

Effect of Educational Nursing Guidelines Regarding Enteral Feeding on Nurses' Knowledge and Practices at Critical Care Units

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Abstract: Background; Administration of enteral nutrition has long been considered the standard of care for nutrition support in critical care units. The study aimed to assess the effect of educational nursing guidelines regarding enteral feeding on nurses' knowledge and practices at critical care units. A quasi-experimental design was used in this study. The study was conducted in general intensive care unit and surgical, emergency care unit at Benha University Hospital. A convenient sample of all available nurses (55) nurses working in the previous setting was used. Two tools were used for data collection; a self-administered questionnaire tool for nurses to assess nurses' knowledge regarding enteral feeding and an observational checklist for nursing practices regarding enteral nutrition. The results of this study revealed that two thirds of the studied nurses were between the ages of 18 to less than 25 years, with Mean \pm SD (23.8 \pm 2.3) and more than two thirds of them had 1 to less than 5 years of experience in ICU nursing. The study concluded that the educational nursing guidelines documented a positive impact on nurses' knowledge and practices regarding enteral feeding at post and follow up implementation of educational guidelines. The study recommended that continuous training programs should be conducted to improve and update nurses' knowledge about care of patients with nasogastric tube. All nurses should be educated and trained about safe administration of enteral feeds and provision of nurses with simple illustrated booklets and posters related to medications' administration via enteral route and food-drugs interactions.

Keywords: Educational; Nursing Guidelines; Enteral Feeding; Nurses' Knowledge and Practices.

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I. Introduction

Enteral nutrition of critically ill patients has become a standard of care in intensive care units (ICUs). Early initiation of enteral feeding is recommended in international guidelines as early nutrition associated with decreased mortality, improves clinical outcomes, reduces gastric intolerance, and promotes early reestablishment of gastroduodenal motility [1]. Enteral tube feeding includes nasogastric feeding, nasoduodenal, gastrostomy and jejunostomy. Nasogastric tubes are usually the primary route for enteral feeding [2].

Nutritional support has become a routine part of the care of the critically ill patient [3]. Feeding the critically ill patient is a unique challenge in nutritional management [4]. Critically ill patients require special attention to prevent muscle wasting and to avoid overfeeding and complications associated with nutritional care [5]. Enteral feeding is used for the patient who has at least some digestive capability but is unwilling or unable to consume enough feeding by mouth. Patients with profound anorexia and those experiencing severe stress that greatly increases their nutritional needs often benefit from tube feeding. However, enteral feeding is contraindicated when patients experience refractory diarrhea, vomiting, bowel obstruction, and when gastrointestinal tract is not intact [4].

Nutritional care forms part of successful medical treatment and nursing care. So, nurses play a key role in implementing the nutritional plan of care for critically ill patients, including advocating for early commencement of enteral nutrition, assessment of calorie requirements, and initiating and administering the nutritional formulas. Deficits in nursing knowledge, lack of compliance with nutritional guidelines, and unsatisfactory level of practice contribute to malnutrition and underfeeding in critically ill patients [6].

Critical care nurses are responsible for delivering prescribed nutrition, fluid and medication safely and effectively. They are also responsible for ascertaining enteral nutrition volume and quality of given formula,

administering nutritional formulas, observing food intake, assessing the nutritional status of patients, giving education about nutrition, assessing and providing the routine for patients on tube feeding [1].

Aim of the Study

This study aimed to assess the effect of educational nursing guidelines regarding enteral feeding on nurses' knowledge and practices at critical care units.

Research Hypothesis: Implementing of educational nursing guidelines will affect positively on post-test nurses' knowledge and practices scores related to enteral feeding compared with pretest scores.

II. Subjects And Method

Design: Quasi-experimental study design was used in this study.

Setting: The study was conducted in General Intensive Care Unit (ICU) and Surgical & Emergency Care Unit at Benha University Hospital.

Subjects: A convenient sample of all available nurses (55), who provide nursing care for patients with enteral tube feeding and working in previously mentioned setting.

-Tools for data collection:

Tool I: Self-Administered Questionnaire Tool for nurses

Part 1: Demographic characteristics: it was used to assess nurses' personal characteristics, this included (age, gender, qualifications, period of experience, marital status, attending training courses and existence of written guidelines). It composed of (7) closed ended questions.

Part 2: Questionnaire about enteral feeding: it was developed and translated by the researcher based on reviewing the related literature [7], [2], [10] and [24] to assess nurses' knowledge regarding enteral feeding before and after implementing educational nursing guidelines. This part composed of (4) yes and no questions and (41) multiple choice questions.

Scoring system:

Each correct answer scored a one point and each incorrect answer scored a zero. Regarding knowledge items by "Yes" response, it was scored a one and if the response "No", it was scored a Zero. The total score for all questions related to nurse's knowledge was 135 points which represented (100 %)

Tool II: Observational Checklist for nursing practices regarding enteral nutrition

It was adopted from [8], [9] and [11] to assess the nurses' practices regarding enteral feeding in the clinical field before and after implementing educational nursing guidelines.

Scoring system:

Scoring system was graded as follows: done correctly (1) and not done (0), if the nurse did it incorrectly or didn't do it at all. Total score of all practices were 111 grades. Total score represented 100%.

Preparatory phase:

It included reviewing of past and current related literature and theoretical knowledge of various aspects of the study using books, articles, exploring internet and periodical magazines to develop the tools for data collection.

Content validity:

Tools content validity was ascertained by 7 experts in the related field to check the relevancy, clarity, comprehensiveness, and applicability of the questions.

Reliability:

Reliability of the developed tools was estimated using the Chronbach's Alpha test to measure the internal consistency of the tool. The reliability of the self-administered knowledge questionnaire and enteral feeding observational checklists were measured using Cronbach's alpha test and the values of Cronbach's alpha were (0.855) and (0.863) respectively.

Pilot study:

A pilot study was carried out on 10% of the study subjects (6 nurses) in order to test applicability and clarity of the data collection tools.

Field work:

After the study protocol has been approved, an official permission was taken from the director of Benha University hospital after explanation of the purpose of the study.

I-Phase one: "Assessment Phase"

During this phase, Practice checklist was filled by the researcher. The nurse's practice was assessed using the continuous observation method throughout each procedure. The researcher utilized the data collection tool I "Self- Administered Questionnaire Tool" to collect the required data.

II-Phase two: "Planning Phase"

Enteral feeding guidelines was developed in Arabic language by the researcher based on nurses' needs after and reviewing the most recent literature and provided in a form of a booklet. Development of these guidelines was based on the result of the questionnaire sheet and the conclusion& recommendations of relevant studies. Then it was revised by the supervisors and reviewed by jury of 7 experts in medical- surgical nursing and Faculty of Medicine in Benha University to confirm content validity.

III-Phase three: "Implementation Phase"

- The content of the educational guidelines was introduced in six educational and training sessions.
- During this phase, nurses were divided into small groups (3-4 nurses/session). Each group received the same program content using the same teaching strategies and handout.

IV-Phase four: "Evaluation Phase"

-Each nurse in the study was interviewed immediately after implementing the educational guidelines (immediate post-test evaluation) and data was collected using tool I.

-Nurses' practice was observed by the researcher to fill out tool II.

-Nurses were reevaluated one month after implementing the educational guidelines (follow up evaluation).

III. Result

Table (1): indicates that 65.5% of the studied nurses were between the ages of 18 to less than 25 years, with Mean \pm SD (23.8 \pm 2.3) and 69.1% of them had 1 to less than 5 years of experience in ICU nursing with Mean \pm SD (2.6 \pm 1.8). There were no written guidelines about enteral nutrition in the study setting.

Table{2): illustrates that illustrates that mean knowledge scores regarding nursing care of enteral feeding were Mean \pm SD (11.1 \pm 6.4, 19.0 \pm 4.4 & 18.9 \pm 5.3) at pre, post and follow up implementation of guidelines respectively. On the other hand, mean knowledge scores regarding NGT insertion were Mean \pm SD (2.3 \pm 1.4, 4.7 \pm 1.2& 4.7 \pm 1.4) at pre, post and follow up implementation of guidelines respectively.

Table (3): clarifies that mean score of nurses' practice regarding enteral feeding Mean \pm SD (14.8 \pm 4.4) at pre implementation of guidelines, while mean scores of nurses' practice regarding enteral feeding were Mean \pm SD (22.1 \pm 5.5 & 21.4 \pm 5.9) at post and follow up implementation of guideline respectively. In addition, mean score of nurses' practice regarding NG tube removal Mean \pm SD (8.7 \pm 2.5) at pre, while mean scores of nurses' practice regarding NG tube removal Mean \pm SD (12.2 \pm 3.0& 11.8 \pm 3.4) at post and follow up implementation of guidelines respectively.

Table(4): describes that there was a highly statistical significant difference ($p \leq 0.001$) between total nurse's knowledge level and total practice level at pre implementation of guidelines and there was a statistical significant difference ($P < 0.05$) between total nurses' knowledge level and total practice level at post implementation of guidelines. While, there was no statistical significant difference ($P \geq 0.05$) between total nurses' knowledge level and total practice level at follow up implementation of guidelines.

Figure (1): reveals that the total nurses' knowledge mean score in pre implementation of guidelines was Mean \pm SD (60.0 \pm 31.2) while, in post implementation of guidelines Mean \pm SD (109.9 \pm 19.2).

Figure (2): shows that the total mean score of nurses' practice was Mean \pm SD (47.6 \pm 12.9) at pre, while total mean score of nurses' practice was Mean \pm SD (70.6 \pm 16.4) at post implementation of guidelines.

Table (1): Frequency and Percentage Distribution of the Studied Subjects (nurse) According to their demographic Characteristics (N=55).

Demographic Characteristics	No	=	%
	55		
Age / years:			
18-<25	36		65.5
25-<35	19		34.5
Mean \pm SD = 23.8 \pm 2.3			
Gender			
Males	3		5.5
Females	52		94.5
Qualifications			
Technical nurse	48		87.3
Bachelor of nursing	7		12.7

Years of Experience		
< 1year	6	10.9
1- <5 years	38	69.1
5- <10 years	11	20.0
Mean ±SD 2.6 ±1.8		
Presence of written guidelines regarding enteral nutrition		
Yes	0	0
No	55	100

Table (2): Mean of nurses' knowledge scores regarding enteral feeding at pre, post and follow up implementation of guidelines (N=55).

Nurses knowledge	Pre	Post	Follow up	ANOVA Test F =	P. Value
	Mean ±SD	Mean ±SD	Mean ±SD		
Nutritional assessment	5.9 ±3.3	9.9 ±2.1	9.8 ±2.6	39.972	<0.001 *
Definition of EF	5.3 ±2.3	8.7 ±1.4	8.6 ±1.8	57.838	<0.001 *
Indication & uses	4.5 ±2.3	7.3 ±1.3	7.3 ±1.7	42.364	<0.001 *
Contraindications	4.5 ±2.9	7.9 ±2.1	7.8 ±2.5	32.456	<0.001 *
Insertion of NGT	2.3 ±1.4	4.7 ±1.2	4.7 ±1.4	63.419	<0.001 *
Enteral Feeding	6.2 ±2.3	9.4 ±1.3	9.3 ±2.1	46.204	<0.001 *
Formulas' handling	8.3 ±4.1	13.3 ±2.7	13.2 ±3.7	35.387	<0.001 *
Medication admin	3.5 ±2.2	5.9 ±1.4	5.9 ±1.6	33.030	<0.001 *
Gastrostomy care	5.4 ±7.2	16.6 ±3.8	16.7 ±4.7	79.427	<0.001 *
Care of EF	11.1 ±6.4	19.0 ±4.4	18.9 ±5.3	38.374	<0.001 *
Complications	3.1 ±2.6	7.3 ±2.3	7.3 ±2.4	52.372	<0.001 *
Total knowledge	60.0 ±31.2	109.9 ±19.2	109.5 ±25.2	68.752	<0.001 *

Table (3): Frequency of satisfactory subtotal practice scores at pre, post and follow up implementation of guidelines (N=55).

procedure	Pre	Post	Follow up	ANOVA Test F=	P Value
	Mean ±SD	Mean ±SD	Mean ±SD		
NGT Insertion	12.9 ±3.3	18.6 ±3.8	18.2 ±4.2	38.792	<0.001**
Medications Administration	11.2 ±4.2	17.7 ±5.4	17.2 ±5.7	27.665	<0.001**
Enteral Feeding	14.8 ±4.4	22.1 ±5.5	21.4 ±5.9	31.892	<0.001**
NGT removal	8.7 ±2.5	12.2 ±3.0	11.8 ±3.4	22.001	<0.001**
Total Score of practice	47.6 ±12.9	70.6 ±16.4	68.6 ±17.1	36.782	<0.001**

Table (4): Relation between total nurses' knowledge level and total practice level at pre, post and follow up implementation of guidelines.

Level of practices	Level of knowledge											
	Pre				Post				Follow up			
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory	
	N	%	N	%	N	%	N	%	N	%	N	%
Satisfactory	7	12.8	0	0	33	60.0	4	7.2	30	54.6	3	5.4
Unsatisfactory	2	3.6	46	83.6	11	20.0	7	12.8	16	29.1	6	10.9
Chi-Square X ²	40.995				5.967				3.188			
P - value	<0.001				0.015				0.074			

Figure (1): Mean of total nurses' knowledge scores regarding enteral feeding at pre, post and follow up implementation of guidelines.

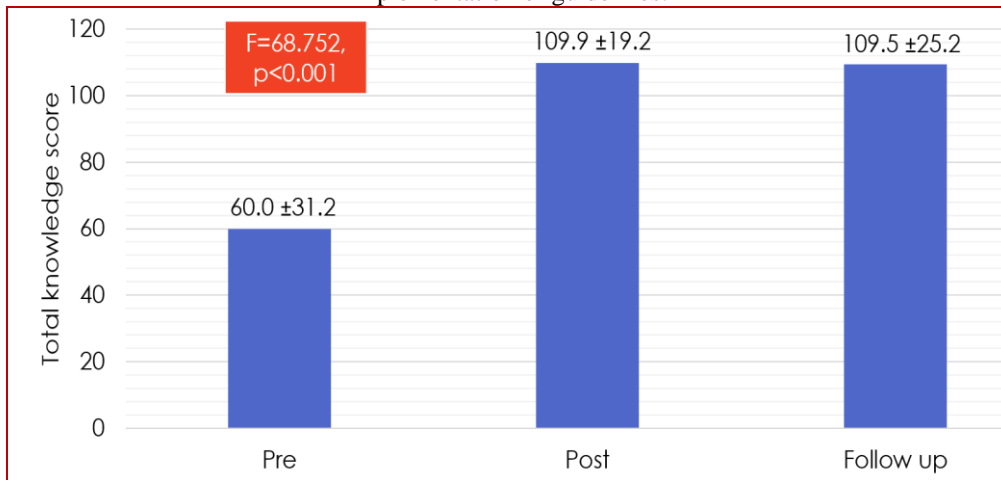
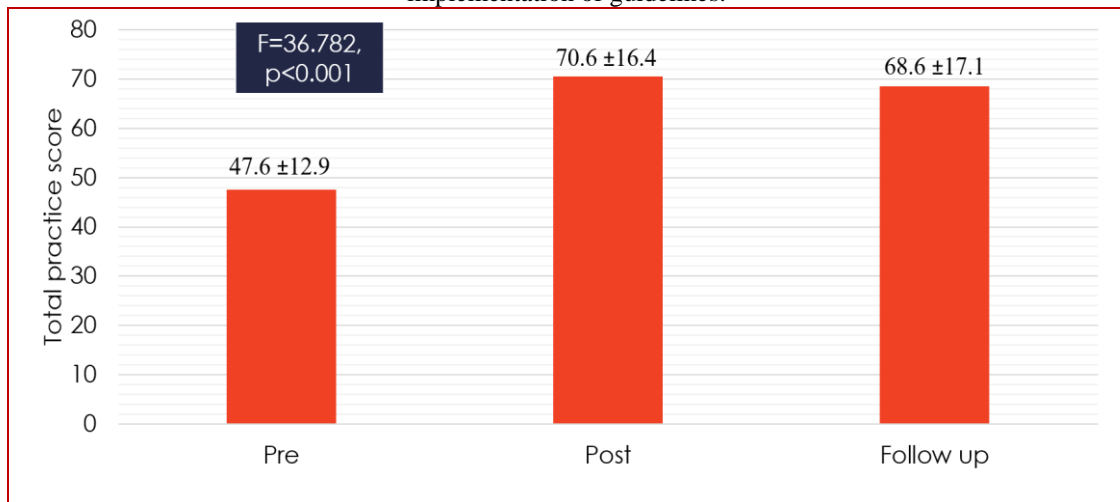


Figure (2): Total mean scores of nurses' practice about enteral feeding at pre, post and follow up implementation of guidelines.



IV. Discussion

Nurses in intensive care are in a key position to maintaining patients' nutritional status at an optimal level and closer to the nutritional goals [12]. Major attention must be focused on nurse's knowledge and performance regarding nasogastric tube because nurses have the major responsibility for providing patients with their essential nutrients without causing complications. As well as, continuous education and training of all hospital staff is essential to increase their awareness about important nursing procedures as nasogastric tube [13].

The results of the current study show that near to two thirds of the nurses were between the ages of 18 to less than 25 years old and with Mean \pm SD (23.8 \pm 2.3), this is in the same line with [12] in a study entitled "Critical Care Nurses' Knowledge and Skill regarding Enteral Nutrition in Critically Ill". He mentioned that the highest percentage of nurses in his study were between age group 18–25 years.

Concerning nurses' years of experience, more than two thirds of nurses in the current study had 1 to less than 5 years of experience in ICU nursing with Mean \pm SD (2.6 \pm 1.8). This finding is consistent with [14] who mentioned in their study that nurses had an average length of 2 years stay in the ICU and three fifths of participants had 0 - <1 year of experience.

The result of the present study shows that majority of studied subjects graduated from technical institute of nursing. This is consistent with [15] who emphasized that nursing institute was the most frequent educational attainment among the studied sample.

The findings of this study reveal there were no written guidelines about enteral nutrition in their workplaces. [23] reported that more than half of the studied sample sure about there was no available standard precaution guidelines about the enteral feeding procedure.

According to the findings of this study, the majority of nurses had unsatisfactory total knowledge score in pre implementation of guidelines. [16] In a study about “Nurses' Experience with the Clinical Application of a Research-Based Nursing Protocol in a Long-Term Care Setting” and concluded that the mean score of nurses' knowledge about NGT was less than one quarter before starting the educational program. [17] Also pointed that the knowledge of the nurses about enteral nutrition in the critical care department was low. In disagreement with this study, [6] stated that three fifths of respondents had good knowledge level about enteral nutrition and minority was excellent.

Concerning the effect of implementing the nursing educational guidelines, this study illustrates that the minority of nurses had unsatisfactory total knowledge score post implementing educational guidelines and there is a highly statistical significant difference ($p \leq 0.001$) in mean scores of total knowledge and all subtotal knowledge scores among pre, post and follow up implementation of educational guidelines. This means that the implementation of educational guidelines significantly improved nurses' knowledge about enteral feeding.

Similarly, [18] conducted a study entitled “A Comparison of Performing Nasogastric tube nutrition with the Standard Procedures at Selected Educational and Treatment Centers of Isfahan” cited that training course of enteral feeding was appropriately held for nurses and the results showed that their knowledge increased from 45% before training to 84%. [19] in a study done about “Development of Evidence-Based Guidelines and Critical Care Nurses Knowledge of Enteral Feeding” mentioned that more than two fifths of nurses in his study completed the questionnaire about enteral nutrition correctly and after the educational program, the majority completed the questionnaire correctly.

In this study mean score of nurses' total practice regarding enteral feeding in pre and post, implementation of educational guidelines was 47.6 ± 12.9 and 70.6 ± 16.4 respectively and 68.6 ± 17.1 in follow up implementation of educational guidelines. While, [20] illustrated that mean score of nursing performance regarding enteral nutrition in three measurements, was estimated 57.49 ± 9.58 .

The current study shows that there is a highly statistical significant difference ($p \leq 0.001$) between total nurse's knowledge level and total practice level in pre implementation of educational guidelines. [21] As well stated that there is relatively low statistical significance between nurses' knowledge and their performance. This is incongruent with [22] who mentioned in this study that the correlation between total information and practice regarding enteral feeding was very weak and not significant.

V. Conclusion

Based on the findings of the present study, the following could be concluded:

- The educational nursing guidelines documented a positive impact on nurses' knowledge and practices regarding enteral feeding at post and follow up implementation of educational guidelines.
- There was a highly statistical significant difference ($p \leq 0.001$) in mean scores of total knowledge among pre, post and follow up implementation of educational guidelines.
- There was a highly statistical significant difference ($p \leq 0.001$) in mean scores of total practice regarding enteral feeding among pre, post and follow up implementation of educational guidelines.
- Nurses' age, gender, qualifications and years of experience were found to be not significantly correlated with both knowledge and practices at pre, post and follow up implementation of educational guidelines. While, there was a highly statistical significant difference ($p \leq 0.001$) between marital status and total nurse's practice level at pre implementation of educational guidelines.

Recommendation

On the light of the findings of the current study, the following recommendations are suggested:-

- Providing educational programs about enteral nutrition focus on contraindications of enteral feeding, medications administration and nasogastric insertion based on evidence.
- Continuous training programs should be conducted to improve and update nurses' knowledge about care of patients with nasogastric tube.
- All nurses should be educated and trained about safe administration of enteral feeding.
- Provision of nurses with simple illustrated booklets and posters related to medications' administration via enteral route and food-drugs interactions.
- Nurses should be taught the necessary skills related to patients nutritional assessment.

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