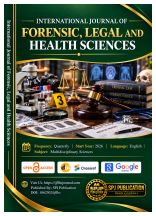
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Original Research

A Descriptive study to assess the knowledge regarding Shaken Baby Syndrome among caregivers of infants who reside in rural community Jamui Bihar

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ABSTRACT

Background: Shaking of an infant or young child is a severe form of child abuse and is commonly known as Shaken Baby Syndrome (SBS). Pediatricians and other physicians are beginning to use the more general term of "abusive head trauma" when describing an inflicted injury to the head of a child. Violent shaking of a child with or without impact can result in a wide spectrum of symptoms due to the brain damage it causes. Children often have additional injuries such as fractures, bruises, and hemorrhages to the back of the eyes when violently shaken.

Objective: To assess the knowledge regarding shaken baby syndrome among caregivers of infants who reside in rural community areas simultaneously, to find out the association between the level of knowledge regarding shaken baby syndrome among caregivers of infants who reside in rural community areas and their selected sociodemographic variables.

Methods: A quantitative research approach with a descriptive design was used. The study was conducted among 60 caregivers of infants selected using a non-probability convenience sampling technique. The study was conducted in Swami Vivekanand School of Nursing, Simultala, Jamui, Bihar. Data were analyzed using descriptive and inferential statistics.

Results: 6(10%) are had poor knowledge score, 11(18.3%) are had average knowledge score, 43(71.7%) are had good knowledge score. Associated with level of knowledge, type of family (5.90), previous knowledge (7.21), and source of knowledge (18.5) were significant, whereas age (3.3), gender (1.36), religion (7.27), educational qualification (3.3), occupation (4.86), and area of residence (3.41) were not significant.

Conclusion: On the basis of observations of our study, it was concluded that knowledge of shaken baby syndrome was good and was directly related to each other. The level of knowledge about shaken baby syndrome was relatively high.

Keywords: Assess, Knowledge, Shaken Baby Syndrome, Infant, Care Giver

INTRODUCTION

Shaken baby syndrome (SBS), commonly included within the broader clinical term abusive head trauma (AHT), is a serious form of inflicted traumatic brain injury that may occur when an infant or young child is violently shaken, struck, or subjected to a combination of shaking and blunt impact. This injury can cause intracranial bleeding, retinal haemorrhage, brain swelling, and neurological damage, potentially resulting in permanent disability or death. [1,2] The term abusive head trauma is increasingly preferred in clinical practice because it encompasses different mechanisms of inflicted head injury rather than attributing all injuries to shaking alone. [2,3] Infants are particularly vulnerable to abusive head trauma because of their developing neurological systems, relatively large head size, immature neck musculature, and limited ability to control head movements. These

anatomical and developmental characteristics make them susceptible to significant head and brain injuries when exposed to violent acceleration, deceleration, or impact forces. [3,4] The risk is particularly high during early infancy, with epidemiological studies indicating that the incidence of abusive head trauma peaks during the first few months of life. The American Academy of Pediatrics has reported an estimated annual incidence of approximately 25–35 cases per 100,000 children younger than one year in the United States, although estimates vary according to case definitions and surveillance methods. [3]

The consequences of shaken baby syndrome can be severe and long-lasting. Clinical manifestations may include irritability, poor feeding, vomiting, lethargy, seizures, altered consciousness, breathing difficulties, and, in severe cases, coma or death. Some affected infants may initially present with nonspecific symptoms, making timely recognition and appropriate medical assessment particularly important. [1,3] Survivors may experience developmental delay, cognitive impairment, learning difficulties, behavioural problems, motor dysfunction, visual impairment, and epilepsy. These complications may become more apparent as children grow and encounter increasing developmental demands. [5] A 2024 review of developmental outcomes in abusive head trauma highlighted the substantial long-term consequences of these injuries while also noting limitations in the available evidence, including variations in outcome measurements and follow-up. [5] Abusive head trauma represents an important public health concern because of its potential severity and the vulnerability of the affected population. The World Health Organization recognises child maltreatment as a major public health and human rights issue associated with significant physical, psychological, and developmental consequences. [6] Although shaken baby syndrome is recognised internationally, its reported incidence and outcomes differ across populations and healthcare settings. Differences in diagnostic criteria, access to healthcare, reporting practices, and surveillance systems can influence the identification and estimation of cases. [3,6]

Persistent or inconsolable infant crying is frequently reported as a trigger for episodes of abusive head trauma. Caregivers may experience frustration, exhaustion, anxiety, or difficulty managing prolonged crying, particularly when they have limited knowledge of normal infant behaviour or effective soothing strategies. [3,7] Infant crying is a normal part of early development and does not necessarily indicate illness or inadequate caregiving. However, misunderstanding crying patterns and responding with frustration may increase the risk of unsafe caregiving behaviour. [7,8] It is therefore essential for parents and other caregivers to understand that an infant must never be shaken or subjected to forceful handling, even when crying persists.

Caregiver knowledge plays an important role in the prevention of shaken baby syndrome. Awareness of the causes, warning signs, complications, and preventive measures may help caregivers recognise unsafe responses to infant crying and adopt appropriate coping strategies. Educational interventions, including programmes that explain normal infant crying and the dangers of shaking, have demonstrated improvements in caregivers' knowledge and selected preventive behaviours. [8,9] Nevertheless, evidence regarding the extent to which educational programmes reduce the incidence of abusive head trauma remains limited, highlighting the need for continued evaluation of prevention strategies. [9,10] Healthcare professionals have an important responsibility to educate parents and other infant caregivers about the dangers of shaking, safe methods of soothing a crying infant, and appropriate responses to caregiver frustration. Preventive guidance should encourage caregivers to place the infant safely in a cot when overwhelmed, take a brief break while ensuring the infant remains safe, seek support from a trusted person, and obtain medical advice when crying is unusual or accompanied by concerning symptoms. [3,8,11] Such education should be delivered in clear, culturally appropriate language and reinforced during antenatal care, postnatal visits, immunisation sessions, and community health programmes.

In rural communities, caregiver education may be particularly important because access to health information and preventive counselling can vary according to educational attainment, socioeconomic circumstances, healthcare accessibility, and previous exposure to maternal and child health services. These factors may influence caregivers' understanding of infant development, recognition of abusive head trauma, and knowledge of appropriate preventive practices. [6,12] Community-based assessment can help identify misconceptions, determine educational needs, and support the development of locally appropriate awareness programmes. Assessing caregivers' knowledge of shaken baby syndrome is therefore an important step towards strengthening infant safety and preventing avoidable injury. Previous studies have demonstrated that targeted education can improve

caregivers' understanding of infant crying and the dangers of shaking, supporting the value of structured educational interventions. [8,9,13] However, knowledge levels may differ between communities and population groups, making it necessary to assess awareness within the specific setting where preventive education is intended to be implemented.

In this context, the present study aims to assess the knowledge regarding shaken baby syndrome among caregivers of infants residing in the rural community of Simultala. It also seeks to determine the association between caregivers' knowledge levels and selected sociodemographic variables. The findings may help identify knowledge gaps, inform the development of targeted health education programmes, and contribute to community-based efforts to promote safe infant care and prevent abusive head trauma.

MATERIALS AND METHODS

Study Design: A descriptive research design was adopted to assess the knowledge regarding shaken baby syndrome (SBS) among caregivers of infants and its association with selected sociodemographic variables.

Study Population and Setting: The study population comprised caregivers of infants residing in the rural community of Simultala, Jamui district, Bihar, India.

Sample Size and Sampling Technique: A total of 60 caregivers of infants were included in the study using a non-probability convenience sampling technique.

Inclusion and Exclusion Criteria: Caregivers of infants who were available during data collection and willing to participate were included. Those who were unavailable, unwilling to participate, or already enrolled in another study were excluded.

Data Collection Tool: Data were collected using a self-structured questionnaire consisting of two sections. Section I recorded sociodemographic information, including age, religion, educational status of the mother and husband, family income, type of family, previous knowledge of SBS, and source of information. Section II assessed knowledge regarding the definition, causes, risk factors, complications, and prevention of shaken baby syndrome.

Development of the Tool: The questionnaire was developed following a review of relevant literature and consultation with experts in nursing and medical sciences. The questions were designed according to the objectives of the study.

Data Collection Procedure: Data collection was conducted in January 2026 after obtaining permission from the concerned authorities. The purpose of the study was explained to eligible participants, and informed consent was obtained before administering the questionnaire. Data were collected from 60 caregivers of infants and recorded for statistical analysis.

Statistical Analysis: The collected data were organised and analysed using descriptive and inferential statistics. Frequencies and percentages were used to describe sociodemographic characteristics and knowledge levels. Mean and standard deviation were used to summarise knowledge scores, where appropriate. The chi-square test was applied to determine the association between knowledge levels and selected sociodemographic variables. Statistical significance was considered at $p < 0.05$.

RESULT

Section I: Distribution of Sociodemographic Characteristics: A total of 60 caregivers of infants participated in the study. The sociodemographic characteristics included age, gender, religion, educational qualification, occupation, area of residence, type of family, previous knowledge regarding shaken baby syndrome (SBS), and source of information.

Table 1. Distribution of participants according to sociodemographic characteristics (n = 60)

Sociodemographic variables	Frequency (n)	Percentage (%)
Age (years)		
25–30	18	30.0
31–35	22	36.6
Above 35	20	33.4
Gender		
Male	20	33.4
Female	40	66.6
Religion		
Hindu	34	56.6
Christian	12	20.0
Muslim	9	15.0
Others	5	8.4
Educational qualification		
Illiterate	20	33.4
Primary/Middle	22	36.6
Higher education	18	30.0
Occupation		
Private job	22	36.6
Labour work	20	33.4

Government job/Business	18	30.0
Area of residence		
Urban	38	63.3
Rural	22	36.7
Type of family		
Nuclear	35	58.3
Joint	25	41.7
Previous knowledge regarding SBS		
Yes	39	65.0
No	21	35.0

As presented in Table 1, the majority of participants (36.6%) belonged to the 31–35 years age group, followed by 33.4% aged above 35 years and 30.0% aged 25–30 years. Females constituted the majority (66.6%) of the study population. Regarding religion, 56.6% were Hindu, while 20.0% were Christian, 15.0% were Muslim, and 8.4% belonged to other religions. In terms of educational qualification, 36.6% had primary or middle-level education, 33.4% were illiterate, and 30.0% had higher education. Regarding occupation, 36.6% were employed in private jobs, 33.4% were engaged in labour work, and 30.0% belonged to the government job/business category. Most participants (63.3%) were reported to reside in urban areas, while 36.7% belonged to rural areas. Nuclear families accounted for 58.3% of participants, and 41.7% belonged to joint families. Furthermore, 65.0% of participants reported having previous knowledge regarding SBS, whereas 35.0% had no previous knowledge.

Table 2. Distribution of participants according to sources of information regarding SBS (n = 60)

Source of information	Frequency (n)	Percentage (%)
Friends/Relatives	25	41.7
Magazines/Health professionals	13	21.6
Mass media	9	15.0
Other/Not specified	13	21.7
Total	**60**	**100.0**

As shown in Table 2, friends and relatives were the most frequently reported sources of information regarding SBS, accounting for 41.7% of participants. Magazines and healthcare professionals were reported together by 21.6%, while 15.0% received information through mass media. Information regarding the remaining 21.7% was not specified in the original data.

Section II: Assessment of Knowledge Regarding Shaken Baby Syndrome: The knowledge of caregivers regarding shaken baby syndrome was assessed using a self-structured knowledge questionnaire. Participants were classified into three categories: poor, average, and good knowledge.

Table 3. Distribution of participants according to their level of knowledge regarding SBS (n = 60)

Level of knowledge	Frequency (n)	Percentage (%)
Poor	6	10.0
Average	11	18.3
Good	43	71.7
Total	**60**	**100.0**

As presented in Table 3, the majority of caregivers (71.7%) demonstrated good knowledge regarding shaken baby syndrome. Approximately 18.3% had average knowledge, while 10.0% demonstrated poor knowledge. These findings indicate that most participants had a good level of awareness regarding SBS, although a proportion of caregivers continued to demonstrate inadequate or moderate knowledge.

Table 4. Mean knowledge scores, mean score percentages, and standard deviations according to knowledge categories

Knowledge category	Mean score	Mean score (%)	Standard deviation
Poor	8.5	14.1	0.9
Average	17.3	28.8	3.5
Good	16.1	26.8	6.6

Table 4 presents the reported mean knowledge scores, mean score percentages, and standard deviations across the three knowledge categories. The average knowledge category had a reported mean score of 17.3 (28.8%), while the good knowledge category had a mean score of 16.1 (26.8%). The poor knowledge category had a mean score of 8.5 (14.1%). The standard deviations were 0.9, 3.5, and 6.6 for the poor, average, and good knowledge categories, respectively.

Section III: Association Between Knowledge Level and Selected Sociodemographic Variables: The association between caregivers' knowledge levels regarding shaken baby syndrome and selected sociodemographic variables was assessed using the chi-square test.

Table 5. Association between knowledge level regarding SBS and selected sociodemographic variables (n = 60)

Sociodemographic variables	Calculated χ^2 value	Result as reported
Age	3.30	Not significant
Gender	1.36	Not significant
Religion	7.27	Not significant
Educational qualification	3.30	Not significant
Occupation	4.86	Not significant
Area of residence	3.41	Not significant
Type of family	5.90	Significant
Previous knowledge	7.21	Significant
Source of information	18.50	Significant

As presented in Table 5, the study findings indicated significant associations between caregivers' knowledge levels regarding SBS and type of family, previous knowledge, and source of information. The calculated chi-square values were 5.90, 7.21, and 18.50, respectively. However, no statistically significant associations were reported for age (χ^2 = 3.30), gender (χ^2 = 1.36), religion (χ^2 = 7.27), educational qualification (χ^2 = 3.30), occupation (χ^2 = 4.86), or area of residence (χ^2 = 3.41).

DISCUSSION

The present study assessed knowledge regarding shaken baby syndrome among 60 caregivers of infants residing in the rural community of Simultala, Jamui district, Bihar. It also examined the association between knowledge levels and selected sociodemographic characteristics. The sociodemographic findings revealed that the largest proportion of participants (36.6%) belonged to the 31–35 years age group, and females constituted 66.6% of the study population. Regarding educational status, 36.6% had primary or middle-level education, while 33.4% were illiterate. These findings highlight the importance of providing accessible health education using simple language and appropriate educational methods. Regarding family characteristics, 58.3% of participants belonged to nuclear families, while 41.7% belonged to joint families. Furthermore, 65.0% reported previous knowledge of shaken baby syndrome, indicating that a considerable proportion of caregivers had some prior awareness of the condition. Friends and relatives were the most frequently reported sources of information (41.7%), followed by magazines and healthcare professionals (21.6%) and mass media (15.0%). This finding highlights the potential influence of informal social networks in disseminating health-related information. However, information obtained through informal sources may vary in accuracy, emphasising the importance of reliable health education delivered by healthcare professionals.

Overall Knowledge Regarding Shaken Baby Syndrome: The assessment of knowledge revealed that 43 (71.7%) caregivers had good knowledge, 11 (18.3%) had average knowledge, and 6 (10.0%) had poor knowledge. Thus, most participants demonstrated good knowledge regarding shaken baby syndrome. Nevertheless, the presence of poor and average knowledge among 28.3% of participants indicates the need for continued awareness and educational programmes focusing on the causes, risk factors, complications, and prevention of SBS.

Association Between Knowledge and Sociodemographic Variables: The association analysis indicated that type of family, previous knowledge, and source of information were reported to have significant associations with caregivers' knowledge levels. In contrast, age, gender, religion, educational qualification, occupation, and area of residence were reported to have no significant associations. These findings suggest that previous exposure to information and the availability of health-related knowledge within the family and social environment may influence caregivers' understanding of shaken baby syndrome. Strengthening community-based health education and involving healthcare professionals in awareness activities may help address existing knowledge gaps. This study highlights the importance of continued educational efforts to improve caregivers' awareness of shaken baby syndrome and promote safe infant-care practices.

CONCLUSION

The study found that most caregivers (71.7%) had good knowledge regarding Shaken Baby Syndrome, while 18.3% had average and 10% had poor knowledge. Knowledge was significantly associated with family type, previous knowledge, and source of information. The findings emphasise the need for

community-based awareness and educational programmes to promote safe infant-care practices and prevent SBS

DECLARATIONS

Ethics Approval and Consent to Participate: Informed verbal consent was obtained from all participants before data collection. Participation was voluntary, and confidentiality was maintained.

Consent for Publication: Not applicable.

Availability of Data and Materials: All data analysed during this study are included in the manuscript. Additional information is available from the corresponding author upon reasonable request.

Conflict of Interest: The authors declare that they have no competing interests.

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Author Contributions: All authors contributed to the study conception, literature search, data collection, data interpretation, manuscript preparation, critical revision, and approval of the final manuscript.

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