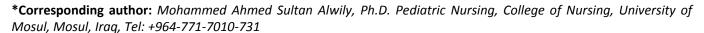RESEARCH ARTICLE

Evaluation of Instructional Program on Pediatric Nurses' Knowledge Regarding Managements of Neonatal Birth Asphyxia in Mosul Hospitals

*Mohammed Ahmed Sultan Alwily, PhD** ![ORCID]

Pediatric Nursing, College of Nursing, University of Mosul, Mosul, Iraq

*Corresponding author: *Mohammed Ahmed Sultan Alwily, Ph.D. Pediatric Nursing, College of Nursing, University of Mosul, Mosul, Iraq, Tel: +964-771-7010-731*

Abstract

Background: Birth asphyxia, which is defined as the failure to establish breathing following delivery and causes an estimated 900,000 deaths each year. This investigation tries to measure the efficiency of an instructional program on the knowledge of pediatric nurses concerning neonatal birth asphyxia management in Mosul Hospitals.

The Methodology: A quasi-experimental one-group pretest and posttest study design was used at Mosul hospitals' pediatric units from 3rd October/2021 to 1st March/2022. A not-randomly purposive sample was used, the whole number of sample (32) nurses, drawn from five Mosul City hospitals. Nurses were given access to the program lectures and the questionnaire. Five lectures made up the program's five lectures, and then questionnaire remained divided into two parts. The initial part of the questionnaire asked about socio-demographic data, while the part second asked about the knowledge of nurses on the management of newborn birth asphyxia and included five components. The validity was examined by thirteen expert committees. The pilot study's dependability was used from 16-17/November/2021 by use of Cronbach's Alpha (0. 831) using SPSS version 26.

The Result: Most of the sample was females at age (20-29) years-old, who graduated from the institute stage had less than five years of service, and not had training courses, and also reading resources related to neonatal birth asphyxia. There was the extremely substantial correlation between the pediatric nurse's knowledge of newborn birth asphyxia between the Pretest with Posttest results demonstrates the educational program's success at P. value ≤ 0.05.

The Recommendations: Widespread training courses, also special programs, and necessity be designed and implemented in other Nineveh hospitals.

Introduction

Neonatal birth asphyxia is a serious disorder that develops when a newborn is unable to resume normal breathing shortly after delivery. It is a medical emergency that calls for urgent treatment to avoid long-term problems including neuro developmental impairments or even death. Understanding the risk factors and adopting suitable therapies are essential in improving outcomes for newborns suffering from neonatal birth asphyxia. The reasons of this disease might include issues with the placenta, umbilical cord, or the baby's own breathing system [1].

The management of neonatal birth asphyxia involves a multidisciplinary approach, including skilled obstetricians, neonatologists, and pediatric nurses; the main objective is to restore and maintain an adequate oxygen supply to the baby's vital organs, especially the brain; this may involve actions like resuscitation, ventilation support, and/or oxygen therapy. As a result, it is a life-threatening and time-sensitive emergency that requires immediate action to ensure the newborn's well-being [2].

According to the WHO, 4 million deaths annually result from birth asphyxia, which accounts for 38% of

Alwily. Int Arch Nurs Health Care 2023, 9:189

• Page 1 of 6 •

all pediatric fatalities under the age of five, although the exact definition of birth asphyxia is unclear, it is associated with 23% of all newborn fatalities in low-income nations [3].

The primary goal of neonatal birth asphyxia management is to ensure adequate oxygenation and provide immediate resuscitation, if necessary. This includes opening the airway, giving extra oxygen, and possibly starting cardiopulmonary resuscitation (CPR) if the baby's heart rate remains low or absent. In severe cases, the baby may need mechanical ventilation to support breathing [2].

Research Question

What is the evaluation of instructional programs on pediatric nurses' knowledge regarding the management of neonatal birth asphyxia in Mosul hospitals?

Objectives

1. To measure the knowledge levels of pediatric nurses concerning the Management of neonatal birth asphyxia in Mosul Hospitals.

2. To evaluate effective of an instructional program for knowledge of pediatric nurses concerning the Management of neonatal birth asphyxia in Mosul Hospitals.

Material and Methods

The design

A quasi-experimental one-group pretest and posttest study design was used at Mosul hospitals' pediatric units from 3rd October/2021 to 1st March/2022.

The sample

A not-randomly purposive sample was used, the whole number of a sample (32) nurses employed inside pediatric wards of five Mosul Teaching Hospitals; Al-Salam Teaching Hospital, Ibn Al-Atheer Teaching Hospital, General Mosul Teaching Hospital, Al-Kanssa'a Teaching Hospital, and Ibn-Sina Teaching Hospital.

Inclusion criteria

Nurses who are working in pediatric wards on the morning and night shifts. Nurses who agreed and were willing to participate were also ready to fill out the online instrument questionnaire of the study. Students' nurses from both sexes (male and female).

The Program Lectures and Instrument Questionnaire

The program lectures and questionnaires were generated and made available to nurses so they could assess the educational program's impact on their understanding of how to manage newborn birth asphyxia. Two lectures each week made up the program's five lectures, and the questionnaire included

two separate parts:

The initial part contains socio-demographic data including data connected to the nurses' sample such as gender, age, level of education, service, training course, and reading source.

The second part consists of a questionnaire related to the knowledge of nurses concerning the management of neonatal birth asphyxia. Questionnaire consists of five sections each section contains five multiple-choice questions in regard to the knowledge of nurses: The first section focuses on knowledge of nurses concerning neonatal birth asphyxia in general. The second section focuses on the knowledge of nurses concerning the symptoms and signs of birth asphyxia. The third section focuses on the knowledge of nurses concerning the causes of birth asphyxia. The fourth section focuses on the knowledge of nurses concerning the management of birth asphyxia, and the fifth section focuses on the knowledge of nurses concerning nursing care of birth asphyxia.

Scoring of the instrument

The extent of the nurses' knowledge, as estimated: Failure equals a knowledge score of 0 to 1 and a total knowledge score of 1 to 5. Non-Acceptable = total knowledge score (6-10) and knowledge score (2) on the solution. Acceptable is equal to a total knowledge score of (11-15) and a knowledge score of (3). Good = (4) knowledge score on the question and (16-20) overall knowledge score on the question. Excellent equals a total knowledge score of (21-25) and a knowledge score of (5).

The validity

A panel of experts evaluated the content validity by (13) specialists in various medical and nursing professions to determine the legitimacy of the program lectures and questionnaire. It was requested of the experts to evaluate the text for appropriateness, relevance, and clarity.

The reliability (pilot study)

From November 16-17, 2021, a pilot study was conducted before the practical phase began. To evaluate the internal consistency of the questionnaire, it comprised (10) nurses who were arbitrarily chosen from Ibn Al-Atheer teaching hospitals (this sample was left out of the original research sample). The study employed Cronbach's Alpha to assess pediatric nurses. The results (0. 811) using SPSS version 26.

Data collection

The instruction program lectures were applied in Ibn Al-Atheer Hospital Hall after collecting all the nurses from all hospitals that participated in the study, where the data were collected Pretest then application of five program lectures, two lectures every week, after

one week of completing the program lectures than a collection of Posttest, all time of data collection occurs during the period from 29 of November till 30 of December/2021.

Data analysis methods

In the current research, the statistical package for social science (SPSS), version 26, is used for analyze of data. Descriptive statistical data analysis (frequencies, percentages), inferential statistical data analysis, paired samples t-test, ANOVA - pair wise comparison, and degree of significance are among the statistical techniques used for data analysis and outcome assessment.

The Result

Table 1, Table 2, Table 3, Table 4 and Table 5.

Discussion

Socio-demographic characteristics of the study sample, are 46.9% (15) of the sample at age (20-29) years, and 78.1% (25) of the sample are female. 43.8% (14) of the sample at the institute stage of educational level, 50.0% (16) of the sample at (1-5) years of general service, and 56.3% (18) of the sample at (1-5) years of service in the current ward. 59.4% (19) of the total sample not having training courses related to the study subject. Lastly, 53.1% (17) of the sample did not have a reading source as shown in Table 1. This result disagrees with Ezenduka, et al. (2016) that demonstrates in their

Table 1: Socio-demographic results of the sample of pediatric nurses in the study.

Socio-Demographic		Freq.	%
Age	(20-29)	**15**	**46.9**
	(30-39)	13	40.6
	(40-49)	4	12.5
Gender	Male	7	21.9
	Female	**25**	**78.1**
Education Level	Junior Stage	7	21.9
	Institute Stage	**14**	**43.8**
	Graduate Stage	9	28.1
	Master Stage	2	6.3
General Service	(1-5)	**16**	**50.0**
	(6-10)	9	28.1
	(11-15)	7	21.9
Service in Current Ward	(1-5)	**18**	**56.3**
	(6-10)	11	34.4
	(11-15)	3	9.4
Training Course	Yes	13	40.6
	No	**19**	**59.4**
Reading Source	Yes	15	46.9
	No	**17**	**53.1**
Total		**32**	**100.0**

Freq. = Frequency, % = Percentage

study the majority 22 (44%) of the sample fell within 31-40 years, 15 (24%), and 1 (2%) were within 21-30 years. 21 (42%) of the sample were Nurses/Midwives, 6 (12%) were nurses, 10 (20%) were Midwives, and 5 (10%) of them worked with children. 8 of them (16%) were nurses with a bachelor's in science. A majority of 17 (34%) are between the ages of 6 and 10. Additionally, 21 (42%) of the sample had no training, whereas 19 (38%) received training [4].

The statistical knowledge results result for pediatric nurses' knowledge on Pretest with Posttest regarding neonatal birth asphyxia, that knowledge of nurses concerning neonatal birth asphyxia in general Pretest 50.0% (16) of them at a failure level, Posttest 56.3% (18) of the sample at an excellent level. Knowledge of nurses concerning signs and symptoms of birth asphyxia in the Pretest is 46.9% (15) at the failure level of them; Posttest is 65.6% (21) at an excellent level of them. Knowledge of nurses concerning causes of birth asphyxia on the Pretest is 62.5% (20) at a not acceptable level; Posttest is 59.3% (19) at an excellent level. Knowledge of nurses concerning of birth asphyxia management in the Pretest was 56.3% (18) at a failure level, and Posttest is 56.3% (18) at an excellent level. Knowledge of nurses concerning the care of birth asphyxia in the Pretest is 46.9% (15) at a failure level; Posttest is 43.7% (14) at a good level as shown in Table 2. These results agree with Al-Wily and Aziz (2020) were describing in their research that, whereas 57.7% (15) of the general knowledge and purpose or intent of usage in the Pretest were at a not acceptable level, 57.7% (15) of them in the Posttest were at an exceptional level. In the Pretest, 69.2% (18) of the normal values and nursing considerations are at a failure level, while in the Posttest, 65.4% (17) are at a good level. In the Pretest, 46.2% (12) of them had clinical manifestations that were not acceptable; in the Posttest, 53.8% (14) had clinical manifestations that were acceptable. In the Pretest, 69.2% (18) of the influencing elements and methods were at the failure level, whereas in the Posttest, 61.5% (16) of them were at the good level [5].

The statistical knowledge results result for the total knowledge of pediatric nurses on the Pretest with Posttest regarding neonatal birth asphyxia, that 68.8% (22) at an unacceptable level, but in the Posttest 59.4% (19) of the at an excellent level as shown in Table 3. These results agree with Subbiah, et al. (2012) showed in their research that the Posttest knowledge scores were more homogenous (SD 6.74) than the Pretest knowledge scores (SD 5.53) and showed the mean knowledge score on the posttest (30.71) was greater than the mean knowledge score on the pretest (19.11) [6].

Statistical association results (paired samples test) for knowledge of pediatric nurses at Pretest with Posttest concerning neonatal birth asphyxia. The results

Table 2: Statistical result for knowledge of pediatric nurses at pretest with post test concerning neonatal birth asphyxia.

Nurses' Knowledge	Estimate	Pretest		Posttest	
		Freq.	%	Freq.	%
Nurses' knowledge regarding neonatal birth asphyxia in general	Fail	8	25.0	0	0.0
	Not Acceptable	**16**	**50.0**	0	0.0
	Acceptable	5	15.6	0	0.0
	Good	3	9.4	14	43.7
	Excellent	0	0.0	**18**	**56.3**
Nurses' knowledge regarding signs and symptoms of birth asphyxia	Fail	**15**	**46.9**	0	0.0
	Not Acceptable	6	18.8	0	0.0
	Acceptable	11	34.4	0	0.0
	Good	0	0.0	11	34.4
	Excellent	0	0.0	**21**	**65.6**
Nurses' knowledge regarding causes of birth asphyxia	Fail	10	31.3	0	0.0
	Not Acceptable	**20**	**62.5**	0	0.0
	Acceptable	2	6.2	2	6.3
	Good	0	0.0	11	34.4
	Excellent	0	0.0	**19**	**59.3**
Nurses' knowledge regarding the management of birth asphyxia	Fail	**18**	**56.3**	0	0.0
	Not Acceptable	9	28.1	0	0.0
	Acceptable	5	15.6	0	0.0
	Good	0	0.0	14	43.7
	Excellent	0	0.0	**18**	**56.3**
Nurses' knowledge regarding nursing care of birth asphyxia	Fail	**15**	**46.9**	0	0.0
	Not Acceptable	12	37.5	0	0.0
	Acceptable	5	15.6	6	18.8
	Good	0	0.0	**14**	**43.7**
	Excellent	0	0.0	12	37.5
Total		**32**	**100.0**	**32**	**100.0**

Freq. = Frequency, % = Percentage

Table 3: Statistical result for total knowledge of pediatric nurses at pretest with posttest concerning neonatal birth asphyxia.

Total Knowledge	Pretest		Posttest	
	Freq.	%	Freq.	%
Fail	5	15.6	0	0.0
Not Acceptable	**22**	**68.8**	0	0.0
Acceptable	5	15.6	1	3.1
Good	0	0.0	12	37.5
Excellent	0	0.0	**19**	**59.4**
Total	**32**	**100.0**	**32**	**100.0**

Freq. = Frequency, % = percentage

are highly significant association relationships among Pretest with Posttest results for all knowledge parts of pediatric nurses at the Pretest with Posttest concerning neonatal birth asphyxia at a p.value equal to or less than 0.05 level as shown in Table 4 these results agree with Kuriakose, et al. (2021) in a study, it was discovered that there was a substantial difference (8.23) between the two, with the mean Posttest knowledge score (26.03) being higher than the mean Pretest score (17.8). At the 0.05 level of significance, the estimated "t" value was (5.71), showing a significant shift in knowledge between the pre- and post-implementation periods. Thus, it was

Table 4: Statistical association results (paired samples t-Test) for knowledge of pediatric nurses at pretest with posttest regarding neonatal birth asphyxia.

		Mean	Std. D.	t	Sig.
Neonatal birth asphyxia in general	Pretest-posttest	-1.594-	1.500	-6.012-	**0.000**
Signs and symptoms of birth asphyxia	Pretest-posttest	-1.281-	0.851	-8.513-	**0.000**
Causes of birth asphyxia	Pretest-posttest	-1.500-	0.916	-9.265-	**0.000**
Management of birth asphyxia	Pretest-posttest	-1.687-	0.859	11.113	**0.000**
Nursing care of birth asphyxia	Pretest-posttest	-1.719-	1.054	-9.221-	**0.000**
Total Nurses' knowledge	Pretest-posttest	-1.125-	1.157	-5.500-	**0.000**

discovered that staff nurses' comprehension of birth asphyxia dramatically enhanced after the adoption of a structured education program [7].

The statistical association (ANOVA - pair wise comparison) for knowledge of pediatric nurses at the Pretest with Posttest regarding neonatal birth asphyxia. The results are highly significant association relationships among Pretest with Posttest results for all knowledge parts of pediatric nurses regarding neonatal birth asphyxia at a p-value equal to or less than 0.05 levels as shown in Table 5. These results agree with Draiko, et al. (2019) using ANOVA measurements, researchers in one study were able to demonstrate that there were substantial improvements in knowledge between the pretest with the post-test for the sample's mean scores at the pretest and posttest, there was a mean difference increase of 55.2 (50.9-59.6; p0.05) [8].

The Conclusion

1. The Socio-demographic characteristics greatest of the sample was female gender at 20-29 years age-old, graduated from the institute stage that had less than five years of service, and not had training course, also reading resources related to neonatal birth asphyxia.

2. The pediatric nurses in Mosul teaching hospital do have not appropriate and not adequate knowledge before the application of the instructional program regarding neonatal birth asphyxia.

3. There was an extremely substantial correlation between the knowledge of pediatric nurses of newborn birth asphyxia between Pretest with Posttest scores, demonstrating the instructional program's efficacy and effectiveness.

The Recommendations

1. Training courses and special programs for all nurses in all Nineveh hospitals regarding neonatal birth asphyxia to enhance knowledge and management.

2. Increasing the number of bachelor's degrees nurses in nursing science to work at pediatric departments in Mosul teaching hospitals for their background and ability.

3. Another study regarding birth asphyxia for all nurses in pediatric departments also enhances future nurses' knowledge.

Ethical Approval

The approval getting first from the University of Mosul/ Collegiate Committee for Medical Research Ethics at the code: CCMRE-Nu-21-41, then the ethical committee of Nineveh Health Directorate after that the approval of the Teaching Hospitals in Mosul City.

Conflicts of Interest

Nobody professed.

Funding

Table 5: Statistical association results (ANOVA - Pairwise Comparison) for knowledge of pediatric nurses at pretest with posttest regarding neonatal birth asphyxia.

		Sum of Squares	df	Mean Square	F	Sig.
Neonatal birth asphyxia in general	Between Groups	40.641	1	40.641	33.113	**0.000**
	Within Groups	76.094	62	1.227		
	Total	116.734	63			
Signs and symptoms of birth asphyxia	Between Groups	26.266	1	26.266	20.428	**0.000**
	Within Groups	79.719	62	1.286		
	Total	105.984	63			
Causes of birth asphyxia	Between Groups	36.000	1	36.000	46.743	**0.000**
	Within Groups	47.750	62	0.770		
	Total	83.750	63			
Management of birth asphyxia	Between Groups	45.563	1	45.563	52.131	**0.000**
	Within Groups	54.188	62	0.874		
	Total	99.750	63			
Nursing care of birth asphyxia	Between Groups	47.266	1	47.266	50.013	**0.000**
	Within Groups	58.594	62	0.945		
	Total	105.859	63			
Total Nurses' knowledge	Between Groups	20.250	1	20.250	26.432	**0.000**
	Within Groups	47.500	62	0.766		
	Total	67.750	63			

Acknowledgment

Authors' Contributions

Mohammed Ahmed Sultan Alwily is in charge of authoring the whole book. The last draft of the work was reviewed and approved by both writers.

References

1. Rainaldi MA, Perlman JM (2016) Pathophysiology of birth asphyxia. Clin Perinatol 43: 409-422.

2. Usman F, Imam A, Farouk ZL, Dayyabu AL (2019) Newborn mortality in Sub-Saharan Africa: Why is perinatal asphyxia still a major cause? Ann Glob Health 85: 112.

3. Aslam HM, Saleem S, Afzal R, Iqbal U, Saleem SM, et al. (2014) Risk factors of birth asphyxia. Italian Journal of Pediatrics 40.

4. Ezenduka PO, Ndie EC, Oburoh ET (2016) Assessment of knowledge, attitude, and practice of nursing management of birth asphyxia in federal medical centre Asaba, Delta State-Nigeria. Clinical Nursing Studies 4.

5. Al-Wily MAS, Aziz AR (2020) Effectiveness of instructional program for nurses' knowledge regarding oxygen administration methods at pediatric teaching hospitals in Mosul city. Medico Legal Update 20: 1519-1525.

6. Subbiah N, Sarin J, Jeeva S (2012) Effectiveness of educational intervention on neonatal resuscitation among nursing personnel. Health Popul Perspect Issues 35: 36-45.

7. Kuriakose JR, Dani S, Mary L, Mariya J, Joy A (2021) Effectiveness of structured teaching program (STP) on knowledge regarding birth asphyxia among staff nurses. IOSR-JNHS 10: 19-24.

8. Draiko CV, Yamarat K, Panza A, Draleru, J (2019) Knowledge, skills and competency retention among health workers one year after completing helping babies breathe training in South Sudan. Pan Afr Med J 33: 175.

Alwily. Int Arch Nurs Health Care 2023, 9:189

• Page 6 of 6 •