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Nurse' Knowledge toward Care & Management Blood Exchange of Newborn

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Abstract:

Background: Most newborns develop some degree of hyperbilirubanemia, a normal physiological transition as they adjusted to life outside the womb. Nurses play a vital roles in providing care for newborns with neonatal elevated bilirubin, who are treated with exchange transfusions.

Objective Study: (1) Assess Nurse' knowledge toward care & management Blood Exchange of newborn at maternity and Pediatric Hospitals .(2) Find –out relationship between nurses of knowledge care and management and their demographic characteristics included (age, gender, level of education, worked at general hospitals for several years, years of experience in NICU, and number of training sessions about the care of newborn in the incubator and training session location).

Methodology: Design of a descriptive study in neonatal intensive care units in Maternity and pediatric Hospitals, from 15th March 2025 up to the end of 20th June 2025 in order to assess Nurse' knowledge toward care & management Blood Exchange of newborn in neonatal intensive care units at Al-Bint -Huda & Al–Habbobe Teaching Pediatric Hospital.Non-probability (purposive) sampling of (50) nurse. In data collection of research was used for which included of three parts. The overall number of the items included in the questionnaire was (14) items. The first part included (7) items related to the demographic data of the nurses, the second part was concerned with Nurse' knowledge toward care & management Blood Exchange of newborn which composed of (10) items. The third part was concerned with nurses' knowledge which composed of (24) items.

Results: The great number of sample (60%) were female, the majority were married, level of education for the most were nursing institute graduate, Moreover, them had less than five years of experience in the NICU. Concerning nurses' knowledge the finding of this result indicated that was acceptable concerning care of the newborn with blood exchange in NICU. The knowledge of nurses was significantly related to some general information for nurses.

Conclusion: The study shows that a large percentage was female of the sample, married, and nursing graduates. The nurses had less than five years of experience, with 72% having less than five years of experience in the NICU. According to the study, there is a strong correlation between nurses' knowledge and factors such as their educational background, years of experience, and training sessions.

Recommendation: All new nurses should participate in an orientation program, and all nurses should participate in active, up-to-date educational activities and skill training, according to the study.

Keyword: Knowledge, Management, Newborn

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INTRODUCTION

The first four weeks of life baby was name neonate.[1] It requires observation and care that go beyond the capabilities of a regular newborn nursery; such infants are referred to as high-risk neonates.[2] The first step in improving the quality of nursing care is to establish standards of care, which serve as a basis for evaluating the quality of care and ensuring nurse accountability.[3] High-risk neonate there related to birth weight or gestational age at birth , A high-risk newborn is one with a greater-than-average likelihood of mortality or morbidity, requiring early management that should take place in NICU. extremely premature and critically ill babies and in the process of recovery and growth and continues to receive special care in that unit.[4] An exchange transfusion is a medical procedure in which the patient's blood is gradually withdrawn and replaced with donor blood.. This process helps eliminate abnormal blood components and circulating toxins while preserving adequate blood volume. The primary purpose of the procedure is to remove antibodies and excess bilirubin in immunes-mediated diseases. However, the frequency of exchange transfusions has declined due to advances in prevention, improved prenatal management of all immune hemolytic disease, and better treatment strategies for neonatal elevated bilirubin.[5] Some medical situations, such as severe newborn jaundice that does not respond to bili light phototherapy, sickle cell crises, an abnormally high red blood cell count in a newborn, Rh-induced hemolytic illness in a newborn, or side effects from specific drugs, may necessitate an exchange transfusion. The general risks are similar to those associated with any blood transfusion. Additional potential complications may include blood clot formation, alterations in blood chemistry (such as low glucose or calcium levels, high or low potassium and changes in acid–base balance) cardiovascular issues or respiratory, a minimal risk of infection due to thorough blood screening, and shock if an insufficient amount of blood is replaced.[6]

Methodology

Study Design:

Research Design (A descriptive design) was conducted on (male and female) of nurses who were working in NICU. The present study was carried out inNICU & Pediatric Ward in maternity and pediatric Hospital. The study purposive(A non-probability) the sample of (50) nurses.

Study instrument:

The using for A questionnaire in data collection and consisted of tow part: the one part regarding to nurses' demographic data while the tow part is related to Nurse' knowledge toward care & management Blood Exchange of newborn in Neonatal Intensive Care. The number items in the questionnaire was (14). Blood Exchange of newborn were according to three levels Likert scale; never, some time and always, scored as 1, 2 and 3. It refers the numbers of data collection (3) were rated as always,(2) as some time, and(1) or less was never.

The data collection:

Data collected were through a direct by interview with the nurses of the sample by using a constructed form, and by using self-report technique for knowledge.

Statistical data analysis:

In this study used in analyzing the data:

1-Descriptive statistic:

a- Frequencies &Percentages (Tables).

b- Mean of score (M.S.).

It was equal to (1.5- 2.5) was considered significant, less than (1.5) was considered no significant while greater than (2.5) considered highly significant.

2-Inferential statistical procedure: This approach was performed through the determination of:

A- Chi-square (X^2) test:

It was used to determine the significant relationship between the Nurses' knowledge and their demographic characteristics at P≤0.05, and was computed as follows:

Results of the Study:

Table (1): Characteristics of the Demographic Distribution of Nurses.

No	Demographic Characteristics	Total sample n=50	
		F	%
1.	Gender		
	Male	20	40
	Female	**30**	**60**
	Total	50	100
2.	Age (year)		
	18-27	**20**	**40**
	28-37	16	32
	38- and more	14	28
	Total	50	100
3.	Marital Status		
	Single	12	24
	Married	**38**	**76**
	Total	50	100
4.	Level of Education		
	Nursing School graduate	4	8
	Secondary Nursing School	16	32
	Nursing institute	**20**	**40**
	Nursing college	10	20
	Total	50	100
5.	Years of employment		
	1-5	**20**	**40**
	6-10	12	24
	11-15	8	16
	16- and more	10	20
	Total	50	100
6.	Years of Experience		
	1-5	**36**	**72**
	6-10	8	16
	16- and More	6	12
	Total	50	100
7.	Training Sessions(neonatal care)		
	None	22	44
	Yes	**28**	**56**
	Total	50	100

Table 1: revaluated that the most of the sample were female, (76%) of them were married. Regarding the educaetional level for nurses were nursing institute graduate. Furthermore while the majority of the sample (40%) had less than five years of employment, while (72%) of them had less than five years of experience in NICU. Also (56%) of nurses had opportunity to be involved in training sessions in neonatal care.

Table (2) Assessment Nurse' knowledge toward care & management Blood Exchange of newborn.

No	Items	Always	Some time	Never	MS	R.S	Severity
		F	F	F			
1	Clean trolley by detergent and disposable towel, and disinfect the top of trolley by alcohol or other proper disinfectant before each procedure	6	6	38	1.36	45	L
2	Prepare antiseptic solutions and do not use that solution which prepared before 24 hour.	4	3	18	1.44	48.0	L
3	Prevent excessive air flow by closing doors, shutting windows, and switch off the fan	2	4	19	1.32	44.5	L
4	Wash hands thoroughly with soap and water before performing the sterile procedure	5	3	17	1.52	50.7	L
5	Check the sterility expiration date for bag of blood and catheters	8	4	13	1.82	60.0	L
6	Put on cap and mask	9	7	9	2.00	66.7	P
7	Put on sterile glove correctly	20	3	2	2.72	90.7	H
8	Using aseptic technique when c=connect the blood administration set to the blood warming coil exchange transfusion, or longer at the direction of the medical officer.	7	5	13	1.76	58.7	L
9	Measure urea and electrolytes, full blood examination, hematocrit and blood gas on a regular basis until infant stable	6	5	14	1.68	56.0	L
10	document the procedure in the progress notes	4	6	15	1.56	2.52	L
11	Drop gloves and waste on the appropriate waste receptacle	18	2	5	2.52	84.0	P
12	Wash hands after finishing the procedure.	5	3	17	1.52	50.7	L
.13	Record time, procedure, amount of blood.	19	3	3	2.64	88.0	P
14	Check and record signs and symptoms of newborn	9	6	10	1.96	65.3	L
Total Knowledge		**252**	**188**	**498**	**2.00**	**66.83**	**P**

MS= Mean of score

Overall, and in regard to the relative sufficiency (RS) and the total mean of scores (MS), which was (2.00); (66.83) respectively, nurses' knowledge was acceptable concerning care of the newborn with blood exchange in neonatal intensive care units.

Table (3): Association between Nurse' knowledge toward care & management Blood Exchange newborn and the gender.

Gender		Always	Some times	Never	Total
Male	F	98	38	10	240
Female	F	154	61	145	360
Total	F	252	99	149	600
	%	42.0	16.5	41.5	100%
X^2 obs=.,561	df=2	X^2 crit=5.991	P >0.05		

In table (3) mention that association between nurses' knowledge and their gender is no significant.

Table (4): Relationship between nurses' understanding of care and management Infant Blood Transfusion and Marital Status.

Marital status		Always	Some times	Never	Total
Married	F	190	74	192	456
Single	F	62	25	57	144
Total	F	252	99	249	600
	%	42.0	16.5	41.5	100%
X^2 obs=0.303	**df=2**	**X^2 crit=5.991**	**P >0.05**		

Table (4) show that association between nurses' knowledge and marital status distribution there is no significant

Table (5): Relationship between the Age of Nurses and Their Level of Knowledge.

Age		Always	Some times	Never	Total
18-27	F	98	37	105	240
28-37	F	79	30	83	192
38and more	F	75	32	61	168
Total	F	252	99	249	600
	%	**42.0**	**16.5**	**41.5**	**100%**
X^2obs=2,833	df = 4	X^2crit = 9.488	P> 0.05		

Table 5 displays the results showing the correlation between the age distribution of nurses and their knowledge. a notable disappearance.

Table (6): Association between Nurse' knowledge toward care & management Blood Exchange of newborn and their educational level.

Educational level.		Always	Some times	Never	Total
Nursing college graduate	F	252	99	249	600
Secondary nursing school	F	79	30	83	192
Institute nursing graduate	F	75	32	61	168
Nursing school graduate	F	98	37	105	240
Total	**F**	**252**	**99**	**249**	**600**
	%	**42.0**	**16.5**	**41.5**	**100%**
X^2obs- 2.833	**df: 4**	**X:lcrit= 9.488**	**P> 0.05**		

Knowledge is significantly associated with age education level, according to the results of table (6).

Table (7): Association between nurses' knowledge and their experience years in intensive care units.

Experience years		Always	Some Time	Never	Total
1-5 y.	F	169	60	203	432
6-10 y.	F	45	24	27	96
11-15 y.	F	38	15	19	72
Total	**F**	**252**	**99**	**240**	**600**
	%	**42**	**16.5**	**41.5**	**100%**
X^2obs= 21.434 df=4 X^2ctit= 9.488 P< 0,05					

There is a strong correlation between the amount of experience nurses have in intensive care units and the amount of information they possess, as seen in table 7

Table (8): Association between Nurse' knowledge toward care & management Blood Exchange of newborn and their training

No. of Training		Always	Some Time	Never	Total
yes	F	152	64	120	336
No session	F	100	35	129	264
Total	**F**	**252**	**99**	**249**	**600**
	%	**42**	**16.5**	**41.5**	
X^2obs= 111.07 df=2 X^2ctit= 5.991 P< 0,05					

The results of the training session are significantly related to the nurses' knowledge, as shown in the table.

Discussion of the Results

In this study, the data are analyzed and discussed in a methodical manner, with the help of pertinent literature, similar studies, and the researcher's own thoughts. The vast majority of nurses were married women (76%). This contradicts the findings of a recent national study of American registered nurses, which found a rise in the number of male nurses. [(7)]

In table 2: show that (5) items rated acceptable knowledge, and (3) items rated moderate knowledge, and (3) items rated good knowledge. This result is agree with results who indiacted that working of nurses in (ICUs) must possess specialized skills, knowledge, and experience to deliver timely and appropriate care to critically ill patients with complex medical needs..[(8)] Furthermore, This finding is consistent with reports stating that nurses in critical care settings, such as intensive care or cardiovascular units, require advanced skills and a broad knowledge base to effectively care for patients with severe illnesses and complex medical conditions.[(9)]

According to the results shown in Tables 3, 4, and 5, there is no statistically significant correlation between the knowledge of nurses and their gender, marital status, or age. Although training, years of experience, and degree of education all significantly correlated with nurses' expertise. Tables 6, 7, and 8 are presented here. This result is supported by mentioned that educational programs, and training session promote the acquisition and application of knowledge and verify knowledge competencies of the nursing staff, such programs provide specific updated information, continuing educational programs designed depending upon the nurses' previous knowledge, attitudes or skills to enhance nursing knowledge and improve health care. [(1)]

Conclusion:

The finding reading was a high of sample (60%) were female. less than five years of employment Concerning nurses' knowledge the finding of this result indicated that nurses' knowledge was acceptable concerning cares of the newborn with blood exchange. Concerning the relationships between nurses' knowledge with some demographic characteristics. There was a relationship between nurses' knowledge and their of experience, and training sessions.

Recommendations:

The current study concluded that: all new nurses should participate in an orientation program; all nurses should participate in active, updated educational activities; and all nurses should undergo skill training. Choosing the best nurses for this specialty is essential, as is stressing the value of permanent staffs. It was also stressed that all nurses working in neonatal intensive care units should adhere strictly to aseptic method in their knowledge. This includes having all necessary equipment, such as gloves and devices, on hand at all times.

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