MAR Nursing and Patient Care (2025) 1:1

Research Article

Assessment of Nurses Knowledge Regarding Care of Preterm and Term Babies in Golden Hour in Maternity and Children Hospital Hafar Albatin 2024

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Received: 14 December 2024

Published: 02 January 2025

Abstract

Background: *The "golden hour" is a crucial period immediately after birth, particularly for preterm and term neonates, involving essential resuscitation and stabilization efforts. This study aimed to assess the knowledge of nurses during this critical time to ensure the highest standard of neonatal care.*

Methods: *A descriptive, quantitative study was conducted between February and May 2024 at the Maternity and Children Hospital in Hafr Albatin, Saudi Arabia. The study included 65 nurses working in the operation room, delivery room, and Neonatal Intensive Care Unit. Data were collected using structured questionnaires and observational checklists and analyzed using SPSS version 28.0.*

Results: *The majority of nurses (52.9%) were aged 25-35 years, predominantly female (95.6%), with slightly more than half being Saudi nationals (51.5%). Most nurses (54.4%) held a bachelor degree. While 72.1% of nurses understood the importance of the golden hour, and 80.9% were familiar with its key components, gaps were identified in specific areas, such as only 51.5% recognizing that the golden hour begins before delivery. Additionally, 85.7% conducted prenatal history checks, and 88.6% consistently asked critical questions during deliveries, but only 65.7% performed pre-resuscitation team briefings, and 51.4% maintained effective team communication. Non-Saudi nurses demonstrated significantly higher knowledge scores than their Saudi counterparts (P = .003), and more experienced nurses also tended to have higher knowledge scores (P = .055).*

Conclusion: *While the majority of nurses demonstrated good knowledge during the golden hour, significant gaps were found in understanding its initiation, conducting team briefings, and preparing the environment. These findings highlight the need for targeted educational interventions to improve neonatal care and collaboration among nursing staff during this critical period.*

Keywords: *Golden hour, neonatal care, preterm babies, neonatal resuscitation, NICU, neonatal outcomes, nursing knowledge, neonatal mortality, Hafar Albatin, Saudi Arabia.*

Introduction

The "Golden Hour" refers to the critical period immediately following birth, typically lasting for the first hour of life, during which prompt and appropriate medical intervention is crucial for optimizing outcomes, particularly for preterm and term infants. This period is marked by rapid physiological adjustments and necessary interventions aimed at stabilizing the newborn and preventing complications (Peleg et al., 2019). Preterm babies, defined as infants born before 37 weeks of gestation, often face numerous health challenges due to incomplete development, necessitating specialized care and monitoring, especially during the immediate postnatal period (Lawn et al., 2023).

Recently, the concept of the "Golden Hour" has gained significant attention in neonatology, underscoring the importance of neonatal care within the first hour of life after birth. This critical period is particularly vital for both preterm and term neonates, as it involves essential resuscitation and stabilization efforts aimed at improving short-term and long-term outcomes (Shah et al., 2018). Golden Hour encompasses evidence-based interventions designed to reduce complications, especially for extremely low gestational age neonates. Key components during this period include antenatal counseling, delayed cord clamping, prevention of hypothermia, respiratory and cardiovascular support, and early nutritional care (Sharma et al., 2017). The connection between gestational age and neurodevelopmental outcomes, as well as mortality rates, highlights the urgency of prompt resuscitation and stabilization during this time (Croop et al., 2020). Effective resuscitation team arrangements, where each member is well aware of their role, are essential to avoid complications and ensure quality care. The Golden Hour demands a standardized approach, effective communication, teamwork, and clinical knowledge to achieve optimal outcomes (Wyckoff et al., 2014).

The care provided by nursing professionals during the Golden Hour is critical for ensuring positive neonatal outcomes. However, there is a notable gap in the assessment of nurses' knowledge regarding neonatal care during this period (Sharma et al., 2017). Globally, complications from preterm births are the leading cause of neonatal mortality, with approximately 15 million babies born prematurely each year (WHO). In Saudi Arabia, despite advancements in healthcare infrastructure and services, neonatal mortality rates remain a concern, with preterm birth complications being a leading cause (Al-Salam et al., 2016). This concern is compounded by the lack of comprehensive assessment of nurses' competencies, particularly in areas such as timely resuscitation, thermoregulation, and initial stabilization of preterm and term neonates. Addressing these gaps through targeted educational interventions is crucial for improving neonatal outcomes, reducing morbidity and mortality rates, and ensuring the provision of high-quality, evidence-based care (Peleg et al.,

2019).

Previous studies predominantly focused on intervention strategies aimed at enhancing knowledge in neonatal care or provided reviews of applied protocols, often without addressing the specific setting or context relevant to the current study. For instance, Bijou et al. (2022) conducted an educational intervention designed to reduce hypothermia in preterm infants, which resulted in a significant increase in nurse knowledge post-intervention. Similarly, Wallingford et al. (2021) implemented and evaluated "Golden Hour" knowledge in infants younger than 33 weeks' gestation, observing a decreased incidence of chronic lung disease as a result of adherence to standardized protocols. Welch et al. (2024) also introduced a quality improvement initiative aimed at enhancing the timeliness of Golden Hour care for premature infants, which led to notable improvements in various aspects of care delivery. Additionally, Bataille (2023) conducted a doctoral project assessing the impact of nursing education on newborn care during the golden hour, highlighting the critical role of education and regular reminders in improving nurse knowledge.

These studies collectively showed the importance of addressing the identified gap in the literature. Unlike previous studies that have concentrated on broader aspects of neonatal care or specific interventions, the current research attempted to fill this gap by conducting a comprehensive assessment of nurses' knowledge specifically concerning the care of preterm and term babies during the golden hour in this unique setting. Given the critical importance of the Golden Hour, assessing and enhancing nurses' knowledge during this period is justified as a means to improve neonatal outcomes significantly. The aim of this study is to evaluate the knowledge of nurses at the Maternity and Children Hospital in Hafar Albatin, Saudi Arabia, regarding the care of preterm and term babies during the Golden Hour. Through identifying gaps and implementing targeted educational interventions, the study seek to enhance the quality of neonatal care, ultimately reducing neonatal morbidity and mortality in this vulnerable population.

Methods

The study applied a quantitative, observational, descriptive cross-sectional design to assess nurses' knowledge regarding neonatal care during the golden hour. This research was conducted between February and May 2024 at the Maternity and Children Hospital in Hafr Albatin, Saudi Arabia. A total coverage sampling technique was applied, which included all 65 nurses working in the operation room, delivery room, and Neonatal Intensive Care Unit (NICU) at the hospital. This approach ensured that the study captured the full range of experiences of nurses directly involved in neonatal care during the golden hour, making the

sample highly relevant and appropriate for the study objectives.

Data were collected using a structured questionnaire and an observational checklist, both of which were adapted from relevant previous studies and validated through a pilot study to ensure their reliability and applicability in the specific hospital setting. The structured questionnaire was designed to comprehensively assess various aspects of the nurses' knowledge and was divided into three sections. The first section gathered sociodemographic information, including details such as age, gender, nationality, marital status, qualifications, years of experience, and any training courses related to the care of neonates in the first hour of life. The second section focused on the nurses' general knowledge about the golden hour, including the care of preterm and term babies, the classification of neonates, the essential components of the golden hour, and the short-term and long-term complications associated with premature babies.

Once the data were collected, they were entered into a digital database and analyzed using SPSS version 28.0. The analysis involved descriptive statistics, including frequencies, percentages, means, and standard deviations, to summarize the data effectively. Bivariate analysis was conducted to explore relationships between variables, with chi-square tests applied to categorical variables and t-tests used for quantitative variables. Pearson correlation coefficients were calculated to assess the correlation between overall perceived barriers and demographic data. A p-value of 0.05 or less was considered statistically significant, indicating the level at which the findings could be considered reliable.

To ensure the integrity and confidentiality of the data, each participant was assigned a unique identifier, and all data were securely stored on a server with restricted access. The study adhered to strict ethical guidelines, obtaining approval from the Institutional Review Board (IRB) and informed consent from all participating nurses. These measures were implemented to protect the rights and privacy of participants, ensuring that the study was conducted according to the highest standards of ethical clinical research.

Results

This study involved 65 nurses who participated in the research. The analysis of demographic and professional characteristics revealed that the majority of participants (52.9%) were between the ages of 25 and 35, indicating a relatively young nursing workforce. A significant gender imbalance was observed, with 95.6% of participants being female. In terms of nationality, slightly more than half of the nurses were Saudi nationals (51.5%), reflecting a diverse and multicultural workforce within the hospital. The marital status of participants showed that most were married (64.7%), while a smaller proportion were single (25%),

divorced (4.4%), or widowed (5.9%). Educational attainment varied, with most nurses holding a bachelor degree (54.4%), while others had a diploma (41.2%) or a master degree (4.4%). The professional characteristics of the participants indicated that a significant portion of the nurses (42.6%) had between one and five years of experience, which was the largest group.

A significant proportion (27.9%) had more than ten years of experience, highlighting the presence of highly experienced staff within the hospital. However, the study also revealed a gap in specialized training related to neonatal care during the golden hour, as only 42.6% of the nurses had received such training. Among those who had undergone training, the most attended course was the Neonatal Resuscitation Program (NRP) stable course (20.6%), followed by intensive trauma medicine training (10.3%). Other courses such as Advanced Cardiac Life Support, Basic Life Support, and the golden minute course were less commonly attended. A significant 57.4% of the nurses had not taken any of these courses as detailed in table 1.

Table (1) the distribution of the participants according to their demographical characteristics (n = 65 nurses in maternity and children hospital, Hafar Albatin, Saudi Arabia in 2024)

Demographic / professional characteristics		Frequency	Percent (%)
Age - years	**25-35 years**	36	52.9
	36-45 years	22	32.4
	46-55 years	9	13.2
	More than 55 years	1	1.5
Gender	**Male**	3	4.4
	Female	65	95.6
Nationality	**Saudi**	35	51.5
	Non-Saudi	33	48.5
Marital status	**Single**	17	25.0
	Married	44	64.7
	Divorced	3	4.4
	Widowed	4	5.9
Education	**Diploma degree**	28	41.2
	Bachelor degree	37	54.4
	Master degree	3	4.4
Experience years in	**Less than 1 year**	3	4.4

nursing	**1 year to 5 years**	29	42.6
	6- years to 10 years	17	25.0
	More than 10 years	19	27.9
Training courses regarding Golden hour of neonate	**Yes**	29	42.6
	No	39	57.4

The study revealed varying levels of knowledge among nurses regarding the care of preterm and term babies during golden hour. A substantial majority (72.1%) understood the importance of the golden hour for both premature and term babies, recognizing it as a critical period for neonatal care. However, gaps in knowledge were evident in several areas. For instance, only 51.5% of nurses were aware that the golden hour begins before delivery, with 22.1% unsure and 26.5% disagreeing with this concept. This indicates a need for better education and clarity on the timing and preparation required for the golden hour. Most nurses (76.5%) recognized the critical importance of the first minute during the golden hour, emphasizing its role in neonatal outcomes. Additionally, 77.9% of participants understood the necessity of performing an Apgar score assessment immediately after birth for both premature and term neonates. However, there was still some uncertainty, as 8.8% were unsure and 13.2% disagreed with the importance of the Apgar score assessment.

Knowledge of the steps involved in neonatal resuscitation, including warming, clearing the airway, breathing, and circulation, was also assessed. Most nurses (76.5%) were aware of these steps, although 14.7% were unsure, and 8.8% disagreed, indicating room for improvement in this critical area of neonatal care. Furthermore, only 67.6% of nurses knew the purpose of conducting a physical examination during the golden hour to assess for congenital anomalies, with 13.2% unsure and 19.1% disagreeing. The study also found that 67.6% of participants recognized the importance of identifying risk factors during pregnancy and labor to anticipate which babies might require resuscitation. However, 22.1% were unsure, and 10.3% disagreed, suggesting that some nurses may not fully understand the significance of these prenatal factors.

Knowledge about high-risk deliveries, including those involving extremely premature babies and those with specific antenatal histories, was acknowledged by 75% of the nurses. However, 13.2% were unsure, and 11.8% disagreed, indicating a need for further education on recognizing and preparing for high-risk scenarios. The study also explored nurses' understanding of the unique challenges premature babies face during resuscitation. A majority (76.5%) were aware of issues such as fragile brain capillaries, deficient lung surfactant, poor temperature control, and a higher likelihood of infection. However, 16.2% were

unsure, and 7.4% disagreed, highlighting the need for more comprehensive training in these areas.

In terms of the classification of high-risk preterm babies, 79.4% of nurses correctly identified very preterm babies as those from 28 to 31 weeks and extremely premature babies as those less than 28 weeks. Nevertheless, 7.4% were unsure, and 13.2% disagreed. Additionally, 77.9% of nurses understood that extremely premature babies are defined as those with a gestational age of less than 28 weeks, while 11.8% were unsure, and 10.3% disagreed. Further knowledge gaps were identified in areas such as the recommended guidelines of delaying cord clamping for 30 seconds to 3 minutes after birth, which was known by 70.6% of participants, with 17.6% unsure and 11.8% disagreeing. The importance of preparing a warmer before delivery and covering the premature baby with a plastic cover to support thermoregulation during the golden hour was understood by 83.8% of nurses, but 1.5% were unsure, and 14.7% disagreed. See the detailed knowledge assessment findings in appendix 1.

The overall knowledge scores of the nurses ranged from a minimum of 0 to a maximum of 30, with a mean score of 22.09 and a standard deviation of 8.453, indicating a varied level of knowledge among participants. See table 2.

Table (2) the distribution of the participants according to their overall knowledge score (n = 35 nurses in maternity and children hospital, Hafar Albatin, Saudi Arabia in 2024)

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Knowledge score	68	0	30	22.09	8.453

Correlation analysis revealed that nationality significantly influenced knowledge scores, with non-Saudi nurses having higher mean scores (25.18, SD = 5.491) than their Saudi counterparts (19.17, SD = 9.715), with a P value of .003. Age (P = .841), gender (P = .768), marital status (P = .104), and educational level (P = .087) did not show significant differences in knowledge scores. However, years of experience in nursing showed a borderline significant difference, with more experienced nurses tending to have higher knowledge scores (P = .055). There was no significant difference in knowledge scores between those who had received training related to the golden hour and those who had not (P = .784). See table 3.

Table (3) the relation between the overall level of knowledge with the nurses demographical and professional characteristics (n = 65 nurses in maternity and children hospital, Hafar Albatin, Saudi Arabia in 2024)

Demographic / professional characteristics		Mean score	SD	P value
Age - years	**25-35 years**	22.50	7.651	.841
	36-45 years	20.95	10.031	
	46-55 years	22.67	8.396	
	More than 55 years	27.00	.	
Gender	**Male**	20.67	12.858	.768
	Female	22.15	8.339	
Nationality	**Saudi**	19.17	9.715	.003*
	Non-Saudi	25.18	5.491	
Marital status	**Single**	21.24	9.840	.104
	Married	23.36	7.134	
	Divorced	11.67	8.386	
	Widowed	19.50	12.557	
Education	**Diploma degree**	19.39	9.585	.087
	Bachelor degree	23.95	7.172	
	Master degree	24.33	7.371	
Experience years in nursing	**Less than 1 year**	25.67	5.774	.055
	1 year to 5 years	19.41	9.030	
	6- years to 10 years	21.71	10.439	
	More than 10 years	25.95	3.009	
Training courses regarding Golden hour of neonate	**Yes**	22.33	9.050	.784
	No	21.76	8.093	

** Significant (p value < 0.05)*

Discussion

In this study, 72.1% of nurses in Hafar Albatin recognized the importance of the golden hour for both preterm and term babies, and 80.9% understood its components, including neonatal resuscitation and post-resuscitation care. This level of knowledge is commendable and slightly higher than what was reported in similar studies. For instance, a study conducted in Tanzania found that 69% of nurses had adequate knowledge of caring for low-birth-weight infants (Mwikali et al., 2023). The difference in knowledge levels could be attributed to better training programs or more frequent exposure to updated neonatal care protocols in Hafar Albatin.

Further comparisons can be drawn with the study by Sharma et al. (2017), which highlighted the successful implementation of a golden hour protocol that significantly improved neonatal outcomes by standardizing care processes. The high level of awareness among nurses in Hafar Albatin regarding the components of the golden hour suggests that similar protocols might be in place, contributing to better neonatal care. However, a significant gap was identified in the understanding that the golden hour begins before delivery, with only 51.5% of nurses recognizing this. This finding is consistent with other studies, such as Mwikali et al. (2023), which also found that pre-delivery preparation was a less understood aspect of neonatal care. The need for enhanced training programs that emphasize the entire spectrum of the golden hour, including the pre-delivery phase, is evident in both settings.

The importance of pre-delivery preparation was further highlighted by Sharma (2017), who emphasized the necessity of immediate and well-coordinated care starting before birth to improve neonatal outcomes. This aligns with the identified gap in the Hafar Albatin study and suggests that implementing structured pre-delivery protocols and comprehensive training could significantly enhance nurses' preparedness.

Another relevant comparison is with the quality improvement initiative by Croop et al. (2020) at UPMC Magee-Womens Hospital. This study demonstrated that structured protocols and collaborative efforts during golden hour reduced complications such as hypothermia and hypoglycemia, particularly in extremely premature infants. The finding that 80.9% of nurses in Hafar Albatin understood the components of the golden hour indicates that similar structured protocols may be contributing to improved neonatal care. However, the study also revealed a gap in knowledge related to pre-delivery actions, which could be addressed by adopting the comprehensive approach used in the UPMC Magee-Womens Hospital initiative.

Peleg et al. (2019) conducted a study on the impact of a golden hour intervention on preterm infants' short-

term outcomes, finding that implementing golden hour protocols led to reduced rates of hypothermia and better overall stabilization of newborns. These findings support the importance of understanding and correctly implementing golden hour optimal knowledge to achieve optimal neonatal outcomes.

The study also identified gaps in pre-resuscitation team briefings and effective communication during team activities, with only 65.7% of nurses performing pre-resuscitation team briefings and 51.4% maintaining effective communication. Comparisons with the studies by Croop et al. (2020) and Sharma (2017) showed the critical role of this information in improving neonatal outcomes. Both studies demonstrated that thorough briefings and clear communication significantly improved team coordination and neonatal care. The relatively lower percentage of nurses conducting pre-resuscitation briefings in Hafar Albatin suggests the need for more structured protocols and enhanced training to reinforce the importance of these issues.

Similarly, Mwikali et al. (2023) highlighted the challenges faced by nurses in neonatal care, particularly in terms of insufficient training and resource allocation, which can hinder optimal implementation of golden hour guidelines. The study recommended continuous professional development and resource investment to address these challenges. The findings from Hafar Albatin, where significant gaps in communication and team coordination were identified, align with these recommendations, suggesting that similar approaches could improve neonatal care in this setting.

The study also explored the influence of demographic factors on nurses' knowledge levels. The significant difference in knowledge scores between non-Saudi and Saudi nurses (P = .003) could be attributed to differences in educational backgrounds, training experiences, and exposure to international best relevant activities. Mwikali et al. (2023) similarly found that nurses with varied training backgrounds and continuous education opportunities tended to have higher knowledge levels. This suggests that fostering an environment that promotes continuous learning and international collaboration could help bridge the knowledge gap among nurses in Hafar Albatin.

The borderline significance of knowledge scores with years of experience (P = .055) suggested that practical, hands-on experience plays a crucial role in enhancing nurses' knowledge of neonatal care during the golden hour. This finding is supported by Croop et al. (2020), who found that experienced nurses were better equipped to implement golden hour protocols effectively. Ensuring that less experienced nurses receive mentorship and training could help improve their knowledge and confidence in managing neonatal care.

Interestingly, other demographic factors such as age, gender, marital status, and education did not show significant differences in knowledge levels. This suggests that while these factors might influence certain aspects of professional practice, they do not necessarily impact knowledge related to specific clinical practices like the golden hour. Sharma (2017) also noted that targeted training and continuous professional development are more significant determinants of knowledge quality than demographic characteristics. This underscores the importance of focusing on professional training and development rather than demographic factors to enhance clinical application.

Therefore, while the majority of nurses in Hafar Albatin demonstrated good knowledge during the golden hour, significant gaps remain. The study highlighted the need for targeted interventions, particularly through enhanced training programs that focus on pre-delivery preparation, structured protocols, and effective communication. Additionally, fostering an environment of continuous learning and international collaboration can help bridge knowledge gaps and ensure that nurses are fully equipped to provide optimal care for preterm and term babies, ultimately improving neonatal outcomes.

Conclusion

The study concluded that, while nurses at the Maternity and Children Hospital in Hafr Albatin generally possessed a solid understanding of the golden hour, there were significant gaps in key areas such as pre-delivery preparation, consistent execution of pre-resuscitation team briefings, effective communication, and the readiness of equipment and room settings. These gaps underscored the need for targeted educational interventions aimed at enhancing specific aspects of neonatal care during this critical period. The implications for nursing practice were significant, indicating a need for ongoing training programs that focused on the comprehensive components of the golden hour, including early initiation and the importance of pre-resuscitation planning. Improving team communication and coordination through regular briefings and clear role assignments was also deemed essential for enhancing the overall effectiveness of neonatal care. The study further suggested that practical training on equipment and room preparation was crucial to ensure that nurses were well-prepared to create an optimal environment for neonatal resuscitation and stabilization.

From a policy perspective, it was recommended that healthcare institutions implement standardized protocols and checklists to ensure consistency in care practices. Regular audits and feedback mechanisms

were suggested as ways to maintain high standards of care and identify areas for improvement. The study also found significant differences in knowledge scores between Saudi and non-Saudi nurses, highlighting the need for culturally sensitive and inclusive training programs that addressed the diverse backgrounds of the nursing staff. When investing in the education and support of all nurses, healthcare systems could ensure a uniformly high level of care for neonates.

However, the study had several limitations that should be noted. Conducted at a single hospital, the findings may not be generalizable to other settings. Additionally, the reliance on self-reported data could have introduced bias, as participants might have overestimated their knowledge. The cross-sectional nature of the study also limited the ability to assess changes in knowledge over time. Future research was recommended to address these limitations by including multiple hospitals, and employing longitudinal designs to track changes in nursing knowledge.

Author contribution

This paper is derived from the master thesis in Critical Care Nursing at Hafr Albatin University, Saudi Arabia, completed in 2024 by the first author, Bashayer Mohammed Alshammari. The first author was responsible for the conception and design of the study, data collection, analysis, and manuscript writing. The second author, Sitelgeel Ali Hamouda Babiker, served as the supervisor, providing guidance and oversight throughout the research process. The second author also contributed to the study design, data interpretation, and critical revision of the manuscript for important intellectual content. Both authors have read and approved the final manuscript.

Acknowledgement

The authors would like to express their deepest gratitude to Hafr Albatin University for the support and resources provided throughout the course of this research. Special thanks go to the staff at the Maternity and Children Hospital in Hafar Albatin for their cooperation and assistance during data collection. We also extend our heartfelt appreciation to the nurses who participated in this study, whose commitment and professionalism made this research possible. Finally, we would like to acknowledge the invaluable guidance and mentorship of our supervisor, Sitelgeel Ali Hamouda Babiker, whose expertise and encouragement were instrumental in the completion of this thesis.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

Data Availability

The data that support the findings of this study are available from the corresponding author, Bashayer Mohammed Alshammari, upon reasonable request.

Ethics Approval

This study was conducted in accordance with the ethical standards of the Institutional Review Board (IRB) of Hafr Albatin University. Informed consent was obtained from all participants prior to data collection, and all procedures were performed in accordance with the principles outlined in the Declaration of Helsinki. The confidentiality and anonymity of all participants were strictly maintained throughout the research process.

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