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Effectiveness of an Interventional Program on Nurses` Practices Toward Post-Operative Intravenous Infusion of Infants with Tracheoesophageal Fistula

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ABSTRACT

Objective(s): The study aims to determine the effectiveness of the intervention program on nurses' practices regarding the post-operative Intravenous Infusion of infants with tracheoesophageal fistula.

Methods: A Quantitative, pre-experimental design, was conducted has been by using the one-group test-retest method, pre-test, post-test 1, and post-test 2. An observational checklist has been adapted to collect the data before and after implementing the Interventional program. A non-probability (convenience) sample consists of all nurses in the Neonatal Intensive Care Unit. After explaining the nature, significance, and objectives of the study to every nurse in the Neonatal Intensive Care Unit, each nurse consented to participate in the research. The data analysis was performed using the social sciences software, version 23.

Results: A statistically significant difference exists between the levels of practice scores in the pre-test post-test I and post-test II. The result findings revealed a significant improvement in the nurse's practices after the implementation of an Interventional program through Analysis of Variance.

Conclusions: The study determined that the intervention program is an effective means of enhancing the post-operative practices of nurses for neonates with tracheoesophageal fistula.

Recommendations: The study recommended that continuous intervention courses be designed, structured, and implemented regularly for the benefit of nurses who perform such procedures, monitoring, and evaluation of nurses regarding procedures for the post-operative care of infants with tracheoesophageal fistula.

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فاعلية برنامج تداخلي في ممارسات الممرضين حول التسريب الوريدي بعد الجراحة للرضع المصابين بالناسور الرغامي المريئي

المستخلص

الاهداف: تهدف هذه الدراسة الى التحقق من فاعلية برنامج تداخلي في ممارسات الممرضين حول التسريب الوريدي للرضع المصابين بالناسور الرغامي المريئي بعد العمليات.

المنهجية: تم اجراء البحث الكمي، التصميم القبلي، من خلال تنفيذ نهج الاختبار - إعادة الاختبار للمجموعة الواحدة (الاختبار القبلي، والاختبار البعدي ١، والاختبار البعدي ٢). تم اعداد استمارة الملاحظة لجمع البيانات قبل وبعد تطبيق البرنامج التداخلي. تتكون العينة الغير احتمالية (الملائمة) من جميع الممرضين في وحدة العناية المركزة لحديثي الولادة. بعد شرح طبيعة وأهمية وأهداف الدراسة لكل ممرض في وحدة العناية المركزة لحديثي الولادة وافق كل الممرضين على المشاركة في البحث. تم إجراء تحليل البيانات باستخدام برنامج العلوم الاجتماعية الإصدار ٢٣.

النتائج: لوحظ وجود فروق ذات دلالة إحصائية بين مستويات ممارسات الاختبار القبلي والبعدي الأول والثاني. حيث اظهرت النتائج تحسنا ملحوظا في ممارسات الممرضين بعد تنفيذ البرنامج من خلال تحليل التباين.

الاستنتاجات: خلصت هذه الدراسة إلى أن البرنامج التداخلي تم تأكيده ليكون وسيلة فعالة لتعزيز ممارسات الممرضين فيما يتعلق بالتسريب الوريدي بعد العمليات للرضع المصابين بالناسور الرغامي المريئي.

التوصيات: اوصت الدراسة بتصميم دورات التداخل المستمرة وتنظيمها وتنفيذها على أساس منتظم لصالح الممرضين الذين يؤدون مثل هذه الإجراءات. والمراقبة والتقييم للممرضين فيما يتعلق بالتسريب الوريدي بعد العمليات للرضع المصابين بالناسور الرغامي المريئي.

الكلمات المفتاحية: فاعلية، البرنامج التداخلي، الممارسات التمريضية، الناسور الرغامي المريئي.

Introduction

Tracheoesophageal fistulas are aberrant, pathologic connections between the tracheal posterior wall and the esophageal anterior wall. Fistula tracheoesophageal TEF and esophageal atresia EA are digestive system illnesses. It is a congenital abnormality characterized by a gap between the upper and lower esophageal pouches, which is frequently accompanied by a tracheal fistula[(1)].

TEF is a diseased link between the trachea and the esophagus, with the most prevalent symptoms being breathing problems, dysphagia, and recurrent respiratory infections [(2)].

Thomas Gibson first described the classic variant of tracheoesophageal fistula with esophageal atresia in 1697. Charles Steele attempted to restore pure esophageal atresia for the first time in 1888 by performing a gastrotomy and inserting a steel instrument through the putative esophageal membrane. Robert Shaw reported the first case of attempted repair of esophageal atresia with a tracheoesophageal fistula using fistula and primary anastomosis in Dallas in 1938 **(3),** although it was first attempted by Thomas Lanman in Boston in 1936**(4).**

Although technical issues were not always the cause, every endeavor was unsuccessful. The technique did not acquire traction until Cameron Haight's successful primary repair of esophageal atresia in 1941 using a left extra pleural approach, fistula ligation, and a single-layer anastomosis after five failure attempts, the first of which occurred in 1939. Esophageal atresia is a congenital anomaly that involves incomplete formation of the esophagus, resulting in its termination before reaching the stomach. It is commonly accompanied by a tracheoesophageal fistula[(5)].

Nursing objectives for newborns with TEF and ER include preventing pneumonia, choking, and apnea. It is crucial to assess the newborn during the first feeding, to reduce the risk of aspiration, infants are typically

given clear water or colostrum if they are breastfed. The neonate should be placed on nothing by mouth status, suctioned to free the airway, and positioned to discharge mucous from the sinuses and pharynx if any symptoms are observed. Surgical intervention is essential for the newborn's survival. [6]

Methods

A quantitative study, a pre-experimental design was used to investigate the effectiveness of an interventional program on the practices of nurses regarding the post-operative Intravenous Infusion of newborns with trachea esophageal fistula for the period 28th of March 2022 to 1st of May 2023. Nineveh Governorate's Neonatal Intensive Care Unit /Pediatric Surgical Center.

A non-probability (convenient) sample consists of all nurses in the Neonatal Intensive Care Unit.

A structured Questionnaire which consist of two parts was used for the purpose of data collection, part (1): personal characteristics of the nurses. and part (II): Observational List Sheet Which was constructed based on relevant pediatric and critical nursing procedures manuals to evaluate nurses' practices concerning neonates with TEF, before applying an interventional program and then.

To ensure the validity of the instrument, it is demonstrated to numerous education specialists. They provided some feedback that was incorporated into the ultimate version of the utility. To ensure the reliability of the instrument, it was administered to five nurses and they were re-observed nearly 20 days later, (test-retest). They are excepted from the model for the investigation. The correlation between the test and retest scores was determined by analyzing the test and retest results. The Pearson Coefficient of Correlation was (r = 0.93). The final draft was ultimately dependent on the study. The period is (1st July to 20th August 2022).

Data were gathered by indirect observation using the research instrument for all study participants related to the Post-Operative Intravenous Infusion of Infants with Tracheoesophageal Fistula. nursing practices were observed three times for each subject in the sample and the mean was calculated.

After explaining the nature, significance, and objectives of the study to every nurse in the neonatal intensive care unit NICU. All participants signed a consent form and were informed that their participation was completely voluntary and that their information would be kept confidential and used solely for scientific research. After presenting the proposal, the pediatric nursing department gave its official approval and the Nursing College at the University of Baghdad granted permission to conduct the research. Then Consent was secured from the research ethics committee at the University of Baghdad's Faculty of Nursing.

Using the SPSS program, data were analyzed using application, descriptive, inferential, and non-parametric statistical tests.

Results

Table 1. Distribution of Nurses' Socio-demographic Characteristics

socio-demographic characteristics	Classification	No.	%
Age	20-24 years old	7	30.4
	25-29 years old	12	52.2
	30-34 years old	1	4.3
	35-40 years old	3	13.0

	28 ± 4.80		
Gender	**Male**	**21**	**91.3**
	Female	2	8.7
Marital status	Single	2	8.7
	Married	**21**	**91.3**
Education level	School Nursing	3	13.0
	Diploma nursing	**15**	**65.2**
	B.Sc. nursing	3	13.0
	Master nursing	2	8.7
Years of Experience	<5 years	14	60.9
	5-10 years	7	30.4
	>10 years	2	8.7
Experience in ICU	**<5 years**	**16**	**69.6**
	5-10 years	7	30.4
Training courses	**No**	**19**	**82.6**
	Yes	4	17.4

No=Number**, %=** Percentage.

Findings show participants' ages; those between the ages of 25 and 29 make up More than half of the sample (52.2%), with a mean age of 28 (4.80). In regards to gender, the male nurses predominated (91.3%). Concerning marital status, the majority of participants were married (91.3%). Concerning the education level, most of the participants had a diploma in nursing (65.2%). Years of experience-related results: more than half of the studied sample were less than 5 years old (60.9%). Experience in NICU: one-third of participants were also less than 5 years old (69.6%). In terms of training courses, the majority of participants were not trained (82.6%).

Table 2. Evaluation of Nurses' Practices toward Post-Operative Intravenous Infusion of Infants with Tracheoesophageal Fistula at Pre Test, Post Test I, and Post Test II Periods

Intravenous Infusion	**Poor**		**Moderate**		**Good**		**M ± SD**
	No.	%	No.	%	No.	%	
Pre-test	16	69.6	6	26.1	1	4.3	51.60 ± 14.98
Post-test I	3	13.0	5	21.7	15	65.2	80.17 ± 15.94
Post-test II	2	8.7	8	34.8	13	56.5	77.74 ± 16.14

No=Number**, %=** Percentage, **M ± SD=** mean±standard deviation **Poor**=33-55, **Moderate**=55.1-77, **Good**=77.1-99.

The results revealed that the nurses had poor reactions to intravenous infusion during the pre-test period 51.60 (14.98) (before the learning package). During the post-test I (later the teaching session), the nurses provided positive answers to intravenous infusion (80.17 (15.94). After a month (posttest II), nurses gave the same answers as in posttest I: 77.74 (16.14).

Table (3): Comparison of Significance of Nurses' Practices Toward Post-Operative Intravenous Infusion of Infants with Tracheoesophageal Fistula at pre-test, Post Test I and Post Test II Periods

IV (I)	**IV (J)**	**Mean Differences (I-J)**	**Std. Error**	**P value**	**95% Confidence Interval**	
					Lower Bound	**Upper Bound**
Pre-test	Post-test I	-.86561-*	.14113	.000	-1.1474-	-.5838-

	Post-test II	-.79183-*	.14113	.000	-1.0736-	-.5101-
Post-test I	Pre-test	.86561*	.14113	.000	.5838	1.1474
	Post-test II	.07378	.14113	.603	-.2080-	.3556
Post-test II	Pre-test	.79183*	.14113	.000	.5101	1.0736
	Post-test I	-.07378-	.14113	.603	-.3556-	.2080

Pretest intravenous infusion practices differ significantly from posttest I and posttest II practices (p =.000). Posttest I practices differ statistically from pretest practices (p=.000) but do not differ from posttest II practices (p=.603). Such practices in posttest II differ statistically after those in pretest time (p=.000), but they do not differ in posttest I (p=.603).

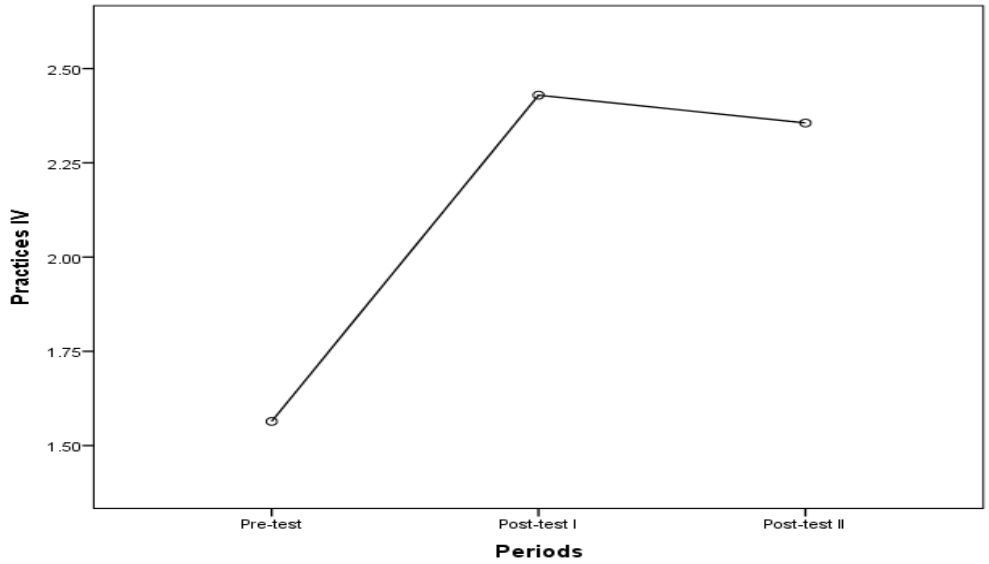

Figure 1: Nurses' Practices Regarding Intravenous Infusion Between Measurement Periods

Table 4. The Relationship between Nurses' Practices and their Socio-demographic characteristics at Post-tests I and Post-test II

Variables	**Post-test -1-**	**Post-test -2-**	**Post-test -1-**	**Post-test -2-**	**Post-test -1-**	**Post-test -2-**	**Post-test -1-**	**Post-test -2-**
	χ^2	**χ^2**	**df**	**df**	***p-value***	***p-value***	***Sig.***	***Sig.***
Age	2.057	1.625	6	6	.914	.951	NS	NS
Gender	3.477	3.058	2	2	.176	.217	NS	NS
Marital status	1.228	.878	2	2	.541	.645	NS	NS
Education level	3.800	3.075	6	6	.704	.802	NS	NS
Years of Experience	5.531	4.528	4	4	.253	.339	NS	NS
Experience in ICU	3.873	4.803	2	2	.147	.155	NS	NS
Training courses	3.113	1.137	2	2	.211	.566	NS	NS

df = degree of freedom; **Sig** = significance.

Findings indicate there was no relationship between nurses' practices and their socio-demographic characteristics at post-test I and Post-test II (p>0.05).

Discussion

At the end of the course of data analysis, the relationship between nurses' practices of post-operative care for infants with tracheoesophageal fistula and their socio-demographic data has been investigated. According to the findings of this correlation, there is no statistically significant relationship between nurses' practices of intravenous infusion, and their sociodemographic variables: age, gender, marital status, degree of education, years of experience in nursing, years of experience in the NICU, and training sessions. at ($p>0.05$). in pre-test, post-test I, and post-test II.

The study's results concur with (Ahmed & and Hassan's, 2021) analysis revealing that the age group (20–30) years had a mean SD of (31.5± 6.92) years, which is consistent with the results of this study. [7]

This study's findings contradict the study done by Hadi and Fadhil (2020). entitled Evaluation of Staff Nurses' Performance at Primary Health Care Centers in Baghdad City, which showed that the largest percentages of study samples were in the age group (30-40 years) [8].

Male nurses predominated in the field (91.3%). whereas women make up the least amount (8.7%). According to the researcher, this indicates that the Pediatric Surgery Center is subordinate to the Al-Khansa Obstetrical and Gynecological Teaching Hospital. As a result, the female nurses are assigned to work in the obstetric wards, and it stands to reason that the male nurses will work in both the pediatric wards and the surgery center.

The findings of this research are consistent with a study done by Atiyah et al., (2012) entitled Evaluation of Nurses' Nurses' practices. The study's findings indicated that 14 nurses were female and 41 nurses (74.5%) were male. **[9]**

This study's results correspond with the study Thiabm and Baker., (2021) conducted in Al-Anbar Governorate Hospitals to assess nurses' knowledge and practices about Enteral Feeding at Critical Care Units in Hospitals found that the mainstream of nurses in the current study were male (81.4%) and female (18.6%) [10].

In terms of marital status, the majority of them (91,3%) are married. According to the researcher, in our culture, when a person has a job, he or she attempts to marry.

According to the findings of a survey done at the AL-Hussein Medical City Hospital (2021) in Holy Karbala, Iraq, more than two-thirds of the nurses (76%) were married [11].

In terms of education level, more than half of the participants are diploma degree graduates 15 nurses (65.2%), two are master's degree graduates (8.7%), and the remainder are bachelor's degree and high school nursing graduates (3 nurses, 13%).

According to the researcher, the number of nursing institutes in the Nenavah governorate was greater than the number of other nursing schools and colleges until a short time ago; consequently, the number of graduates from nursing institutes is significantly higher than the number of graduates from other nursing schools and colleges. In addition, the institute level has multiple departments designated as nursing positions More than half of the participants are diploma degree graduates 15 nurses (65.2%), two are master's degree graduates (8.7%), and the remainder are bachelor's degree and high school nursing graduates (3 nurses, 13%).

This study's findings are comparable to those of the study in Al-Anbar Governorate Hospitals revealed that the majority of nurses (75.2%) were graduates from nursing school. [10].

Regarding their nursing work, (60.9%) of them have operated for less than 5 years, and (30.4%) of each nurse has worked for (5-10) years, the researcher believes that this is due to administrative reasons represented in the distribution of staff and the ill-conceived transfer of nursing staff. In terms of years of intensive care experience, one-third of participants had fewer than three years.

It is possible to interpret these results in a manner that provides empirical support. Concerning the nursing standards for intravenous infusion, analysis of such a comprehensive evaluation demonstrates that nurses have demonstrated poor practices. However, once the intervention program was put in place, such practices were better in the post-test I. In post-test II, nurses' use of these treatments is still strongly encouraged. This can be a result of the nurses' sincere commitment to implementing the intervention program's best practices in their regular jobs. As a result, their processes have undergone a significant update. A dearth of expertise due to a lack of years working in intensive care for newborns, as well as a lack of opportunities to partake in specialized training courses, may be one of the most significant factors.

At the end of the course of data analysis, the relationship between nurses' practices of post-operative care for infants with tracheoesophageal fistula and their socio-demographic data has been investigated.

According to the findings of this correlation, there is no statistically significant variation between nurses' practices of intravenous infusion, of post-operative care for infants with tracheoesophageal fistula, and their sociodemographic variables: age, gender, marital status, degree of education, years of experience in nursing, eons of practice in the NICU, and training sessions. at ($p>0.05$). in pre-test, post-test I, and post-test II.

Conclusion

Based on discussion and interpretations of the study's findings, the following conclusion is reached:

1. The postoperative intravenous infusion of nurses for neonates with tracheoesophageal fistula has been substandard relative to the standards of nursing procedures.
2. It is confirmed that the intervention program is an effective means of enhancing nurses' post-operative intravenous infusion for neonates with tracheoesophageal fistula.

Recommendations

Based on the early derived conclusion, the study recommends that:

1. The Intervention Program can be used by the Ministry of Health and Environment to supplement nurses' post-operative care for newborns with tracheoesophageal fistulas.
2. Continuing education courses and training sessions can be designed, structured, and implemented on a regular base for the benefit of nurses who perform such procedures.

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