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Nurse's Knowledge and Practice Regarding Prevention of Neonatal Sepsis

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ABSTRACT

Background: Neonatal sepsis is the single most common cause of neonatal death in hospital as well as community in developing country.

Methods: A cross sectional study design was used to identify the nurse's knowledge and practice regarding prevention of neonatal sepsis. Total 120 samples were selected to use purposive sampling technique and data were collect by using self-administered semi-structured questionnaire.

Result: In this study, Knowledge Mean scores of knowledge was16.03 and mean practice was 40.36. 80.15% of the participants had adequate knowledge level and 80.72% had a good practice level.

Conclusion: This study underscores that nurses possess a commendable level of knowledge and practice regarding the prevention of neonatal sepsis, with high compliance in key areas such as hand hygiene, aseptic techniques, and umbilical cord care.

KEYWORDS: Knowledge, Practice, Prevention, Neonatal Sepsis, Infection.

ARTICLE DETAILS

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INTRODUCTION

Neonatal sepsis remains a critical health challenge worldwide, particularly in low- and middle-income countries where neonatal mortality rates are disproportionately high (World Health Organization [WHO], 2020). Defined as a systemic infection occurring in newborns during the first 28 days of life, neonatal sepsis is a leading cause of neonatal morbidity and mortality (Klingenberg et al., 2018). The condition can result from bacterial, viral, or fungal pathogens and often presents with nonspecific symptoms, complicating timely diagnosis and intervention (Shane et al., 2017). Preventative measures, including adherence to infection control practices, appropriate use of antibiotics, and vigilant monitoring, are pivotal in mitigating the incidence of neonatal sepsis (Stoll & Hansen, 2016).

The role of nurses in preventing neonatal sepsis is pivotal, as they are at the forefront of providing care, maintaining hygienic practices, and educating families about infection prevention (Sharma et al., 2018). Ensuring that nurses have adequate knowledge and follow evidence-based practices is essential to reduce the risk of neonatal infections and improve health outcomes for newborns. Despite advancements in healthcare, gaps in nurses' knowledge and practice persist, contributing to preventable neonatal infections (Haque et al., 2018). For instance, inconsistent hand hygiene, improper use of personal protective equipment, and inadequate sterile techniques during invasive procedures have been identified as common factors leading to neonatal sepsis (Cruz et al., 2015). Addressing these gaps through targeted training programs and continuous professional development can significantly enhance the quality of neonatal care (Saleh et al., 2021). This paper aims to explore nurses' knowledge and practices regarding the prevention of neonatal sepsis and to identify strategies for improving adherence to infection control protocols in neonatal intensive care units (NICUs).

Nurses play a central role in the prevention of neonatal sepsis, given their constant interaction with neonates and their involvement in key caregiving activities such as hand hygiene, aseptic technique, and the management of invasive devices (Aly et al., 2019). Despite the critical role of nurses,

knowledge gaps and inconsistent practice patterns are common, which may contribute to the persistence of neonatal sepsis in healthcare settings (Shrestha et al., 2020). Thus, understanding and enhancing nurses' knowledge and practice in this area are essential for improving neonatal outcomes.

This study aims to assess nurses' knowledge and practices regarding the prevention of neonatal sepsis, exploring the barriers they face and identifying opportunities for targeted interventions. By addressing these gaps, healthcare institutions can develop evidence-based strategies to enhance nursing care and ultimately reduce the burden of neonatal sepsis.

General Objective

To assess the nurse's knowledge and practice regarding prevention of neonatal sepsis

Specific objectives

i. To describe the socio-demographic characteristics of respondent's
ii. To assess the knowledge regarding prevention of neonatal sepsis among nurse's
iii. To identify the practice regarding prevention of neonatal sepsis among nurse's

MATERIALS AND METHODS

Study design: A cross-sectional study design was conducted to describe the nurse's knowledge and practice regarding prevention of neonatal sepsis.

Study place and population: The target population in this study was Nurse's at Dhaka Medical College Hospital

Study period: The study was conducted from December, 2023 to June, 2024.

Sampling technique: The purposive sampling method was used to collect sample from the population.

Sample Size: Sample size was 120

Research Instrument: A self-administered semi-structured questionnaire was developed to collect data by reviewing the existing literature. It had three sections - Section-1: socio demographic information. Section-2: Nurse's Knowledge Regarding Prevention of Neonatal Sepsis question including 20(twenty) items with "yes" and "No" option. Each correct answer was bearing one (1) score. The level of knowledge was categorized on knowledge scores; High (above 80%), Moderate (60-80%), Low (below 60%). Section-3: Nurse's Practice Regarding Prevention of Neonatal Sepsis question including 10(ten) items were five options –Never, Sometime, Neutral, Often and Always. Never =1, Sometime =2, Neutral =3, Often =4 and Always =5. The Practice was categorized on scores; Good (above 80%), Average (60-80%), Poor (below 60%).

Data collection Procedure: Data was collected by researcher herself by face to face interview.

Data Analysis: Data was analyzed by SPSS version 26.

ETHICAL IMPLICATIONS

Ethical permission was carried out from the local ethical committee and before initiation of the interview the respondents were informed about their full right to participate or refuse to participate in the study. The researcher also assured that all the information obtained would be used for the purpose of the study only. A complete assurance was given to them that all information provided by them would be kept confidential and their names or anything which could identify them would not be exposed any part of the study.

RESULTS

Table 1: Distribution of Socio-demographic characteristics of Participants (n=120)

Items	**Categories**	Frequency ***(f)***	Percentage **(%)**	**Mean ±SD**
Age				32.64 ±5.78
Educational Status	Diploma in Nursing	63	52.5%	
	B.Sc. in Nursing	47	39.2%	
	M.Sc. in Nursing/MPH	10	8.3%	
Marital Status	Currently Married	107	89.2%	
	Unmarried	13	10.8%	
Duration of Service in Year	2-9 year	98	81.7%	7.13 ±4.38
	10-17 year	15	12.5%	
	18-26 year	7	5.8%	
Duration of experience in neonatal unit	1-7 year	108	90%	3.45 ±2.90
	8-14 year	12	10%	

Result showed that the mean age of nurses was 33.64 and standard deviation was ± 5.79 years this was ranged from 25 years to 52 years. Most of the nurses (52.5%) had diploma in nursing degree, 39.2% had B.Sc. in nursing degree and rest of 8.3% had Master degree. It was found that majority of the nurses (89.2%) was married and 10.8% were unmarried. It

showed that the mean Duration of Service in Year of nurses was 7.13 and standard deviation was a ±4.38 years which were ranged from 2 years to 26 years. It was found that Duration of experience in neonatal units of nurses was 3.45 and standard deviation was ±2.90 years which were ranged from 1 year to 14 years.

Table 2: Distribution of Nurse's Knowledge Regarding Prevention of Neonatal Sepsis (n=120)

Items	Categories	Frequency (*f*)	Percentage (%)
Know definition of Neonatal Sepsis	Yes	120	100%
	No	-	-
Neonatal age is up to 28 days	Yes	119	99.2%
	No	1	0.8%
Bacteria is responsible for neonatal sepsis	Yes	117	97.5%
	No	3	2.5%
Virus is responsible for neonatal sepsis	Yes	84	70%
	No	36	30%
E.coli is responsible for neonatal sepsis	Yes	103	85.8%
	No	17	14.2%
History of resuscitation at birth is one of the risk factor for neonatal sepsis	Yes	97	80.8%
	No	23	19.2%
Rupture of membrane is one of the risk factor for neonatal sepsis	Yes	113	94.2%
	No	7	5.8%
Prematurity is one of the risk factor for neonatal sepsis	Yes	115	95.8%
	No	5	4.2%
Prolong labour is the risk factor of neonatal sepsis	Yes	101	84.2%
	No	19	15.8%
Fever is the clinical feature of neonatal sepsis	Yes	113	94.2%
	No	7	5.8%
Blood culture is the best way to diagnose neonatal sepsis	Yes	117	97.5%
	No	3	2.5%
Neonatal sepsis is treated by antibiotic	Yes	114	95%
	No	6	5%
Neonatal sepsis is treated by analgesic	Yes	54	45%
	No	66	55%
Maintain aseptic technique is most important to prevent neonatal sepsis	Yes	116	96.7%
	No	4	3.3%
Sterile dropping is important to prevent neonatal sepsis	Yes	108	90%
	No	12	10%
Hypothermia is the clinical feature of neonatal sepsis	Yes	82	68.3%
	No	38	31.7%
Cord care may prevent neonatal sepsis	Yes	112	93.3%
	No	8	6.7%
Exclusive breastfeeding is essential for prevent neonatal sepsis	Yes	115	95.8%
	No	5	4.2%
Hyperglycemia is the clinical feature of neonatal sepsis	Yes	66	55%
	No	64	45%
Providing a clean place for prevent delivery neonatal sepsis	Yes	116	96.7%
	No	4	3.3%
Mean±SD=16.3±1.34			

In this table total Knowledge Regarding Prevention of Neonatal Sepsis mean was (16.03), SD (±1.34). It showed that E.coli is responsible for neonatal sepsis correct answer 85.8% of the respondents and sterile dropping is important to prevent neonatal sepsis that 90% respondents were right answer. It was found that majority of the nurses 99.2% responses were correct answer at neonatal age is up to 28 days.

Table 3: Response regarding Practice of Prevention of Neonatal Sepsis (n=120)

Items	Never	Sometime	Neutral	Often	Always
	f (%)	*f* (%)	*f* (%)	*f* (%)	*f* (%)
Wash your hands before providing nursing care	3(2.5)	2(1.7)	-	5(4.2)	110(91.7)
Wash your hands after providing nursing care	-	2(1.7)	1(.8)	4(3.3)	113(94.2)
Wear sterile gloves before providing nursing care	4(3.3)	15(12.5)	2(1.7)	24(20)	75(62.5)
Maintain aseptic technique during provide nursing care	2(1.7)	10(8.3)	5(4.2)	17(14.2)	86(71.7)
Take proper care of umbilical cord	-	6(5)	8(6.7)	17(14.2)	89(74.2)
Wear protective eye	25(20.8)	34(28.3)	16(13.3)	12(10)	33(27.5)
Maintain aseptic technique during provide medication to the baby	-	3(2.5)	7(5.8%)	24(20)	86(71.7)
Maintain ascetic technique during withdraw of blood sample from the baby	-	5(4.2)	5(4.2)	11(9.2)	99(82.5)
Maintain aseptic technique during intra-venous cannula to the baby	-	6(5)	5(4.2)	12(10)	97(80.8)
Wear gown or apron when exposed any invasive procedures to the baby	5(4.2)	10(8.3)	6(5)	18(15)	81(67.5)
Mean = 40.36 SD =±4.05					

The table showed that Practice Regarding Prevention of Neonatal Sepsis mean was 40.36, SD (±4.05). It was found that wash your hands before providing nursing care Responses were 91.7 % (always), 4.2 % often, and 2.5 never and 1.7 % sometime of the respondents. Take proper care of umbilical cord, majority of the respondents were responses 74.2% always and 14.2% often, 6.7% neutral, 5% sometime.

Table: 4 Level of Nurses Knowledge Regarding Prevention of Neonatal Sepsis (n=120)

The level of knowledge was categorized on knowledge scores; High (above 80%), Moderate (60-80%), Low (below 60%).

Items	Level	Categories	Frequency *(f)*	Percentage (%)	Mean ±.SD
Knowledge	**Low**	**<12(60%)**	**-**	**-**	**16.03**
	Moderate	**12-16(60%-80%)**	**42**	**35**	**±1.34**
	High	**>16(80%)**	**78**	**65**	

Table: 5 Level of Nurses Practice Regarding Prevention of Neonatal Sepsis (n=120)

The Practice was categorized on scores; High (above 80%), Moderate (60-80%), Low (below 60%).

Items	Level	Categories	Frequency *(f)*	Percentage (%)	Mean ±.SD
Practice	**Poor**	**<30(60%)**	**4**	**3.3**	**40.36**
	Average	**30-40(60%-80%)**	**45**	**37.5**	**±4.05**
	Good	**>40(80%)**	**71**	**59.2**	

DISCUSSION

The educational status of nurses plays a critical role in influencing the quality of care provided in healthcare settings. In this study, a majority of the participants held a Diploma in nursing (52.5%), followed by those with a Bachelor of Science in Nursing (B.Sc.) degree (39.2%), and a smaller proportion held advanced degrees such as a Master of Science

in Nursing (M.Sc.) or a Master of Public Health (MPH) (8.3%).

The findings align with the global nursing workforce trend, where a significant portion of nurses often enter the profession with diploma-level education, which serves as the foundational qualification for practice in many countries (World Health Organization [WHO], 2020). However, the increasing representation of B.Sc. and M.Sc. holders highlights a positive shift towards advanced educational attainment in nursing. Higher educational qualifications have been associated with improved critical thinking, better patient outcomes, and enhanced professional development (Aiken et al., 2014).

The majority of participants identified bacterial infections as a primary cause of neonatal sepsis (97.5%), with *Escherichia coli* being a commonly recognized pathogen (85.8%). However, awareness of viral pathogens as a potential cause was comparatively lower (70%), which could indicate the need for targeted education on non-bacterial causes of neonatal sepsis. This aligns with existing literature emphasizing the importance of understanding various microbial etiologies to improve diagnostic accuracy (Shane et al., 2017).

Participants demonstrated strong awareness of key risk factors for neonatal sepsis, such as prematurity (95.8%), rupture of membranes (94.2%), and prolonged labor (84.2%). Similarly, they correctly identified clinical features such as fever (94.2%) and hypothermia (68.3%). These findings underscore the participants' ability to recognize both maternal and neonatal factors that predispose to sepsis, as highlighted in studies by Simonsen et al. (2014).

Despite the overall high level of knowledge, certain gaps remain, such as the understanding of hyperglycemia as a clinical feature (55%) and viral contributions to sepsis. Addressing these gaps through targeted educational programs and continuous professional development could further enhance the quality of neonatal care and improve neonatal survival rates.

The findings from this study indicate that the majority of nurses adhere to essential practices for infection prevention in neonatal care. A significant proportion of participants reported "always" washing hands before (91.7%) and after (94.2%) providing nursing care, aligning with established guidelines emphasizing hand hygiene as a cornerstone of infection control (World Health Organization [WHO], 2020). Regarding the use of sterile gloves and aseptic techniques, 62.5% of participants reported "always" wearing sterile gloves before care, and 71.7% consistently maintained aseptic techniques during nursing procedures. While these percentages are encouraging, the remaining participants who reported performing these practices less consistently highlight gaps in adherence that could compromise patient safety. This is particularly relevant, as studies have shown that consistent adherence to aseptic techniques significantly reduces healthcare-associated infections in neonatal units (Allegranzi et al., 2016).

Umbilical cord care, a critical component of neonatal infection prevention, was "always" practiced by 74.2% of participants. However, the 5% who "sometimes" and 14.2% who "often" engaged in this practice reveal areas where additional training could ensure standardized care. Similarly, while 80.8% and 82.5% of participants reported "always" maintaining aseptic techniques during intravenous cannula insertion and blood sampling, the remaining percentages suggest a need for further skill reinforcement in invasive procedures.

The practice of wearing protective equipment, such as gowns or aprons during invasive procedures, was reported as "always" by 67.5% of participants. However, a notable proportion (28.3%) reported performing this practice "sometimes" or less frequently, indicating a potential underestimation of the importance of personal protective equipment (PPE) in reducing cross-contamination and protecting both the neonate and the healthcare worker (Centers for Disease Control and Prevention [CDC], 2020).

Overall, the mean adherence score (40.36 ± 4.05) reflects generally strong compliance with infection prevention protocols but underscores variability among specific practices. To address these gaps, healthcare facilities should prioritize ongoing education, routine audits, and supportive supervision to ensure that all nurses consistently follow recommended infection control measures, particularly in high-risk neonatal settings.

CONCLUSION

The study highlights that nurses generally possess a strong knowledge base and demonstrate commendable practices regarding the prevention of neonatal sepsis. Most participants were well-informed about the causes, risk factors, clinical features, and preventive measures of neonatal sepsis. Similarly, adherence to key infection prevention practices, such as hand hygiene, aseptic techniques, and proper umbilical cord care, was notably high. However, gaps were identified in areas such as the consistent use of personal protective equipment, understanding the role of viral pathogens, and the management of certain clinical features like hyperglycemia.

Addressing these gaps through targeted training programs, regular audits, and supportive supervision can enhance the consistency and quality of neonatal care provided by nurses. Ensuring adherence to best practices for infection prevention is critical for reducing the burden of neonatal sepsis and improving neonatal survival rates. Moreover, fostering a culture of continuous learning and professional development among nurses is essential to sustaining improvements in neonatal health outcomes.

RECOMMENDATIONS

- Implement regular in-service training and workshops for nurses to update their knowledge on neonatal sepsis.
- Strengthen hand hygiene practices through the provision of accessible hand washing stations.
- Ensure consistent use of aseptic techniques during all nursing procedures by providing competency-based training and refresher courses.
- Encourage consistent use of PPE, such as gowns, aprons, and gloves, during invasive procedures through training, proper availability of supplies, and strict enforcement of infection prevention policies.
- Ensure that neonatal units are well-equipped with the necessary resources, including sterile equipment, hand hygiene supplies, and personal protective equipment, to facilitate adherence to infection prevention measures.
- Support nurses to engage in research and evidence-based practices by providing access to journals, conferences, and academic resources focused on neonatal care and sepsis prevention.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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