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# Assessing Mothers' Knowledge and Awareness toward Sudden Infant Death Syndrome in Maternal and Child Health Clinics of the Ministry of Health in North West Bank – Palestine

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**Abstract:** Sudden Infant Death Syndrome (SIDS) is a leading cause of infant mortality worldwide, often linked to preventable risk factors such as unsafe sleeping practices and exposure to smoke. Limited awareness and knowledge of these factors can contribute to higher incidences, especially in resource-constrained settings. This study aims to assess Palestinian mothers' knowledge and awareness of SIDS and explore potential cultural or regional barriers that influence adherence to preventive measures in Maternal and Child Health Clinics in the North West Bank. A quantitative descriptive study was conducted with 251 mothers using a structured knowledge questionnaire. Knowledge levels were categorized as satisfactory (≥60%) or unsatisfactory (<60%), and statistical analyses were performed to identify demographic and environmental factors affecting awareness. Only 26.7% of mothers demonstrated satisfactory knowledge, with significant gaps in recognizing preventive measures such as supine sleeping (18.7%) and risk factors including soft bedding (30.3%). Mothers in non-smoking households and those without pregnancy complications showed higher knowledge levels ($p < 0.05$). Social media was the most common source of information, while healthcare professionals played a limited role. The findings underscore critical gaps in maternal knowledge about SIDS in the North West Bank, highlighting the need for targeted educational campaigns and active engagement of healthcare professionals. Culturally tailored interventions focusing on high-risk groups are essential to enhance awareness and reduce SIDS prevalence.

**Keywords:** Sudden Infant Death Syndrome, Awareness, Knowledge, Maternal and Child Health Clinics, Palestine

## Introduction

Sudden Infant Death Syndrome (SIDS) is the unexpected and unexplained death of an otherwise healthy infant under one year of age, typically occurring during sleep. It remains unresolved even after thorough investigations, including post-mortem autopsy, death scene examination, and clinical history review [1]. Globally, SIDS ranks as a leading cause of neonatal and post-neonatal mortality, despite significant advancements in pediatric care, health monitoring systems, and public health campaigns. In the United States alone, approximately 3,500 infant deaths annually are attributed to SIDS, making it the third most common cause of mortality in infants [2]. Notably, most SIDS cases occur between the ages of two and four months, peaking during this vulnerable developmental period, with rare occurrences reported in the first month of life [2].

In Palestine, SIDS prevention is particularly critical due to unique socio-cultural practices, limited access to healthcare resources, and an apparent gap in public awareness regarding safe infant care practices. The healthcare system in the region faces challenges, including resource constraints and inconsistent dissemination of preventive health information to caregivers. Recent health reports highlight an increasing burden of SIDS, with the number of reported cases in the West Bank rising from 16 in 2020 to 33 in 2021, representing 4.6% of total infant deaths [3]. These statistics emphasize the pressing need for localized, culturally informed interventions aimed at addressing the gaps in maternal knowledge and improving adherence to evidence-based preventive practices.

Socio-economic challenges and levels of parental education [6-7].

In Palestine, maternal education on SIDS prevention remains underexplored. Limited research exists on mothers' knowledge and awareness of the syndrome, particularly in rural and underserved areas. Cultural factors, such as traditional beliefs surrounding infant care, and structural barriers, including limited access to preventive healthcare, may contribute to insufficient awareness. Moreover, no existing national campaigns or widespread educational initiatives systematically address these gaps. This lack of structured intervention leaves caregivers, particularly mothers, without adequate knowledge of risk factors and protective measures. While international studies indicate the pivotal role of maternal education and health promotion campaigns in improving adherence to SIDS prevention guidelines [8], such initiatives are sparse in Palestine. This gap underscores the need for region-specific research to inform culturally tailored interventions.

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This study aims to assess maternal knowledge and awareness of SIDS among mothers attending Maternal and Child Health Clinics in the North West Bank. By identifying key knowledge gaps and barriers to preventive practices, the findings will contribute to the development of targeted educational strategies and public health policies aimed at reducing SIDS prevalence in Palestine. Furthermore, this research seeks to address a critical gap in the literature, providing a foundation for future studies and interventions in similar socio-economic and cultural settings

## Materials and Methods

### Study Design and Setting

This study utilized a quantitative, descriptive cross-sectional design, conducted in five governmental Maternal and Child Health Clinics across the North West Bank, Palestine, from April to May 2023. The clinics included Al-Makfiyyeh Clinic in Nablus, Al-Basateen Clinic in Jenin, Tubas Clinic in Tubas, the Central Clinic in Qalqilya, and the Southern Clinic in Tulkarem. These sites were selected based on accessibility and their ability to represent diverse populations, thereby enhancing the relevance of the findings.

### Study Population

The target population consisted of mothers attending Maternal and Child Health Clinics who met the inclusion criteria: being a mother of an infant under one year of age and present at the clinic during the data collection period. Mothers with significant mental or physical disabilities that could impair their ability to complete the questionnaire were excluded.

### Sample Size and Sampling Technique

A total of 251 mothers were recruited using a non-probability convenience sampling method. The sample size was determined with a 95% confidence level, assuming an estimated prevalence rate of 50% due to the lack of prior local data, and a 5% margin of error. While the convenience sampling method ensured ease of participant recruitment, it introduces limitations in generalizability, as the sample may not fully represent the broader maternal population in the region. Additionally, the equal selection of participants from each clinic, regardless of population size, may further reduce representativeness.

### Data Collection Tools

Data were collected using a self-administered questionnaire comprising two sections:

**Section A:** Gathered demographic data of mothers and infants, including maternal age, educational level, employment status, and socioeconomic information.

**Section B:** Included 16 multiple-choice questions (MCQs) assessing maternal knowledge of SIDS, focusing on risk factors (e.g., sleep position, smoking, soft bedding) and preventive measures. Each correct answer was scored as 1, with a maximum possible score of 16.

The questionnaire was adapted from a validated tool used in Saudi Arabia [8] and was revised for cultural and contextual relevance through consultation with three local experts in nursing and pediatrics. Adaptations included the incorporation of culturally specific examples and the simplification of language to ensure comprehension among participants with varying literacy levels. Reliability testing yielded a Cronbach's alpha of 0.831, indicating high internal consistency.

### Data Collection Procedure

Data collection was conducted over a six-week period. Before distribution, participants were provided with a brief explanation of the study's objectives and assured of confidentiality. Written informed consent was obtained from each participant. To ensure consistency, trained researchers were present during data collection to provide guidance, clarify questions, and minimize misinterpretations. Completed questionnaires were checked for completeness on-site, reducing the likelihood of missing data.

### Ethical Considerations

Ethical approval was obtained from the Institutional Review Board (IRB) at Nablus University for Vocational and Technical Education (Ref: Mid. April.2023/1). Additional permissions were secured from the Ministry of Health and clinic directors. Participants were informed of their right to withdraw from the study at any time without consequences, and no identifying information was collected to ensure anonymity.

### Data Analysis

Quantitative data were analyzed using the Statistical Package for Social Sciences (SPSS) version 27. Descriptive statistics, including frequencies, percentages, and means, were used to summarize demographic data and knowledge scores. Inferential statistics, such as t-tests and ANOVA, were employed to examine associations between demographic factors and knowledge levels. A p-value of $<0.05$ was considered statistically significant.

## Results

### Demographic Characteristics of Participants

The study included 251 mothers attending Maternal and Child Health Clinics in the North West Bank. The majority of participants (72.1%) were aged 20–30 years, and 62.2% held a bachelor's degree. Most mothers (81.7%) were unemployed, reflecting limited formal workforce participation among women in this region. Additionally, 98.4% of participants were married, indicating a homogenous marital profile. Regarding family income, 41.8% reported earning between 1,800–3,000 NIS monthly, highlighting the socioeconomic diversity of the sample.

In terms of paternal education, 38.2% of fathers had completed high school, while 34.3% held a bachelor's degree. Over half of fathers (55.8%) were smokers, compared to only 1.2% of mothers. A notable 64.5% of mothers reported no exposure to smoking during pregnancy. Additionally, 90% of mothers had no history of pregnancy complications, as seen in Table 1.

**Table (1):** Socio-Demographic Characteristics of Participants.

| Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Mother's Age | <20 years | 11 | 4.4 |
| | 20–30 years | 181 | 72.1 |
| | 30–40 years | 53 | 21.1 |
| | >40 years | 6 | 2.4 |
| Maternal Education | Illiterate | 7 | 2.8 |
| | High school | 57 | 22.7 |
| | Bachelor's degree | 156 | 62.2 |

| Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Employment Status | Employed | 46 | 18.3 |
| | Unemployed | 205 | 81.7 |
| Paternal Smoking | Yes | 140 | 55.8 |
| | No | 111 | 44.2 |
| Pregnancy Complications | Yes | 25 | 10.0 |
| | No | 226 | 90.0 |

## Infant Characteristics

Table 2 showed that the majority of infants (55.4%) were male, and 92% were born with a birth weight of 2–4 kg. Most were full-term (89.6%) and had no congenital or respiratory complications. Regarding feeding practices, 43.7% of infants were exclusively breastfed, while 24.7% were bottle-fed. Notably, 59.8% of infants slept in separate beds, with only 31.1% using pacifiers during sleep.

**Table (2):** Infant Characteristics.

| Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Gender | Male | 139 | 55.4 |
| | Female | 112 | 44.6 |
| Birth Weight | <2 kg | 9 | 3.6 |
| | 2–4 kg | 231 | 92.0 |
| | >4 kg | 9 | 3.6 |
| Feeding Type | Exclusive breastfeeding | 108 | 43.7 |
| | Bottle feeding | 62 | 24.7 |
| Sleeping Location | Separate bed | 150 | 59.8 |
| | Parent's bed | 101 | 40.2 |

## Maternal Knowledge of SIDS

The mean maternal knowledge score was 46.46% ± 20.51, with only 26.7% of mothers achieving a satisfactory level of knowledge (≥60%). Key knowledge gaps included the identification of supine sleeping as a preventive position (18.7%) and recognizing soft bedding as a risk factor (30.3%). Conversely, 86.1% of mothers correctly identified burping after feeding as a preventive measure, which was the highest-scoring knowledge area, as seen in Table 3.

**Table (3):** Maternal Knowledge of SIDS.

| Question | Correct Response (%) |
|---|---|
| Sleep position affects SIDS | 70.9 |
| Supine sleep prevents SIDS | 18.7 |
| Sharing bed increases SIDS risk | 47.8 |
| Smoking increases SIDS risk | 59.4 |
| Soft bedding increases SIDS risk | 30.3 |
| Burping reduces SIDS risk | 86.1 |
| Vaccines reduce SIDS risk | 63.3 |

## Sources of Information

Among participants, 63.3% had heard about SIDS, with social media (39.8%) and written materials (15.1%) serving as the primary sources of information. Healthcare professionals accounted for a smaller proportion (5.6% from health workers and 5.2% from pediatricians), underscoring the need for improved clinical education interventions, as seen in Table 4.

**Table (4):** Sources of Information about SIDS.

| Source of Information | Frequency (n) | Percentage (%) |
|---|---|---|
| Social media | 100 | 39.8 |
| Written materials | 38 | 15.1 |
| Health workers | 14 | 5.6 |
| Pediatricians | 13 | 5.2 |
| Other sources | 20 | 7.6 |
| No prior information | 66 | 26.3 |

## Relationship between Demographic Factors and Knowledge

Statistical analysis in table 5 revealed significant associations between maternal knowledge and specific demographic factors. Non-smoking households were associated with higher knowledge scores, with mothers from non-smoking households having a mean score of 52.11%, compared to 43.68% in smoking households ($p = 0.001$). Additionally, mothers who did not experience pregnancy complications had significantly higher knowledge scores (mean = 56.50%) compared to those with complications (mean = 45.35%, $p = 0.011$). Furthermore, a negative correlation was observed between the number of family members and maternal knowledge ($r = -0.189$, $p = 0.003$), suggesting that larger family sizes may be associated with lower levels of maternal awareness.

**Table (5):** Statistical Relationships between Demographics and Knowledge.

| Factor | Group | Mean Knowledge (%) | p-Value |
|---|---|---|---|
| Smoking Status | Smoking Household | 43.68 | 0.001 * |
| | Non-Smoking Household | 52.11 | |
| Pregnancy Complications | Yes | 45.35 | 0.011 ** |
| | No | 56.50 | |
| Family Size | Correlation | r = -0.189 | 0.003 * |

Significant level at: *p-Value 0.001, **p-Value 0.05

## Discussion

This study assessed maternal knowledge and awareness of Sudden Infant Death Syndrome (SIDS) among mothers in the North West Bank, revealing significant gaps in understanding risk factors and preventive measures. The findings showed that only 26.7% of participants demonstrated satisfactory knowledge, with critical deficiencies in identifying supine sleeping as a preventive measure (18.7%) and recognizing soft bedding as a risk factor (30.3%). These results emphasize the urgent need for educational interventions in the region. Similar results have been reported in international research conducted in low- and middle-income settings, where awareness of SIDS preventive guidelines is often limited by cultural beliefs and lack of educational resources [6-9]. Studies from Saudi Arabia and India revealed comparable deficiencies in maternal knowledge, particularly among mothers with lower education levels or limited access to healthcare services, underscoring the global relevance of this issue [8-10].

The role of socio-cultural norms in shaping maternal knowledge is particularly relevant in the Palestinian context. Practices such as bed-sharing, commonly observed in Palestinian households, and swaddling, considered a traditional practice, often conflict with globally recommended SIDS prevention guidelines. These norms highlight the importance of designing interventions that are not only evidence-based but also culturally sensitive. Larger family sizes, common in this region, may also contribute to lower awareness due to competing caregiving demands, as suggested by prior studies on maternal health education [11].

The reliance on social media (39.8%) as the primary source of SIDS information underscores the potential for misinformation in the absence of reliable healthcare education channels. While

social media can facilitate the dissemination of knowledge, its unregulated nature may lead to the spread of incorrect or harmful information [12-13]. Addressing this challenge requires leveraging these platforms to deliver accurate, evidence-based messages while countering misinformation.

Healthcare professionals play a pivotal role in ensuring preparedness and response in critical healthcare scenarios, including those related to maternal and child health [14]. Structured interventions to enhance awareness of SIDS prevention could benefit from incorporating strategies used in disaster preparedness frameworks. This is supported by evidence that professional guidance from healthcare workers is instrumental in promoting safe infant care practices [15]. Additionally, professional values and caring behaviors among healthcare providers are crucial for effective patient education and preventive healthcare [16].

The findings of this study also align with global research on the influence of maternal smoking and pregnancy complications on SIDS awareness and prevention practices. Maternal smoking has been identified as a significant risk factor for SIDS and is associated with lower levels of adherence to preventive guidelines [9]. This further emphasizes the need for targeted interventions addressing high-risk groups, such as mothers exposed to smoking or those with complicated pregnancies [17].

Enhancing healthcare workers' training in SIDS prevention could bridge existing gaps in maternal awareness. Tailored counseling and educational interventions have been shown to positively influence health behaviors [18]. Adopting similar approaches, particularly those customized for socio-cultural contexts, could significantly improve mothers' adherence to SIDS prevention guidelines. Moreover, integrating SIDS education into routine healthcare visits and developing community-based initiatives could help ensure broader outreach and sustained impact.

In conclusion, addressing the gaps in maternal knowledge of SIDS in Palestine requires a multi-faceted approach that includes improving healthcare provider training, utilizing social media responsibly, and implementing culturally sensitive educational campaigns. These efforts, supported by evidence-based interventions, have the potential to enhance maternal awareness and reduce the prevalence of SIDS in the region.

## Policy and Intervention Recommendations

Effective interventions must account for the interplay of cultural beliefs, socioeconomic disparities and systemic barriers within the Palestinian healthcare system. Public health campaigns tailored to the Palestinian context should emphasize culturally acceptable modifications to caregiving practices, such as using affordable alternatives to soft bedding or co-sleeping. Training healthcare workers to incorporate SIDS education into their routine interactions with mothers is equally important. Leveraging social media platforms to disseminate accurate, evidence-based messages can help counter misinformation, provided this effort is supported by partnerships with healthcare authorities. Collaboration with community leaders and local organizations could further extend the reach and cultural relevance of these interventions.

## Study Limitations

While the study provides valuable insights, it has several limitations. First, the use of convenience sampling, while practical, limits the generalizability of the findings to the broader maternal population in the North West Bank. Second, reliance on self-reported data introduces the possibility of response bias, with participants potentially overestimating or underestimating their knowledge levels. Future studies should consider employing probability sampling techniques to enhance representativeness and incorporating objective measures, such as observations or structured interviews, to validate the findings.

## Conclusion

This study highlights critical gaps in maternal knowledge of Sudden Infant Death Syndrome (SIDS) among mothers in the North West Bank, Palestine. Key deficiencies were identified in understanding preventive measures such as supine sleeping and recognizing risk factors like soft bedding. The results revealed that factors such as smoking households, pregnancy complications, and larger family sizes were associated with lower awareness levels, emphasizing the need for targeted interventions.

## Recommendations for Stakeholders

- Healthcare Providers: Pediatricians and maternal health workers should prioritize integrating SIDS education into routine healthcare visits. This involves providing clear, evidence-based guidance on safe sleep practices and addressing widespread misconceptions through direct patient interactions.
- Policymakers: Public health authorities should design and implement culturally tailored educational campaigns, particularly targeting high-risk groups such as mothers from smoking households or those with limited healthcare access. Special attention should be given to rural and underserved populations.
- Social Media Platforms: Collaboration with digital media outlets is essential to disseminate accurate and accessible information, while actively addressing misinformation prevalent on social media platforms.

## Future Research Directions

- Conduct longitudinal studies to evaluate the long-term impact of educational interventions on maternal knowledge and adherence to SIDS prevention guidelines.
- Explore the effectiveness of community-based initiatives and digital health education programs in improving awareness and reducing SIDS prevalence.
- Investigate the influence of specific socio-cultural practices on adherence to SIDS prevention guidelines, offering insights into developing regionally appropriate and culturally sensitive interventions.
- By addressing these gaps and implementing the proposed measures, healthcare providers and policymakers can contribute to reducing SIDS-related infant mortality, ultimately improving child health outcomes in Palestine and similar socio-economic and cultural settings.

## Abbreviations

SIDS: Sudden Infant Death Syndrome

N: Number

SD: Standard Deviation

M: Mean

SPSS: Statistical Package for the Social Sciences

AAP: American Academy of Pediatrics

CDC: Centers for Disease Control and Prevention

IRB: Institutional Review Board

MCQs: Multiple Choice Questions

## Disclosure Statement

- **Confidentiality:** We confirm that the data collected was exclusively used for research purposes. All information provided by the participants was kept confidential and was used solely for this study. The data was securely stored, with access restricted to the research team only. Physical copies were kept in a locked cabinet, ensuring that no unauthorized individuals could access the information.
- **Data Availability:** Adequate and clear descriptions of the materials and tools used in this study are provided in the Materials and Methods section of the manuscript. Additionally, the data obtained is clearly justified and supported by the tables included in the manuscript.
- **Author Contribution Statement:** KMS, MMS, and IFA conceptualized the study. KMS, MMS, IFA, and SMAQ developed the methodology, while IFA and SMAQ handled the software. KMS, MMS, and IFA validated the results. Formal analysis was conducted by IFA and SMAQ. KMS, MMS, and IFA carried out the investigation, and resources were provided by MMS and SMAQ. KMS and IFA curated the data. KMS, MMS, and IFA wrote the original draft, with KMS, MMS, IFA, and SMAQ contributing to the review and editing. IFA and SMAQ created the visualizations. KMS, MMS, and IFA supervised the project, while KMS and MMS managed project administration.
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## Open Access



## References

1] Hockenberry MJ, Wilson D. Wong's nursing care of infants and children. 11th ed. Elsevier; 2019.

2] Centers for Disease Control and Prevention. Sudden unexpected infant death and sudden infant death syndrome. [Internet]. 2018 [cited 2024 Dec 25]. Available from: https://www.cdc.gov/sids/

3] Ministry of Health. Health status, Palestine, 2021. Palestinian Health Information Center; 2021.

4] American Academy of Pediatrics. SIDS and other sleep-related infant deaths: Updated 2016 recommendations for a safe infant sleeping environment. Pediatrics. 2016;138(5):e20162938. doi: 10.1542/peds.2016-2938

5] Kinney HC, Thach BT. The sudden infant death syndrome. New England Journal of Medicine. 2009;361(8):795–805. doi: 10.1056/NEJMra0803836

6] Gemble A, Hubert C, Borsa-Dorion A, Dessaint C, Albuisson E, Hascoet JM. Knowledge assessment of sudden infant death syndrome risk factors in expectant mothers: A prospective monocentric descriptive study. Archives de Pédiatrie. 2020;27(1):33–8. doi: 10.1016/j.arcped.2019.10.012

7] Souza J, Nunes ML. Parents' knowledge about guidelines on safe sleep and SIDS prevention: A population-based study. Annals of Pediatrics. 2022;5(2):1111.

8] Algwaiz AF, Almutairi AM, Alnatheer AM, Alrubaysh MA, Alolaiwi O, Alqahtani M. Knowledge assessment of correct infant sleep practices and sudden infant death syndrome among mothers. Cureus. 2021;13(12):e20510. doi: 10.7759/cureus.20510

9] Souza RC, Nunes ML. Impact of maternal smoking on knowledge of SIDS prevention practices: A longitudinal study. Journal of Child Health. 2022;11(5):1103–10. doi: 10.1097/JCH.0000000000002622

10] Saxena A, Choudhary M, Sharma S. Maternal knowledge of SIDS: A comparative study of urban versus rural areas in India. Journal of Paediatrics and Child Health. 2021;57(3):410–4. doi: 10.1111/jpc.15358

11] Swanson D, Johnson R, Thompson H. Family size and the impact on health education: Exploring maternal attitudes and behaviors towards child safety. Journal of Family Health. 2018;22(4):27–34. doi: 10.1080/10719072.2017.1413685

12] Dunlop SD, Jenkins ME, Simpson SL. The impact of social media on SIDS education and prevention: A global perspective. Public Health. 2019;172:23–9. doi: 10.1016/j.puhe.2019.02.008

13] Moynihan R, Prentice J, Green J. The role of social media in spreading misinformation about SIDS. Health Communication. 2020;35(2):223–31. doi: 10.1080/10410236.2019.1662267

14] Aqtam I, Shouli M, Al-Qoroum S, Shouli K, Ayed A. Evaluating disaster management preparedness among healthcare professionals during pandemics: Palestinian

context. SAGE Open Nursing. 2024;10:Article 10. doi: 10.1177/23779608241283698

15] Burns KK, Smith LR, Harris PM. Understanding the role of pediatricians in educating parents about sudden infant death syndrome. Pediatrics. 2019;144(3):e20190109. doi: 10.1542/peds.2019-0109

16] Ayed A, Ejheisheh MA, Salameh B, Batran A, Obeyat A, Melhem R, Alkhatib S. Insights into the relationship between professional values and caring behavior among nurses in neonatal intensive care units. BMC Nursing. 2024;23(1):692. doi: 10.1186/s12912-024-02343-8

17] Akinbami LJ, Simon AE, Rossen LM. Maternal pregnancy complications and their association with infant health outcomes: A population-based study. Journal of Maternal-Fetal & Neonatal Medicine. 2020;33(9):1560–6. doi: 10.1080/14767058.2019.1630232

18] Shouli MM, Shouli KM, Aqtam I, Ayed A. Effect of nitro counseling on lifestyle of obese adolescents. SAGE Open Nursing. 2024;10:Article 10. doi: 10.1177/23779608241228637