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ORIGINAL ARTICLE

Effectiveness of the Interventional Program on Nurses' Practices about Enteral Feeding Tube for Premature Neonates in the Neonatal Intensive Care Unit

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ABSTRACT

Background: Nurses who are members of the health-care team are responsible for monitoring the dietary requirements of babies. Those who care for newborns in neonatal intensive care units (NICUs) must be well-versed in nutrition and feeding techniques, and they must follow scientifically verified recommendations when doing their duties.

Objective: This aims to evaluate the effectiveness of the interventional program on nurses' practices about enteral feeding tube for premature neonates in the neonatal intensive care unit.

Methodology: A quasi-experimental design using test-retest approach for study group and control group participants employed in Kirkuk City Hospitals being, evaluated in three periods pre-test, post-test-1, and post-test-2. The interventional program being delivered as classroom lectures for participant. Data collection is done by self-administrated questionnaire form, and it was given for nurses to answer after taking their agreement. A non - probability purposive sample selected from nurses who were working at the neonatal intensive care units. The sample was forty nurses, (20) nurses enrolled as a control group and (20) nurses enrolled as a study group. The study group participants were exposed to an interventional program. The selection criteria included Only neonatal nurses' who have from (1-20 and more) years of experience in the neonatal intensive care unit.

Results: The findings in this table indicated that there is improvement in the nurses practice related to the insertion of the enteral feeding tube for the premature neonates and initiating continuous enteral feeding in the 1st period of (pretest and Posttest I) than (study group) in the 2nd period (pretest and posttest II) in item (number 1) by suggested sign score of assessment through the relative sufficiency.

Conclusion: The interventional program demonstrated a favorite effect on nurses' practice regarding the insertion of enteral feeding tubes and initiation continuous enteral feeding tube for the premature neonates.

Keywords: Interventional Program, Nurses, practices, Enteral Feeding Tube, Premature Neonates, Neonatal Intensive Care Unit.

INTRODUCTION

Nurses who are a member of the health care team keep an eye on the nutritional needs of newborns. Those caring for newborns in neonatal intensive care units (NICUs) must be experienced in nutrition and feeding methods, and they must adhere to scientifically validated recommendations when doing so (Oznur et al., 2019) [1].

Neonates require nutritional assistance on a daily basis. This should be started immediately as the newborn is admitted and continued for as long as the infant is not feeding satisfactorily. Since it is an optimised nutrient intake during the hospitalization in the Neonatal Intensive Care Unit, the neonate's brain is uniquely sensitive to nutrition, and other organs and tissues are at critical developmental stages in infanthood; (NICU). It could also help with long-term neurodevelopment and health outcomes (Burdall et al., 2017) [2].

The blind installation of a feeding tube, while commonly thought to be a harmless surgery, can lead to serious and even fatal consequences. Because tube feedings are used by patients of all ages, even a tiny percentage of difficulties can affect a large group of people (Metheny et al., 2007) [3].

Because of these constraints, neonates are unable to obtain the nutrients necessary for growth, development, healthy bodily functioning, and organism renewal by natural means. It may be required to employ enteral or parenteral nutrition in certain circumstances. Pregnancy age, birth weight, the accessibility of food sources, nutritional strategy, the existence of development failures and metabolic changes generated by illnesses and medicines for newborns should be taken into consideration when selecting one of these ways (Oznur, 2019) [1].

Nasogastric tube feeding is recommended for newborns with gastrointestinal problems, comatose babies, babies whose breathing is faster than normal or who require the use of a mechanical ventilator, and premature babies (Corpeleijn et al., 2011) [4].

The indications of an NG tube for a low-birth-weight kid or newborn range from respiratory distress syndrome, neonatal infections, and issues associated to congenital anomalies, dehydration, and electrolyte imbalances to dehydration and electrolyte imbalances. However, due to the rapid expansion of feeding via this method, the number of very premature babies who developed necrotizing enterocolitis (NEC) after receiving enteral nourishment increased (Parker et al., 2013) [5].

Enteral nutrition is the process of providing food to the intestines through with a tube or other device. Many youngsters rely on enteral feedings to enhance their nutrition or to provide them with a complete meal. Feeding regimens, withdrawal from tube feeding, sensory ramifications of tube feeding, management of pain or nausea accompanied with eating, oral-motor difficulties,

and behavioral concerns in the child and family are all issues that must be addressed by a team of physicians (Edwards et al., 2016) [6].

One of the most difficult and critical elements of newborn care is providing adequate nutrition to very low birthweight (VLBW) infants in the NICU (Corpeleijn et al., 2011) [4]. Despite the fact that enteral nutrition is the preferred form of nutritional administration, the risk of necrotizing enterocolitis (NEC) and feeding intolerance (FI) makes decisions about beginning and progression challenging and contentious. The ultimate objective of enteral feeding is for children to grow and develop normally while avoiding complications such as NEC and FI. Unfortunately, decisions on enteral nutrition, such as when to start and how fast to progress, as well as when to stop and how to give it, are contentious and frequently based on personal or institutional preferences rather than scientific data (Parker et al., 2013) [5].

METHODOLOGY

The study was designed as a quasi-experimental design using test-retest approach for study group and control group participants employed in Kirkuk City Hospitals being, evaluated in three periods pre-test, post-test-1, and post-test-2.

The study group participants are tested prior implementing the interventional program, the interventional program lectures started from (15th - 22th of February 2022 to the study group) then post-test-1 conducted for control and study group (in 23th – 24th February 2022) then one month the posttest-2 had been conducted (in 23th – 24th March 2022).

The interventional program being delivered as classroom lectures for participant. Data collection is done by self-administrated questionnaire form, and it was given for nurses to answer after taking their agreement.

A non - probability purposive sample selected from nurses who were working in the neonatal intensive care units in Azadi Teaching Hospital, Kirkuk General Hospital, Pediatric Hospital, and Gynecology and Pediatric Hospital. The sample was 40 nurses, (20) nurses enrolled as a control group and (20) nurses enrolled as a study group. The study group participants were exposed to an interventional program. The selection criteria included Only neonatal nurses' who have from (1-20 and more) years of experience in the neonatal intensive care unit.

The data analysis approaches were used in order to analyze and assess the results of the study under the application of the statistical package (SPSS) ver. (22.0).

RESULTS OF THE STUDY

Table 1: Comparison among Three Periods (pre, post-I and post II tests) for Nurses' practice toward insertion of the enteral feeding tube for the premature neonates Control Group

Questions Related to practice	Pre-Test		Post I Test		Post II Test		ANOVA		
	Mean	Eva.	Mean	Eva.	Mean	Eva.	F	P-value	C.S.
Putting instructions for contraindications and explanatory signs on the door of the room of the premature neonates	1	L	1	L	1.1	L	1	.374	NS
Provide clarification on the steps and actions that must be taken to complete the intervention	1.1	L	1.1	L	1.15	L	.078	.925	NS
Washing hands with soap and other disinfectants using standard sterile technology	1.1	L	1	L	1.05	L	.600	.552	NS
Wear medical paws before starting any procedure with the premature neonates	1	L	1.15	L	1.2	L	1.27	.290	NS
Prepare all the tools needed to perform the intestinal feeding tube for the premature neonates	1	L	1.05	L	1.1	L	1.04	.361	NS
Choosing the right size of the enteral feeding tube for a premature neonates	1.1	L	1.1	L	1.15	L	.078	.925	NS
Determining the method of introduction through the nose or through the mouth	1	L	1.1	L	1.15	L	1.53	.226	NS
Determining the length of the tube on the body of the premature neonates, by measuring the distance from the stomach trench to the ear loop and then to the place of insertion (nose or mouth)	1.1	L	1.05	L	1.1	L	.145	.865	NS
Gently examine the nostrils to check that they are clear if the tube was inserted through the nose into the stomach	1.8	M	1.55	L	1.6	L	.444	.644	NS
Wetting the tube head before insertion	1	L	1.05	L	1.1	L	1.04	.361	NS
Supporting the head of the premature neonates by placing the hand behind his neck	1	L	1.1	L	1.1	L	.500	.609	NS
The enteral tube is placed perpendicular to the face of the premature neonates	1.1	L	1.15	L	1.2	L	.247	.782	NS
Inserting the intestinal tube in a gentle way while monitoring the condition of the premature neonates	1	L	1.05	L	1.1	L	.600	.552	NS
Monitoring the level of oxygen and the number of heartbeats with the state of consciousness of the premature neonates	1.1	L	1.15	L	1.15	L	.107	.899	NS
Monitoring the state of respiration with monitoring of the number of breaths per minute After completing the enteral tube insertion	1	L	1.15	L	1.25	L	1.47	.239	NS
Ensure that the tube is placed in the correct place by pushing	1.	L	1	L	1.05	L	1	.374	NS

a few ml of air into the syringe Put the stethoscope on the stomach trench and make sure to hear gurgling sounds									
Intake of air using the same syringe and make sure that gastric juice appears	1.	L	1	L	1.05	L	1	.374	NS
Fixation of the enteral tube by placing a plaster on the enteral tube	2	M	1.85	M	1.9	M	.127	.881	NS
Put a piece of plaster on it, the size of the tube and the date of insertion	1	L	1.05	L	1.1	L	1.04	.361	NS
Remove medical paws in the appropriate manner and wash hands	1.1	L	1.1	L	1.2	L	.352	.705	NS

ANOVA= Analysis of Variance, Eva= evaluation , d.f= degree of freedom, F= F-test, p: probability, C.S. : Comparison, Significant , NS : Non Significant at P > 0.05 , Eva.= evaluation level of mean score, L=low level (1-1.66), M=moderate level (1.67-2.33), H=high level (2.34-3)

The finding in this table revealed that nurses (control group) have low level of practice toward insertion of the enteral feeding tube for the premature neonates at the pretest, posttest I & posttest II at mean in the low level of practice class (1-1.66). Also, there is no significant statistical different between then mean score of nurses practice at three period of test. This is indicated that nurses level of practice in the control group had not improved because they were not received the training session of the educational program.

Table 2: Comparison among Three Periods (pre, post-I and post II tests) for Nurses' practice toward Initiating continuous enteral feeding Control Group

Questions Related to practice	Pre-Test		Post I Test		Post II Test		ANOVA		
	Mean	Eva.	Mean	Eva.	Mean	Eva.	F	P-value	C.S.
Provide clarification on the steps and actions that must be taken to complete the intervention	1	L	1.1	L	1.15	L	1.53	.226	NS
Washing hands with soap and other disinfectants using standard sterile technology	1.6	L	1.4	L	1.45	L	.338	.715	NS
Wear medical paws before starting any procedure with the premature neonates	1	L	1.05	L	1.1	L	1.04	.361	NS
Withdraw the prescribed amount of milk from the bottle as directed by the doctor	1	L	1.05	L	1.1	L	1.04	.361	NS
Put a label showing the type of milk and the date and time it was given	1.7	M	155	L	1.5	L	.268	.766	NS
Make sure to observe the correct procedure for setting up the continuous feeding pump	1	L	1.05	L	1.05	L	.500	.609	NS
Check that the tube is in the correct position and the tape is secure (observe hourly).	1	L	1	L	1.2	L	2.11	.130	NS
Aspirate gastric tube at least once per shift to confirm placement and determine residual volume	1.6	L	1.45	L	1.45	L	.221	.802	NS
Check that the correct ml/kg are calculated daily	1.8	M	1.6	L	1.6	L	.339	.714	NS
Determine the measurement of the infant's body weight and document it according to the doctor's instructions	1	L	1.1	L	1.15	L	1.53	.226	NS
Observing for spills and abdominal distension.	1	L	1.05	L	1.15	L	1.21	.306	NS
Accurately record the amount of feeding every hour or every feeding	2.2	M	1.8	M	1.8	M	1.13	.329	NS
Ensure that the amount of breast milk/milk mixture in the bottle is recorded	2.2	M	1.95	M	1.95	M	.484	.619	NS
Maintain the correct hourly rate of the continuous feeding pump and the exact total volume given	1	L	1.1	L	1.1	L	1.06	.355	NS
Checking and signing the balance schedule each time the rate is changed and when the shift is changed	1.1	L	1.1	L	1.15	L	.078	.925	NS
Change the tube at the appointed time and clearly label it with the date and time	1	L	1.05	L	1.05	L	.500	.609	NS
Gastric tube is aspirated 6 hourly and documented	1	L	1.15	L	1.2	L	1.27	.290	NS
Only use four hours worth of milk at a time (unless otherwise specified on the bottle label)	1	L	1.1	L	1.15	L	.796	.456	NS
Examination of the child's clinical condition by monitoring vital signs	2.3	M	1.85	M	1.9	M	1.32	.275	NS
Remove medical paws in the appropriate manner and wash hands	1.1	L	1.1	L	1.15	L	.117	.890	NS

ANOVA= Analysis of Variance, Eva= evaluation , d.f= degree of freedom, F= F-test, p: probability, C.S. : Comparison, Significant , NS : Non Significant at P > 0.05 , Eva.= evaluation level of mean score, L=low level (1-1.66), M=moderate level (1.67-2.33), H=high level (2.34-3)

The finding in this table revealed that nurses (control group) have low level of practice Initiating continuous enteral feeding at the pretest, posttest I & posttest II at mean in the low level of practice class (1-1.66). Also, there is no significant statistical different between then mean score of nurses practice at three period of test. This is indicated that nurses level of

practice in the control group had not improved because they were not received the training session of the educational program.

Table 3: Comparison among Three Periods (pre, post-I and post II tests) for Nurses' practice toward insertion of the enteral feeding tube for the premature neonates study Group

Questions Related to practice	Pre-Test		Post I Test		Post II Test		ANOVA		
	Mean	Eva.	Mean	Eva.	Mean	Eva.	F	P_{-value}	C.S.
Putting instructions for contraindications and explanatory signs on the door of the room of the premature neonates	1.3	L	2.4	H	2.35	H	10.1	.000	HS
Provide clarification on the steps and actions that must be taken to complete the intervention	1	L	2.95	H	2.95	H	670	.000	HS
Washing hands with soap and other disinfectants using standard sterile technology	1	L	2.5	H	2.45	H	27.6	.000	HS
Wear medical paws before starting any procedure with the premature neonates	1	L	2.6	H	2.70	H	45.1	.000	HS
Prepare all the tools needed to perform the intestinal feeding tube for the premature neonates	1.1	L	3.0	H	3.00	H	361	.000	HS
Choosing the right size of the enteral feeding tube for a premature neonates	1.6	L	3.0	H	3.00	H	44.3	.000	HS
Determining the method of introduction through the nose or through the mouth	1	L	2.3	M	2.25	M	23.8	.000	HS
Determining the length of the tube on the body of the premature neonates, by measuring the distance from the stomach trench to the ear loop and then to the place of insertion (nose or mouth)	1	L	2.7	H	2.40	H	49.4	.000	HS
Gently examine the nostrils to check that they are clear if the tube was inserted through the nose into the stomach	1.6	L	3.0	H	2.90	H	33.8	.000	HS
Wetting the tube head before insertion	2.4	H	3.0	H	2.95	H	7.12	.002	HS
Supporting the head of the premature neonates by placing the hand behind his neck	1.7	M	3.0	H	2.95	H	32.3	.000	HS
The enteral tube is placed perpendicular to the face of the premature neonates	2.3	M	3.0	H	2.95	H	9.08	.000	HS
Inserting the intestinal tube in a gentle way while monitoring the condition of the premature neonates	1	L	2.95	H	2.90	H	296	.000	HS
Monitoring the level of oxygen and the number of heartbeats with the state of consciousness of the premature neonates	2	M	3.0	H	2.85	H	13.5	.000	HS
Monitoring the state of respiration with monitoring of the number of breaths per minute After completing the enteral tube insertion	1	L	2.95	H	2.95	H	760	.000	HS
Ensure that the tube is placed in the correct place by pushing a few ml of air into the syringe Put the stethoscope on the stomach trench and make sure to hear gurgling sounds	1.2	L	3.0	H	2.90	H	106	.000	HS
Intake of air using the same syringe and make sure that gastric juice appears	1	L	2.95	H	2.90	H	296	.000	HS
Fixation of the enteral tube by placing a plaster on the enteral tube	1.6	L	2.6	H	2.65	H	9.96	.000	HS
Put a piece of plaster on it, the size of the tube and the date of insertion	1	L	2.4	H	2.40	H	25.2	.000	HS
Remove medical paws in the appropriate manner and wash hands	1.4	L	2.75	H	2.6	H	22.8	.000	HS

ANOVA= Analysis of Variance, Eva= evaluation , d.f= degree of freedom, F= F-test, p: probability, C.S. : Comparison, Significant , NS : Non Significant at $P > 0.05$, Eva.= evaluation level of mean score, L=low level (1-1.66), M=moderate level (1.67-2.33), H=high level (2.34-3)

The finding in this table revealed that nurses (study group) have low level of practice insertion of the enteral feeding tube for the premature neonates at the pretest, at mean in the low level of practice class (1-1.66). While, in the posttest I and posttest II nurses had high level of practice (2.34-3). Also, there is highly significant statistical different between then mean score of nurses practice at three period of test. This is indicated that nurses level of practice in the study group had improved due to the training session of the educational program.

Table 4: Comparison among Three Periods (pre, post-I and post II tests) for Nurses' practice toward initiating continuous enteral feeding study Group

Questions Related to practice	Pre-Test		Post I Test		Post II Test		ANOVA		
	Mean	Eva.	Mean	Eva.	Mean	Eva.	F	P-value	C.S.
Provide clarification on the steps and actions that must be taken to complete the intervention	1	L	2.7	H	2.3	M	36.9	.000	HS
Washing hands with soap and other disinfectants using	1.7	M	2.9	H	2.85	H	19.8	.000	HS

standard sterile technology									
Wear medical paws before starting any procedure with the premature neonates	2.1	M	2.9	H	2.5	H	5.27	.008	HS
Withdraw the prescribed amount of milk from the bottle as directed by the doctor	1.9	M	3.0	H	3.0	H	23.2	.000	HS
Put a label showing the type of milk and the date and time it was given	1	L	2.95	H	2.95	H	760	.000	HS
Make sure to observe the correct procedure for setting up the continuous feeding pump	1	L	2.9	H	2.4	H	87	.000	HS
Check that the tube is in the correct position and the tape is secure (observe hourly).	1	L	2.7	H	2.7	H	53.8	.000	HS
Aspirate gastric tube at least once per shift to confirm placement and determine residual volume	1	L	2.8	H	2.85	H	107	.000	HS
Check that the correct ml/kg are calculated daily	3	H	2.95	H	2.95	H	.500	.609	NS
Determine the measurement of the infant's body weight and document it according to the doctor's instructions	1	L	2.5	H	2.7	H	42.4	.000	HS
Observing for spills and abdominal distension.	1	L	2.95	H	2.95	H	760	.000	HS
Accurately record the amount of feeding every hour or every feeding	1	L	2.9	H	2.8	H	144	.000	HS
Ensure that the amount of breast milk/milk mixture in the bottle is recorded	3	H	2.95	H	2.95	H	.50	.609	NS
Maintain the correct hourly rate of the continuous feeding pump and the exact total volume given	2.2	M	3.0	H	3.0	H	12.7	.000	HS
Checking and signing the balance schedule each time the rate is changed and when the shift is changed	1.8	M	3.0	H	3.0	H	28.5	.000	HS
Change the tube at the appointed time and clearly label it with the date and time	1	L	2.65	H	2.8	H	72.2	.000	HS
Gastric tube is aspirated 6 hourly and documented	2.1	M	3.0	H	3.0	H	15.6	.000	HS
Only use four hours worth of milk at a time (unless otherwise specified on the bottle label)	1.6	L	3.0	H	3.0	H	44.3	.000	HS
Examination of the child's clinical condition by monitoring vital signs	3	H	2.95	H	2.95	H	.50	.609	NS
Remove medical paws in the appropriate manner and wash hands	1	L	2.9	H	2.6	H	94.4	.000	HS

ANOVA= Analysis of Variance, Eva= evaluation , d.f= degree of freedom, F= F-test, p: probability, C.S. : Comparison, Significant , NS : Non Significant at P > 0.05 , Eva.= evaluation level of mean score, L=low level (1-1.66), M=moderate level (1.67-2.33), H=high level (2.34-3)

The finding in this table revealed that nurses (study group) have low level of practice initiating continuous enteral feeding at the pretest, at mean in the low level of practice class (1-1.66). While, in the posttest I and posttest II nurses had high level of practice (2.34-3). Also, there is highly significant statistical different between then mean score of nurses practice at three period of test. This is indicated that nurses level of practice in the study group had improved due to the training session of the educational program.

DISCUSSION

Discussion of nurses' practice toward insertion of the enteral feeding tube for the premature neonates in the control and study group: Through using results from the pretest, posttest I, and posttest II, it can be concluded that the nurses in the control group have a poor degree of practice when it comes to inserting an enteral feeding tube for premature newborns. Nurses' mean scores during three periods of testing show no statistically significant difference (Table 1). This shows that the control group's level of nursing practice did not improve as a result of not participating in the interventional program's training sessions.

Using Table (3), it was discovered that nurses (study group) have a low level of practice insertion of the enteral feeding tube for premature infants at the pretest, with an average level of practice falling into the low level of practice class. However, nurses demonstrated a high level of practice in both the posttest I and posttest II. Additionally, there is a statistically significant difference in the mean score of nurses' practice at each of the three periods of the test. Consequently, it can be concluded that the training session of the interventional program had an influence on the level of practice of the research group's nursing staff.

All clinicians inserting NG/NE tubes should get sufficient training and undergo competency testing to provide the best possible patient outcomes. This is merely a guideline that should be used appropriately to each institution, but a systematic approach to tube placement is critical (Powers et al., 2021) [7].

We discovered that after participating in the interventional program, neonatal intensive critical care nurses' practices regarding enteral feeding dramatically improved. Other researchers corroborate this conclusion, observing an improvement in nurses' parenteral nutrition practice following a four-session instruction program (Al-Rafay & Al-Sharkawy, 2012) [8]. This was in contrast to the findings of Ameri et al. (2016) [9], who discovered no change in nursing practice following a single session of parenteral feeding training. These findings indicate that further research on the duration, nature, and manner of an education program is necessary. The large change in a number of individual practices items in this study indicates

that critical care nurses require additional education about these practices, particularly given their low pre-test scores. As a result, it is recommended to provide a comprehensive in-service education program to help bridge the gap between evidence-based nutritional practice and actual practice (Kim & Chang, 2018) [10].

Discussion of nurses' practice toward initiating continuous enteral feeding tube for the premature neonates in the control and study group: The results of the pretest, posttest I, and posttest II revealed that nurses (control group) had a low level of practice initiating continuous enteral feeding at the pretest, posttest I, and posttest II at the mean, placing them in the low level of practice class. Furthermore, there is no statistically significant difference between the mean score of nurses practicing at three different periods of the test (Table 2). This indicates that the level of practice of nurses in the control group did not improve because of the fact that they did not participate in the interventional program's training sessions.

Nursing students (study group) had a low level of practice initiating continuous enteral feeding at the time of the pretest, with the mean score falling into the low level of practice class. However, nurses demonstrated a high level of practice in both the posttest I and posttest II. Additionally, there is a statistically significant difference in the mean score of nurses' practice at each of the three periods of the test (Table 4). This indicates that the nurses' level of practice in the study group had improved as a result of the training session provided by the interventional program, which is encouraging.

In the same context as this study, previous research has revealed that initiating early enteral feedings protects the developing premature GI system and likely contributes to the prevention of later GI disorders and sepsis, independent of the infant's gestational age. As described in this study, enteral feeding was initiated predominantly on the basis of gestational age and birth weight. Enteral tube feeding has been reported to be contraindicated based on a variety of clinical circumstances, including treatment for a PDA, the presence of umbilical catheters, the requirement for vasopressor medication, and oxygen consumption (Gregory & Connolly, 2012) [11].

In terms of enteral feeding initiation, while 45% of respondents claimed they had no precise target period in mind, 24% stated they would initiate within 4–6 hours of PICU admission (Tume et al., 2013) [12].

CONCLUSION

The interventional program demonstrated a favorite effect on nurses' practice regarding the insertion of enteral feeding tubes and initiation continuous enteral feeding tube for the premature neonates, as nurses' practice in the control group had not improved after the interventional program because they were not received the training sessions. While the study group's nurses' practice has increased because of the interventional program's training sessions.

Recommendation: Give a special attention to nurses' skills and practice especially those who are recently employed. Adopting such interventional programs to be taught for nurses in different hospitals nationally and internationally.

REFERENCES

1. Oznur, B., Dilara, K., & Turkan, K. (2019). Enteral and parenteral feeding of neonate. Journal of Neonatal Nursing, 25(3), 107–110. https://doi.org/10.1016/j.jnn.2018.10.003
2. Burdall, O. C., Howarth, L. J., Sharrard, A., & Lee, A. C. H. (2017). Paediatric enteral tube feeding. Paediatrics and Child Health (United Kingdom), 27(8), 371–377. https://doi.org/10.1016/j.paed.2017.05.001
3. Metheny, N. A., Meert, K. L., & Clouse, R. E. (2007). Complications related to feeding tube placement. Current Opinion in Gastroenterology, 23(2), 178–182. https://doi.org/10.1097/MOG.0b013e3280287a0f
4. Corpeleijn, W. E., Vermeulen, M. J., Van Den Akker, C. H., & Van Goudoever, J. B. (2011). Feeding very-low-birth-weight infants: our aspirations versus the reality in practice. Annals of Nutrition and Metabolism, 58(Suppl. 1), 20–29.
5. Parker, L. A., Neu, J., Torrazza, R. M., & Li, Y. (2013). Scientifically Based Strategies for Enteral Feeding in Premature Infants. NeoReviews, 14(7), e350–e359. https://doi.org/10.1542/neo.14-7-e350
6. Edwards, S., Davis, A. M., Bruce, A., Mousa, H., Lyman, B., Cocjin, J., Dean, K., Ernst, L., Almadhoun, O., & Hyman, P. (2016). Caring for tube-fed children: A review of management, tube weaning, and emotional considerations. Journal of Parenteral and Enteral Nutrition, 40(5), 616–622. https://doi.org/10.1177/0148607115577449
7. Powers, J., Brown, B., Lyman, B., Escuro, A. A., Linford, L., Gorsuch, K., Mogensen, K. M., Engelbrecht, J., Chaney, A., McGinnis, C., Quatrara, B. A., Leonard, J., & Guenter, P. (2021). Development of a Competency Model for Placement and Verification of Nasogastric and Nasoenteric Feeding Tubes for Adult Hospitalized Patients. Nutrition in Clinical Practice, 36(3), 517–533. https://doi.org/10.1002/ncp.10671
8. Ameri, Z. D., Vafaee, A., Sadeghi, T., Mirlashari, Z., Ghoddoosi-Nejad, D., & Kalhor, F. (2016). Effect of a comprehensive total parenteral nutrition training program on knowledge and practice of nurses in NICU. Global Journal of Health Science, 8(10), 135.
9. Kim, H., & Chang, S. J. (2018). Australian Critical Care Implementing an educational program to improve critical care nurses ' enteral nutritional support. Australian Critical Care, 1–5. https://doi.org/10.1016/j.aucc.2018.04.001
10. Gregory, K. E., & Connolly, T. C. (2012). Enteral feeding practices in the NICU results from a 2009 neonatal enteral feeding survey. Advances in Neonatal Care, 12(1), 46–55. https://doi.org/10.1097/ANC.0b013e3182425aab
11. Al-Rafay, S. S., & Al-Sharkawy, S. S. (2012). Educational outcomes associated with providing a comprehensive guidelines program about nursing care of preterm neonates receiving total parenteral nutrition. Clinical Nursing Research, 21(2), 142–158.
12. Tume, L., Carter, B., & Latten, L. (2013). A UK and Irish survey of enteral nutrition practices in paediatric intensive care units. British Journal of Nutrition, 109(7), 1304–1322. https://doi.org/10.1017/S0007114512003042