

The Effect of Educational Guidelines on Nurse Performance for Patients Undergoing Percutaneous Laparoscopic Gastrostomy

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Abstract

Background: Percutaneous laparoscopic gastrostomy is a way to provide enteral access in patients unable to maintain adequate nutrition via the oral route. Educational Guidelines is the key to positive outcomes in patient requiring enteral feeding. **Aim:** This study aimed to evaluate the effect of educational guidelines on nurse performance for patients undergoing percutaneous laparoscopic gastrostomy. **Design:** A quasi-experimental design with pre/posttest was utilized to meet the aim of the study. **Setting:** This study was conducted at Gastroenterology Endoscopy unit in Medicine Hospital affiliated to Ain Shams University Hospital, Cairo. Egypt. **Study subject:** A convenience sample of all available nurses (30) caring for patients undergoing percutaneous laparoscopic gastrostomy in the previously mentioned unit. **Tools:** I. Nurses' self-administered questionnaire, II. Nurses' practice observational checklists. **Results:** The study findings revealed that 66.67% of studied nurses had satisfactory knowledge, and 33.33% of studied nurses had competent practices regarding care of patients undergoing percutaneous laparoscopic gastrostomy post implementation of educational guidelines, with statistically correlation between satisfactory and unsatisfactory knowledge and competent and incompetent practice pre and post implementation of the educational guidelines at $p= 0.001$. **Conclusion:** Educational guidelines improved nurse's performance regarding care of patients undergoing percutaneous laparoscopic gastrostomy. **Recommendations:** An orientation program should be prepared to help the newly hired nurses to revise, acquire and develop the knowledge and practice regarding care of patients undergoing percutaneous laparoscopic gastrostomy.

Keywords: Educational guidelines. Percutaneous laparoscopic gastrostomy

Introduction:

Gastrostomy is a palliative surgical procedure for inserting a feeding tube through the abdomen wall and into the stomach. Gastrostomy is generally performed in a patient who are temporarily or permanently needs to be fed directly through a tube in the stomach (Tanaka et al., 2019).

Percutaneous Laparoscopic Gastrostomy placement stands out as a minimally invasive surgical intervention that combines the techniques of laparoscopy and endoscopy to establish enteral access for nutritional support. The laparoscopic approach provides visualization for the feeding tube insertion

and for approximation of the gastric and abdominal walls. This method proves particularly beneficial for individuals who require long-term enteral feeding while having obstacles with traditional approaches to stomach access due to diverse medical conditions. The merits of this approach extend to reduction in postoperative discomfort, expedited recovery time, and a diminished risk of infection (Albutt, 2024).

Nurses are typically responsible for preparation for gastrostomy and preventing complication by skilled methods. As the patient should have fasted for 8 hours for

solid food and 2 to 3 hours for fluids to allow gastric emptying; however, in addition antibiotics prophylaxis administered 30 minutes before the procedure, use of a mouthwash with an oral chlorhexidine solution to reduce bacterial burden, and also regular wound care (Albutt, 2024).

Regarding the position of nurses as a member of the medical team that have the most interaction with patients and their families, they can play a significant role in reducing the burden of complications of patients undergoing percutaneous laparoscopic gastrostomy and improve the quality of patients' lives if they have the appropriate empowerment through training programs (Mahmodabadi et al., 2020).

Nurses are mainly providing care to patients with gastrostomy tubes. It is important that health professionals' team have the knowledge and skills to provide information to the patients and their families to provide the best possible care for patients. Also, the patient/ caregivers should be instructed and provided with written information on safe and effective gastrostomy tube care and feeding (Shangab and Shaikh, 2019).

Educational nursing guidelines are documents that synthesize current evidence and recommendations for nursing professionals about the care of patients with specific conditions. A valid guideline has the prospective to influence patient care outcomes, so it needs to be effectively publicized and implemented. These guidelines establish a baseline of high quality patient care and provide an objective standard of accountability within the nursing profession (American Nurses Association, 2021).

Significance of the study

One of the common complications in this method is perforation with an incidence of 0.008%–0.04%. The incidence of these complications is affected by inadequate

nursing skills in the care of patients with gastrostomy (Raaf et al., 2019). Preoperative antibiotic prophylaxis and postoperative local wound care were conducted according to standard nursing procedures (Poola et al., 2018).

So there is an obvious need for current nursing guidelines to enhance the quality of patient care. Hence this study conducted to evaluate the effect of educational guidelines on nurse performance for patients undergoing percutaneous laparoscopic gastrostomy (Moii, 2018).

Aim of the study

This study aimed to evaluate the effect of educational guidelines on nurse performance for patients undergoing percutaneous laparoscopic gastrostomy

- Assess nurses' level of knowledge regarding care of patients undergoing percutaneous laparoscopic gastrostomy pre and post implementation of the guidelines.
- Assess nurses' level of practice regarding care of patients undergoing percutaneous laparoscopic gastrostomy pre and post implementation of the guidelines.
- Develop and implement educational guidelines on nurse performance for patients undergoing percutaneous laparoscopic gastrostomy
- Evaluating the effect of educational guidelines on nurse performance for patients undergoing percutaneous laparoscopic gastrostomy.

Research Hypothesis

H1: Educational guidelines will improve nurse knowledge regarding care of patients undergoing percutaneous laparoscopic gastrostomy

H2: Educational guidelines will improve nurse practice regarding care of patients undergoing percutaneous laparoscopic gastrostomy.

Subject and Methods

A. Research Design

A quasi-experimental design with pre/posttest will be utilized to meet the aim of the study. This design is one of the experimental designs in which data are collected from research subjects both before and after introducing the experimental intervention and it is also called an interrupted time series design (Rogers & Révész, 2020).

B. Setting:

This study conducted at Gastroenterology Endoscopy unit at Medicine Hospital affiliated to Ain Shams University Hospitals. The unit located at the ground floor at medicine hospital and composed of three rooms as follow: Furnished preparation room (Six beds), Endoscopy operating rooms (Three OR rooms) and post anesthesia room (Six ICU beds).

C. Subjects:

A convenient sample of all available nurses (30) who caring for patients undergoing percutaneous laparoscopic gastrostomy in the previously mentioned unit and willing to participate was recruited in this study.

D. Tools of Data Collection:

I-Nurses' self-administered questionnaire:

It was developed by the researchers based on reviewing of related literature (González et al., 2018); it was written in Arabic language and consisted of the two parts as following:

- **The first part:** it is concerned with demographic data including (age, gender,

educational level, years of experience, previous courses regarding endoscopy).

- **The second part:** It is used to assess the nurses' knowledge regarding care of patients undergoing laparoscopic percutaneous gastrostomy, it was constructed of with total 45 multiple choice questions divided into four sections as follows: I-General knowledge about gastrostomy (five questions). II: Nursing role before laparoscopic percutaneous gastrostomy (15 questions). III: Nursing role during laparoscopic percutaneous gastrostomy (10questions). **III: Nursing role after laparoscopic percutaneous gastrostomy (15questions).**

Scoring system

- Each question graded with zero for incorrect answer and one grade for the correct answer. **The total scoring for nurses' knowledge categorized as following:**
 - $\geq 85\%$ (=38grades or more) considered satisfactory level of knowledge.
 - $\leq 85\%$ (less than 38grades) considered unsatisfactory level of knowledge.

II. Nurses' practice observational checklists:

- Three checklists were used to assess the nurse's practice regarding care of patients undergoing laparoscopic percutaneous gastrostomy (Pre- During- Post), it was written in English by the researchers after reviewing the related literature (Tanaka et al., 2019 & Lynn 2019). It composed of three checklists with total (40 steps): -
 - Pre procedure of Laparoscopic percutaneous gastrostomy (15 steps).
 - During procedure of Laparoscopic percutaneous gastrostomy (10 steps).
 - Post procedure of Laparoscopic

percutaneous gastrostomy (15 steps).

Scoring system

Every step was correctly done given one grade and zero for not done step. **The total score for nurses' practice classified as following:**

- $\geq 90\%$ (=36 grades or more) considered competent level of practice.
- $< 90\%$ (less than 36 grades) considered incompetent level of practice.

Tools validity and reliability

Validity: assessing face and content validity of the educational guidelines medias and suggested tools through a jury of seven experts 6 professors of Medical Surgical Nursing Staff, and 1 professor of Gastroenterology medicine in Ain Shams University, who reviewed the instruments for clarity, relevance, comprehensiveness, understanding, and easiness for administration. Based on the opinion of the panel of expertise minimal modifications were done, and then the final form was developed.

The Reliability of the study tools was assessed using the Cronbach's Alpha test to evaluate their internal consistency. The nurse's self-administered questionnaire was reliable at (0.83), and the three observational checklists (Pre-During -Post) showed reliability with scores of (0.85, 0.84, 0.86) respectively. Additionally, the educational guidelines were reliable at (0.79).

Preparatory phase:

Administrative design: The necessary official approvals were obtained from the administrators of the Gastroenterology Endoscopy unit affiliated to Ain Shams

University Hospital. Letters of request were issued to them from the Faculty of Nursing at Ain Shams University explaining the aim of the study and its expected outcomes.

Ethical considerations:

Ethical approval for this study was granted by the Ethical Committee of the Faculty of Nursing at Ain Shams University (Study no: 23.12.175). To safeguard the rights of the nurses involved in the study, written consent was obtained from each participant prior to the initial interview. This consent was given after the nurses were fully informed about the study's nature, purpose, and potential benefits. The nurses were also advised that their participation was completely voluntary and they had the option to withdraw at any point without needing to provide a reason. The confidentiality and anonymity of the collected data were ensured. It was made clear that personal information would be kept private and only accessed by the researchers and the data would be used solely for the purposes of this research.

Pilot Study:

Once permission was granted to proceed with the proposed study, a pilot study was carried out before starting data collection on 10% of targeted patients (3nurses) from the previously mentioned setting to evaluate feasibility, the clarity, applicability of the tools, and calculate the time needed to collect data to detect any potential hindrances that might meet the researchers and restrict with data collection. Minimal modifications were done, so the nurses included in pilot study were excluded from the sample.

Field work

Firstly, the researchers introduce themselves to the nurses explaining the purpose of the

study. The study took place from November 2023 to June 2024. The researchers conducted visits to the Gastroenterology Endoscopy unit during the morning shifts (8 am to 2 pm) and afternoon shifts (2 pm to 8 pm) to coincide with the actual working hours of the nurses. The study was executed in several phases as follows.

I-Assessment phase

This phase involved using Laparoscopic Percutaneous Gastrostomy observational checklists, which the researchers filled out by observing the nurses' practices. Additionally, the nurses completed questionnaires to evaluate their knowledge about laparoscopic percutaneous gastrostomy.

Educational guidelines

Designed by the researchers, written in simple Arabic language including different medias (booklet, pictures, and videos about real percutaneous endoscopic gastrostomy insertion, kit components, uses & indications, types, methods of insertion, patient preparation, complications, instructions regarding permitted & unpermitted food, amounts of water drinking, wound care, infection warning signs, and smoking cessation) based on the determined nurses' educational needs using the related literatures (Hii et al., 2018 & Jaafar et al., 2019). The media was handed out for each nurse; composed of following headings as follow:

- Objective of the guidelines
- How to use the handout?
- Preface introduction
- What is gastroscopy?
- What is Percutaneous Laparoscopic Gastrostomy?
- Purposes of laparoscopic percutaneous gastroscopy
- Components of the gastrostomy tube
- How the laparoscope is done (during

nursing care)?

- How to prepare the patient who undergoing laparoscopic gastrostomy (pre nursing care)?
- Laparoscopic complications
- Nurses role in patient education about gastrostomy complications (post nursing care).

II. Implementation phase

The participants were organized into small groups, each consisting of 2-3 nurses. During this phase, all nurses received a handout and participated in educational sessions led by the researchers. These sessions, lasting about 20-35 minutes each, totaled five sessions for each group. It covered detailed procedures of laparoscopic percutaneous gastrostomy and included lectures and discussions for addressing any questions the nurses had. The researchers also used equipment and video demonstrations to showcase the procedure steps.

The researchers had trained regarding implementation of the procedures under supervision of the gastroenterology physician included in the jury to assure the accuracy of the steps.

Evaluation phase:

This phase began three months after the educational guidelines were implemented. The researchers then re-evaluated the nurses' performance in laparoscopic percutaneous gastrostomy using the same tools - the self-administered questionnaire for nurses and the Nurses' Performance Observational Checklists.

Statistical Design:

The data was coded and entered using the personal computer. We used the Statistical Package for the Social Sciences (SPSS) 20. The study data were obtained using

descriptive statistics in the form of frequencies and percentages. T-test was utilized as an inferential statistic was used to evaluate the effect of guidelines. The chi-square test was used to identify the relationship between qualitative variables and Mean \pm SD also, was used. Statistical significance was considered at p-value \leq 0.05, and $<$ 0.001 was considered highly statistically significant

Results:

Table (1): Shows that the mean age of studied nurses was 28.54 ± 5.76 , regarding to gender 60% of them are females. 60% of nurses had diploma nursing degree, 63.3% of the nurses had 1-5 years of experience in endoscopy unit and 83.3% of them weren't received training courses in caring of patients post Laparoscopic percutaneous gastrostomy.

Table (2): Reveals that 63%, 67%, 63% of nurses had satisfactory knowledge about General knowledge about gastrostomy, nursing role before laparoscopic percutaneous gastrostomy, and Nursing role during laparoscopic percutaneous gastrostomy respectively post implementation of educational guidelines, with high statistically significant difference at $p < 0.001$.

Table (3): Reveals that 63%, 57%, 67% of nurses had competent practices regarding pre, during and Post procedure of Laparoscopic percutaneous gastrostomy respectively, with high statistically significant difference at $p < 0.001$.

Figure (1): Shows that 66.67% of studied nurses had satisfactory knowledge regarding care of patients undergoing percutaneous laparoscopic gastrostomy post implementation of educational guidelines.

Figure (2): Shows that 33.33% of studied nurses had competent practices regarding care of patients undergoing percutaneous laparoscopic gastrostomy post implementation of educational guidelines.

Table (4): Reveals a high statistically significant relation between total knowledge and practice pre and post implementation of the educational guidelines at $p < 0.001$.

Table (5): Shows a high statistically correlation between satisfactory and unsatisfactory knowledge and competent and incompetent practice pre and post implementation of the educational guidelines at $p = 0.001$.

Table (1): Frequency and Percentage distribution of studied nurses' characteristics. (n=30).

Items	Number	%
Age(years)		
20<30	25	83.3%
30<40	5	16.7%
Mean± SD	28.54±5.76	
Gender		
Male	12	40.0%
Female	18	60.0%
Qualification:		
Diploma Nursing	18	60 %
Technical Institute	7	23.33 %
Bachelor degree	5	16.67 %
Experience in endoscopy unit(years)		
1-<5	19	63.3%
≥ 5	11	36.7%
Mean± SD	6.66±3.87	
Previous courses about gastrostomy care		
Yes	5	16.7%
No	25	83.3%

Table (2): Frequency and percentage distribution of the total nurse's level of knowledge regarding care of patients undergoing percutaneous laparoscopic gastrostomy (n = 30).

Items	Level of nurses' knowledge (n= 30)								X ²	P-value
	Pre				Post (after 1 month)					
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory			
	No	%	No	%	No	%	No	%		
I-General knowledge about gastrostomy	10	33	20	67	19	63	11	37	31.4	<0.0001**
II: Nursing role before laparoscopic percutaneous gastrostomy	10	33	20	67	20	67	10	33	19.3	<0.001**
III: Nursing role during laparoscopic percutaneous gastrostomy	12	40	18	60	19	63	11	37	27.8	<0.0001**
IV: Nursing role after laparoscopic percutaneous gastrostomy	7	23	23	77	13	43	17	57	33.8	<0.0001**

P>0.05 Not significant *p<0.05 Significant **P<0.001 highly significant

Table (3): Frequency and percentage distribution of the total nurse's level of practice regarding care of patients undergoing percutaneous laparoscopic gastrostomy (n = 30).

Items	Level of nurses' practice (n= 30)								X ²	P-value
	Pre				Post (after 1 month)					
	Competent		Incompetent		Competent		Incompetent			
	No	%	No	%	No	%	No	%		
Pre procedure of Laparoscopic percutaneous gastrostomy	10	33	20	67	17	57	13	43	24.310	<0.001**
During procedure of Laparoscopic percutaneous gastrostomy	15	50	15	50	19	63	11	37	33.098	<0.001**
Post procedure of Laparoscopic percutaneous gastrostomy	10	33	20	67	20	67	10	33	25.886	<0.001**

P>0.05 Not significant *p<0.05 Significant **P<0.001 highly significant

Figure (1): Distribution of the studied nurses according total level of knowledge regarding care of patients undergoing percutaneous laparoscopic gastrostomy (n = 30).

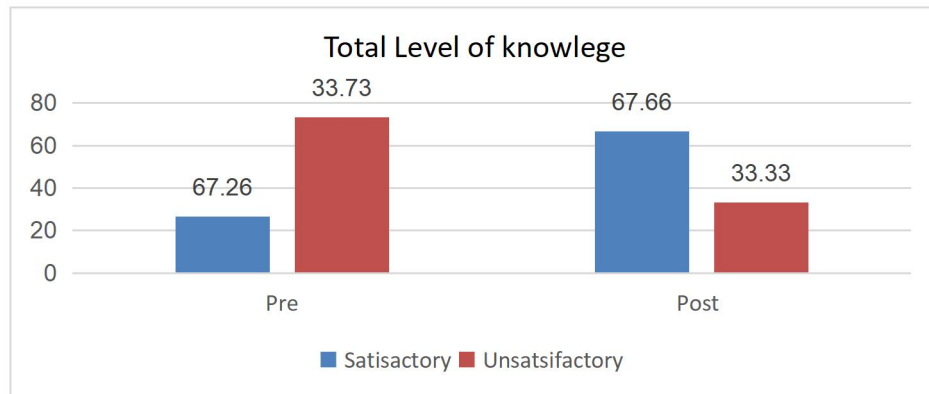


Figure (2): Distribution of the studied nurses according total level of practice regarding care of patients undergoing percutaneous laparoscopic gastrostomy (n = 30).

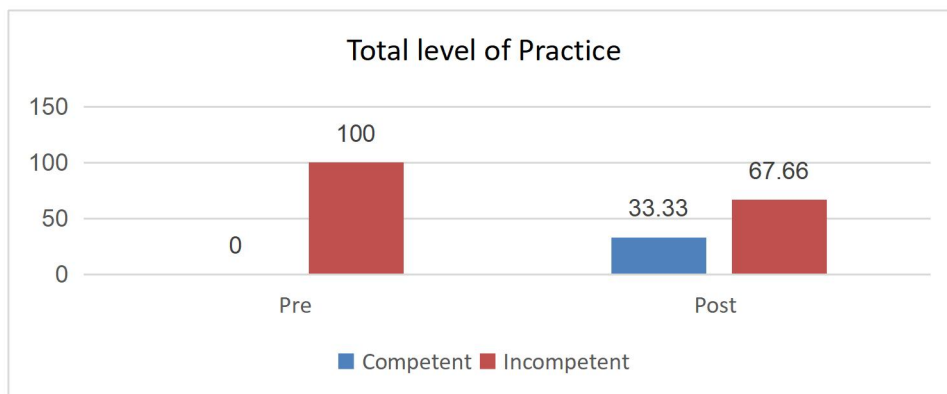


Table (4): Correlation between total level of nurses’ knowledge and practice post educational guidelines (n= 30).

Items		Total Knowledge	
		Pre	Post
Total Practice	r	0.648	0.745
	p	<0.001**	<0.001**

P>0.05 Not significant *p<0.05 Significant **P<0.001 highly significant

Table (5): Correlation between total level of nurses’ knowledge and practice post educational guidelines (n= 30).

Nurses Practice		Nurses Knowledge				Chi square	P- value
		Satisfactory (n=20)		Unsatisfactory (n=10)			
		No	%	No	%		
Competent (n=15)	No	13	65	2	20	21.34	<0.001** HS
	%	76	-	24	-		
Incompetent (n=15)	No	7	35	8	80		
	%	24	-	62	-		

P>0.05 Not significant *p<0.05 Significant **P<0.001 highly significant

Discussion:

Percutaneous laparoscopic gastrostomy tube feeding is indicated for patients who require prolonged enteral tube feeding. Different techniques for gastrostomy tube insertion exist. Patients undergoing for this procedure are usually necessitate for careful and continuous observation from their nurses to prevent any common complications and problems associated with percutaneous gastrostomy feeding processes (**Tanaka et al., 2019**).

The present study results showed that less than two thirds of the studied nurses were females and their age ranged between 20-30 years. These results agree with **Hassan & Hosny (2020)** in a study entitled “Factors affecting performance of critical care nurses regarding enteral tube flushing” that revealed that more than half of the staff nurses were females and there are aged from 20 to 25 years old. Also, these results contradicted with a study done by **Aziz & Adham (2020)** entitled “Determination of the Critical Care Nurses Knowledge toward Enteral Tube Feeding” who stated that the majority of studied nurses were males and their age range from 22-26 years old.

Regarding educational level, it revealed that more than half of studied nurses had diploma of nursing and more than one fifth had technical institute nursing, and less than two thirds have 1 to 5 years of experience in endoscopy unit. And regarding previous courses the study results revealed that most of the nurses had not previous courses regarding gastrostomy care. These results agree with a study done by **Khani et al. (2016)** entitled “Evaluating knowledge, attitude and practice of intensive care unit

nurses in administering medications via enteral tubes” which revealed that the majority of the staff nurses had bachelor’s degree in nursing practice and the mean average of working experience with gastrostomy patients was more than 5 years. Also, these results contradicted with a study done by **Mueer et al. (2016)** entitled “Assessment of Nurses' Knowledge and Performance Regarding Feeding Patients with Nasogastric Tube” who revealed that nursing institute was the most frequent educational degree among the studied sample, and nearly half of them had previous experience less than one year and about one-quarter of them had from 5 to less 10 years of experience.

Also, the results showed that the majority of the studied nurses received courses in caring of patients post gastrostomy. This result agreed with a study done by **Aziz & Adham (2020)** who stated that more than four fifth of the studied nurses received a training courses regarding enteral tubes. Also this result contradicted with a study done by **Shehab et al. (2017)** entitled “Assessment of the Nurses Performance in Providing Care to Patients Undergoing Nasogastric Tube”, who showed that, the majority of nurses did not receive training programs regarding enteral feeding.

A study of (**Mohammed et al. (2023)**) who studied “Nurses’ Performance Regarding Care of Patients Post Percutaneous Endoscopic Gastrostomies in Critical Care Unit” which revealed that more than two thirds of the nurses had unsatisfactory level of the total score of knowledge. And more than two thirds of the nurse had unsatisfactory level of the total

practice. This results will support our hypothesis in effect of educational guidelines on nursing performance

The results of our study revealed that more two thirds of the studied nurses had satisfactory level of knowledge regarding care of patients undergoing percutaneous laparoscopic gastrostomy post implementation of nursing guidelines. This result in the same line with **Bayoumy & Moradi, (2015)** in a study entitled “The Effect of PEG Tube Feeding Simulation on Nursing Students’ Knowledge, Competence” who showed that about more than half of the studied nurses had satisfactory level of knowledge regarding care of patients post gastrostomy.

On the other hand, this result is contradicted with a study of **Morphet et al. (2016)** entitled “Intensive care nurses' knowledge of enteral nutrition” who revealed that high percentage of the studied nurses had unsatisfactory level of knowledge regarding enteral nutrition.

Concerning practice, the study revealed that more than one third of the studied nurses had competent practice regarding care of patients undergoing percutaneous laparoscopic gastrostomy post implementation of nursing guidelines. These results in the same line with **Hassan & Hosny (2020)** who revealed that a high percentage of nurses had satisfactory level of practice related to care of patients post gastrostomy. This confirms the effectiveness of in service educational guidelines as stated by **Dokoutsidou et al., (2020)** who suggested in a study titled “Assessment of Subjects with Nursing Education Trained in Sigmoidoscopy by Means of a Simulator’

that training nurses and nursing students is feasible by means of a proper training program.

The results revealed that there was a highly statistically significant relation between the nurses' level of knowledge and their sex, marital status and years of experience. These results contradicted with a study done by **Ramuada, (2017)** who showed that in a study titled “Assessment of knowledge, attitude and practice of nurses regarding Enteral Nutrition at a Military hospital” there were no statistically significant relations between the levels of nurses’ knowledge regarding enteral nutrient management and the following variables: gender, marital status and years of experience. From the researcher point of view, this discrepancy might be attributed to continuous and appropriate evaluation system.

The study results revealed a high statistically significant relation between satisfactory knowledge and practice of nurses regarding care of patients undergoing percutaneous laparoscopic gastrostomy post implementation of nursing guidelines. This result is in agreement of a study of **Hussein & Negm (2020)** entitled “Nursing-based guidelines for caregivers regarding adult patients with percutaneous endoscopic gastrostomy” which revealed a statistically significant differences between pre/post and follow-up nursing-based guidelines for caregivers’ knowledge and practice regarding patients with percutaneous endoscopic gastrostomy. This emphasized that Nursing-based guidelines were helpful in the improvement of the caregiver's knowledge and practice regarding

percutaneous endoscopic gastrostomy.

Conclusion:

Based on the findings of the current study, the researchers concluded that more than two thirds of studied nurse's had satisfactory knowledge and more than one third had competent practices regarding care of patients undergoing percutaneous laparoscopic gastrostomy post implementation of nursing guidelines. Moreover; there are high statistical significant relations between nurse's knowledge and practices regarding care of patients undergoing percutaneous laparoscopic gastrostomy post implementation of nursing guidelines.

Recommendations:

- An orientation program should be prepared to help the newly hired nurses to revise, acquire and develop the knowledge and practice regarding care of patients undergoing percutaneous laparoscopic gastrostomy.
- Providing periodically scheduled training program to improve and refresh nurses' knowledge and practice regarding care of patients undergoing percutaneous laparoscopic gastrostomy
- Replication of the study on other sample selected from different hospitals in Egypt to generalize the study findings.
- Further research is recommended to evaluate the effect of training program on nurse's performance regarding care of patients undergoing percutaneous laparoscopic gastrostomy.

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