Effect of Educational Guidelines on Nurses' Performance for patients Undergoing Colonoscopy

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Abstract

Back ground: Colorectal cancer (CRC) is the second most common cause of cancer death worldwide, after lung cancer , so early cancer detection permits costs reduction for treatment and increase the survival rate, colonoscopy is the only invasive procedure with the double capability of optically screen the entire colonic mucosa and perform a polypectomy procedure .The removal of polyps is associated with a reduction of 60% of deaths. **Design:** Quasi- experimental study. **Setting**: The study conducted in the endoscopy unit at Tanta International Teaching Hospital and Internal Medicine Hospital affiliated to Tanta University Hospital. **Subjects:** The sample consisted of all nurses (33nurses) who are working in the previously mentioned settings (22 nurses from Internal Medicine Hospital and 11nurse from Tanta International Teaching Hospital) . **Tools**: Two tools were enrolled in the study for data collection: **Tool (I)**"Structured Interview Schedule", **Tool (II)** : "Nurses' Observational Checklist". **Results**: shows that none of the studied nurses in I.M.H and T.I.T.H group satisfactory at practice before educational guidelines (0.00%) compared to the majority (90.9% and 77.3%) at I.M.H and the majority (100%, 81.8 %) at T.I.T.H had satisfactory immediately and one-month post educational guidelines. **Conclusion**: the educational guidelines improved the knowledge and practice score of the nurses towards patients undergoing colonoscopy with a highly statistically significant difference throughout periods of study as P value 0.001. **Recommendation:** designing and implementation–service training program for nurses in the GIT endoscopy unit to improve their knowledge and practices and decrease complications for patients undergoing colonoscopy.

Key words: Colonoscopy , Educational guidelines, Nurse's performance.

Introduction

Colorectal cancer (CRC) is the second most common cause of cancer death worldwide, after lung cancer , early stage detection is key to increase the survival rate, so colonoscopy remains to be the gold standard procedure for early detection of colorectal cancer due to its dual capability to optically inspect the entire colonic mucosa and to perform interventional procedures at the same time[1].

Colonoscopy is a vital tool utilized in modern medicine today, it's versatility and utility make it a vital life-saving procedure, both in the short and long term setting. It can be used for oncological and non-oncological conditions, including sigmoid volvulus, gastrointestinal bleeding and colonic impactions, screening colonoscopy is important to detect and treat early colorectal cancers [2].

Colonoscopy is often performed as a diagnostic or therapeutic intervention to investigate possible bowel cancer, either in people with symptoms and signs of bowel disease ,or those with an increased risk of bowel cancer as indicated by a positive screening test, previous pathology, family history or genetic conditions [3] The success of colonoscopy depends on how well the colon is prepared, adequate colon cleansing provides optimal visualization and decreases the time needed for the procedure. Cleansing of the colon can be accomplished in various ways such as scheduled bowel preparation up to five days prior to the colonoscopy, dietary restrictions such as not eating fiber-rich foods , dairy products ,ingesting large amounts of fluid and purgative solutions for colon cleansing, laxative for two nights before the examination and a fleet's or saline enema until the return is clear at the morning of the test [4,5].

Nurses have vital role during the preparation and procedure for the colonoscopy to be performed effectively, also the nurses have responsibility during colonoscopy encompasses different tasks to ensure the patient's safety before, during, and after the procedure[6].Nursing role before the colonoscopy procedure include the responsibility of bowel preparation for the patient undergoing colonoscopy because success of the procedure depending on the good preparation [7].

Nursing role during colonoscopy as assisting the patient to resume correct position , administering medications as pain medication and sedative, instructing the patient to bear down and encouraging the patient to take slow and deep breaths. Also nurses have a role in the post procedural phase as observe the patient closely for signs of bowel perforation, obtain and record the patient's vital signs, instruct patient to resume a normal diet, fluids, and activity and provide privacy while the patient rest after the procedure ,monitor for an rectal bleeding and encourage increased fluid intake [8].

The Aim of the study

To evaluate the effect of educational guidelines on nurses' performance for patients undergoing colonoscopy.

Research hypothesis

Nurses who receive educational guidelines for patients undergoing colonoscopy will be expected improvement in their performance.

Research design - A quasi-experimental research design was utilized in this study.

Setting- The study was conducted in the following setting:-

1-Tanta International Teaching Hospital at the endoscopy unit, consists of 2 wards, first ward contains 5 beds and second ward contains 4 beds (total beds are 9).

2-Internal Medicine Hospital affiliated to Tanta University at the endoscopy unit , consist of 3 wards, each ward contains 6 beds (total beds are 18).

Subject

The sample of this study consisted of all nurses (33nurses) who are working in the previously mentioned settings (22 nurses from Internal Medicine Hospital and 11nurse from Tanta International Teaching Hospital) .

Tools of data collection

The data of this study collected using two tools :

Tool I: Nurses' Structured Interview Scheduled

This tool was developed by researcher after reviewing relevant literature to collect baseline data pertinent to the current study [9,10] .It was consisted of two parts as follows:-

Part one: Demographic Characteristics of Nurses

This part included data related to age, sex, marital status, level of education, total years of experience in previous mentioned department, previous and current training program on colonoscopy and previous work shop and webinars regarding colonoscopy .

Part two: Structured nurses' knowledge interview questionnaire

It was constructed by the researcher after reviewing of related literature [11,12]. It has been used to assess the nurse's knowledge before and after implementation of the educational guidelines regarding colonoscopy.

The total scoring system of nurses' knowledge will be calculated and classified as the following

-High level if total knowledge score > 80%.

 -Moderate level if total of knowledge score from 65% to 80%.

 -Low level if total knowledge score < 65%.

Scoring system of nurses' knowledge

Correct and complete answer scored (1), while don't know or incomplete answer (0).

Tools (II) : **Nurses' Observational Checklist**

This tool was developed by the researcher after reviewing of related literature [13,14]. To assess the actual nursing care has been provided for patients undergoing colonoscopy before and after implementation of the educational guidelines.

Scoring system of nurses practice

Three levels of scoring for each item in checklist was utilized as following:

-Correct and complete done will be scored (2).

-Correct and incomplete done will be scored (1).

-Incorrect done will be scored (0).The total scoring system of nurses' practice will be calculated and classified as the following:

-The total score of practice $\geq$ 80% indicates satisfactory.

-The total score of practice < 80 indicates unsatisfactory.

Method: The study was accomplished through the following steps

Administrative process

1-Official Permission to carry out the study was obtained from the responsible authorities of Tanta International Teaching Hospital at the endoscopy unit and Internal Medicine Hospital at the endoscopy unit before conducting this study through official letters from Faculty of Nursing explaining the purpose of the study.

2-Ethical consideration

- Approval of ethical committee was obtained before the study conduction.
- Written consent was obtained from every nurse was included in this study after explanation of the aim of the study .
- Confidentiality and anonymity was maintained and the right of withdrawal was reserved.
- Privacy of the studied nurses was maintained

3-Tool development

Two tools were used in this study. Tools (I and II) were developed by the researcher after extensive review of the relevant literature [8. 9, 10] .

˙4- Validity of the tools

All tools were tested for content validity by five jury of experts in the field of Medical-Surgical Nursing at the Faculty of Nursing, and endoscopy field professors and accordingly needed modifications were done.

5-Suitable reliability test was done. Alpha Cronbach's test was used to test tool reliability and applied on 3 nurses Cronbach's Alpha for Tool 1 (Nurses' Structured Interview Scheduled) 0.912 **Cronbach's Alpha for Tool II (Nurses' Observational Checklist)** 0.896

6- A pilot study

It was conducted before the actual study on 10% of the participants , in order to test the clarity, feasibility and applicability of the different items of the developed tools .Modifications, rephrasing and some additional terms were done by the researcher before the main study, according to the experience gained from this pilot study. Data obtained from those nurses were excluded and not included in the current study.

The present study was conducted at four phases as the following

1)Assessment phase of nurses' performance

Nurses' knowledge related to colonoscopy and nursing intervention before ,during and after colonoscopy procedure were assessed three times pre and post (immediately and post one month) the educational guideline by using Tool (I) part (2) in two phases as the following

First phase -pre implementation of educational guideline.

Second phase- immediately post of educational guideline.

-Assessment was filled by the nurses and the researcher to collect base line data

-Nurses' practice was observed three times pre and post immediately and one month post

educational guideline by using Tool (II).

II-Planning phase

This phase was formulated based on data from the assessment phase, literature review priorities, goals, determined needs, baseline measures, and researches, and expected outcome criteria were taken into consideration when planning patients care.

III- Implementation Phase

Educational program for nurses regarding care of patients undergoing colonoscopy was developed and implemented by the researcher based on determining needs, baseline measures, relevant literature, researches and expected outcomes.

Educational methods and aids

Teaching methods and aids were used during the session that covered three domains of education. It was include: Group discussions ,lecture , demonstration and re-demonstration.

Teaching aids include: Arabic language booklet, Handout ,video and Power point prepared by the researcher based on literature review [15] . The booklets distributed to the studied nurses at the end of sessions.

Statistical analysis

Statistical presentation and analysis of the present study was conducted, using the mean, and Linear Correlation Coefficient (r(tests by SPSS V22.0.

Results

Table (1) Percentage distribution of the studied nurses according to their demographic characteristics pre, immediately and one-month post educational guidelines .

The result revealed that most of the studied nurses between 21-30 years old in both groups. The majority of studied nurses were female , married and had experience more than 5 years also had experience in endoscopy unit more than 2 years in both groups. less than half of the studied nurses at Internal Medicine Hospital and more than two thirds of the studied nurses respectively at Tanta International Teaching Hospital group had Institute technical. It was observed that the most of nurses did not attend training courses respectively in I.M.H and T.I.T.H groups.

Table (2) Distribution of the studied nurses according to their knowledge regarding nursing intervention before, during and after colonoscopy pre, immediately and one-month post educational guidelines . These results highlighted that improvement in the studied nurses knowledge in both groups immediately of educational guideline than knowledge level pre educational guidelines in all items that assess knowledge level related to colonoscopy then knowledge level decreased after one month of educational guidelines with highly statistical significant differences as P value < 0.05.

Fig(1) Percentage distribution of the studied nurses' total knowledge score pre, immediately and one-month post educational guidelines . The figure shows that the studied nurses in I.M.H had 50% low level and 50% moderate level of knowledge before educational guidelines compared to the majority had high knowledge level immediately and one-month post educational guidelines respectively. Regarding the studied nurses in T.I.T.H more than half had moderate level of knowledge before educational guidelines compared to the majority had high knowledge level immediately and one-month post educational guidelines respectively.

Fig (2) Percentage distribution of the studied nurses' total practice scores pre, immediately and one-month post educational guidelines .The

figure shows that none of the studied nurses in I.M.H and T.I.T.H group satisfactory at practice before educational guidelines compared to the majority (90.9% and 77.3%) at I.M.H and the majority (100%, 81.8 %) at T.I.T.H had satisfactory immediately and one-month post educational guidelines respectively.

Table (3) Distribution of the studied nurses according to their total practice domain regarding colonoscopy pre, immediately and one-month post educational guidelines . It was obvious that highlighted that improvement in the studied nurses practice in both groups immediately of educational guideline than practice level pre educational guidelines in all items that assess practice level include nursing care before ,during and after the colonoscopy and instructions on discharge then practice level decreased after one month of educational guidelines with highly statistical significant differences where p value =0.001*

Table (4) Correlation between total level of knowledge and total practice in both groups pre, immediately and one-month post educational guidelines . It showed that there was not statistically significant correlation between the total knowledge scores and their total practice scores of both studiedgroups.

Table (1) Percentage distribution of the studied nurses according to their demographic characteristics pre, immediately and one-month post educational guidelines .

| Characteristics		The studied nurses (n=33)				X^2	P-value
		I.M.H (n=22)		T.I.T.H(n=11)			
		N	%	N	%		
Age	21 – 30	13	59.1	9	81.8	3.068	0.216
	31 – 40	4	18.2	2	18.2		
	41 – 50	5	22.7	0	0		
	Range	21 – 46		21 – 40		T: 1.755	0.192
	Mean ± SD	31.27 ± 8.38		27.55 ± 5.52			
Sex	Male	0	0	1	9.1	2.063	0.151
	Female	22	100	10	90.9		
Marital Status	Single	3	13.6	0	0	2.276	0.320
	Married	18	81.8	11	100		
	Widow	1	4.5	0	0		
Educational level	Diplome	6	27.3	2	18.2	4.313	0.230
	Institute technical	8	36.4	8	72.7		
	Bachelor's degree	7	31.8	1	9.1		
	Master degree	1	4.5	0	0		
Years of experience in the nursing	< 5	6	27.3	1	9.1	1.451	0.228
	> 5	16	72.7	10	90.9		
Years of experience in Endoscopy Unit	< 2	8	36.4	0	0	5.280	0.022*
	> 2	14	63.6	11	100		
Attendance of Training program or work shop	No	12	54.5	9	81.8	2.357	0.125
	Yes	10	45.5	2	18.2		

(I.M.H) : Internal Medicine Hospital   (T.I.T.H) : Tanta International Teaching Hospital

Table (2) Distribution of the studied nurses according to their knowledge regarding nursing intervention before, during and after colonoscopy pre, immediately and one-month post educational guidelines

The studied nurses (n=33)

Knowledge domain		I.M.H (n=22) Pre N	Pre %	Immediate N	Immediate %	Post N	Post %	X² / P-value	T.I.T.H (n=11) Pre N	Pre %	Immediate N	Immediate %	Post N	Post %	X² / P-value
1-knowledge of nurses related to colonoscopy	Low	10	45.5	0	0	2	9.1		5	45.5	0	0	0	0	
	Moderate	12	54.5	0	0	3	13.6		5	45.5	0	0	0	0	
	High	0	0	22	100	17	77.3	50.062	1	9.1	11	100	11	100	28.696
	Range	6 – 9		11 – 12		7 – 12		0.001*	4 – 10		11 – 12		10 – 12		0.001*
	Mean ± SD	7.73 ± 0.98		11.86±0.35		10.36 ± 1.59			7.27 ± 1.95		11.73±0.47		10.64±0.81		
2-knowledge related to nursing intervention before the colonoscopy	Low	20	90.9	0	0	1	4.5		8	72.7	0	0	0	0	
	Moderate	2	9.1	1	4.5	8	36.4		3	27.3	1	9.1	7	63.6	
	High	0	0	21	95.5	13	59.1	63.927	0	0	10	90.9	4	36.4	31.948
	Range	3 – 8		8 – 10		6 – 10		0.001*	3 – 7		8 – 10		7 – 10		0.001*
	Mean ± SD	4.95 ± 1.40		9.68 ± 0.57		8.64 ± 1.18			5.09 ± 1.51		9.73 ± 0.65		8.27 ± 0.90		
3-knowledge related to nursing intervention during colonoscopy	Low	3	13.6	0	0	1	4.5		1	9.1	0	0	0	0	
	Moderate	9	40.9	1	4.5	5	22.7		5	45.5	0	0	2	18.2	
	High	10	45.5	21	95.5	16	72.7	13.772	5	45.5	11	100	9	81.8	9.669
	Range	2 – 5		4 – 5		3 – 5		0.008*	2 – 5		5 – 5		4 – 5		0.046*
	Mean ± SD	4.27 ± 0.83		4.95 ± 0.21		4.68 ± 0.57			4.27 ± 0.90		5.00 ± 0.00		4.82 ± 0.40		
4-knowledge related to nursing intervention after colonoscopy	Low	7	31.8	0	0	0	0		4	36.4	0	0	0	0	
	Moderate	6	27.3	0	0	2	9.1		1	9.1	0	0	0	0	
	High	9	40.9	22	100	20	90.9	26.765	6	54.5	11	100	11	100	11.786
	Range	2 – 6		5 – 6		4 – 6		0.001*	2 – 6		6 – 6		5 – 6		0.019*
	Mean ± SD	4.09 ± 1.02		5.91 ± 0.29		5.45 ± 0.67			4.18 ± 1.66		6.00 ± 0.00		5.73 ± 0.47		
5-True and false questions	Low	7	31.8	0	0	1	4.5		2	18.2	0	0	0	0	
	Moderate	11	50	1	4.5	3	13.6		4	36.4	0	0	0	0	
	High	4	18.2	21	95.5	18	81.8	33.438	5	45.5	11	100	11	100	14.667
	Range	2 – 7		6 – 8		5 – 8		0.001*	4 – 8		8 – 8		7 – 8		0.005*
	Mean ± SD	5.64 ± 1.22		7.77 ± 0.53		7.0 ± 0.76			6.36 ± 1.21		8.00 ± 0.00		7.73 ± 0.47		

*Significant at level P<0.05   (I.M.H):Internal Medicine Hospital   (T.I.T.H):Tanta International Teaching Hospital
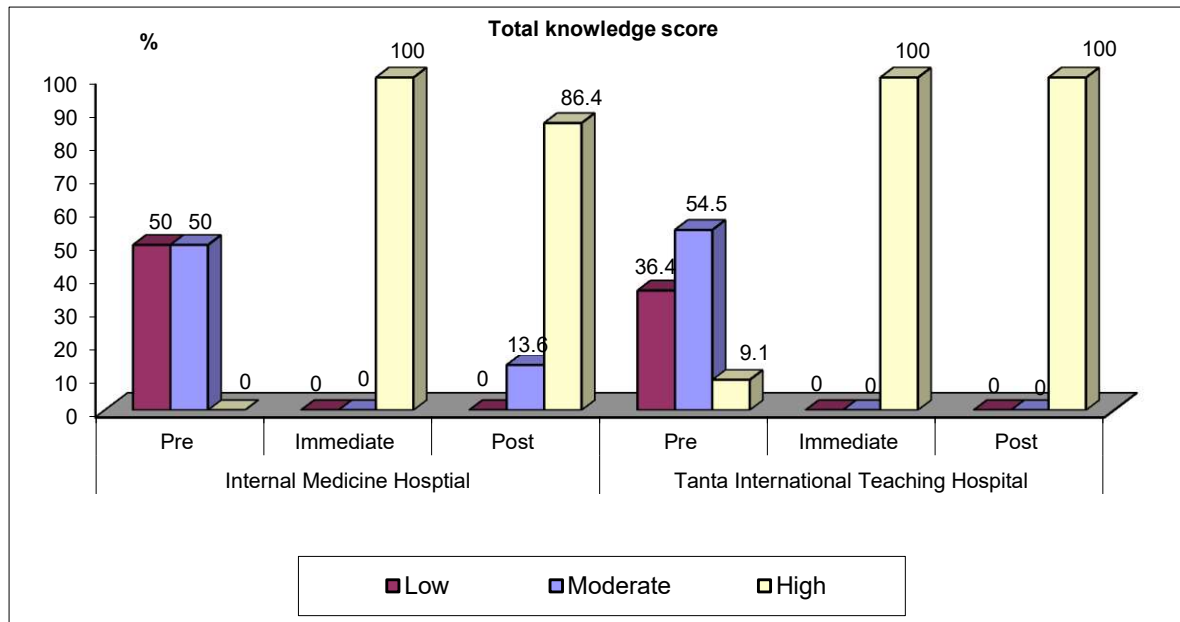
Fig(1) Percentage distribution of the studied nurses' total knowledge score pre, immediately and one-month post educational guidelines.
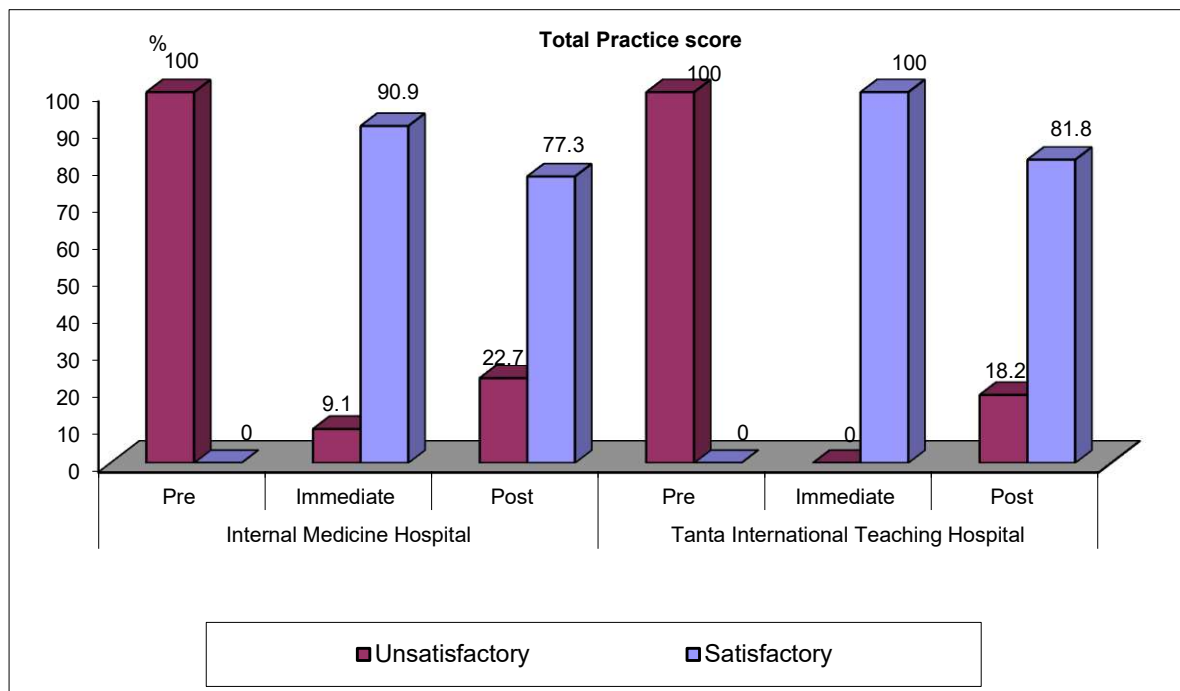

Fig (2) Percentage distribution of the studied nurses' total practice scores pre, immediately and one-month post educational guidelines

Table (3) Distribution of the studied nurses according to their total practice domain regarding colonoscopy pre, immediately and one-month post educational guidelines .

practice domain		The studied nurses (n=33)						X^2	T.I.T.H (n=11)						X^2
		I.M.H (n=22)						P-value							P-value
		Pre		Immediate		Post			Pre		Immediate		Post		
		N	%	N	%	N	%		N	%	N	%	N	%	
1-Nursing care before colonoscopy	Unsatisfactory	21	95.9	0	0	5	22.7	45.819	9	81.8	0	0	1	9.1	20.984
	Satisfactory	1	4.5	22	100	17	77.3	0.001*	2	18.2	11	100	10	90.9	0.001*
	Range	9 – 23		22 – 30		15 – 24			9 – 23		24 – 32		20 – 27		
	Mean ± SD	13.82±3.65		25.18±2.04		20.05 ± 2.73			17.27 ±3.95		27.64 ± 2.50		24.27 ± 2.45		
2-Nursing care during colonoscopy	Unsatisfactory	20	90.9	0	0	4	18.2	44.000	8	72.7	0	0	0	0	21.120
	Satisfactory	2	9.1	22	100	18	81.8	0.001*	3	27.2	11	100	11	100	0.001*
	Range	13 – 20		18 – 22		17 – 22			12 – 19		20 – 22		18 – 22		
	Mean ± SD	16.59±2.34		21.32 ± 1.32		19.41 ± 1.65			14.91 ± 2.55		21.64 ± 0.81		19.73 ±1.49		
3-nursing care after colonoscopy	Unsatisfactory	21	95.5	0	0	7	31.8	42.553	9	81.8	0	0	2	18.2	18.273
	Satisfactory	1	4.5	22	100	15	68.2	0.001*	2	18.2	11	100	9	81.8	0.001*
	Range	5 – 10		12 – 14		8 – 14			6 – 10		13 – 14		10 – 13		
	Mean ± SD	6.64±1.71		12.91±0.92		11.00±1.88			7.73±1.27		13.73±0.47		12.00±1.18		
4-Instructions on discharge	Unsatisfactory	21	95.5	1	4.5	5	22.7	42.120	10	90.9	0	0	3	27.2	20.054
	Satisfactory	1	4.5	21	95.5	17	77.3	0.001*	1	9.1	11	100	8	72.7	0.001*
	Range	2 – 13		14 – 22		6 – 17			7 – 10		18 – 22		12 – 17		
	Mean ± SD	6.41±3.33		17.55±2.13		12.05±3.05			8.36±1.12		20.27±1.49		14.55±1.63		

Unsatisfactory <80 %   Satisfactory ≥ 80%   *** Significant at level P<0.05.**

Table (4) Correlation between total level of knowledge and total practice in both groups pre, immediately and one-month post educational guidelines

The studied nurses (n=33)

Total knowledge level		I.M. H (n=22) Unsatisfactory		Satisfactory		X² P-value	T.I.T.H (n=11) Unsatisfactory		Satisfactory		X² P-value
		N	%	N	%		N	%	N	%	
Pre educational guidelines	Low	11	50	0	0		4	36.4	0	0	
	Moderate	11	50	0	0	-	6	54.6	0	0	-
	High	0	0	0	0		1	9.1	0	0	
	r, p	-0.042, 0.853					-0.269, 0.425				
Immediate educational guidelines	High	2	9.1	20	90.9		0	0	11	100	
	r, p	-0.094, 0.679					-0.315, 0.345				
Post educational guidelines	Low	0	0	0	0	1.022	0	0	0	0	
	Moderate	0	0	3	17.6	0.312	0	0	0	0	-
	High	5	100	14	82.4		2	100	9	100	
	r, p	0.046, 0.839					0.471, 0.144				

r: Pearson correlation coefficient

* Significance at level P<0.05.

(I.M.H):Internal Medicine Hospital

(T.I.T.H):Tanta International Teaching Hospital

Discussion

Colonoscopy is the gold standard of examination of the lining of the large intestine or colon, using a thin, flexible tube with a camera and light on its end called a colonoscopy [16].Colonoscopy is considered the most useful diagnostic test for early detection of colorectal cancer and various other colon lesions . Its diagnostic efficiency is highly dependent on the quality of bowel preparation . Inadequate bowel preparation may result in residual feces masking clinically important lesions, leading to major tumors going undetected[17].

In the current study demographic characteristics of the nurses, revealed that ages of nurses in both studied groups ranged from (21-30)years old with no significant difference between the two groups, This in the same line with **Sadiq et al,(2017)** [18], who reported that the majority of studied nurses less than 31 years old .Similarly, **Moqbel et al, (2018)** [19], who revealed that the most of nurses their age less than 30 years with a mean. **In relation to sex**, the present study clarified that the majority of the studied nurses in Internal Medicine Hospital (I.M.H) and Tanta International Teaching Hospital (T.I.T.H) were female . This is in line with **Zeidan et al ,(2018)**[20], who reported that the majority of the studied nurses were females. **On the other hand**. **Concerning to marital status** in this study the majority of the studied nurses were married were married . **Mohamed et al ,(2018)** [21], was in the same direction with the current result and reported that two thirds were married and others were

single . Also agreement with **Abd-Elhamid et al, (2016)**[22], who reported that the majority of the studied nurses were married. **Regarding educational level ,** the current study revealed that less than half of the studied nurses at I.M.H had institute technical and bachelor's degree but more than two thirds of the studied nurses respectively at T.I.T.H group had Institute ,which in line with **Abdou et al,(2019)** [23], who reported that half of the studied nurses had nursing institute . **On the other hand**, This study is in contrast with **Nehmatallah et al, (2021)**[24] , who reported that more than half the nursing staff is secondary nursing school. **As regard years of experience in the nursing field** , the findings of the current study illustrated that the highest proportion more than two thirds of nurses in I.M.H and the majority of nurses at T.I.T.H group had experience more than 5 years , which in the same match with **Mohamed et al,(2018)**[25], who reported that more than half of the nursing staff had experience in the nursing field >5 years . **Concerning to years of experience in endoscopy unit ,** it was noticed that more than half of nurses in I.M.H and all of nurses at T.I.T.H   group had experience in endoscopy unit more than 2 years. This is study supported by **El-Maghawry et al, (2019)** [26], who reported that near of two thirds of the studied nurses had experience in Endoscopy Unit more than 3 years .**As well,** the current study revealed that more half of the studied nurses at I.M.H and the majority of the studied nurses   at   T.I.T.H   did   not   attend

training program, this study is supported by **Arslanca et al, (2022)**[27], who recorded that all of nurses had not any training programs .

Regarding knowledge of the studied nurses in both studied groups pre , immediate and post educational guidelines, this study revealed that improvement in knowledge immediate and post one month compared to knowledge level pre educational guidelines ,where all of the studied nurses in both groups had high level of knowledge immediately and then decreased in the post one month assessment period, with highly statistically significant difference as P value= 0.001*. This improvement might be related to the majority of nurses who are enthusiastic to learn and have a highly expressed need to learn more about colonoscopy. Also, this finding shows that the educational guidelines had a good impact on improving nurses' knowledge, which could be due to the concise presentation of each session using simple Arabic language, clear educational methods, instructional media, and frequent repetition to fix the knowledge. These results were supported by **Mahawongkajit et al ,(2022)**[28], who showed that, the majority of studied groups had low level of knowledge pre implementing educational program, and more than two thirds of study group constituting had moderate knowledge level post-test, however the most of study group after education program had high knowledge with highly statistically significant differences (p= 0.001**). **This study also agreement with Harry R et al ,(2019)** [29] ,who

reported that the majority of studied nurses were unsatisfactory pre educational program then increased to more than two third were satisfactory post and then decreased to two third were satisfactory at follow up after educational program. This result is nearly in line with **Arslanca et al, (2022** [30], it was noticed that the majority of nurses had inadequate knowledge before applying health education program ,while after one month of applying health education program ,the nurse's knowledge was satisfactory . This also is in agreement with **Abd El-latief et al, (2020)** [31] ,who recorded that more than half of studied nurses was unsatisfactory pre instructional program, but knowledge level improved to two third post instructional program. This study also supported by **Liu et al ,(2017)**[32] ,who reported that half studied nurses satisfactory and other half un satisfactory pre educational intervention and all of studied nurses satisfactory post one month educational intervention.

According to the acquisition practice ,this study shows that none of the studied nurses satisfactory at practice before educational guidelines compared to the majority had satisfactory immediately and then decreased post one month after educational guideline. This may be attributed to the poor knowledge level, increasing work overload, lack of nurses' evaluation against the standards of nursing practice by the nursing supervisor and head nurses for detecting the strength and weakness point to work on it and appointment of new graduated nurses in the endoscopic unit especially at I.M.H

and lack of workshops to train new appointments. **These results were supported by Liang et al,(2022)** [33], who reported that the all of studied sample in pretest had weak performance level , while in posttest the majority had a good performance and more than half of them had accepted performance after 3 months. Also this study with the same line with **Latos et al,(2022)**[34], who recorded that none of the studied nurses satisfactory at practice pretest compared to the majority had satisfactory posttest and more than half follow up after educational program. This result is supported by **Jin et al, (2016)** [35] , also **Arsalan et al, (2022)**[36],who recorded that the majority of studied nurses had un satisfactory practice pre and minimal only had satisfactory practice then improved to the majority had satisfactory practice post-one-month educational intervention, with highly statistically significant difference as P value= 0.001*. **Regarding correlation** between total level of knowledge score of the studied nurses and their total practice scores .This result showed that there was not significant correlation between the total knowledge scores of the studied nurses and their total practice scores pre and immediately of educational guidelines ,where p value > 0.05 .This result supported by **Suttriuk(2022)**[37], who reported that non-significant correlation between total practice and total knowledge level .This result is contrasted by **Song et al, (2017)**[38],who reported that, positive statistically significant where in pretest(r value= 0.105 & p=0.05*)posttest (r value=0.364 & p= 0.021*) and after 3 months (r value=0.304& p= 0.047*).Also this

result disagreed with **Thul et al, (2020)**[39],who reported that positive significant correlation between nurse's knowledge and practice before and after guidelines implementation**.**

Conclusion:

Based on the findings of the present study, it can be concluded that:

The educational guidelines improved the knowledge and practice score of the studied nurses in both groups toward nursing care of patients undergoing colonoscopy .

-It was found that there is a statistical significant difference related to the knowledge of the studied nurses related to (colonoscopy , nursing intervention before , during and after colonoscopy) in both studied groups pre-immediate and post one of educational guidelines, with P value= <0.05.

-It was found that there is a highly statistical significant difference related to the practice of the studied nurses related to (nursing care before , during after colonoscopy and instructions after colonoscopy) in both studied groups

Recommendations

Based on the findings of the current study, the following recommendations are derived and suggested:

1-Recommendation for nurses:

A-Designing and implementation–service training program for nurses in the GIT endoscopy unit to improve their knowledge and practices and decrease complications for patients undergoing colonoscopy.

B-Continuous and adequate education and training of nursing staff working at gastrointestinal endoscopy units with regular and continuous evaluation of nurses' practice

C-Provide support to help prevent spread of infectious diseases through evidence-based infection control measures in endoscopy unit.

2-Recommendations for further research studies:

- Replication of the current study with a larger sample of nurses in different settings is required for generalizing the results.

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