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Assessment of Mothers' Knowledge and Attitude Regarding Shaken Baby Syndrome Hazards

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Abstract

Background: Shaken baby syndrome is signifying a constellation of symptoms and signs. It's considered as a one of the most common causes of death among newborn infants**. Aim**: This study aimed to assess mothers' knowledge and attitude regarding shaken baby syndrome hazards. D**esign:** An exploratory descriptive research design was used in this study. **Setting:** This study was conducted at four Maternal and Child Health (MCH) centers. One MCH center, Elset Khadra MCH, is affiliated with the Helwan district in Cairo, while the other three MCH centers—Materatris MCH, Elkeman MCH, and Elhadka MCH—are affiliated with Fayoum city. **Sample:** A purposive sample comprised of 200 mothers have infant less than one year attended to the previous mentioned settings**. Tools:** Two tools were used in this study for data collection, 1) A structured interview questionnaire to assess mother's knowledge regarding shaken baby syndrome hazards, 2) Likert type-rating Scale to assess mothers' attitude regarding shaken baby syndrome hazards. **Results**: More than two third of studied mothers had unsatisfactory knowledge regarding shaken baby syndrome hazards and more than half of the studied mothers had appropriate attitude regarding shaken baby syndrome hazards. **Conclusion**: The current study concluded that, about half of the studied mothers had unsatisfactory knowledge and appropriate attitude regarding shaken baby syndrome hazards. Meanwhile, there was a significant difference between mothers' knowledge and their characteristics mainly level of education and occupation and there was statistically significant difference between mothers' attitude and their characteristics mainly age, level of education and marital status. **Recommendations**: Constantly educational training program for mothers to increase awareness and improve their knowledge and attitude regarding shaken baby syndrome hazards.

Keywords: S*haken Baby Syndrome, Hazards, Mothers, Knowledge and Attitude*

Introduction:

Shaken baby syndrome (SBS) also known as abusive head trauma, non-accidental head injury (NAHI), inflicted traumatic brain injury (ITBI), non-accidental head trauma (NAHT), shaken impact syndrome (SIS) and whiplash shaken infant syndrome (WSIS). It is a deadly brain injury caused by a person violently shaking an infant or toddler.

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Also, it is usually used to describe brain injury symptoms caused by distressed parent or caregiver. Therefore, abusive head trauma is the leading cause of traumatic death in infancy and causes considerable morbidity in children younger than 2 years **(De Paula et al., 2020).**

Parent may shake an infant out of frustration or anger, often because the infant won't stop crying. The infant has weak neck muscles and often have difficulty supporting their heads. When an infant is forcefully shaken for more than10 seconds or one minute, their head moves uncontrollably. Which, the violent movement repeatedly throws the baby's brain against the inside of the skull, causing bruising, swelling, internal bleeding, brain cells are destroyed and prevented oxygen from entering the brain **(Eismann et al., 2019).**

Symptoms of SBS include bleeding in the retina portion of the eye, breathing problems, pale or bluish skin, coma, fractures in ribs, skull or bones, vomiting, tremors and difficulty staying awake. However, boys under the age of 2 years are more likely victims of abusive head trauma and also children under the same age who live in a single parent's home and or below poverty line **(Font et al., 2020).** Therefore, intracerebral injury producing secondary injury. The secondary insult is a complex stage with the release of toxic substances leading to hypoxia-ischemia, brain swelling, and increased intracranial pressures. However, abusive head trauma can lead to devastating long-term consequences for the infant. Meanwhile, abusive head trauma can be prevented through evidence-based interventions which consider a critical to decrease poor neurological and cognitive outcomes **(Alshahrani et al., 2018).**

Shaken baby syndrome accounts more than 50% of accidental injuries and one of the most common cause of death among newborn-infants, 21to 74 per 100,000 children worldwide are victims of shaken baby syndrome annually and 25%to30% of all shaken babies die from their injuries. Therefore, the remaining 75% can suffer severe brain damage. However, approximately 60% of shaken baby syndrome infant either die from their injuries at a later time or suffer functional disorders including learning difficulty, behavior problems, advanced cognitive and developmental retardation, stroke and blindness **(International Society for Prevention of Child Abuse and Neglect ISPCAN, 2018).**

Unfortunately, majority of infant morbidities and mortalities occur due to unawareness of parents, especially the mothers. Therefore, insufficient knowledge or misunderstanding of maternal role and neonatal care during neonatal period is dramatic challenges. However, pediatric nurse has a crucial role to evaluate the mothers' knowledge of their infant care and the affecting factors **(Adib-Hajbaghery et al., 2017).** Furthermore, nurses should discuss for mothers about the techniques of dealing with inconsolable infant crying and help parents to create a concrete emergency action plan that can be implemented when parents begin to feel overwhelmed, frustrated, and angry. Secondary prevention interventions may be necessary to identify the high-risk families and providing

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additional interventions **(Lopez-Bushnell et al.,2017).**

Consequently, Pediatric nurses can help mothers in preventing abusive head trauma through primary and secondary prevention. Meanwhile, primary prevention efforts should be undertaken for all parents of infants discharged from the intensive care unit. Infants who have required hospitalization in the neonatal intensive care unit or extended hospitalization during the newborn period may not have bonded with their parents as much and may have medical conditionals that put them at risk for abusive head injury. Moreover, primary prevention for abusive head trauma involving parents in the care of their infant and teaching parents about the normal developmental outcomes tailored to their infant. **(Fraser et al.,2017).**

Significance of the study:

Shaken baby syndrome is associated with a high rate of morbidity and mortality. Therefore, the Centers for Disease Control and Prevention (CDC) mentioned that, SBS is most prevalent under 5 years of age with a rate of 30/100,000 infants less than one-year-old and a mortality rate of 25% in exposed children. Therefore, inconsolable crying is the most common stimulus for parent or a caregiver to shaken their infants. (**Jalloul, et al., 2021).** So that, from the research point of view it is important to conduct the current study to highlight on mothers' knowledge and attitude regarding shaken baby syndrome and it is hazards to improve it.

Aim of the study:

The aim of this study is to assess mothers' knowledge and attitude regarding shaken baby syndrome hazards.

Research questions:

The research will answer the following questions:

1- What are the mothers' level of knowledge and attitude regarding shaken baby syndrome hazards?
2- Is there a relation between characteristics of mothers and their level of knowledge and attitude regarding shaken baby syndrome hazards?

Subjects and Methods:

Design:

A descriptive research design was used for conducting this study.

Setting:

This study was conducted at four Maternal and Child Health (MCH) centers. One MCH center, Elset Khadra MCH, is affiliated with the Helwan district in Cairo, while the other three MCH centers—Materatris MCH, Elkeman MCH, and Elhadka MCH—are affiliated with Fayoum city. Each center includes four rooms and provides services such as diagnosis, follow-up, vaccination, and counseling for mothers. The MCH centers receive patients six days a week, from Saturday to Thursday, between 9:00 AM and 2:00 PM.

Subjects:

A purposive sample was comprised of 200 mothers have infant less than one year attended to the previous mentioned settings (MCH Centers), and meet the inclusion criteria

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Inclusion criteria:

- Mothers have infant less than one year

Exclusion criteria:

- Mothers who have infant with chronic illness (physical or mental) or congenital anomaly.

Research tools:

The data collected through using the following tools:

Tool (I): Structured interviewing questionnaire sheet:

It was designed by the researcher based on relevant content and studies. The tool is in Arabic and consists of two parts.

Part (I): It was including data about:

1. personal characteristics of the studied mothers: Such as mothers age, number of children, educational level, work position, place of residence (urban or rural) and marital status.

2. personal characteristics of infants: such as age, gender and birth order.

Part (II): Questionnaire sheet: It was adapted from **Waltz-Feher et al., (2005)** It was used to assess mother's knowledge regarding shaken baby syndrome, and include a multiple choice questions (14 questions) with five options, one response will be correct and there will be some questions have more than one correct answer. A written multiple-choice question will be used.

Scoring system:

The mothers' knowledge was scored and calculated based on their answers. It was evaluated using a model answer sheet prepared by the Mothers' knowledge was scored and calculated based on their answers using a model answer sheet prepared by the researcher. Each question was scored from 0 to 2, with a good answer receiving 2 points, an average answer receiving 1 point, and a poor answer receiving 0 points. The total score was 28 (equivalent to 100%), which was then converted to a percentage. A percentage score of ≥ 60% (17–28) was considered satisfactory, while a score of < 60% (0–16) was categorized as an unsatisfactory level of knowledge.

Tool (II): Likert Type-rating Scale:

Which developed by **Dias et al., (2005),** and translated into Arabic language by the researcher to suit the nature of the study and to assess mother's attitude about hazards of SBS. This scale consist of 15 items mothers were asked to rank the appropriateness of a soothing or discipline practice.

Scoring system:

The mothers' attitude were scored and calculated based on their answers. Each question was assigned a score ranging from 0 to 2: a correct and appropriate response received a score of 2, an ambiguous response received a score of 1, and a response indicating risk received a score of 0. The total score was 30 (equivalent to 100%). A total score of more than 18 (≥ 60%) was considered indicative of an appropriate attitude, while a total score of less than 18 (< 60%) was considered indicative of an inappropriate attitude.

Content validity and reliability:

Content Validity:

The face and content validity of the tools was reviewed by 3 experts from Faculty of Nursing - Helwan University and Ain-shams university (2experts specialized in pediatrics health nursing

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and one expert in community health nursing to test the face and content validity of the tools for clarity, relevance, comprehensiveness, understanding and applicability. Minor modifications of the tools were done according to the expert's comments on clarity of sentences, appropriateness of content and sequences of items.

Reliability:

Reliability of the tools tested by using cronbach's Alpha test for testing internal consistency of the tools was performed. The result was 0.826 for mothers‟ Knowledge questionnaire sheet and 0.783 for Likert Type-rating Scale.

Pilot study:

A pilot study was carried out on 10% of the subjects equal (9 mothers) based on sample criteria, it has been conducted to test the clarity, applicability. little modification was done as replacing and arrangements of some items. The involved mothers of the pilot study were excluded later from the main study sample.

Field work:

The actual field work was carried out for data collection over 6 months started from April 2021 till end of September 2021, data collected 2 days per week during the morning shifts from 9 am to 12 pm, the purpose of the study was explained by the researcher to each mother accompanying her infant before sharing interviewing and data collection in addition to clear and brief idea about aim of the study and its expectation .The average time needed for completion of each questionnaire sheet was approximately 15 minutes, the investigator taken 8 mothers each week consists about 32 mothers per month, total number of mothers = 200 mothers.

Ethical consideration:

An official permission to conduct the proposed study was obtained from the Scientific Research Ethics Committee faculty of nursing Helwan university. Participation in the study was voluntary and subjects were given complete full information about the study and their role before signing the informed consent and that they had the right to refuse to participate. The ethical considerations included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the Information where it was not accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs was respected.

Statistical Analysis:

The collected data was organized, categorized, tabulated, entered and analyzed by using SPSS (statistical package for social science), software program version 26. Statistical significance and association were assessed using the arithmetic mean, standard deviation (SD), chi-square (X^2) and p-value to detect the relation between variables of the standard. Statistical significance was considered at (P-value <0.05).

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Results:

Table (1): number and percentage distribution of the studied mothers according to their characteristics (n=200):

Mother's Characteristics	No.	%
Age in years		
< 20	34	17.0
20: <30	109	**54.5**
30: < 40	55	27.5
≥ 40	2	1.0
$\bar{X}$ ± **SD**	**26.26 ± 6.31**	
Level of Education		
Illiterate	39	19.5
Read and write	25	12.5
Primary	20	10.0
Intermediate	48	24.0
University	68	**34.0**
Occupation		
Housewife	118	**59.0**
Working	82	41.0
Marital status		
Married	157	**78.5**
Divorced	20	10.0
Widow	23	11.5
Residence place		
Urban	48	24.0
Rural	152	**76.0**
Number of family members		
Three members	74	**37.0**
Four members	29	14.5
Five members	49	24.5
More than five members	48	24.0

Table (1): Regarding the studied mothers' characteristics, this table showed that, more than half (54.5%) of the studied mothers were in the age group from 20 <30 years ($\bar{X}$ ± SD was 26.26 ± 6.31 years). As regarding to the level of education more than one third (34%) of them reported University education. Also this table showed that more than half of the studied mothers (59 %) were not working, while, more than two thirds (78.5%) of them were married and more than three-quarters (76%) of them lived in rural areas.

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Table (2): Number and percentage distribution of the studied infants according to their characteristics (n=200)

Infants characteristics	No.	%
age in months:		
< 3	61	**30.5**
3: < 6	51	25.5
6: < 9	54	27.0
9: ≤ 12	34	17.0
$\bar{X}$ ± **SD**	**5.09 ± 3.16**	
Infant gender:		
Male	97	48.5
Female	103	**51.5**
infant order between his siblings:		
First	77	**38.5**
Second	28	14.0
Third	50	25.0
Fourth and more	45	22.5

Table (2): Concerning the studied infant characteristics, this table revealed that, near to one third (30.5%) of the studied infant were in the age group <3 months ($\bar{X}$ ± SD was 5.09 ± 3.16 months). Concerning infant gender, more than half (51.5%) of them were females and more than one third (38.5%) of them were the first infant within their families.

Table 3: Distribution of the studied mothers' total knowledge regarding shaken baby syndrome hazards (n=200)

Data	Total knowledge	
	No.	**%**
Satisfactory	65	32.5
Unsatisfactory	135	**67.5**
Total	200	100.0

Table (3): This table clarified that, more than two thirds (67.5%) of the studied mothers had unsatisfactory knowledge about shaken baby syndrome, while the rest of them (32.5%) had satisfactory knowledge.

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Table 4: Distribution of the studied mothers according to their total score of attitude regarding shaken baby syndrome hazards (n=200)

Data	Total attitude	
	No.	%
Inappropriate	85	42.5
Appropriate	115	**57.5**
Total	200	100.0

Table (4) reveals that, more than half (57.5 %) of the studied mothers had appropriate attitude regarding SBS. While, 42.5% of mothers had inappropriate attitude regarding SBS.

Table (5): Relation between the studied mothers' knowledge and attitude regarding shaken baby syndrome hazards (n=200):

Total score knowledge	Total score attitude						
	Inappropriate		Appropriate		Total	X^2	P-value
	No.	%	No.	%			
Unsatisfactory	72	53.3	63	46.7	135	**19.949**	**<0.001***
Satisfactory	13	20	52	80.0	65		
Total	85	42.5	115	57.5	200		

Table (5): Clarified that, there was statistically significant difference between mother's knowledge and their attitude regarding SBS, $X^2 = 19.949$ and p-value = <0.001

Discussion:

As regard characteristics of the studied mothers, the findings of the present study stated that, more than half of the studied mothers aged between 20 to less than 30 years. These results were in an accordance with the study performed by **Rebbe et al., (2020)** who studied "Incidence and Risk Factors for Abusive Head Trauma: A Population-Based Study in Washington State, USA" and indicted that, more than half of the studied mothers aged between 20 to 29 years. In addition to study by **Fujiwara et al., (2016)** who studied "Self-Reported Prevalence and Risk Factors for Shaking and Smothering Among Mothers of 4-Month-Old Infants In Japan" who found that, about one third of studied mothers' age was 20 to 29 years.

Concerning educational level, the results of the current study showed that, more than one third of studied mothers had a university education. which indicated that educational level among the studied sample was high. This result goes in line

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with a study done by **Lopez et al., (2017)** who studied "Shaken Baby Syndrome: a Hospital-Based Education and Prevention Program in the Intermediate Care And The Newborn Intensive Care Nurseries" in University of New Mexico hospitals who found that, more one than third of the studied parents had higher education. On the contrary **Sevgili and Zengin, (2019)** who studied "Investigation of Parents' Knowledge Levels of and Attitudes towards Shaken Baby Syndrome in Turkey", and indicted that, less than half of mothers had high school education.

According to the present study results, more than half of the studied mothers were housewives. This may be due to some mothers give up their jobs to care for their children. Also, may be due to the traditional belief that, mothers are more close to their own children in rural area. These results were in agreement with these findings of **Sevgili and Zengin, (2019)** who found that, more than half of the studied mothers were unemployed. On the contrary **Berthold et al., (2019)** who studied **"**Awareness of Abusive Head Trauma in a German Population-Based Sample" who found that the majority of the studied population were employed.

Regarding marital status, the present study results demonstrated that, the majority of studied mothers were married. In congruence with these present study findings, **Fujiwara et al., (2016)** found that, the majority of the studied mothers were married. In addition to **Antonietti et al., (2019)** Who studied "The Medical and Social Outcome in 2016 of Infants Who Were Victims of Shaken Baby Syndrome" in Marseille Cedex, France he found that, about three quarter of the studied parents living together. On the contrary **Duzinski et al., (2018)** who studied "Effectiveness of a Pediatric Abusive Head Trauma Prevention Program Among Spanish-Speaking Mothers" and indicted that, more than two third of mothers live single and separated.

As regarding place of residence, more than three quarter of the studied mothers were lived in rural areas. This result is in consistent with **Adham et al., (2019)** who studied "Mothers' Knowledge, Believes and Attitudes Regarding Shaken Baby Syndrome Hazard" in Egypt who found that more than three quarter of the studied mothers lived in rural areas. Also, this study disagrees with **Lopez et al., (2017)** who found that, about one third of the studied mothers live in rural areas.

As regard characteristics of the studied infants the current study results reveled that, the $\bar{X} \pm SD$ of age was 5.09 ± 3.16 months, this result was supported by **Antonietti et al., (2019).** Who found that, the $\bar{X} \pm SD$ of age of the studied infants was 4.11 ± 2.41 months. Also, these results supported by **Sevgili and Zengin, (2019)** who found that, the $\bar{X} \pm SD$ ages of the studied children were 7.19 ± 3.87 months.

Regarding to infant's gender, the results of the present study showed that, more than half of them were females. This finding was in the same line with **Hashem et al., (2020)** who studied **"**The Efficacy of a Preventive Instructional Module On Mothers' Knowledge Regarding Shaken Baby Syndrome" in Mansoura, Egypt and noted that more than half of infants were females. This finding

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contradicted with **Sevgili and Zengin, (2019)** they found that, the more than half of infants was males.

As regards the studied infant's order between their siblings, the current study finding revealed that, more than one third of the studied infants were ranked as the first child. This may be due to that most of the studied mothers are newly mothers. In the same context **Fujiwara, (2015**) who studied "Effectiveness of Public Health Practices Against Shaken Baby Syndrome/Abusive Head Trauma" in Japan. who found that, more than one third of the studied mothers were the first child in addition to **Antonietti, (2019)** Who found that, less than half of the studied infant were the first child. On the other hand, this result contradicted with **Adham et al., (2019)** who found about third of the studied mothers have two siblings and **Fujiwara et al., (2016)** who found that, more than half of the studied children were Subsequent child.

In relation to mothers' knowledge regarding shaken baby syndrome hazards, the present study revealed that more than two thirds of the studied mothers had unsatisfactory knowledge regarding SBS hazards. These results answered the research question of the study and this may be due to lack of educational programs about SBS prevention and may be due to that the studied mothers were from rural area and most of them are housewives. This finding is on the same line with those obtained by **Alshahrani et al., (2018)** who studied the "Evaluation of Knowledge Regarding Shaken Baby Syndrome Among Parents" in Tabuk City and indicted that, more than two thirds of mothers participated in the study had no idea about the risks of shaken the baby during the first year of life. Another study agrees with the current study finding conducted by **Pinky atony (2018)** who studied "The Effect of Structured Teaching Program On Knowledge Regarding Shaken Baby Syndrome Among Caregiver of Infants" in India, he noted that the majority of the studied infant caregivers have inadequate knowledge about SBS. These results also were similar with the study conducted by **Adham et al., (2019)** who reported that more than two thirds from the studied mothers had unsatisfactory knowledge regarding shaken baby syndrome. Moreover, this finding also agree with **ElSayed and Mahmoud (2020),** Who studied "The Effect of Educational Materials On Mother's Awareness, Knowledge and Behavior Regarding the Dangers of Shaken Baby Syndrome" in Ismailia – Egypt and found that the majority of the studied mothers did not hear anything about SBS. On the other hand, the study findings of **Berthold et al., (2019)** disagrees with the current study finding, he found that less than two thirds of the overall studied population in Germany have a good knowledge about SBS this may be due to regular application of health teaching programs including SBS prevention in the Germany.

The present study results demonstrated that, less than half of the studied mothers had good knowledge regarding preventive SBS through education this answered sured the need for mother's education programs to increase mother's awareness of knowledge regarding SBS. This finding in the same line with **Adham et al., (2019)** Who reported that, about the half of participant mothers believe that shaken baby syndrome is preventable through

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education. In addition to **ElSayed and Mahmoud (2020)** they revealed that, the mean score of total knowledge and behavior of the mothers improved after the educational materials, and the difference was statistically significant.

As regard to the relation between mother's knowledge about SBS and their attitude. It was noticed that, there were statistically significant differences between the mother's total knowledge about SBS and their total attitude. This result in the same line with **Adham et al., (2019)** who found that, there is a positive relation between mother's knowledge level and attitudes regarding shaken baby syndrome hazards. In addition to findings of **ElSayed et al., (2020)** who noted that, there was a positive correlation with highly statistical significant relation between mother's knowledge and behavior regarding SBS.

Conclusion

The current study concluded that, about half of the studied mothers had unsatisfactory knowledge and appropriate attitude regarding shaken baby syndrome hazards. Meanwhile, there was a significant difference between mothers' knowledge and their characteristics mainly level of education and occupation and there was statistically significant difference between mothers' attitude and their characteristics mainly age, level of education and marital status.

Recommendations

Based on the previous findings, the following recommendations are suggested:

1. Disseminations program in all health services centers to improve mothers' knowledge and attitude regarding shaken baby syndrome hazards.
2. Simple illustrated booklets, posters and guidelines for mothers about shaken baby syndrome hazards.
3. Frequent maternal workshops about shaken baby syndrome hazards.
4. Further researches are needed to improve level of mother's knowledge and attitude regarding shaken baby syndrome hazards.
5. Orientation programs on mass media as TV should be carried in order to increase public health awareness regarding shaken baby syndrome.

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