowledge and practices regarding SIDS prevention and safe sleep recommendations.

Keywords: Educational program, knowledge, mother, safe sleep practice recommendation for SIDS prevention, sudden infant death syndrome.

Introduction

According to Centers of Disease Control and Prevention (CDC) Sudden Infant Death Syndrome (SIDS) is considered the third leading cause of infant deaths in the United States (US) (Centers of Disease Control and Prevention, 2018; Kinney, Hefti, Goldstein, & Haynes, 2018). The major factor contributes to SIDS, including suffocation which is considered the leading cause of unintentional death for children under one year of age

(Gollenberg, & Fendley, 2018; Bairoliya, & Fink, 2018). Infants' deaths due to suffocation occur when the child is placed in a position that makes him unable to breathe. So, sleep environment and positioning play a large preventable role in decreasing the number of SIDS which is a type of Sudden Unexpected Infant Deaths (SUIDs) each year.

Sudden Unexpected Infant Death is the sudden and unexpected death of an

infant in which the manner and cause of death are not immediately obvious before investigation (**Goldberg, Rodriguez-Prado, Tillery, & Chua, 2018**). Based on diagnostic criteria by CDC most SUIDs are reported as one of three types of infant deaths: Sudden Infant Death Syndrome, unknown cause, and accidental suffocation and strangulation in bed. About half of SUIDs are SIDS (**Lambert, Parks, & Shapiro-Mendoza, 2018**).

Sudden Infant Death Syndrome is defined as the sudden death of an infant less than 1 year of age that cannot be explained after a thorough investigation, a complete autopsy is conducted, an examination of the death scene, and a review of the medical history (**Hauck, & Tanabe, 2017**). Also, it can affect infants up to one year of age, but most SIDS deaths occur by the end of the sixth month of age; the greatest number of SIDS deaths occur in infants between two and four months of age and rare during the first month of life because most cases of SIDS occur when a baby is sleeping in a crib, SIDS is also commonly known as “crib death” (**Spinelli, Collins - Praino, Van Den Heuvel, & Byard, 2017**).

According to CDC (2016), in the US nearly 3,500 infants die suddenly and unexpectedly each year with no immediately obvious cause (**Gollenberg, & Fendley, 2018**). On the other hand, worldwide in 2015, there were about 1,600 deaths due to SIDS (43%), 1,200 deaths due to unknown causes (32%), and about 900 deaths due to accidental suffocation and strangulation in bed (25%) (**Centers of Disease Control and Prevention, 2017**). In Egypt, there are inadequately recorded statistics about incidences of infants' deaths which is due

to unknown causes (**Elsobkey, 2018; World Health organization, 2020**).

SIDS is a complex and multifactorial disorder which its cause is still not fully understood. The research reported that the critical developmental period with brain abnormalities or genetic defect makes some infants risky to SIDS. Also, these infants are exposed to an outside stressor which triggers them to sudden death. Behavioral risk factors identified in epidemiological studies include prone and side sleeping positions, smoke exposure, soft bedding, and overheating. Although SIDS affects infants from all social strata, lower socioeconomic status, younger maternal age, inadequate prenatal care, and lower maternal education level are consistently associated with an increased risk of SIDS (**Oliveira, & Amorim, 2018**).

The American Academy of Pediatrics (AAP) endorses a safe sleep environment which can reduce the risk of all sleep-related deaths of infants. The recommendations were established to decrease the risk of SIDS and sleep-related suffocation, asphyxia, and entrapment among infants in the general population. The AAP endorsement includes recommendations concerned mainly about caring infants and educating persons who provide this care such as parents, other caregivers, and health care personal. Moreover, some recommendations focused also on educating mothers about risky practices during pregnancy periods which can effect on infant's health such as smoking, a significant risk factor for SIDS (**Hitchcock, 2012; American Academy of Pediatrics, 2016**).

The top recommendation included: placing the infant in a supine position to sleep, a firm sleep surface, offering a pacifier to an infant when put

down to sleep, placing infants in a prone position for tummy time when awake, no bed-sharing, keeping objects and loose bedding out of the sleep space and avoiding infant exposure to smoke or overheating. So, Nurses in postpartum units are in a unique position to model a correct sleeping position, educate caregivers about SIDS prevention, risk-reduction recommendations, and become role models of infant care once they are discharged home (**Dowling, Barsman, Dowling, Damato, & Czeck, 2015**)

Parents and caregivers tend to seek advice from a perceived trusted source, such as a mother or a female family member or friend, and they often follow conflicting information even if this meant deviating from safe sleep practices. Nurses in postpartum units are in a unique situation to model correct positioning and educate caregivers about SIDS prevention (**Dowling et al., 2015**). The published recommendations by AAP (2016) counsel that health care professionals, including nurses in postpartum units, endorse and educate parents about SIDS risk-reduction recommendations. Role modeling of infant care by nurses is an important factor in the care of infants once they are discharged home (**American Academy of Pediatrics, 2016**).

Significance of the study:

Sudden infant death is one of the leading causes of infant mortality and the leading cause of postnatal mortality in the US. Infant safe sleep guidelines are not consistently adopted in communities and are often rejected by parents with concerns about infant comfort, choking, and varying advices from health care providers. In addition, the incidence of SIDS has been declined more than half as a result of safe sleep recommendations by American Academy of Pediatrics

Task Force on Infant Positioning and SIDS (**Möllborg, Wennergren, Almqvist, & Alm, 2015; Centers of Disease Control and Prevention, 2017**).

Moreover, in Egypt most of recorded infant deaths are attributed to a previously known causes such as pneumonia, prematurity, infectious diseases, and cardiovascular abnormalities but those due to unknown cause are not recorded. Also, there is scarcity of knowledge about SIDS in Egypt despite the worldwide recognition of this syndrome since 1960. This could be due to inadequate studies about SIDS. In addition, recommendations about safety sleep practices have changed considerably from one generation to the next(**Elsobkey, 2018**).

Therefore, it's important to educate parents about up to date preventive practices to reduce the risk for SIDS and for nurses and care providers to be role models for new parents regarding infants' safe sleep environment as recommended by AAP.

This study aimed to:

Assess the mothers' knowledge and practices for the prevention of sudden infant death syndrome.

Research question:

- What are the mothers' knowledge and practices for the prevention of sudden infant death syndrome.

Subjects and Method:

Research design:

This study was carried out using the descriptive research design.

Setting and study participants:

This study was carried out at the postnatal department at Kafrelsheikh general hospital in Kafrelsheikh. A purposive sample of 180 newly delivered mothers free from eclampsia, chronic diseases and recently delivered a baby free from health problems as neonatal

jaundice & respiratory distress syndrome.

Tool of data collection:

Interview questionnaire sheet:

The researcher developed the tool guided by updated recommendations for a safe infant sleeping environment and preventive guidelines of SIDS by the AAP (2016). Questionnaire questions were closed-end questions form and consisted of four parts:

Part (I): Characteristics of studied mothers and their infants

This part included characteristics of mothers (15 items) as; age, occupation, educational level, residence, family members number, marital status, delivery mode presence of smoker personal in-home, follow-up during pregnancy, and occurrence of health problem during pregnancy or at delivery. It also addressed the child's characteristics (five items) as the date of birth, age, sex, ordering of the infant, and occurrence of complications at birth.

Part (II): Mothers' knowledge about sudden infant death syndrome

This part was used to gather data about mothers' knowledge about SIDS (11 items) such as definition, causes, the most common age, risk factors for SIDS, indicators of infant overheating, and measures done to avoid infant's exposure to overheating or smoking to avoid SIDS.

Part III: Mothers' knowledge about reported practices to avoid sudden infant death syndrome

This part was used to assess mothers' knowledge about preventive practices for SIDS (20 items) such as recommended sleep position, the reason for placing the infant in a prone or side-lying position, when put the infant in a supine or prone sleeping position, recommended place of infant's sleep,

safe characteristics for infant crib, when infant using a pacifier, recommended guidelines which must be followed during pregnancy to avoid SIDS, the definition of exclusive breastfeeding and recommended type of feeding and vaccination for infant to avoid SIDS.

Part (IV): Mothers' reported practices about sudden infant death syndrome

Mothers' reported practices about SIDS were assessed through this part (35 items) such as infant's sleep positioning, place of infant's sleeping, characteristics of infant crib, guidelines for maintenance of child and room temperature, smoking, pacifier using, vaccination and feeding guidelines.

Scoring system for the instrument

Mothers' responses were scored as follows: (two scores) for correct & complete response, (one score) for correct & incomplete response, and (Zero score) for incorrect answer or didn't know. The mothers' knowledge was considered **good** if the percent score was $\geq 60\%$ of the total score, **average** when the percent score was ranged from 50% to less than 60% of the total score, and **poor** when the percent score was $< 50\%$ of the total score (Elbilgahy, Abusaad, El-mouty, El-Sheikh, & Fathy, 2019)

Mother's reported practices were scored as follows: (one score) for done practices and (Zero score) for not done practices. The mothers' practices were considered **Satisfactory** when the percent score was $\geq 50\%$ of the total score and **Unsatisfactory** when the percent score was $< 50\%$ of the total score (Elbilgahy et al., 2019).

Operational design

It includes two phases; preparatory and exploratory.

1. The preparatory phase

- Using accessible periodicals, magazines, articles, and books for

reviewing the current and past related studies and literature. In order to be familiar with the different research aspects and research tool.

- The researcher prepared the study tool in modest Arabic language to fulfill the needs of mothers then revised and modified by supervisors of the study.
- Five experts in the pediatric nursing field assessed the content validity of the research tool, and the required corrections were made according to their suggestions.
- Using Cronbach's alpha coefficient test for testing the internal consistency and reliability of the developed tool, the alpha test was 0.87.

2. Exploratory phase

This phase contains pilot study and fieldwork.

a) A pilot study

Eighteen mothers (10% of the subjects) were chosen at random for the pilot study in order to assess the clarity, feasibility, and applicability of the tool. Besides, they were omitted from the total number of the study sample. Any necessary modifications were done accordingly.

b) The fieldwork

Data gathering interval

The gathering of data was prolonged for six months from November 2018 to April 2019. The researcher presented from 9.00 am to 4.00 pm in the postpartum unit two days per week.

Study framework: Study framework:

Every mother was interviewed separately to document characteristics of the characteristics of them both (she and her child) using part I of the study tool. In addition, assessment of mothers'

knowledge about SIDS was done by parts II, and III. Besides, assessment of mothers' reported practices for the prevention of SIDS was done by parts IV of the study tool.

Administrative Approval:

The researcher got official consent from the responsible personal and administrative staff of Kafrelsheikh general hospital and the Head of the post-natal department.

Ethical Consideration

- The researcher obtained ethical approval from the Committee of Research Ethics of the Nursing Faculty, Mansoura University to conduct the study.
- The researcher obtained Informed oral permission from every mother for her contribution after explaining the study's goal, benefits, and process.
- Participants were informed that contribution in the study is nonobligatory and they are free to pull out at any time without any accountability.
- Anonymity and data confidentiality were secured and utilized only for research objectives.

Data Analysis

The data was prearranged, tabularized, and statistically analyzed using the SPSS package. For quantitative data, the range, mean, and standard deviation were calculated. For qualitative data, the number and percentage distribution were calculated. The statistical t-test and Mc Nemar were utilized to obtain if there are differences between the mothers' knowledge before and after the educational program. Finally, the significance was assumed for $p < 0.05$.

Table (1) shows the characteristics of the studied mothers. It

is revealed that more than one-third of the mothers were aged from 25 to less than 30 years and from 30 to less than 35 years (33.3% and 30.6% respectively) with a mean age of 27.93 ± 5.247 . Regarding the mothers' education, it was found that more than half of mothers (52.2%) had secondary education while the minority of them (8.9%) were illiterate (did not read or write). Moreover, about half of the mothers (48.9%) lived with smokers in the same house.

Table (2) shows percent distribution of the studied infants regarding their characteristics. It is observed from the table that more than half of the infants (54%) were aged two days with a mean age of 2.52 ± 1.0 . Also, more than half of infants (53.9%) were males whereas 46.1% were females. Moreover, the majority of the infants (77.8%) had not any problem at birth.

Figure (1) shows that more than three-quarters of the mothers (86.11%) didn't hear about SIDS before program implementation.

Figure (3) illustrates that there is a significant improvement in the mothers' knowledge regarding the risk factors of SIDS. It is observed from the figure that infant overheating and tobacco smoking were considered risk factors for SIDS for less than half of mothers only (36.11% and 45%) before the program compared to all mothers (100%) after the program. In addition, around two-thirds of mothers (60.56%) stated that they put their infants in prone sleeping position pre-program compared to only 0.56% post-program which is considered a significant risk factor.

Table (3) portrays percent distribution of studied mothers' knowledge about SIDS. It is clear from the table that the majority of the mothers

had incorrect answer regarding both definition and Age of most infants 'deaths of SIDS (85% & 93.89%) respectively. In addition, two thirds of the mothers had incorrect answer regarding both causes and risk factors of SIDS (71.67% & 65.56%) respectively. Furthermore, more than one third of the mothers had correct answer regarding both measures to avoid overheating and smoke exposure to avoid SIDS (31.11% & 31.67%) respectively.

Figure (3) portrays mothers' total knowledge regarding SIDS. It is clear from the figure that more than three-quarters of mothers (85.00%) had poor knowledge level compared to only 10.6% and 4.4% of them had average and good knowledge level about SIDS. Percent distribution of the studied mothers' level of reported practices about SIDS prevention is shown in **Table (4)**. It was observed from the table that the minority of studied mothers (5.00%) had a satisfactory level of performance regarding infants' sleeping place, as the majority of them (95%) put their infant in the same bed with them. Concerning the sleeping position of infants, it was found that half of mothers (50%) were unsatisfactory. Whereas, only 21.11% of studied mothers put their infants in a supine sleeping position.

As regards the maintenance of child and room temperature, it was observed that half of mothers (49.4%) had satisfactory level performances. While more than half of the studied mothers (55.00% & 50.56%) covered their infants' face and head and used a lot of blankets to become warmer respectively. On the other hand, 56.11% of studied mothers had an unsatisfactory level of performance related to pacifier using guidelines. As more than three-

ASSESSMENT OF MOTHERS' KNOWLEDGE AND etc...

quarters of the studied mothers (86.11%) used a pacifier during wake only.

Total level of studied mothers' reported practices about SIDS prevention is illustrated in **Figure (4)**. It was revealed that about half of the studied

mothers (44.4%) were unsatisfactory about SIDS.

Table (5) shows that there was a significant positive correlation between the studied mothers' total score of knowledge and reported practices ($P=0.004$).

Table (1): Percent Distribution of Studied mothers based on their Characteristics

Characteristics	No (n=180)	(%)
Age		
< 25	50	27.8
25 -	60	33.3
30 -	55	30.6
35 & more	15	8.3
Mean±SD	27.93±5.247	
Education Level		
Do not read or write	16	8.9
Primary education	3	1.7
Diploma (secondary) education	94	52.2
University education	30	16.7
Other	37	20.6
Mothers work		
Working	33	18.3
Non-working / housewife	147	81.7
Residence		
Rural	124	68.9
Urban	56	31.1
Marital status		
Married	175	97.2
Divorced	4	2.2
Widowed	1	0.6
Number of other children		
None	40	22.2
1-2	98	54.4
3-4	38	21.1
More than 4	4	2.2
Are there smokers in your home		
Yes	88	48.9
No	92	51.1

Table(2):PercentDistribution of the Studied Infants regarding their Characteristics.

Characteristic	No (n=180)	(%)
Age /days		
1	13	7
2	98	54
3	40	22.2
4	24	13.3
5	3	1.7
6	1	0.6
8	1	0.6
Mean ± SD	2.52±1.0	
Sex		
Female	83	46.1
Male	97	53.9
Birth order?		
First	40	22.2
Second	40	22.2
Third	58	32.2
Fourth	35	19.4
Other	7	3.9
Infant's health problems at birth		
Yes	40	22.2
No	140	77.8
Type of health problems at birth		
Growth retardation	0	0.0
Decrease in oxygen	8	4.4
Decrease in weight	29	16.1
Other (meconium and amniotic aspiration)	3	1.7

Table (3):Percent Distribution of Studied Mothers' Knowledge about SIDS (n = 180).

Knowledge Items	Incorrect answer or didn't know		Correct and incomplete answer		Correct and complete answer	
	N	%	N	%	N	%
Definition	153	85.00	26	14.44	1	0.56
Causes	129	71.67	51	28.33	0	0.00
Age of most infants 'deaths	169	93.89	1	0.56	10	5.56
Risk factors	118	65.56	60	33.33	2	1.11
Indicators of infant overheating	22	12.22	130	72.22	28	15.56
Measures to avoid overheating to avoid SIDS	19	10.56	105	58.33	56	31.11
Measures to avoid smoke exposure to avoid SIDS	23	12.78	100	55.56	57	31.67

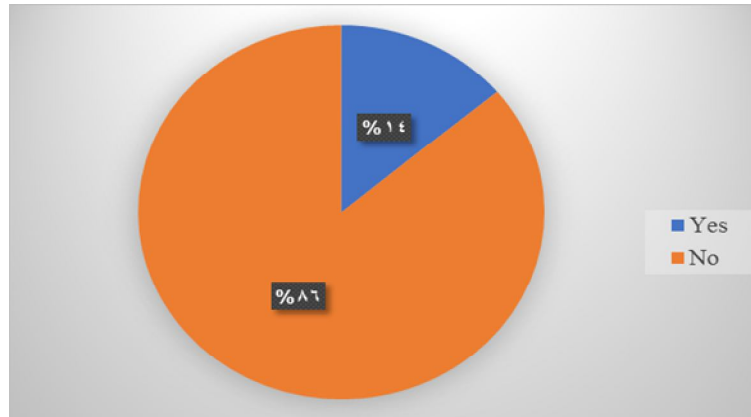


Figure 1 Percent Distribution of Studied Mothers regarding Hearing about SIDS.

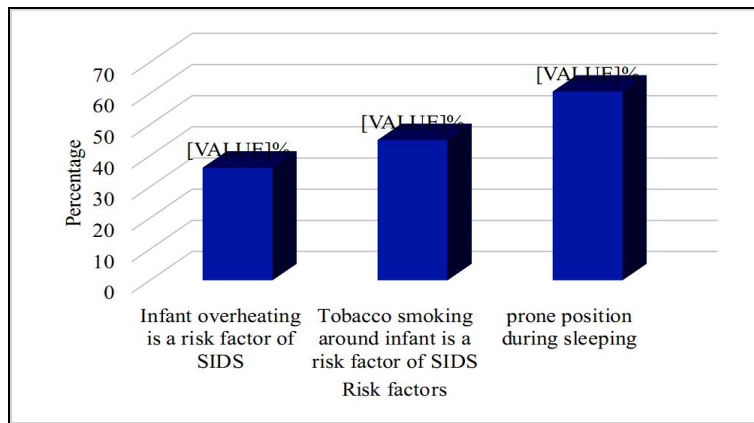


Figure 2 Percent Distribution of Studied Mothers' Knowledge about Risk Factors of SIDS.

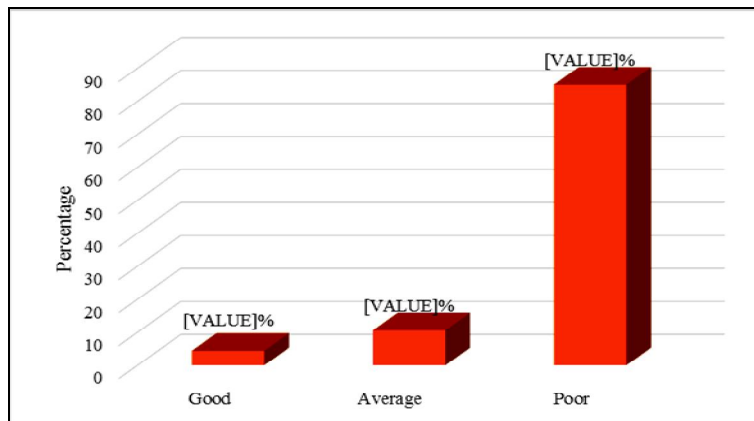


Figure 3 Total Level of Studied Mothers' Knowledge about SIDS.

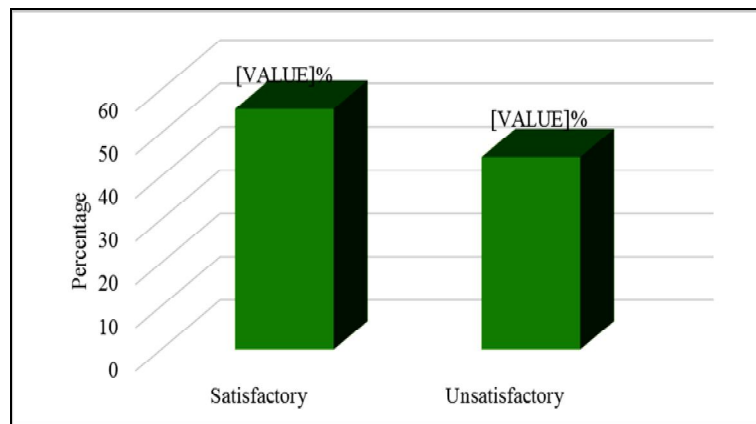


Figure 4 Total Level of Studied Mothers' Reported Practices about SIDS Prevention.

Table (4): Percent Distribution of the Studied Mothers' Level of Reported Practices about SIDS Prevention (n = 180).

Reported practices items	Unsatisfactory		Satisfactory	
	N	%	N	%
Sleeping place	171	95.00	9	5.00
Characteristics of infant crib	82	45.56	98	54.44
Sleep position	90	50.00	90	50.00
Child and room temperature	91	50.56	89	49.44
Smoking	86	47.78	94	52.22
Pacifier	101	56.11	79	43.89
Feeding	94	52.22	86	47.78
Vaccinations	2	1.11	178	98.89

Table (5): Correlation between the Mothers' Total Score of Knowledge & Reported Practices about SIDS.

Total Reported practices score	Total Knowledge score	
	r	P
	0.216	0.004*

r = correlation coefficient *Statistically significant difference at P<0.5

Discussion

Sudden Infant Death Syndrome is considered one of the main death reasons for infants in the postnatal period in the world as well as accountable for more than half of all SUID in spite of the

reduction of its prevalence (Murphy, Mathews, Martin, Minkovitz, & Strobino, 2017). The SIDS prevalence has been reduced to more than half as a consequence of the AAP endorsements of safe sleep” supine sleeping only”

since 1992. (Gollenberg, & Fendley, 2018).

This study was conducted to assess the mothers' knowledge and practices for the prevention of sudden infant death syndrome. As regards the characteristics of studied mothers in (Table, 1), the results of the current study delineate that, more than half of mothers had secondary education. This finding could be due to the majority of mothers lived in rural communities where facilities of high education are limited. Similarly, (Elsobkey, 2018) in her Egyptian study entitled: Mothers' Health Education based on Health Belief Model to Promote Health of Preterm Infant Related to Sudden Infant Death Syndrome, who mentioned that two-thirds of mothers had secondary education.

In addition, the current study findings also showed that about half of mothers stated that there were smokers in their homes (Table, 1). This finding could be due to the ignorance of the mothers and their families about the dangers of smoke exposure on the health of pregnant women and their fetuses as it is considered a risk factor for SIDS especially the majority of mothers didn't hear about SIDS before program implementation (Figure 1). This result disagreed with a US study done by (Mathews, Joyner, Oden, Alamo, & Moon, 2015) entitled: Comparison of infant sleep practices in African-American, and US Hispanic families: implications for sleep-related infant death, who found that the majority of the studied mothers that there were no smokers in their house.

Concerning the characteristics of the studied infants (Table 2), the results of the present study showed that more than half of infants were males. This may

be related to the higher incidence of SIDS in males than females could be due to the greater biological vulnerability of males infants than females as the males are at greater risk of prematurity which is the main risk factor of SIDS. The finding was in an agreement with (Oden, Joyner, Ajao, & Moon, 2010) in their USA study entitled: Factors influencing African American mothers' decisions about sleep position. Also, the finding of the same study showed that more than one-third of infants was the third child in a family contradicting with (Chung-Park, 2012) who mentioned that the majority of the mothers had one or two children in their US study entitled: Knowledge, opinions, and practices of infant sleep position among parents.

Although the AAP endorses a safe sleeping atmosphere for infants which may decrease all associated risks of sleep for infants, there is a scarcity of knowledge about SIDS in Egypt (Abolwafa, & Ali, 2019). The existing study revealed that the majority of mothers didn't hear about SIDS (Figure, 1). This could be related to the fact that the parents' education is the responsibility of the medical team who considered the main source of knowledge to influence their practices especially nurses, but the medical team may not have enough time to educate mothers with proper knowledge due to their shortage and increase workload. This finding is supported by (Bezerra et al., 2015) in their Brazilian research entitled: Factors associated with knowledge of mothers on sudden infant death syndrome. They reported that only 15% of the studied mothers had heard about SIDS.

As regards nurses' total level of knowledge (Figure, 3), the current study revealed that more than three-quarters of

mothers had a poor knowledge level about SIDS. This finding could be attributed to a large proportion of mothers were from rural communities (**Table 1**) in which there are limited services for education and a lack of awareness about SIDS. Therefore, they were interested to gain information about how to preserve their infants' lives. Besides, more than half of mothers had secondary education. This finding is consistent with (**Hutton et al., 2017**) in their USA study entitled: Randomized trial of a children's book versus brochures for safe sleep knowledge and adherence in a high-risk population who stated that the total safe sleep knowledge scores increased significantly for both groups after program implementation.

In relation to the safest position for an infants' sleep (**Figure, 2**), unfortunately, the current study revealed that two-thirds of mothers stated that they put their infants in prone sleeping position. This could be interpreted by mothers' unawareness about the benefits of supine sleep position to infants and risks related to other sleep positions. Similarly, (**Isezuo et al., 2017**) in their study done in Nigeria, entitled: Infant sleep practices and knowledge of sudden infant death syndrome among mothers of infants attending the pediatric clinics of a Tertiary Hospital in Sokoto, Nigeria. They mentioned that the minority of studied mothers correctly identified the recommended position as supine.

Although bed-sharing among infants and family members is common in many cultures, bed-sharing can increase the risk of SIDS. So, AAP recommendation enforces that infants' sleeping should be in the room of their parents, near to their bed, but in his separate crib for one year of life (**McDonald et al., 2019**). Unfortunately,

the findings of the present study showed that the majority of mothers put their infant in the same parent 'bed. (**Table, 4**). It can be attributed to mothers' belief that they needed to be closer to their infant for breastfeeding, bonding, and to stop the infant's cries. In addition to the high cost of infants' crib and living standards are low as a large proportion of mothers were housewives and had insufficient income. This result is consistent with (**Isezuo et al., 2017**) in their study which conducted in Nigeria, entitled: Infant sleep practices and knowledge of sudden infant death syndrome among mothers of infants, who mentioned that the majority of the studied mothers put their infants in the same bed with them or their sibling.

Studies showed that overheating associated with increased SIDS risk and thermoregulatory changes. Therefore, parents should maintain child and room temperature as recommended by AAP (**Newberry, 2019**). The present study clarified that more than half of mothers reported covering their infants' face and head and used a lot of blankets (**Table, 4**). This may be attributed to mothers' belief of the importance of maintaining child and room temperature for his wellbeing and prevention of any risks of becoming cold. Besides, their ignorance of the relation between overheating and SIDS risk as only more than one-third of studied mothers stated that infant overheating is considered a risk factor for SIDS preprogram (**Figure 3**). This finding is inconsistent with (**Qasim, & Alrabaty, 2017**) in their study which conducted in Iraq, entitled: Infant Sleep Practice and Sleep Environment in Erbil City, they stated that the majority of the mothers don't cover their infants' face during sleep to avoid overheating.

Pacifier use has been shown to decrease the incidence of SIDS if mothers follow proper guidelines for its use recommended by AAP as the mother should offer a pacifier to the infant at nap time and bedtime and never force their infant to take the pacifier if he refuses it (Badke, Tanz, Sanguino, & Unti, 2018). In the current study, the majority of the studied mothers reported using a pacifier during wake only (Table 4). It may be attributed to the fact that mothers' ignorance of the proper use of a pacifier as the majority of them reported using a pacifier at wake only to stop infant's crying. In contrary to the present findings (Qasim, & Alrabaty, 2017) who stated that more than two-thirds of studied mothers gave their infants the pacifier during sleeping.

Concerning the total reported practices of the studied mothers about SIDS (Figure,4), the current study revealed that about half of mothers had an unsatisfactory level of reported practices regarding SIDS. This result can be attributed to the fact that knowledge is the prerequisite to practice as in our study, the majority of mothers didn't hear about SIDS (Figure,1) and more than three-quarters of mothers had a poor knowledge level about SIDS (Table 4). This is supported by, (Voos, Terreros, Larimore, Leick-Rude, & Park, 2015) in their study conducted in Kansas City, entitled: Implementing safe sleep practices in a neonatal intensive care unit, who stated that, 21% of eligible infants were in a safe sleep environment

Conclusion:

Based on the findings of the present study, it can be concluded that:

More than three-quarters of the mothers didn't hear about SIDS and the

rest of them stated that family and friends were the main sources of knowledge about SIDS. Besides, more than three-quarters of mothers had a poor knowledge level about SIDS. In addition, about half of the mothers demonstrated an unsatisfactory practice level about SIDS prevention.

Recommendations:

Based on the previous findings and conclusion of the present study, the following recommendations are suggested: -

- A regular and continuous health education program is essential for improving the newly delivered mothers' knowledge and practices regarding SIDS prevention and safe sleep recommendations from the medical staff starting from the neonatal care unit and on every health visit for the infant in his first year.
- Educational programs are recommended to improve nurses' awareness about the importance of teaching mothers regarding the risk factors for sudden infant death syndrome.
- Periodical educational and training programs for staff members in neonatal care units and primary health care centers are mandatory to raise and update their awareness of SIDS risk factors and its preventive guidelines as they are the main source of the mother's information and counseling about the care of their infants.

Further study:

- Study grandmothers' attitude toward the application of guidelines on SIDS prevention.
- Further studies are needed to identify barriers to adherence to preventive guidelines of SIDS.

- Further studies are needed to identify the incidence and possible risk factors leading to SIDS in Egypt.
- Effect application of educational program on nurses' knowledge and practices about SIDS prevention.

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