

Research Article

A STUDY TO ASSESS THE EFFECTIVENESS OF PLANNED TEACHING PROGRAM ON KNOWLEDGE REGARDING EXCHANGE BLOOD TRANSFUSION AMONG NURSES WORKING IN PEDIATRIC UNITS OF M.S.RAMAIAH MEDICAL TEACHING HOSPITAL AND M.S.RAMAIAH MEMORIAL HOSPITAL, BANGALORE.

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ABSTRACT

A Study to Assess the Effectiveness of Planned Teaching Program on Knowledge Regarding Exchange Blood Transfusion Among Nurses working in Pediatric Units of M.S.Ramaiah Medical Teaching Hospital and M.S.Ramaiah Memorial Hospital, Bangalore." **Introduction:** Exchange transfusion is a potentially life-saving procedure that is done to counteract the effects of serious jaundice or changes in the blood due to diseases such as sickle cell anemia. The procedure involves slowly removing the patient's blood and replacing it with fresh donor blood or plasma. The types of exchange blood transfusion are 1) Partial exchange transfusion: is typically performed for Polycythemia (HCT>65%) that may be due to : delayed clamping of the cord , twin – twin transfusion, maternal – fetal transfusion , iatrogenic transfusion , and increased RBCs production in utero due to hypoxia. It consists of removing whole blood and replacing it with albumin, plasma, or normal saline to lower the HCT to approximately 55%. 2) Single blood volume exchange :using (80 – 100 ml/Kg) and usually performed for anemia with heart failure (i.e. hydrops fetalis) 3) Double volume exchange: (160 – 200 ml/Kg of blood). Usually performed for severe hemolytic disease of newborn. Exchange transfusion is usually done through umbilical venous catheter taking 5 – 10 ml/Kg of blood out at a time and replacing it ml for ml. **Objectives:** To assess the pretest level of knowledge on exchange blood transfusion among nurses. To evaluate the effectiveness of planned teaching programme on knowledge regarding exchange blood transfusion among nurses. To find the association between the post test level of knowledge with elected socio demographic variables. **Methods:** The study to assess the effectiveness of planned teaching programme on knowledge regarding exchange blood transfusion among nurses working in pediatric units of M.S.Ramaiah Medical Teaching Hospital and M.S.Ramaiah Memorial Hospital, Bangalore. Non-probability convenient sampling technique was used and 50 staff nurses working in pediatric units of M.S.Ramaiah Medical Teaching Hospital and M.S.Ramaiah Memorial Hospital were assessed. **Results:** The results of the major findings indicated that staff nurses had inadequate knowledge in various aspects of exchange blood transfusion. Planned teaching programme was found to be very effective. The mean post-test knowledge is significantly higher than the mean pre-test knowledge scores, 't' value is 15.241 which was highly significant at P<0.001. **Conclusion:** The study concluded that the planned teaching program on exchange blood transfusion was an effective method in providing knowledge and help staff nurses to provide effective nursing care.

Keywords: Exchange of Transfusion, Bilirubin, Jaundice, Polycythemia ,Sickle cell.

INTRODUCTION

Children are the future property of the nation. Healthy children are the greatest resources of any nation. Children are not adults but are special individuals with unique minds, bodies and needs. Jaundice is the commonest abnormal physical finding during first week of life. Over two-third of newborn babies develop clinical jaundice. Severe hyperbilirubinaemia is the most common cause of neonatal readmission to hospitals. Long term results in severe hyperbilirubinaemia including bilirubin encephalopathy and kernicterus resulting in a neurological handicap and early death of affected children. The management of hyper bilirubinaemia depends on the routine physical examination and initiation of early and frequent breast feeding, intravenous immunoglobulin, phototherapy and exchange blood transfusion. Exchange blood transfusion is a potentially life-saving procedure that is done to counteract the effects of serious jaundice or changes in the blood due to diseases such as sickle cell anemia. The procedure involves slow removal of the

patient's blood and replacing it with fresh donor blood or plasma. Exchange blood transfusion reduces serum bilirubin levels by removal of the bilirubin itself. Exchange blood transfusion is usually employed when phototherapy is unable or unlikely to adequately control the rising bilirubin levels. The W.H.O. pocket book of hospital care for children recommends that if the bilirubin level is elevated up to 20mg/dl or more, one can safely do an exchange blood transfusion. 2 Condition in which exchange blood transfusion may be needed include hemolytic disease of the newborn (Rh diseases), severe sickle cell crisis, severe disturbances in blood chemistry, toxic effects of certain drugs, polycythemia, severe neonatal hyperbilirubinaemia which does not respond to phototherapy, life threatening metabolic disorders, accidental injection of local anesthetic to the fetus etc. So exchange blood transfusion has a wide range of importance in clinical setting. Care of the children with exchange blood transfusion includes monitoring of ECG, blood pressure, oxygen saturation, transcutaneous carbondioxide and temperature during exchange blood transfusion, measure pH at mid-point measure glucose and electrolytes at the end of exchange blood transfusion, warm blood to 34-35 degree Celsius if less than that causes hemolysis. Agitate the unit of donor blood 10-15 minute so that cells do not settle,. Exchange transfusion is potentially lifesaving procedure performed to counteract the effects of serious physiological

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and pathological jaundice. so nurses must be alert knowledgeable to save the life of children and reduce the child mortality rate. Nurses form the backbone of neonatal care service. Working with sick neonates especially neonatal intensive set up can be quite taxing and "burn out" is extremely common. Therefore nurses working in the neonatal unit have to be highly motivated and should be committed to the care of the sick neonate. Since nurses are the ones most constantly in touch with the baby and family, neonatal nurses should have adequate knowledge of the problems in children and provide holistic nursing care.

OBJECTIVES

1. To assess the pretest level of knowledge on exchange blood transfusion among nurses.
2. To evaluate the effectiveness of planned teaching programme on knowledge regarding exchange blood transfusion among nurses.
3. To find the association between the post test level of knowledge with selected socio demographic variables.

REVIEW OF LITERATURE

A study on jaundice in the newborns in All India Institute of Medical Sciences, Ansari Nagar, New Delhi, India. (2008) which stated that Hyperbilirubinemia is the commonest morbidity in the neonatal period and 5-10% of all newborns require intervention for pathological jaundice. Latest guidelines from the American Academy of Pediatrics (AAP) for management of jaundice in a normal term newborn have been included in the protocol. Separate guidelines have been provided for the management of jaundice in sick term babies, preterm and low birth weight babies, for hemolytic jaundice and prolonged hyperbilirubinemia. A study on Hyperbilirubinemia at USA in 2009 and found out that Hyperbilirubinemia is the most common condition requiring evaluation and treatment in newborns. The clinical

manifestation of hyperbilirubinemia occurs in 60% of normal devastating effects. Nurses must be vigilant when caring for babies with "just jaundice" by monitoring bilirubin levels, identifying infants at risk for developing severe hyperbilirubinemia, and implementing prescribed treatment effectively when indicated.18

METHODOLOGY:

The sample was selected by non-probability convenient sampling method. The sample size for the present study was 50 nurses who are working in the pediatric units of M.S.R.M.T.H. and M.S.R.M.H. Used structured knowledge questionnaire on exchange blood transfusion with 40 items. The tool used for the data collection is Structured Knowledge Questionnaire to assess knowledge of staff nurses on exchange blood transfusion. The reliability and validity of the tool was established by split half method reliability $r' = 0.943$, Content validity of the tool was established from ten experts.

Data was collected, and analyzed using descriptive and inferential statistics in terms of frequencies, percentage, mean, mean percentage, standard deviation, paired' values and chi-square.

RESULTS

The data collected were analyzed according to the plan for data analysis, which includes both descriptive and inferential statistics. The findings have been organized and presented under following headings. Socio demographic variables of staff nurses on exchange blood transfusion Pretest knowledge of nurses on exchange blood transfusion Posttest knowledge of nurses on exchange blood transfusion Effectiveness of planned teaching programme on knowledge regarding exchange blood transfusion among nurses. Association of posttest level of knowledge and the selected socio demographic variable.

Table 1 Socio Demographic Variables of Staff Nurses on Exchange Blood Transfusion.

N=50			
Sl. No.	Demographic data	Frequency (f)	Percentage (%)
1. Age in Years			
(a)	≤25	18	36
(b)	26-30	28	56
(c)	31-35	2	4
(d)	36-40	2	4
2. Gender			
(a)	Male	0	0
(b)	Female	50	100
3. Professional qualification			
(a)	G.N.M	50	100
(b)	P.C.Bsc (N)	-	-
(c)	Bsc(N)	-	-
4. Designation			
(a)	Staff Nurse	50	100
(b)	Senior Staff Nurse	-	-
(c)	Ward supervisor	-	-
5. Years of experience in pediatric units			
(a)	<1	9	18
(b)	1-3	23	46
(c)	4-6	8	16
(d)	>6	10	20
6.Number of times exchange blood transfusion done			
(a)	1-5 times	18	36
(b)	5-10 times	5	10
(c)	>10 times	19	38
(d)	Not done	8	16
7.Undergone training programme on exchange blood transfusion.			
(a)	Yes	4	8
(b)	No	46	92
8.Like to attend training programme on exchange blood transfusion			
(a)	Yes	50	100
(b)	No	0	0
9. Additional exposure of staff nurse			
(a)	Attending workshop	32	64
(b)	Undergone short term courses	8	16

Table 1: Shows the distribution of demographic variables according to age in years, majority of 28(56%) nurses belong to the age group of 26-30 years while 18 (36%) nurses were found to be in the age group of ≤ 25 years and 2(4%) nurses were found to be in the age group of 31-35 years similarly 2(4%) nurses were found to be in the age group of 36-40 years. Based on sex, professional qualification, and designation, all the 50(100%) nurses belong to female sex. Professional qualification of all the nurses 50(100%) was G.N.M. 50 (100%) nurses belong to the category of staff nurse. According to years of experience in pediatric units, majority of the nurses 23(46%) had 1-3 years of experience while 10 (20%) of the nurses had >6 years of experience, 9(18%) had <1 year of experience and only 8 (16%) nurses had 4-6 years of experience in pediatric units.

Based on number of times exchange blood transfusion done, majority of the nurses 19(38%) done >10 times, 18(36%) nurses 1-5 times done, 8(16%) nurses not done, 5(10%) nurses done 5-10 times exchange blood transfusion.

As per the training programme undergone by the nurses, majority of nurses 46(92%) had not undergone training programme remaining 4(8%) had undergone training programme on exchange blood transfusion. According to additional qualification of staff nurse, majority of nurses 32 (64%) attended the training programme, 8 (16%) nurses underwent short term courses, 4 (8%). subjects underwent other courses, and 6 (12%) nurses had not answered the structured knowledge questionnaire.

Table 2 Mean, Mean% and Standard Deviation of Knowledge Variable in Pretest and Post test.

Aspect wise analysis of knowledge score	Max. score	Pre-test score			Post-test score			Percentage of enhancement
		Mean	SD	Mean%	Mean	SD	Mean%	
General information related to exchange blood transfusion	8	4.98	1.13	62.25	6.54	0.61	81.75	31.33
Related to exchange blood transfusion procedure	15	8.58	2.07	57.20	12.06	1.33	80.40	40.56
Related To Nursing Management	17	9.24	2.18	54.35	13.40	1.23	78.82	45.02
Overall knowledge score	40	22.78	3.55	56.95	32.00	2.23	80.00	40.47

Table 2: Shows percentage of enhancement of knowledge after planned teaching programme. In general information related to exchange blood transfusion level of knowledge enhancement was 31.33, related to exchange blood transfusion procedure enhancement level of knowledge was 40.56, related to nursing management level of knowledge enhancement e was 45.02. Overall knowledge enhancement level of knowledge score was 40.47.

Table 3 Effectiveness of Planned Teaching Program on Knowledge Regarding Exchange Blood Transfusion Among Nurses

Knowledge variable	N=50			
	Improvement			Paired 't' value
	Mean	Mean%	SD	
General information related to exchange blood transfusion	1.56	19.5	0.52	8.409 **
Related to exchange blood transfusion procedure	3.48	23.2	0.74	10.004 **
Related To Nursing Management	4.16	24.47	0.95	11.835 **
Overall knowledge score	9.22	23.05	1.32	15.241 **

** Highly significant at $p < 0.001$.

Table 3: Shows effectiveness of planned teaching programme. Highest improvement mean score 4.16 was obtained in the area related to nursing management and the standard deviation of 0.95 with mean% of 24.47 and the lowest improvement mean was obtained in the area regarding general information related to exchange blood transfusion mean score was 1.56 and 0.52 standard deviation with mean% of 19.5. The overall improvement mean was 9.22 with 1.32 standard deviation and the t- value calculated was 15.241 which was highly significant at $p < 0.001$ level.

DISCUSSION

Results shows that 50 nurses had inadequate and moderately adequate knowledge in pretest with mean score is 22.78 with standard deviation 3.55. This is supported by the survey conducted by Saillour Glennison F (2002) in France, among a random sample of 1090 nurses from 14 hospitals and the data was collected by structured interview methods. The results showed that 47% of nurses had poor knowledge and practice related to the bedside compatibility check, and recognition of abnormal reaction after transfusion. They concluded that, low training and transfusion activity were the key determinants of poor transfusion related knowledge.

The comparison of pre and post test knowledge of nurses reveals that the paired' test value was 15.241. It is more than the table value, which was highly significant at $P < 0.001$ Hence the research hypothesis (H1) stated that there is a significant difference between pre test and post test level of knowledge among nurses was accepted. This is supported by a national survey conducted in all the Belgium hospitals in 1998, it was suggested that transfusion should be improved by better education to all physicians and nurses involved with transfusion and by improving standardized guidelines and better documentation by all health care workers who are involved in exchange blood transfusion.

The calculated χ^2 value was less than the table value. So it was identified that there is no significant association between post test level of Knowledge and selected demographic variables except years of experience in pediatric units. Hence the research 'hypothesis H2' stated as there is significant association between post test level of knowledge and selected demographic variables was rejected except years of experience of staff nurse in pediatric units.

CONCLUSION

The present study assessed the knowledge regarding exchange blood transfusion among registered nurses working in pediatric units of M.S.Ramaiah Medical Teaching Hospital and M.S.Ramaiah Memorial Hospital, Bangalore. The overall knowledge of the nurses regarding blood transfusion was found to be inadequate knowledge (32%) and moderately adequate knowledge (68%). The finding showed that nurses had moderately adequate knowledge and inadequate knowledge which signifies the need for planned teaching programme and there was no significant association between level of knowledge and selected socio-demographic variables except years of experience in pediatric units. The investigator found that the study was useful and planned teaching programme would help the nurses to improve their knowledge and practice.

RECOMMENDATIONS

- The study can be replicated in different settings with larger samples.
- A comparative study can be done among nurses working in different hospitals.
- A similar study can be done on practice of nurses on exchange blood transfusion.

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