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Evaluation of Nurses' Practice Toward Care of Neonates During Hypothermia

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Abstract

Introduction: Hypothermia is a perturbation of the thermoregulatory state of neonates, characterized by a decrease in body temperature below(36.5°C) in the newborn. The maintenance of body temperature is a crucial aspect of neonatal care, and it is imperative that healthcare providers and specialists possess a comprehensive understanding, aptitude, and disposition towards neonatal thermoregulation.

Methods: A descriptive study was conducted from (October 3, 2022 to May 15, 2023) among a sample of 160 nurses working in neonatal intensive care units and delivery rooms in Kirkuk City Hospitals. The sample was selected using non-probability purposive sampling.

Results: level of practice among nurses regarding neonatal hypothermia is moderate. The level of practices is significantly associated with both education and place of work.

Conclusions: Overall, this study indicated inadequate practices regarding provision of care for newborns with hypothermia.

Keywords: *Evaluating, Nurses' Practice, hypothermia.*

Introduction

A neonate is a term used to describe an infant who is in the immediate postnatal period, typically ranging from a few hours to a few weeks after birth, or alternatively, an infant in the first 28 days of life. The period of birth presents the highest level of risk to an infant. Infants are highly susceptible to illnesses during the initial week of their existence, resulting in a significant number of fatalities in this age group. The mortality rate of infants within the first 24 hours of life is approximately 500 times higher compared to their mortality rate at one month of age (1).

Evaluation refers to the process of assessing the worth or significance of a particular entity. In the realm of education, the term "evaluation" pertains to the act of quantifying or scrutinizing a given process in order to assess its worth, typically by means of comparison to established benchmarks or other analogous criteria (2).

According to the World Health Organization (WHO), neonatal hypothermia is characterized by an axillary temperature that falls below (36.5 °C.) The diminution of thermal stability has enduring physiological consequences that culminate in mortality resulting from hypoxia and hypotension. It is estimated that four million neonates perish worldwide during the initial four weeks of life, constituting two-thirds of all fatalities in

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the first year of existence and (40%) of deaths among children under five years old. The overwhelming majority (99%) of neonatal fatalities occur in countries with low and middle-income economies (3).

The aforementioned concept is of a technical nature, necessitating the nurse to amalgamate data from multiple sources and generate a multitude of hypotheses regarding the situation at hand. The nurse must employ analytical skills to deliver care, think critically, and mitigate ambiguity (4).

Skin to skin connection is important, in which midwives required to reach as a natural after labor. Nonetheless, daily training, midwives face many problems to care, such as absence knowledge among parents and specialists about the skin connection to skin, post-delivery caesarean section, and other governmental difficulties. Additional skin connection between mother and the infant is a trial for midwives who felt prohibited and unsatisfied its benefit also decrease incidence of infant hypothermia (5).

Nurses occupied in neonatal unit must be included in continues teaching training for improvement and care of neonates', also to know appropriate and active maintenance been produced. Instruction are active methods for actual nursing care at NICU (6).

All infant deliver under (37) weeks' gestation is conversion from intra-uterine to extra-uterine life is greatest challenge. period from birth in to (28) days of life is termed neonatal period and newborn baby. This phase is greatest risk for mortality as the extreme potential in long term physical & neuro-cognitive changing stress (7).

Nurse's children interview of the infant and parent help to comprehensive new region. World Health Organization clear newborn hypothermia as axillary temperature must be less than (36.5 °c). Decrease thermal stability has long term effect physiologically that leads to death because of hypoxia, and hypotension. Worldwide estimated of 4 million newborns babies die within the life first four weeks, which assume (2/3rd) of all deaths in their first year of life and (40 %) of under five deaths. Most deaths Neonatal about (99 %) arise in countries low and middle income (8).

Infants born prematurely are prone to experiencing various complications, with the likelihood of these complications increasing in proportion to the degree of prematurity. Additionally, premature birth is associated with an elevated risk of mortality. Certain complications may manifest at birth, including intra-ventricular hemorrhage. Additionally, a significant proportion of newborns, specifically (48.3%), exhibit hypothermia and necessitate prompt medical intervention (9).

The maintenance of thermoneutrality in neonates is contingent upon various factors including meteorological conditions, gestational age, and low birth weight. The regulation of metabolism plays a crucial role in the maintenance of thermal homeostasis among pediatric populations. The neutral thermal environment refers to a temperature range that is conducive to maintaining the body temperature through metabolic demands. The present discourse outlines the diverse mechanisms of hypothermia in neonates (10).

As postnatal age increases, the necessary environmental temperature decreases. This implies that as the infant progresses in age, a reduced environmental temperature is sufficient. Illness. Infants who are unwell require an elevated ambient temperature. As an illustration, a preterm neonate weighing (1000g) on the first day of life may require an ambient temperature of (37 °C) to maintain thermoregulation, whereas a full-term neonate on the fifth day of life may only necessitate an ambient temperature of (20 °C) for the same purpose (11).

Hypothermia not typically a primary cause of mortality, significantly contributes to neonatal deaths worldwide, primarily as a comorbidity. Countries with the highest burden of neonatal mortality have reported a significant incidence of neonatal hypothermia. Thus, mitigating the incidence of neonatal hypothermia in resource-limited

communities constitutes a substantial contribution towards ameliorating the worldwide burden of neonatal mortality (12).

The prediction and prevention of congenital anomalies pose a significant challenge for healthcare professionals across various specialties. The timely identification of infant hypothermia through early diagnosis has the potential to mitigate its prevalence, minimize associated complications, and facilitate effective planning for appropriate healthcare services (13).

Materials and Methods

Study design

A descriptive study was conducted from September (20th, 2022 to February 26th, 2023) to assess the practices of nurses regarding neonatal hypothermia in hospitals located in Kirkuk City. The research tool was developed based on a comprehensive analysis of relevant literature and prior investigations pertaining to neonatal hypothermia. The evaluation of the practice checklist form style was conducted using a Likert scale consisting of three levels. The scale assigned a score of three for "always," (2) for "sometimes," and (1) for "never." The scores of (1, 2, and 3) were respectively assigned a cutoff point of (0.66).

Sample

The study's participant pool comprises (160) nurses who are employed in neonatal intensive care units and delivery rooms. The participants are chosen through the utilization of non-probability sampling, specifically purposive sampling. The study sample has been chosen depending on criteria 1) Nurses from both gender, 2) Nurses with all levels of education, 3) Nurses whom agree to participate in the study, 4) Nurses who work in neonatal care unit & labor room and the Exclusion criteria were Nurses participated in pilot study and Nurses who have less than (1) year of experience in (NICU) & labor room.

Intervention

The researcher provided an explanation of the study and its objectives to the nursing staff, obtained verbal consent from the participants, and subsequently commenced data collection. The observation of nurses' practices serves as a means of collecting data.

Ethical Considerations:

Prior to data collection, ethical approval was obtained from the Scientific Research Ethics Committee of the Baghdad College of Nursing and hospitals participating in the study.

Study Instrument:

The research tool was developed based on a comprehensive analysis of relevant literature and previous studies; it includes:

Part I: Socio-demographic data: nurses' age, gender, marital status, educational level, years of experience, and source of knowledge.

Part II: Evaluation of nurses' practices towards neonatal care during hypothermia. This section includes a total of sixteen items relating to nurses' practices regarding hypothermia of newborns.

Validity of the Study

Content validity of instrument, is determined by a panel of (14) experts it was subjected to evaluation by a group and hailing from diverse fields were from College of

Nursing/University of Baghdad, College of Nursing/University of Kirkuk, Medical Technical Institute / Maysan university.

Reliability of the Study Internal

The questionnaire's reliability was assessed to ascertain its precision. The selection of a research instrument is crucial in ensuring the reliability and validity of measuring a variable. The current investigation considers a satisfactory threshold for the inter-rater reliability of the survey measuring nurses' practice, as indicated by the Pearson correlation coefficient.

Data Collection

The researcher provided an explanation of the study and its objectives to the nursing staff, obtained verbal consent from the participants, and subsequently commenced data collection. The acquisition of practice by nurses is facilitated through the utilization of self-administered methods. The data is obtained by employing the constructed questionnaire (in Arabic language).

Data Analysis

The statistical package for social sciences analysis of the data of the study is done by using (Microsoft office excel 2010 and SPSS version 20)

Results

Table (1) Distribution of nurses socio demographic characteristics variables with comparisons significant

Demographic Characteristic		**Groups**	**No.**	**%**
Age		20-29	83	51.9
		30-39	51	31.9
		40-49	16	10.0
		50 and more	10	6.3
		Mean ± SD	**31.83±8.532**	
Gender		Male	58	36.3
		Female	102	63.7
Marital status		Married	93	58.1
		Single	67	41.9
Education		High nursing school	21	13.1
		Nursing institute	81	50.6
		Nursing college	55	34.4
		Master	3	1.9
Years of service		1-5	91	56.9
		6-10	31	19.4
		11-15	11	6.9
		16-20	13	8.1
		21-25	6	3.8
		26 and more	8	5.0
knowledge about hypothermia		Yes	134	83.8
		No knowledge	26	16.3
Source of knowledge		No knowledge	26	16.3
	Friend	Yes	42	26.3
		No	92	57.5
	Book	No knowledge	26	16.3

		Yes	54	33.8
		No	80	50.0
	Internet	No knowledge	26	16.3
		Yes	51	31.9
		No	83	51.9
	College	No knowledge	26	16.3
		Yes	50	31.3
		No	84	52.5
Training session		No	82	51.2
		1-2	49	30.6
		3-4	24	15
		5-6	5	3.2
Place of work		NICU	100	62.5
		Labor room	60	37.5

The results show over half (51.9%) of the nurses are between the ages of (20-29), and a majority (63.7%) are female and married about (58.1%), and (50.6%) have graduated from a nursing institute. The majority of the nurses have (1-5) years of service (56.9%). The primary sources of knowledge for the nurses are friends, books, the internet, and college, with percentages of (26.3%, 33.8%, 31.9%, and 31.3%), respectively. A majority of the nurses (51.2%) do not participate in training courses, and most of them (62.5%) work in neonatal intensive care units, while the remaining (37.5%) work in labor rooms.

Discussion

Table (1) shows a summary of the sociodemographic characteristics of nurses, indicating that the majority of the sample were female (63.7%) and the age group with the highest representation was (20-29) years, comprising 83 individuals (51.9%). These results are consistent with a study in the Neonatal Intensive Care Unit (NICU) at a Pediatric Teaching Hospital located in the city of Baghdad (14).

Also, the study reveals that the entirety of the participants in the Neonatal Intensive Care Unit at al-Batool Teaching Hospital in Baqubah City were of the female gender, with a majority percentage of (76%) belonging to the age group of (20-29) years (15).

According to years of service 91(56.9%) of nurses had (1-5) years of service. This is because of the medical graduation law, as some nurses move to work in rural areas and do not return to work in city center hospitals as well as the common age group in the study sample (51.9%) were young (83%) (20-20) newly recruited in hospitals and they do not have many years of service. Confirmative on this result, a study revealed that more than half of nurses had less than (5) years of experience in the neonatal intensive care unit in AL- Nasiriyah City Hospitals (16).

With respect to gender, the majority of nurses, specifically (102) individuals, accounting for (63.7%) of the sample, were identified as female. This outcome is due to the higher likelihood of females being admitted to nursing institutes and colleges in Iraq compared to males, as well as the prevalent preference for female healthcare professionals to work in maternity wards within Arab Muslim societies. This results were consisted with the result in Sudan which found that all of nurses working in NICU were females (17).

Regarding the marital status of the nurses, it was found that (93) individuals, constituting (58.1%) of the sample, were married. This results are consistent with a study in Ethiopia and reported that (69%) of the nurses surveyed were married (18).

Concerning to education level, 81(50.6%) of nurses graduated of the institute of nursing. This result may be related to number of graduates from the institutes are more than the graduates of the bachelor's degree or postgraduate studies, because their studies are completed in a shorter time and within only two years, and then they got to work in the hospitals. In accordance with these findings, a study in southern India reported that a vast majority of the nursing staff (95.9%) had successfully completed a diploma program in general nursing (19).

Another study conducted in India, was discovered that the majority of participants, specifically (83.33%), held a diploma degree in nursing (20).

In respect to the source of knowledge or information about hypothermia, more than two-third of the sample 134 (83.8%) had knowledge about hypothermia. The source of their knowledge's was from friends 42 (26.3%), books 54(33.8%), internet 51(31.9%) and college 50 (31.3). In contrast, in India a study found that (90%) had not previous knowledge about neonatal hypothermia because of differences in educational level (21).

According to training session, 49(30.6%) of them had (1-2) training courses. Its due to the absence of continuous nursing education in the hospital and the lack of focus on newborn care. This finding is similar to study conducted in Asia indicate that a significant proportion of nurses have not received any training courses related to the prevention of hypothermia. Specifically, the studies report that (98% and 91.5%) of nurses in Asia respectively, did not attend such training courses (22).

Table (2) Summary Statistics of Nurses' Practice about neonatal hypothermia

Practice items	Resp.	No.	%	MS	SD	Ev.
Prevention of hypothermia						
1. The nurse drains the baby of fluids immediately after birth	Never	8	5.0	2.62	.581	H
	Sometimes	45	28.1			
	Always	107	66.9			
2. The nurse ensures that the child is adequately covered, including the head and limbs, and that undue exposure is avoided	Never	19	11.9	2.37	.687	H
	Sometimes	63	39.3			
	Always	78	48.8			
3. The nurse adjusts the incubator or heating	Never	34	21.2	2.23	.776	M
	Sometimes	56	35.0			
	Always	70	43.8			
4. The nurse adjusts the temperature of the newborn's room to 22-26 degrees Celsius	Never	66	41.3	1.80	.767	M
	Sometimes	60	37.5			
	Always	34	21.2			
5. The nurse educates the mother on early breastfeeding	Never	17	10.6	2.55	.680	H
	Sometimes	38	23.8			
	Always	105	65.6			
6. The nurse monitors the baby's temperature every 3 hours during the first days after birth	Never	41	25.6	2.16	.807	M
	Sometimes	52	32.5			
	Always	67	41.9			
7. The nurse educates the mother using the kangaroo method to prevent hypothermia in newborns who suffer from hypothermia	Never	52	32.5	2.02	.820	M
	Sometimes	53	33.1			
	Always	55	34.4			
8. The nurse takes body temperature at	Never	20	12.5	2.41	.703	H

birth	Sometimes	54	33.7			
	Always	86	53.8			
9. The nurse works to avoid washing the baby immediately after birth	Never	72	45.0	1.79	.809	M
	Sometimes	49	30.6			
	Always	39	24.4			
10. The nurse takes care of skin-to-skin contact after childbirth	Never	18	11.3	2.49	.691	H
	Sometimes	45	28.1			
	Always	97	60.6			
11. The nurse works to turn off the fan and air conditioning in the maternity hall	Never	73	45.6	1.79	.811	M
	Sometimes	48	30.0			
	Always	39	24.4			
Nursing care of hypothermia						
1.The nurse adjusts the temperature of the incubator to 35-36 degrees Celsius	Never	40	25.0	2.18	.810	M
	Sometimes	50	31.2			
	Always	70	43.8			
2.The nurse places the child on the lap or changing table, on his stomach, turning face down	Never	57	35.6	1.86	.748	M
	Sometimes	68	42.5			
	Always	35	21.9			
3.The nurse monitors the increase in the child's temperature. If the increase is not enough, then he increases the temperature of the place	Never	38	23.8	2.10	.754	M
	Sometimes	68	42.5			
	Always	54	33.7			
Practice items	**Resp.**	**No.**	**%**	**MS**	**SD**	**Ev.**
4.The nurse checks the breathing rate (tachypnea), depth and pattern	Never	52	32.5	2.04	.830	M
	Sometimes	50	31.2			
	Always	58	36.3			
5. The nurse works by observing the presence of redness, shortness of breath, moisture, and fluid loss	Never	37	23.1	2.25	.808	M
	Sometimes	46	28.7			
	Always	77	48.2			
6. The nurse adds a layer of clothes and an extra blanket if necessary	Never	16	10.0	2.36	.657	H
	Sometimes	71	44.4			
	Always	73	45.6			
7. The nurse works to re-measure the newborn's temperature from half to one hour after each nursing intervention	Never	61	38.1	1.89	.800	M
	Sometimes	56	35.0			
	Always	43	26.9			
8. The nurse covers the infant's head, hands and legs, and avoids undressing	Never	34	21.3	2.19	.764	M
	Sometimes	61	38.1			
	Always	65	40.6			
9. The nurse gets rid of the wet towel and baby blanket and replaces them with a dry towel	Never	20	12.5	2.43	.705	H
	Sometimes	52	32.5			
	Always	88	55.0			
10. The nurse holds the thermometer for at least two minutes when checking the	Never	46	28.7	2.09	.811	M
	Sometime	54	33.8			

child's temperature	s					
	Always	60	37.5			
11. The nurse treats hypothermia after childbirth: using hot compresses that are controlled thermally at 37-38 degrees Celsius	Never	60	37.5	1.83	.740	M
	Sometimes	68	42.5			
	Always	32	20.0			
12. The nurse follows up on the newborn and advises the mother to help her reduce the risk of hypothermia	Never	35	21.9	2.23	.786	M
	Sometimes	53	33.1			
	Always	72	45.0			
13. The nurse places the child under a heating pad or uses the incubator	Never	29	18.1	2.28	.751	M
	Sometimes	58	36.3			
	Always	73	45.6			
14. When managing severe hypothermia, the nurse uses a warm incubator (setting it at a temperature higher than body temperature from 1 to 1.5 degrees Celsius) and adjusting it as the newborn's temperature rises	Never	76	47.5	1.72	.770	M
	Sometimes	53	33.1			
	Always	31	19.4			
15. The nurse gives intravenous fluid (normal saline) and vitamin K	Never	83	51.9	1.68	.788	M
	Sometimes	45	28.1			
	Always	32	20.0			
16. The nurse works to add notes: (the child's awareness, measurement of vital signs, the incubator's temperature, and the use of intravenous diabetic fluid) and record them and the nursing documentation	Never	22	13.8	2.39	.719	H
	Sometimes	53	33.1			
	Always	85	53.1			

Resp.=response, MS= mean score, SD=standard deviation, Ev. =Evaluation, L=Low (1-1.66), M=moderate (1.67-2.33), H=High (2.34-3)

As per the nursing protocol pertaining to neonatal hypothermia outlined in The study's results indicated that the nursing participants demonstrated a moderate level of proficiency in both the first domain, which pertains to the prevention of hypothermia, and the second domain, which concerns the nursing care of hypothermia. (45.45%) of the prevention measures for hypothermia were reported to have received a high level of response. Only three items elicited high level responses, which accounted for (18.75%) of the total observations. Also, the summary statistic in table revealed that nurses had mean and standard deviation (2.203±0.363) and (2.141±0.303) at moderate level of practice for the both domains. And the findings indicated that 99(61.9%) of nurses had moderate level of practice about hypothermia. This result may be related to most of nurses had a moderate knowledge about neonatal hypothermia which is reflected in the performance and practices of nurses at (NICU). Also, half of participant had limited training session

In consistent with the present study finding in Asia found that (62%) of nurses had fair practice about neonatal hypothermia prevention (22).

A study in Sudan, it was discovered that a significant proportion of participants had practical experience in identifying signs of hypothermia, including shivering, slow breathing, confusion, and acrocyanosis. Additionally, a majority of participants reported having experience in covering the head, hands, and legs of infants, while avoiding undressing them. Furthermore, a considerable proportion of participants reported having experience in placing infants under a radiant warmer or incubator (17).

Regarding thermal protection, Pakistani study revealed that 220 (78%) of the participants dried all of the infants with a dry towel, while 60 (20%) only did so for some of the infants (23).

A study in Sudan found that, in a total of 210 (75%) of the respondents kept all of their newborns on their mothers' bellies right away, while 70 (24%) of them did not (9,5).

A study in Sudan found that, in a total of 165 (58%) of the respondents discarded wet towels and covered all of their newborns with dry towels, while 115 (40%) only did so for some of the infants (24).

A study in Switzerland found that, nurses had positive practice about neonatal hypothermia, (80%) for keeping delivery room warm, (90%) drying immediately after birth, (73%) skin to skin care, (88%) appropriate clothing, (73%) warm transportation, (84%) radiant warm, (90%) treating underlying cause (25).

A study in India found that, majority of nurses (96.6%) demonstrated good practice with a mean score of (11.05±0.824) (21).

According to study in Sudan, it was observed that nurses exhibited proficient practices in preparing the warmer prior to admitting a baby to the neonatal intensive care unit (NICU) and promptly measuring vital signs, particularly temperature. It is recommended to closely monitor the neonate's blood glucose levels and vital signs, and provide warm and secure transportation in the event of (NICU) admission. To prevent hypothermia, (26).

A study in Iran found that, in (18%) of the nurses had poor practice and the majority of them (82%) were performing usual and good practice (27).

A study in Egypt found that (96.7%) of nurses had incompetent performance regarding neonatal hypothermia. These studies in opposite side of the present study finding (28).

Conclusion:

The research findings indicate that the level of practice nurses regarding neonatal hypothermia is moderate. And Noteworthy statistical correlation was observed between the knowledge of nurses and their place of employment. Furthermore, there exists a correlation between the professional practice and educational background of nurses, as well as their work environment.

Recommendations:

Implementation of training programs aimed at enhancing nurses' practices regarding the management of neonatal hypothermia. To facilitate the implementation of continuing education programs in hospitals to enhance professional development and develop an educational curriculum aimed at enhancing the nurse's competence and ability to clinical practices, and continuous follow-up of nurses' practices in caring for a newborn with hypothermia.

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