



Parental Awareness Regarding Shaken Baby Syndrome and Associated Factors in Jordan

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ABSTRACT

Background: Shaken Baby Syndrome (SBS) is a serious public health issue believed to result from non-accidental trauma by violently shaking the baby. **Purpose:** To evaluate the awareness about SBS among parents in Jordan. Risk factors associated with SBS including psychological distress and age were investigated. **Methods:** A descriptive questionnaire-based study consisting of demographic characteristics, SBS knowledge, and parental self-reported psychological distress was conducted. The questionnaire was conducted online between September and October 2022. Descriptive analysis of frequency and percent distribution was used for demographic analysis. Contingency table (Cross Tabulation and Chi-square) along with frequency analysis was used to describe the associations among the frequency distributions of the categorical variables. **Results:** Over two-thirds (67.65%) of parents (a total of 306 participants) were unaware of SBS and 68.30% of them reported shaking their children. Aging was significantly associated with less SBS knowledge and more self-reported psychological distress. Self-reported psychological distress was significantly associated with increased shaking incidents ($p < 0.05$). Most parents who had shaken their children and were unaware of the syndrome reported psychological distress at an ages of 30 and above. **Conclusion:** A serious lack of SBS awareness exists among parents in Jordan. Parents' characteristics including age and self-reported psychological distress are important factors to formulate a logical understanding of the SBS phenomenon. The triad of SBS knowledge, age and psychological distress should be essential components of successful educational programs. **Implications for Nursing:** The study supports the need for SBS interdisciplinary education and training programs for parents and professionals caring for babies in pediatrics units.

Keywords: Shaken baby syndrome, Knowledge, Psychological distress, Abusive head trauma.

What does this paper add?

1. A serious lack of SBS awareness and knowledge exists among parents in Jordan.
2. The risk factors associated with SBS knowledge and practice are psychological distress, especially among parents above 30 years of age.
3. SBS awareness programs are needed for parents of all ages in Jordan.
4. Psychological distress management programs should also be implemented to help parents and

caregivers create healthy and supportive environments for children.

5. In rehabilitation settings, SBS education and training programs should be carried out within an interdisciplinary rehabilitation team approach by trained professionals, especially for those caring in pediatrics rehabilitation units, such as physical therapists, nurses, occupational therapists, among other related healthcare professionals.

Introduction

Shaken Baby Syndrome (SBS) was first defined by pediatric radiologist Dr. John Caffey in 1946 (Gunderman, 2021). It is a term commonly used to describe the non-accidental trauma caused by forceful shaking, repetitive quick flexion, extension, and rotational movements; or blunt impact in children under the age of two years causing bruising and bleeding in the brain (Adham et al., 2019; AlOmran et al., 2022; Didişen et al., 2019; Eyisi et al., 2019; Hung, 2020; Joyce et al., 2022). SBS is also known as Abusive Head Trauma (AHT), Non-accidental Head Injury (NAHI), and Whiplash Shaken Infant Syndrome (WSIS) (Joyce et al., 2022).

SBS is a worldwide major concern as reported by the American Academy of Pediatrics with an average of 35 cases per 100 000 with about 25% mortality of these cases (Narang et al., 2020), even among parents in the medical field who are expected to be knowledgeable about this phenomenon (Gao et al., 2021; Mann et al., 2015; Marcinkowska et al., 2021; Russell & Britner, 2006). Another concern is that SBS may be misdiagnosed, since parents provide the physician with an inaccurate medical history (Adham et al., 2019; Vitale et al., 2012). Other reasons that contribute to misdiagnosis of SBS is that some patients may experience a vague symptom after shaking which does not necessitate immediate care, or the physicians may be unsure of the observed signs and symptoms of SBS (Joyce et al., 2022). Mostly, a proper diagnosis requires up to three visits to a medical professional by which several shaking occurrences may have added insult to injury (Joyce et al., 2022).

Another issue is that research has shown that SBS may take place only once with instantaneous effects or it may be part of recurrent abuse that lasts for days or even months (Joyce et al., 2022). More importantly, SBS may result in early complications, such as unconsciousness, seizures or even death (Adham et al.,

2019; Blumenthal, 2002; Didişen et al., 2019; Joyce et al., 2022; Vitale et al., 2012). The majority of survivors may develop major long-standing cognitive or behavioral sequelae, such as learning difficulties, behavior issues, developmental delays, stroke and blindness (Laurent-Vannier et al., 2009; Russell & Britner, 2006; Squier, 2011).

The best approach is to understand that SBS is completely preventable. Therefore, improving the awareness level about SBS is critical for successful prevention. Educational and prevention programs are needed for understanding the dangers of violent shaking of a baby, the risk factors and triggers associated with SBS, and ways to prevent it. The assessment of caregivers' awareness and knowledge about SBS is of paramount importance to support any subsequent actions. Yet no studies evaluating the awareness of the shaken baby syndrome have been conducted in Jordan considering that children in Jordan are subjected to all forms of child abuse (Al Khatib, 2022). Furthermore, the risk of developing shaken baby syndrome may be influenced by a variety of factors, such as low childcare experience, low educational attainment, and low socioeconomic status (Hung, 2020; Joyce et al., 2022; Miehl, 2005; Russell & Britner, 2006). However, to our knowledge, no studies have evaluated SBS awareness and its relationship to psychological distress and social demographic features, including age. It is worth mentioning that high scores for psychological distress were reported among the Jordanian population (Abuhammad et al., 2022).

The primary goal of this research was to evaluate the awareness of shaken baby syndrome among parents who have children less than 2 years old in Jordan. This research also aimed to investigate the risk factors that are associated with SBS, specifically psychological distress and age.

Materials and Methods

Study Design

A descriptive cross-sectional questionnaire-based study was carried out in Jordan between September and October 2022, to investigate the level of knowledge among parents in Jordan about SBS and the associated risk factors. Parents in Jordan with children younger than 2 years of age were included and recruited to participate by filling a pre-designed questionnaire. The questionnaire was disseminated to them *via* social-media sites.

Instrument

An online self-administered questionnaire of close-ended questions with 17 items was used. It was divided into three sections: Section A (5 items): Age, gender, nationality, number of children, educational level; Section B (4 items): Multiple-choice (Yes/No) questions about the awareness about SBS including knowledge (Yes: aware and No: Not aware) and practice toward SBS (Yes: practiced shaking and No: Did not practice shaking); and Section C (4 items): Multiple-choice questions about self-reported psychological distress including stress/anxiety and depression (Yes: have psychological distress and No: Do not have psychological distress). The validation of the questionnaire content was established using the following steps (AlOmrán et al., 2022; Boparai et al., 2018): First, the questionnaire was constructed with the cooperation of a faculty member who is specialized in psychiatric/ mental health and by a professor specialized in questionnaire development and validation. The latter is also a statistician who revised and approved the statistical analysis. Then, two faculty members with distinct research experience confirmed the content validity. Pre-testing was conducted on 20 individuals to assess the formulation, appropriateness, and relevance of the questions. The questionnaire was written and distributed in Arabic, which is the native language of the study population.

Data Analysis

The obtained data was coded and analyzed using the Statistical Package for Social Sciences (SPSS), version 23. A descriptive analysis based on frequency and percent distribution was done for all variables including socio-demographic data. Contingency table (cross-tabulation and chi-square test) was used to display the frequencies for combinations of categorical variables of

interest, including age, SBS knowledge and psychological distress and investigate the significance of the observed frequencies of these combinations. The p-value was calculated and considered statistically significant when it was less than 0.05 ($p < 0.05$). To better visualize and express part-to-whole associations in the categories of variables (Akoglu, 2018; Schober et al., 2018), a detailed frequency analysis using pie charts-summarizing groups of cases was used to display summary statistics for the categorical variables: (1) age, the action of shaking, and parents' knowledge about SBS and (2) age, the action of shaking, and self-reported psychological distress.

Ethical Considerations

Consent to participate in the study was requested before completing the questionnaire, and a letter outlining the goals of the study was enclosed with the questionnaire itself. Confidentiality was preserved, since the questionnaire did not ask for names or phone numbers and only the authors had access to the data. This study was approved by the Institutional Review Board (IRB) at Jordan University of Science and Technology.

Results

The study included 306 respondents of whom 242 were mothers (79.1%) and 64 were fathers (20.9%). In terms of age, 38.6 % of the respondents were 40 years or older, 30.4 % were between 30 and 39 years, 28.1% were between 20 and 29 years, and 2.9 % were less than 20 years old. Jordanians represented 94.1% of the respondents (n=288). Furthermore, most respondents have a high level of education, with (42.8 %) holding a bachelor's degree. About 77.8% of the respondents had between one and four children. Table 1 shows the socio-demographic profile of the participants.

Table 1. Socio-demographic profile of the participants (n=306)

Socio-demographic Characteristics	Frequency	Percentage
Gender		
Mother	242	79.1 %
Father	64	20.9 %
Age		
Less than 20 years	9	2.9 %
Between 20 and 29 years	86	28.1 %
Between 30 and 39 years	93	30.4 %
40 years or older	118	38.6 %

Nationality		
Jordanian	288	94.1 %
Non-Jordanian	18	5.9 %
Education		
High school education or lower	92	30.1 %
Diploma	57	18.6 %
Bachelor	131	42.8 %
Postgraduate degree	26	8.5 %
Number of children		
1-4 children	238	77.8 %
5-7 children	53	17.3 %
More than 7 children	15	4.9 %

Awareness Regarding SBS

According to Table 2, the results show that 67.6% of the parents were unaware of the shaken baby syndrome,

as compared to 32.4% who were aware of the syndrome. More than two-thirds (68.3%) of parents reported incidences of shaking their infants.

Table 2. Parental awareness and practice regarding shaken baby syndrome (n=306)

	Frequency	Percentage
Parents' knowledge about SBS		
Aware	99	32.4 %
Unaware	207	67.6 %
Parents' practice toward the action of shaking		
Those who shook their children	209	68.3 %
Those who not shake their children	97	31.7 %

Parental Psychological Distress

Based on the findings presented in Table 3, most parents were psychologically distressed. Two hundred

and seven (67.6%) of the parents self-reported that they had psychological distress of stress and/or anxiety.

Table 3. Parental self-reported psychological distress (n=306)

	Frequency	Percentage
Self-reported psychological distress	207	67.6 %
Did not self-report	99	32.4 %

Risk Factors associated with SBS

As demonstrated in Tables 4.a, 4.b and 4.c, increased age was significantly associated with a decreased level of knowledge about SBS (Table 4.a) and increased self-

reported psychological distress (Table 4.b). Similarly, there was a significant association between increased psychological distress among participants and the incidence of shaking their infants (Table 4.c).

Table 4. Cross-tabulation contingency tables and chi-square analysis (contingency tables) for the associations among the observed frequencies of the variables' categories: (Table 4.a) age and SBS knowledge, (Table 4.b) age and self-reported psychological distress and (Table 4.c) self-reported psychological distress and the action of shaking

Age * SBS_Knowledge Cross-tabulation			
		SBS_Knowledge	
		Yes	No
Age	< 20 yrs	44.4%	55.6%
	20-29 yrs	33.7%	66.3%
	30-39 yrs	41.9%	58.1%
	> 40 yrs	22.9%	77.1%
Chi-square Tests			
		Value	p-value
Pearson Chi-Square		9.414	0.024

(4.b) Age * Psychological Distress Cross-tabulation			
		Psychological Distress	
		Yes	No
Age	< 20 yrs	58.5%	41.5%
	20-29 yrs	68.8%	31.2%
	30-39 yrs	76.7%	23.3%
	> 40 yrs	88.9%	11.1%
Chi-square Tests			
		Value	p-value
Pearson Chi-square		9.702	0.021

(4.c) Psychological_Distress * Shaking Cross-tabulation			
		Shaking	
		Yes	No
Psychological_Distress	Yes	72.9%	27.1%
	No	58.6%	41.4%
Chi-square Tests			
		Value	p-value
Pearson Chi-square		6.3790	0.012

To better interpret the observed associations and to express part-to-whole relationships in the categories of variables in Table 4 (Akoglu, 2018; Schober et al., 2018), detailed frequency analysis (Pie Charts-summarizing Groups of Cases) was performed for the relationship between age, the action of shaking, and parents' knowledge about SBS (Figure 1). A similar detailed frequency analysis was performed for the relationship between age, the action of shaking, and psychological distress (Figure 2).

Association between Age, the Action of Shaking, and Parents' Knowledge about SBS

As shown previously in Table 2, 67.6% were unaware of the shaken baby syndrome (also indicated in Figure 1. c and Figure 1. d). More importantly, the detailed frequency analysis in Figure 1 indicated that 48.37% of parents who reported "Yes" for shaking their babies were also unaware of SBS, considerably among those aged 30 years and above (Figure 1. c). This is compared to 12.42% of parents who are aware of SBS and had never shaken their children (Figure 1. b).

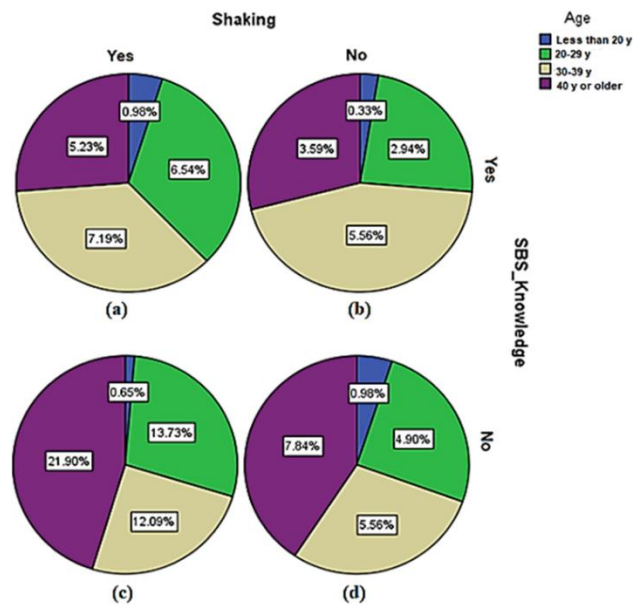


Figure 1. Detailed frequency analysis for the relationship between age, the action of shaking, and parents' knowledge about SBS

As shown in Table 3, over two-thirds (67.65 %) of parents reported having psychological distress (also indicated in Figure 2.a and Figure 2.b). The detailed frequency analysis in Figure 2 showed that among the parents who reported psychological distress, 49.35% of parents who reported “Yes” for shaking their babies

were having psychological distress, especially those who were aged 30 years and above (Figure 2. a). This is compared to 18.3% of parents who were having stress and anxiety and had never shaken their children (Figure 2. b).

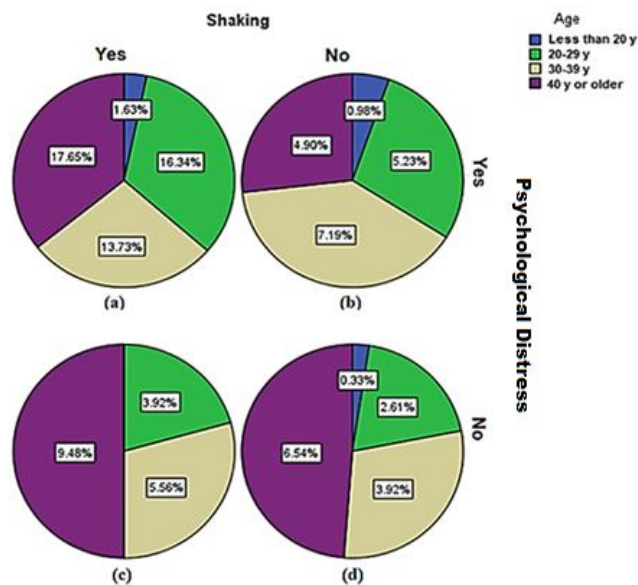


Figure 2. Frequency analysis for the relationship between age, the action of shaking, and psychological distress

Discussion

Our study revealed that there is an overall lack of

awareness about shaken baby syndrome among parents in Jordan and high levels of self-reported psychological

distress. Although Jordan high levels for psychological distress were reported among the Jordanian population (Abuhammad et al., 2022), this is the first study to investigate the level of knowledge about SBS among parents in Jordan. Further, the vast majority of parents who had shaken their children, were unaware of SBS, and were aged 30 years and above. Age was significantly associated with high levels of self-reported psychological distress and more shaking incidences. To the researchers' knowledge, this is also the first study to investigate the associations of SBS awareness, psychological distress, and social demographic features, including age.

Altogether, detailed frequency analysis (Figure 1 and Figure 2) showed that most parents who reported "Yes" for shaking their babies were unaware of SBS, and were mostly aged 30 years and above, which we suggest being the most critical group among the cases in Figure 1. The second detailed frequency analysis showed that most parents who reported "Yes" for shaking their babies were having psychological distress, mostly those aged 30 years and above, which we also suggest being the most critical group among the cases in Figure 2. Therefore, shaking a baby is connected, in part, with the psychological distress that parents or caregivers may experience while caring for their children, as parents may shake their babies when they are anxious or fatigued to calm them down ("Joint Statement on Shaken Baby Syndrome," 2001). The latter may be even more critical among those who lack knowledge about SBS and its harmful effect. Therefore, in order to form a logical whole understanding of SBS phenomenon, the triad of SBS knowledge, age and self-reported psychological distress should be considered as essential components of successful educational programs.

Our study findings were consistent with those of a study conducted by AlOmran et al. (2022) that assessed parents' awareness and knowledge of shaken baby syndrome in Riyadh city, KSA. They similarly reported a poor level of knowledge about SBS among parents. Also, our findings are consistent with the findings of a 2018 study, stating that almost 70% of parents were unaware of SBS, 67.39% were unaware of the risks associated with shaking a baby, and approximately 57.61% reported shaking their infants to calm them down during the first year of a child's life (Alshahrani et al., 2018). The results are in line with the study conducted by Mann et al. (2015) in Ireland that

demonstrated that most of the parents had never heard about SBS. This low level of awareness could be linked to lack of educational programs and awareness initiatives aimed at parents regarding SBS in these areas.

Our findings are in contrast with those of the study by Eyisi et al. (2019) that found a high SBS knowledge level with 73.3% of participants being aware of SBS. Yet, the latter finding cannot be generalized, as the study was limited to caregivers in a pediatric unit in one hospital setting. Another study in Germany by Berthold et al. (2019) found that 59.4% of subjects have reported that they heard about SBS from the media and the researchers indicated that the awareness among those with a higher risk of perpetration was low. We believe that SBS prevention and education programs in Germany, primarily targeting parents shortly after birth, have contributed to the findings of the latter study which form an indicator of the importance of these programs (Berthold et al., 2019).

The study findings revealed that most parents in Jordan experienced self-reported psychological distress. Further, the association between age, SBS knowledge, psychological distress, and the incidence of shaking revealed significant associations which we suggest to have a practical importance as well. Research on psychological distress and age has produced inconsistent findings (Brenes, 2006). Parenting psychological distress could negatively impact the attitudes of parents toward their children (Bornstein & Zlotnik, 2008; Neece et al., 2012; Tedgård et al., 2020). Furthermore, parents' health is significantly impacted by psychological distress, which can sap all their emotional stamina and concentration (Bornstein & Zlotnik, 2008). Therefore, parental psychological distress is an important factor to consider that can impact and shape the way in which they care for their children (Amrock & Weitzman, 2014). This could be even more alarming in countries like Jordan where growing psycho-social and economic pressures with the booming refugee crisis (Khawaldah & Alzboun, 2022) and the recent pandemic (Abuhammad et al., 2022).

Finally, even though age was associated with less knowledge about SBS, we believe that the most efficient prevention and educational programs should be initiated with younger parents (Berthold et al., 2019), especially in the early stages of pregnancy until the period during which the frequency of crying is expected to increase (Taşar et al., 2014). Such programs should be carried out

within an interdisciplinary team approach (McInerney et al., 2020).

Implications for Nursing

Patient education is an essential component of effective intervention and prevention care (Bhattad & Pacifico, 2022) and is considered a mutual responsibility of all members in the rehabilitation team (Jung et al., 2021). More specifically, the unique communication between nurses and physical therapists within a team-based pediatric care is effective in promoting healthcare services, especially when conducting patient education (Jung et al., 2021; Katkin et al., 2017). As SBS is completely preventable and education is the key for successful prevention, pediatric rehabilitation team members, such as nurses and physical therapists, assume leadership skills and roles in SBS prevention and should therefore have sufficient SBS knowledge, so that they educate parents regarding the potential harmful effect of SBS (Pediatrics, 2019).

Conclusion

In conclusion, this study reports serious lack of SBS awareness and knowledge among parents in Jordan. The risk factors to consider with SBS knowledge and practice include psychological distress, especially among those above 30 years of age. This indicates that we need to raise the awareness of the shaken baby

syndrome among parents of all ages in Jordan. Psychological distress management programs should also be implemented to help parents and caregivers create healthy and supportive environments for children.

The solution to avoiding SBS is caregiver education and teaching proper childcaring and handling and training health providers to recognize SBS and its associated signs and symptoms. Therefore, caregivers, parents and teachers in direct contact with children should be educated about the potential harmful effect of SBS and further receive prevention training in addition to coping strategies for frustration that may arise from caring for distraught children, especially those with special needs or health problems (Pediatrics, 2019). We believe that such education and training programs should be carried out within an interdisciplinary rehabilitation team approach by trained professionals, especially those caring in pediatrics rehabilitation units, such as physical therapists, nurses, occupational therapists, among other related healthcare professionals.

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Conflict of Interest

All authors declare no conflict of interest.

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