

Outcome of Designed Guidelines for Nurses caring of Patients Undergoing Upper Gastrointestinal Endoscopy

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Abstract

Upper gastrointestinal endoscopy is a diagnostic and therapeutic procedure that provides good view of the mucosal surfaces of the upper gastrointestinal tract and management of many gastrointestinal conditions. Improving the outcomes of upper gastrointestinal endoscopic patients requires the best efforts of nurses in multiple settings and roles, working collaboratively with other health team. **The aim of this study** was to evaluate the outcome of designed guidelines for nurses caring of patients undergoing upper gastrointestinal endoscopy. **Design:** A quasi-experimental design was utilized to achieve the aim of this study. **Setting:** The study was conducted at gastrointestinal endoscopy unit at Ain Shams University Hospital. **Subject:** A convenient sample of all staff nurses working in gastrointestinal endoscopic unit, in addition to, a purposive sample of 60 adult patients undergoing upper gastrointestinal endoscopy were recruited. According to certain inclusion criteria the patients were selected and divided into control and study groups. **Tools of data collection:** Self-administered questionnaire for nurses' practice, observational checklist and Patients' outcome evaluation sheet. **Results:** The results of this study showed that, total satisfactory level of nurses' knowledge and practice regarding caring of patients undergoing upper gastrointestinal endoscopy significantly improved post the designed guidelines implementation compared to pre (66.7% versus 23.3%) and (56.7% versus 16.7%) respectively. Furthermore, patients' satisfaction level significantly improved post the designed guidelines implementation compared to pre (64.0% versus 44.0%). **Conclusion:** The designed guidelines for nurses caring of patients undergoing upper gastrointestinal endoscopy had statistically significant positive effect on outcome regarding level of nurses' performance (knowledge and practice) and patients' satisfaction level, but the results didn't reveal any statistically significant difference between control and study groups regarding complications. **Recommendations:** The study recommended the importance of implementing the designed educational guidelines for nurses caring of patients undergoing upper gastrointestinal endoscopy in different endoscopic units of different hospitals to improve their performance and patients' outcomes.

Key words: Upper gastrointestinal endoscopy, Nurses/patients' outcomes, Designed guidelines.

Introduction

Endoscopy services are the cornerstone of diagnosis and treatment in gastroenterology. Upper gastrointestinal (GI) endoscopy is a diagnostic and

therapeutic procedure that provides good view of the mucosal surfaces of the upper GI tract. It is an integral tool in the evaluation and management of many GI conditions. Endoscopy nursing has been developed as a discipline with a highly

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qualified nurses working alongside the endoscopist. The role of endoscopic nurse is very relevant for the outcomes of endoscopy procedure (Metwally, Abou Donia, & Abdel Aziz, 2016).

The nurse endoscopist should be offer a holistic package of care to patients undergoing GI endoscopy before, during and after endoscopy procedure to prevent any hazards or complications and improve patients' satisfaction. Also, the nurse must have the skills and knowledge to assess the needs of each individual attending for endoscopy from admission to discharge. She gives advice on admission and discharge, ensures safe delivery of endoscopic equipment. Also, the nurses follow the courses to keep up-dated in this field because of the constant evolution of the endoscopic instruments and techniques (Mohamad, Mohamad, & sayed, 2014).

Significance of the study:

In recent years, the role of endoscopy has increased many folds because of the establishment of ample range of diagnostic and therapeutic endoscopic procedures. Through diagnosis and management, endoscopy plays a role in nearly all GI diseases as well as a crucial role in clinical research.

The master thesis conducted by Mohamed (2016) entitled Nurses' Performance in GI Endoscopy Unit revealed that (83%) and (90%) of the studied nurses had unsatisfactory level of knowledge and practice regarding caring of patients undergoing GI endoscopy. These findings necessitate the researcher for the importance of conducting this study to design and implement guidelines for nurses

caring of patients undergoing upper GI endoscopy and evaluate its effectiveness on the nurses' performance and consequently on patients' outcomes.

Aim of the study

This study aimed to:

Evaluate the outcome of designed guidelines for nurses caring of patients undergoing upper GI endoscopy through the following:

1. Assessing level of performance (knowledge and practice) for nurses caring of patients undergoing upper GI endoscopy.

2. Designing and implementing guidelines for nurses caring of patients undergoing upper GI endoscopy.

3. Evaluating the effect of implementing the designed guidelines on nurses' level of performance (knowledge and practice).

4. Evaluating the effect of implementing the designed guidelines on patients' outcome (complications and satisfaction).

Research Hypothesis:

The current study hypothesized that:

- 1-The designed guidelines will improve nurses' performance (knowledge and practice) regarding caring of patients undergoing upper GI endoscopy.

- 2-The designed guidelines will improve outcomes of patients undergoing upper GI endoscopy (complications and satisfaction).

Subjects and Methods

A-Research design:

A quasi-experimental design was utilized in this study.

B- Research Setting:

The study was conducted in GI endoscopy unit at Ain Shams University Hospital.

C- Subjects:

The study included a convenient sample of all staff nurses working in GI endoscopic unit. In addition, a purposive sample of 60 adult patients undergoing upper GI endoscopic procedure was selected according to certain inclusion criteria and was divided into control and study groups. The sample size of patients was determined statistically by power analysis considering the total number of patients undergoing upper gastrointestinal endoscopy admitted to gastrointestinal endoscopic unit (2015/2016).

Type I error with significant level $\alpha=99\%$.

Type II error by power test $\beta=95\%$.

The both groups of patients were homogenic with Mean \pm SD of age 37.96 ± 9.54 for control group and 38.92 ± 10.36 for study group.

Inclusion and exclusion criteria:

The study subject of patients selected according to the following criteria: Adult patients, from both genders, their ages ranged from 18 to 60 years, undergoing upper GI endoscopy, with no critically or

psychotic disorders, able to comprehend instructions, not exposed before for any educational or learning experience and who agree to participate in the study.

Tools for data collection:

The study data were collected through the following three tools:

I-Self-administered questionnaire for nurses: It was used to assess nurses' level of knowledge regarding caring of patients undergoing upper GI endoscopy. It was developed by the researcher after reviewing the related literature: (American Society for Gastrointestinal Endoscopy (ASGE), 2015; Society of Gastroenterology Nurses and Associates (SGNA), (2017); Brown, Edwards, Seaton, & Buckley, 2017; Decristoforo, et al., 2018; Treuting, Dintzis, Liggitt, & Frevert, 2018; Lichtenstein, & Alfa, 2019). It was divided into six parts as the following:

The 1st part: It concerned with the demographic characteristics of nurses under the study

The 2nd part: included questions related to nurses' knowledge regarding anatomy and physiology of digestive system.

The 3rd part: covered questions related to nurses' knowledge regarding GI endoscopy.

The 4th part: involved questions related to nurses' knowledge regarding upper GI endoscopy and anesthesia.

The 5th part: contained questions related to caring of patients undergoing

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upper GI endoscopy (before, during and after the endoscopy procedure).

The 6th part: included questions related to nurses' knowledge regarding reprocessing of endoscope.

Scoring system:

The total score of knowledge was 70 marks. Each correct answer was given one mark and the incorrect answer was given zero.

- $\geq 85\%$ = Satisfactory level of knowledge = $\geq 59/70$ correct answers.

- $< 85\%$ = unsatisfactory level of knowledge = $< 59/70$ correct answers.

II-Nurses' practical observational checklist: it was used to assess nurses' level of practice regarding caring of patients undergoing upper GI endoscopy. It was developed by the researcher after reviewing the related literature: (American Society for Gastrointestinal Endoscopy (ASGE), 2015; Society of Gastroenterology Nurses and Associates (SGNA), 2017; Decristoforo, et al., 2018; Tan, Thompson, & Sharma, 2018). It was divided into four phases as the following:

The 1st part: It was used to assess nurses' practice pre-procedure

The 2nd part: It was used to assess nurses' practice during the procedure.

The 3rd part: It was used to assess nurses' practice post procedure

The 4th part: It was used to assess nurses' practice regarding reprocessing of GI endoscope.

Scoring system:

The total score of practice was 66 marks; each correct step was given one mark and zero for the step which was not done or done incorrectly.

- $\geq 85\%$ = Satisfactory level of the practice = $\geq 56/66$ correct actions.

- $< 85\%$ = unsatisfactory level of the practice = $< 56/66$ correct actions.

III- Patients' outcome evaluation sheet: It was developed by the researcher after reviewing the related literature (Hucl, Dinis-Ribeiro, Gralnek, & Reddy, 2016; Moorhead, Johnson, Maas, & Swanson, 2018; Yoon, et al, 2018; Bistriz, Ennis-Davis, Mulgrove, Greenaway, & van Zanten, 2018).

This tool was divided into four parts as the following:

The 1st Part: included demographic characteristics of the patients under study such as gender, age, residence, marital status, level of education, employment and income.

The 2nd Part: involved patients' clinical data such as medical diagnosis, complain on admission, type of endoscopy, past medical and family history.

The 3rd Part: concerned with complications that developed among all patients post upper GI endoscopy.

The 4th Part: focused on satisfaction level of patients undergoing upper GI endoscopy regarding the received care.

Scoring system:

The total score of patients' satisfaction was 44 marks; each satisfactory answer was given one mark and zero for unsatisfactory answer.

- $\geq 75\%$ = satisfactory level of patients = $\geq 33/44$ marks.

- $< 75\%$ = unsatisfactory level of patients = $< 33/44$ marks.

II. Operational design:

The Operational design included preparatory phase, validity and reliability, pilot study and fieldwork.

Preparatory phase:

It included reviewing of the current and more recent national and international related literature and theoretical knowledge of various aspects of the study using books, articles, periodicals, magazines and internet to develop tools for data collection and nursing guidelines for caring of patients undergoing upper GI endoscopy.

Tools validity and reliability:

Validity of the developed tools was tested using face and content validity. Validity was tested through a jury of 7 experts from Medical Surgical Nursing department, Ain Shams University (2 professors, 3 assistant professors and 2 lecturers). The experts reviewed the tools for clarity, relevance, comprehensiveness and simplicity; minor modifications were done.

Testing reliability of the developed tools was done statistically by Alpha Cronbach test. Alpha Cronbach for Self-administered questionnaire was 0.745, for Nurses' practical observational checklist was 0.728, and Patients' outcome evaluation sheet was 0.804 for complications and 0.712 for satisfaction which indicate moderate to high reliability of the used tools, with statistically significant difference ($p < 0.05$).

Pilot study:

A pilot study was carried out on 20% of total study subjects of nurses and 10% of total study subjects of patients to test applicability, clarity as well as the time needed to conduct the designed study tools included self-administered questionnaire, a practice observational checklist for the nurses and patients' outcome evaluation sheet

Field work:

Field work included two phases: implementation & evaluation phases.

A. Implementation phase:

This phase started by selecting all staff nurses (30 nurses) caring of patients undergoing upper GI endoscopy. In addition, 60 adult patients undergoing upper GI endoscopy who met the inclusion criteria and explaining simply the aim and nature of the study as well as taking their approval to participate in the study prior to data collection.

-The studied patients were assigned into two matched equal groups (control and study), the control group was recruited first from GI endoscopy unit before

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implementing nurses' guidelines for nurses caring of patients undergoing upper GI endoscopy, while the study group was recruited later after implementing nurses' guidelines.

-The studied patients' telephone numbers were obtained at the first time for contacting them to determine the other appointments in order to complete data collection process.

-The Patient's outcome evaluation tool was used to assess patients' outcome (complications and satisfaction) for control group. This tool was filled in by the researcher for each patient according to their level of education; it had taken about 30-45 minutes to be filled in for every patient of control group.

- Then, the studied nurses' telephone numbers were obtained at the first time for contacting them to determine the other appointments in order to complete data collection process

-The studied nurses were observed by the researcher using observational checklists to assess their level of practice regarding caring of patients undergoing upper GI endoscopy. The observational checklist was used prior to administration of the questionnaire to ensure the maximal realistic observations of the nurses' practice and minimize the possibility of bias.

- The studied nurses' practice was assessed by the researcher while they caring of patients undergoing upper GI endoscopy which included Pre procedure nursing care (General preparation and Preparation of patient), during procedure

nursing care, post procedure nursing caring of upper GI endoscope.

- Self-administered questionnaire was used to assess nurses' level of knowledge regarding caring of patients undergoing upper GI endoscopy. This tool was filled in by the nurses; it had taken about 30-45 minutes to be filled in for every nurse.

- Based on nurses' learning needs, the researcher developed the designed guidelines in Arabic language including the following contents: anatomy and physiology of digestive system GI endoscopy, upper GI endoscopy, anesthesia for upper GI endoscopy, caring of patients undergoing upper GI endoscopy (pre- during- post procedure), and Reprocessing of Endoscope.

- Teaching sessions of the designed guidelines were conducted for the nurses. The booklet was handed out for every nurse; it includes six sessions, starting with orientation about the designed guidelines purpose, time and content was done by using simple words and a tone of voice that shows interest, concern and friendliness.

- The studied nurses were allowed to ask questions in case of misunderstanding while listening and expressing interest for them. At the end of these sessions the researcher informed them that they will be followed by the researcher after two weeks of the designed guidelines at the GI endoscopy unit.

-The designed guidelines were carried out at GI endoscopy unit over two days for every 4 to 5 nurses together according to their level of education and

understanding. The self-care guidelines were conducted through small group discussion, role play, and demonstration, supported by using posters and booklet.

-Data collections teaching sessions for the subjects of this study took about 10 months were conducted in morning and afternoon shifts in nursing office at GI endoscopy unit started from July 2018 until April 2019.

B. Evaluation phase:

Post the designed guidelines implementation, self-administered questionnaire and observational checklist for studied nurses and patients' outcome evaluation tool for the study group of patients were refilled in again after two weeks of the designed guidelines implementation. Evaluations the effect of designed guidelines on nurses' performance and patient outcome was done by comparing the results pre and post the designed guidelines implementation by using the same data collection tools which were done for nurses and study groups of patients after two weeks.

III. Administrative Design:

An official letter was issued from the Faculty of Nursing, Ain Shams University to the director of GI endoscopy unit explaining the purpose of the study to obtain their permission to conduct this study.

Ethical considerations:

The ethical research considerations in the study included the following:

- The research approval was obtained from the ethical committee of

faculty of nursing before initiating the study work.

- The researcher clarified the objectives and aim of the study to nurses and patients included in the study.

- Patients' and nurses' oral consent to participate in the study was obtained.

- The researcher assured maintaining anonymity and confidentiality of subjects' data.

- Nurses and Patients were informed that they allowed withdrawing from the study at any time.

IV. Statistical Design:

The data were collected, coded and entered into a suitable excel sheet. Data were transferred into (the statistical package for social science) SPSS version (17). Quantitative data were presented as mean, standard deviation; comparison was done using X^2 test. Qualitative data were presented as percentages.

Operational definition:

Outcomes means consequences of designed guidelines implementation on the studied nurses' performance regarding caring of patients undergoing upper GI endoscopy that was measured by self-administered questionnaire and practice observational checklist. In addition to its consequence on the studied patients' complications and their satisfaction level in both control and study groups which were measured by patients' outcome evaluation sheet.

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Results:

Table (1) showed that 86.7% of the studied nurses were females, 66.7% of them were more than 40 years old with mean age 39.87 ± 7.9 years and 66.7% of them were nursing diploma. Also, 86.7% of the nurses under the study had experience more than 15 years with mean experience years 20.07 ± 8.39 years and 73.3% of them didn't attend any training courses.

Figure (1) reported that, total satisfactory level of nurses' knowledge regarding caring of patients undergoing upper GI endoscopy significantly improved post the designed guidelines implementation compared to pre (66.7% versus 23.3%) with statistically significant differences ($P < 0.001$).

Figure (2) represented that, total satisfactory level of nurses' practice regarding caring of patients undergoing upper GI endoscopy significantly improved post the designed guidelines implementation compared to pre (56.7% versus 16.7%) with statistically significant differences ($P < 0.001$).

Table (2) showed that, 53.3% and 60.0% of the patients in control and study groups respectively were males. Regarding age, 50.0% of the patients in control group their age were ≥ 40 years with mean age 37.96 ± 9.54 and 56.7% of patients in study group were ≥ 40 years with mean age 38.92 ± 10.36 . As regards marital status, 53.3% and 66.7% of the patients in control and study groups respectively were married. As regards the educational level 46.7% and 43.4% of the patients in control and study groups respectively had diploma

education. In relation to residence 56.7% and 53.3% of the patients in control and study groups respectively from rural. As well as, 70.0% and 73.3% of patients in the control and study groups respectively had occupation also, 66.7% and 59.1 of them had enough income respectively. There were no statistically differences between two groups according to their demographic characteristics ($P > 0.05$).

Table (3) represented that, there were no statistically significant differences between control and study groups regarding upper GI endoscope related complications and associated discomforts. All of the patients in the control and study groups (100.0%) had difficulty of swallowing and sore throat, 63.3% of and 50.0% of control and study groups respectively had abdominal pain. In addition, 6.7% and 3.3% of control and study groups respectively had bleeding from mouth. As well as, there were no statistically significant differences between control and study groups regarding anesthesia related complications and associated discomforts, 30.0% and 23.3% of the control and study groups respectively suffered from headache, 23.3% and 16.7% of the control and study groups respectively had nausea, 13% and 10% of the control and study groups respectively had hypotension and bradycardia, 10.0% and 6.7% of the control and study groups respectively had chest pain, difficulty of breathing and vomiting.

Figure (3) represented that, total satisfactory level of patients undergoing upper GI endoscopy in the study and control groups regarding the received care significantly improved post the designed

guidelines implementation compared to pre (64.0% versus 44.0%) and ($P < 0.05$).

Table (4) revealed that there was statistically significant relation between total nurses' knowledge mean score and educational level pre the designed guidelines implementation $P < 0.05$. While, there was statistically significant relation between their knowledge mean score and their demographic characteristics including age, educational level, years of experience and training courses post the designed guidelines implementation ($P < 0.05$).

Table (5) represented that there was statistically significant relation between total nurses' practice mean score and their years of experience pre the designed guidelines implementation. While, there was statistically significant relation between their practice mean score and their demographic characteristics including age,

educational level, years of experience and training courses post the designed guidelines implementation of ($P < 0.05$).

Table (6) represented that there was positive correlation between total level of nurses' knowledge regarding caring of patients undergoing upper GI endoscopy and their total level of practice and patients' satisfaction, while there was negative correlation between total level of nurses' knowledge and patients' complications pre and post the designed guidelines implementation. As well as, there was positive correlation between total level of nurses' practice regarding caring of patients undergoing upper GI endoscopy and patients' satisfaction, while there was negative correlation between total level of nurses' practice and patients' complications pre and post the designed guidelines implementation ($P < 0.001$).

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Table (1) Frequency distribution of the studied according to their demographic characteristics (n=30)

Demographic characteristics	Studied nurses	
	N	%
Gender		
Male	4	13.3%
Female	26	86.7%
Age		
18-<30 years	4	13.3%
30-<40 years	6	20.0%
40-<50 years	20	66.7%
Mean ± SD	39.87 ± 7.9	
Level of education		
Nursing diploma	20	66.7%
Nursing institute	4	13.3%
Nursing Bachelor	6	20.0%
Experience years		
<5 years	0	0.0%
5-<15 years	4	13.3%
15-<30 years	26	86.7%
Mean ± SD	20.07 ± 8.39	
Training courses about nursing care for upper GI endoscopic patient		
Yes	8	26.7%
No	22	73.3%

Figure (1) Frequency distribution of total satisfactory level of nurses' knowledge regarding caring of patients undergoing upper gastrointestinal endoscopy pre and post the designed guidelines implementation (n= 30).

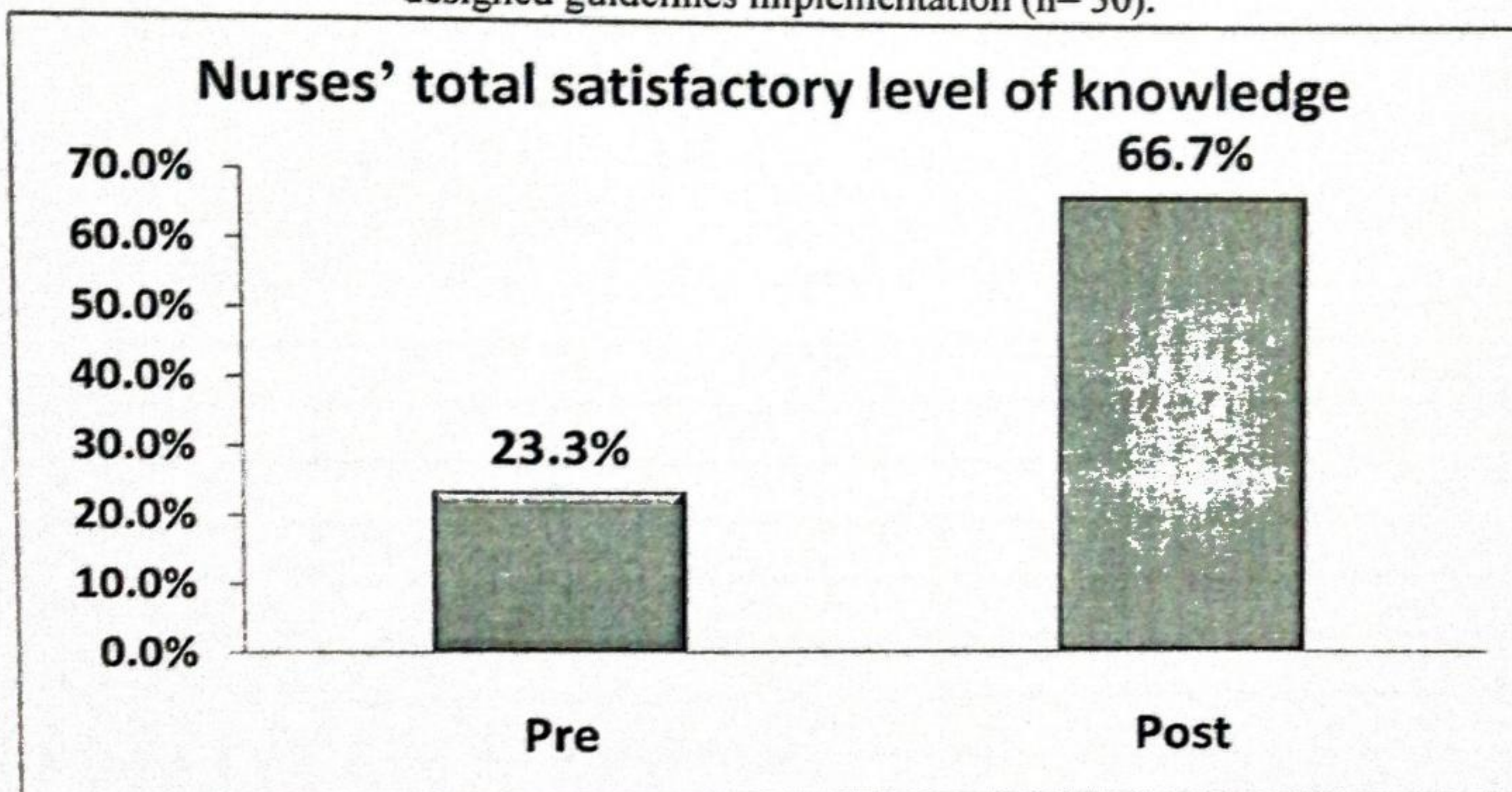
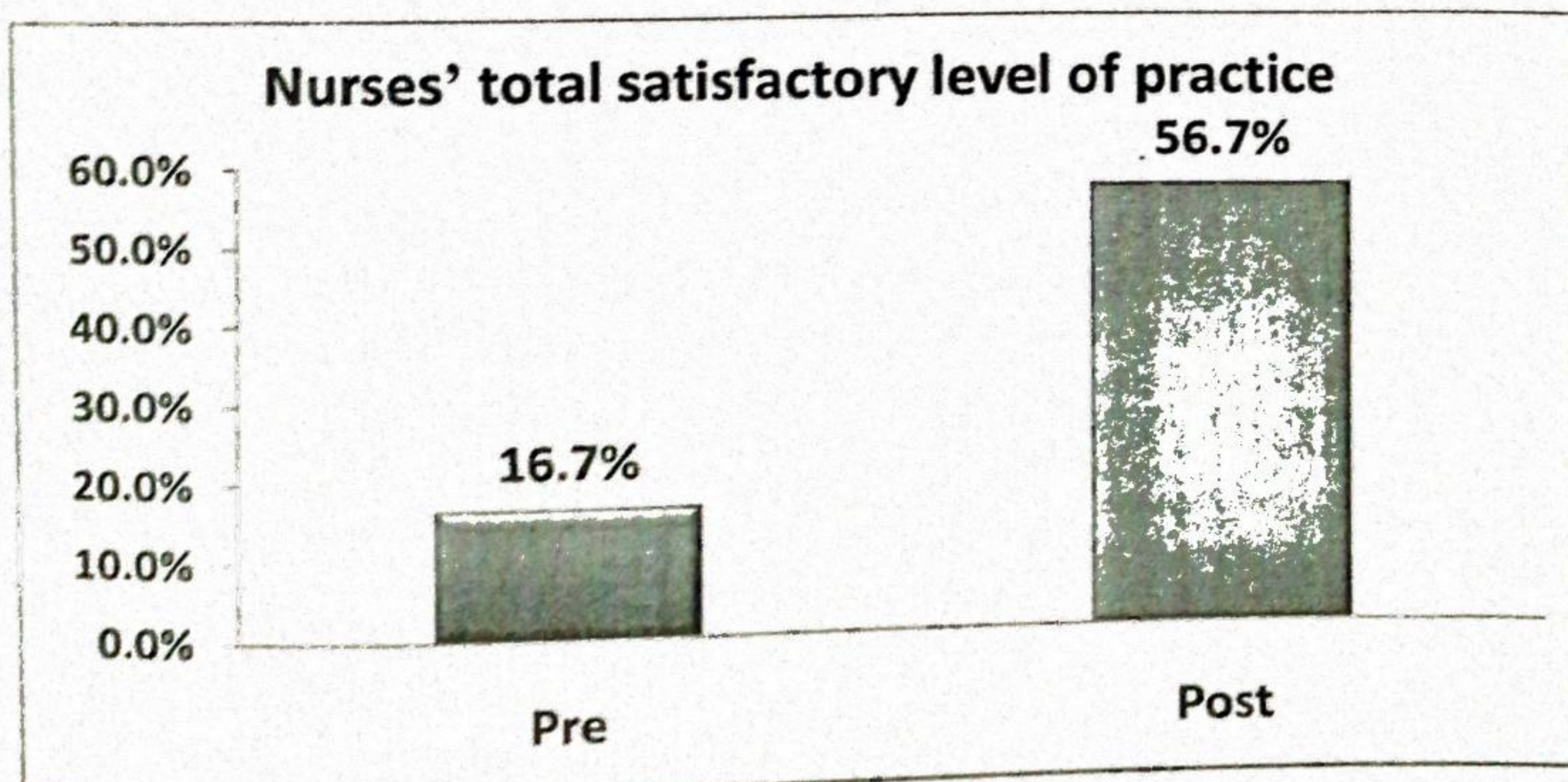


Figure (2) Frequency distribution of total satisfactory level of nurses' practice regarding caring of patients undergoing upper gastrointestinal endoscopy pre and post the designed guidelines implementation (n= 30).



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Table (2): Frequency distribution of the studied patients in study and control groups according to their demographic characteristics

Demographic characteristics	Studied patients				Chi-square	
	control		Study			
	(n=30)		(n=30)		X ²	P-value
	N	%	N	%		
Gender						
Male	16	53.3	18	60.0	0.271	0.602
Female	14	46.7	12	40.0		
Age						
18<30	7	23.3	6	20.0	0.322	0.851
30<40	8	26.7	7	23.3		
40<55	15	50.0	17	56.7		
Mean± SD	37.96±9.54		38.92±10.36			
Marital status						
Single	9	30.0	7	23.3	2.793	0.425
Married	16	53.3	20	66.7		
Divorced	3	10.0	1	3.3		
Widow	2	6.7	2	6.7		
Level of education						
Illiterate	4	13.3	4	13.3	0.112	0.990
Read/ Write	4	13.3	4	13.3		
Diploma education	14	46.7	13	43.4		
University education	8	26.7	9	30.0		
Residence						
Rural	17	56.7	16	53.3	0.001	0.971
Urban	13	43.3	14	46.7		
Occupation						
Work	21	70.0	22	73.3	0.082	0.774
Not working	9	30.0	8	26.7		
Income according to patient's opinion						
Enough	14	66.7	13	59.1	0.264	0.607
Not enough	7	33.3	9	40.9		

Table (3): Frequency distribution of the studied patient's complications and associated discomforts in the study and control groups.

Items	Studied patients				Chi-square	
	Control group		Study group			
	(n=30)		(n=30)		X ²	P-value
	N	%	N	%		
Upper GI endoscope related complications and associated discomforts						
1-Upper GIT bleeding						
• Bleeding from mouth	2	6.7	1	3.3	0.351	0.554
2-Infection						
• Fever	3	10.0	1	3.3	1.071	0.301
• Chilling	3	10.0	1	3.3	1.071	0.301
• Abdominal pain	19	63.3	15	50.0	1.086	0.297
3-Upper GIT perforation						
• Fever	3	10.0	1	3.3	1.071	0.301
• Difficulty of breathing	3	10.0	2	6.7	0.218	0.640
• Difficulty of swallowing	30	100.0	30	100.0	-----	
4-Others						
• Hoarseness	14	46.7	10	33.3	1.111	0.292
• Sore throat	30	100.0	30	100.0	-----	
• Hiccup	3	10.0	2	6.7	0.218	0.640
• Exhaustion	14	46.7	7	23.3	3.590	0.058
• Severe dizziness	9	30.0	7	23.3	0.341	0.559
• Anorexia	7	23.3	5	16.7	0.417	0.519
Anesthesia related complications and associated discomforts						
1-Respiratory complications						
• Chest pain	3	10.0	2	6.7	0.218	0.640
• Difficulty of breathing	3	10.0	2	6.7	0.218	0.640
2-Cardiovascular complications						
• Hypotension	4	13.3	3	10.0	0.162	0.688
• Bradycardia	4	13.3	3	10.0	0.162	0.688
3-Others						
• Nausea	7	23.3	5	16.7	0.417	0.519
• Vomiting	3	10.0	2	6.7	0.218	0.640
• Headache	9	30.0	7	23.3	0.341	0.559
Mean ± SD	8.15±7.4		6.3±7.33		0.794	0.432

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Figure (3) Frequency distribution of total satisfactory level of patients undergoing upper GI endoscopy in study and control groups

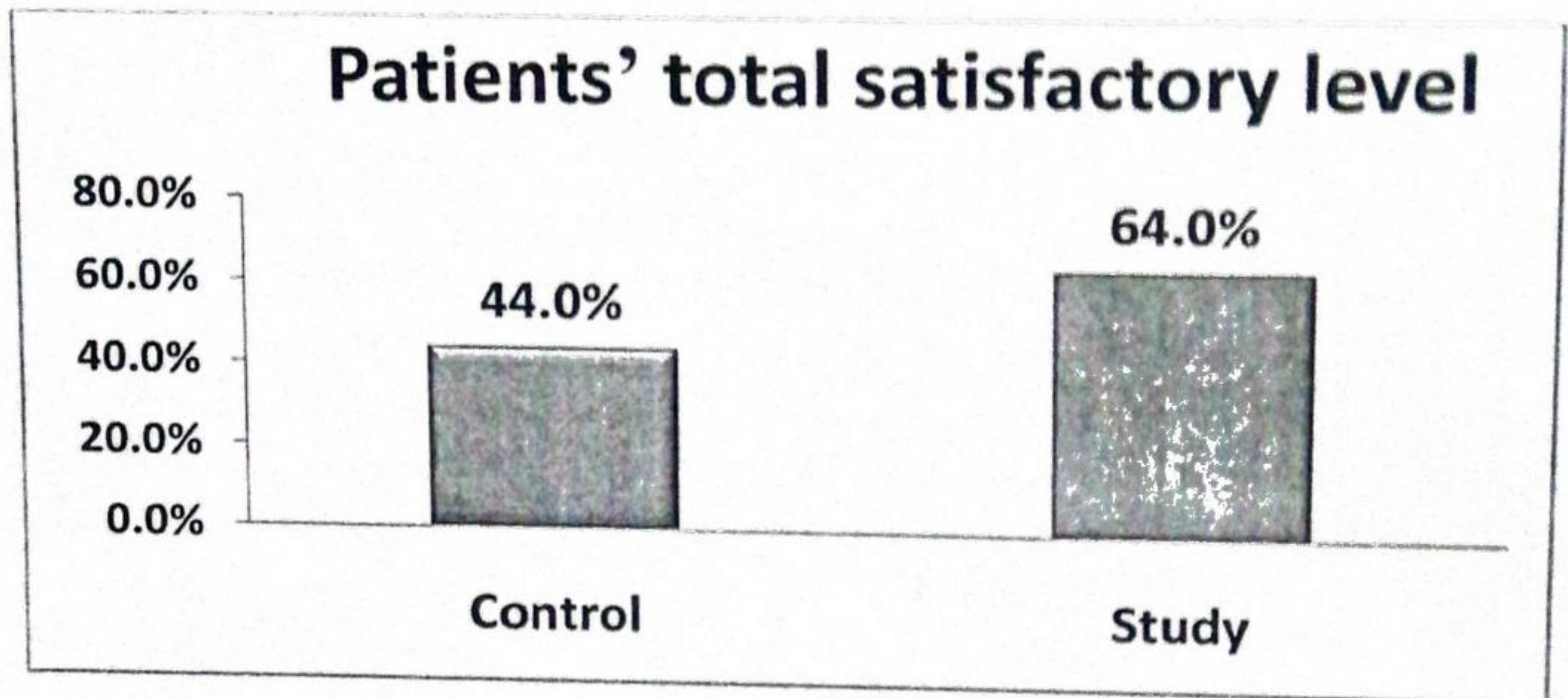


Table (4): Relation between total mean score of nurses' knowledge regarding caring of patients undergoing upper GI endoscopy and their demographic characteristics pre and post the designed guidelines implementation

Items	Total mean score of nurses' knowledge					
	Pre			Post		
	Mean \pm SD	f/t	P-value	Mean \pm SD	f/t	P-value
Age						
18<30	35.25 \pm 3.91	1.694	0.203	44.00 \pm 4.76	4.964	0.015*
30<40	36.33 \pm 4.98			47.67 \pm 4.08		
40<50	38.75 \pm 3.87			50.65 \pm 3.25		
Level of education						
Nursing diploma	34.55 \pm 3.06	4.704	0.018*	45.45 \pm 3.33	3.441	0.047*
Nursing institute	37.25 \pm 3.29			45.75 \pm 2.72		
Nursing bachelor	39.33 \pm 4.85			49.50 \pm 3.73		
Years of experience						
<5 years	.....	1.333	0.193	.....	3.493	0.002*
5<15	35.25 \pm 5.91			45.00 \pm 4.76		
15<30	38.35 \pm 4.10			51.65 \pm 3.37		
Training courses about nurses' role in gastrointestinal unit						
Yes	38.13 \pm 4.42	1.880	0.071	47.00 \pm 3.63	2.646	0.013*
No	34.14 \pm 5.36			43.23 \pm 3.39		

Table (5): Relation between total mean score of nurses' practice regarding caring of patients undergoing upper GI endoscopy and their demographic characteristics pre and post the designed guidelines implementation

Items	Total mean score of nurses' practice					
	Pre			Post		
	Mean ± SD	f/t	P-value	Mean ± SD	f/t	P-value
Age						
18<30	14.20 ± 3.79	1.483	0.245	34.75 ± 3.52	2.825	0.077
30<40	14.70 ± 4.83			38.83 ± 5.61		
40<50	17.40 ± 4.33			39.70 ± 3.21		
Level of education						
Nursing diploma	15.80 ± 4.30	1.823	0.181	35.55 ± 4.84	3.317	0.049*
Nursing institute	16.25 ± 5.70			37.50 ± 6.35		
Nursing bachelor	19.67 ± 3.69			41.50 ± 4.57		
Years of experience						
<5 years	.....	2.103	0.045*	.....	2.767	0.010*
5<15	13.50 ± 3.79			33.75 ± 5.52		
15<30	18.42 ± 4.42			39.50 ± 3.62		
Training courses about nurses' role in gastrointestinal unit						
Yes	17.50 ± 4.54	0.441	0.662	38.75 ± 4.22	3.056	0.005*
No	16.77 ± 3.82			34.09 ± 3.50		

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Table (6) Correlations between total level of nurses' knowledge and their total level of practice and patients' complications and patients' satisfaction level pre and post the designed guidelines implementation regarding caring of patients undergoing upper GI endoscopy

Items	Total level of nurses' knowledge			
	Pre		Post	
	Pearson Correlation Coefficient	P-value	Pearson Correlation Coefficient	P-value
Total level of nurses' practice	0.564	<0.001	0.502	<0.001
Patients' complications	-0.047	0.723	-0.519	0.003
Level of Patients' satisfaction	0.282	0.024	0.607	<0.001
Items	Total level of nurses' practice			
	Pre		Post	
	Pearson Correlation Coefficient	P-value	Pearson Correlation Coefficient	P-value
Patients' complications	-0.265	0.041	-0.240	0.064
Level of Patients' satisfaction	0.335	<0.001	0.428	<0.001

Discussion

Regarding demographic characteristics of the studied nurses, the results of the present study revealed that, more than three quarter of the studied nurses were females. The higher percentage of female nurses may be due to the increased in the number of female nurses as compared with males and about two third of them were more than 40 years old with mean age 39.87 ± 7.9 years. This finding is consistent with study conducted by **Ali & Taha (2014)** entitled: "Effect on Infection Control Training Program and Microbial Results on GIT Endoscopes" who reported that, about two thirds of the

studied nurses working in GI endoscopy unit were females and in middle age.

Also, more than three quarter of the studied nurses had experience more than 15 years with mean experience 20.07 ± 8.39 years. This finding goes in the same line with what was reported by **Abd-Elhamid, El-khashab, Taha & Saleh (2016)** who found in the study entitled: "Impact of training education program on improving of nurses performance regarding infection control in endoscopy unit" that, the majority the of the sample had more than 10 years of experience with mean 23.8 ± 8.6 years.

In relation to educational level, about two third of them were nursing diploma. This might elaborate the current condition of nursing qualification. This finding is consistent with **Metwally, Abou Donia, Abdel Aziz, (2016)** who found in the study entitled: "Safety Measures for Patients Undergoing Upper GIT Endoscopy" that, near three quarter of the studied nurses were holding diploma of the nursing secondary school and near three quarter of them didn't attend training courses about caring of patients undergoing upper GI endoscopy. This may reflect lack of in-service training programs. This finding is in agreement with **Amer, Zaton, Taha & El-Khashab (2018)** who reported in the study which was entitled: "Nurses Intervention Regarding Caring for Patients with Esophageal Varices during Endoscopy" that, the minority of the studied sample hadn't received previous training courses about their role in GI endoscopy.

The results in the present study revealed that, significant improvement in level of nurses' knowledge post the designed guidelines implementation regarding caring of patients undergoing upper GI endoscopy. These results are in agreement with those of **Amer, Taha & Zaton (2015)** who noted in the study which was entitled: "Nurses Knowledge and Practice Regarding Gastrointestinal Endoscopy and Suggested Nursing Guidelines" that, low level of knowledge regarding GI endoscopy in the initial baseline data knowledge assessment for the nurses and nurses' knowledge improved immediately after attending to the training programs.

In the present study, the results revealed that the nurses' staff had unsatisfactory level of knowledge pre the designed guidelines implementation. This reflects from the researcher opinion the lack of scientific preparation in this specialized unit. This might be related to the fact that providing care for patients undergoing upper GI endoscopy need special skills, knowledge and nursing specialty for nurses caring of such group of patients or may be attributed to insufficient training courses related to endoscopic procedure.

In the present study, the results revealed that the nurses' staff had unsatisfactory level of practice pre the designed guidelines implementing, this could be attributed to lack of the nurses' knowledge which reflected on their practice, inadequate in-service training program, lack of qualification as about two third of studied nurses were nursing diploma, insufficient nursing staff. Also, this may be due to lack of job description and nurses believe that a lot of these aspects are physician responsibilities.

This study finding indicated that skills of the studied nurses can be easily improved especially if it was linked with relevant scientific knowledge. Educational programs result in improvement in practical level of nurses.

These study results are in similar with **Information Resources Management Association (IRMA), (2018)**. Who mentioned that, nursing education programs are one of the alternatives to increase the quality of nurses and assist to make future health practitioners useful in their field. **Sridhar**

& Wu (2018) stated in the study which was entitled: "Diagnostic and therapeutic procedures in gastroenterology: an illustrated guide" that, the staff nurses practice in the endoscopy unit with skills and techniques acquired through training from accredited schools of nursing and continuous educational programs to provide ethically sound nursing care to the patients.

Regarding demographic characteristics of the studied patients' results of the present study revealed that, more than half of both groups were males. These results are in agreement with Lotfy, Elgazzar, Awad, Yusuf, & Fathy (2017) who reported in the study which was entitled: "Thoracic complications of upper gastrointestinal endoscopy in Zagazig University Hospitals" that, male patients represented two third of the studied population while female patients were one third.

Regarding age, results of the present study revealed that half of the patients in the control group their age were ≥ 40 years with mean age 37.96 ± 9.54 , more than half of study group was ≥ 40 years with mean age 38.92 ± 10.36 , This could be attributed to gastrointestinal tract disturbances especially gastric disorder are occurs with the greatest frequency in people between the age of 30 and 55years. This supported by Qayed, Srinivasan, & Shahnavaz (2016).

As regards marital status and residence, it was found that more than half of the control group and two third of the study groups were married, this may reflect that married people were liable to gastric diseases more than singles because they

always facing physical and psychological stress of their social role. The present study results clarified that more than half of study and control group from rural. These findings may be interpreted as unavailability of specialized hospitals affording upper GI endoscopy in rural areas. This result was congruent with Bayumi (2016) who mentioned in the study which was entitled: "Effect of Nursing Intervention on Clinical Outcomes and Patient Satisfaction among Upper Gastrointestinal Bleeding" that, the highest percentage of the studied sample was from rural and most of the studied sample was married.

As regards the educational level, near half of the patients in the control and study groups were diploma education. Educational level will help the helps the patients to understand a health care provider's direction and may increase their knowledge and improve the outcomes of the endoscopy. This result is congruent with Hiremath, Mohite, Naregal, Pawar, & Bhosale (2016) who found in the study which was entitled: "Study to Assess the Knowledge, Attitude and Pre Procedure Anxiety Level of Patient Undergoing Upper GI Endoscopy" that, the highest percentage of the study group and most of the control groups were able to read and write.

As well as, near three quarter of patients of the patients in the control group had occupation and two third of them had enough income, as well as near three quarter of the study group of patients had occupation and more than half of them had enough income according to their opinion. Some patients were unable to work, this may be due to the changes of their work

abilities and increase their daily living finance because of the disease treatment cost. These study results were in the same line with **Shebl, Mohamed, & Othman (2013)** who mentioned in the study which was entitled: "Effect of Nursing Intervention on Clinical Outcomes and Patient Satisfaction among Upper Gastrointestinal Bleeding" that, about two third of studied patients had manual work and less than half of them had enough income.

Concerning Upper GI endoscopy related complications and associated discomforts, all studied sample of the control and study groups had difficulty of swallowing, and sore throat. These findings may be interpreted as the insertion of endoscopy itself through the mouth and throat causing these symptoms. These findings were consistent with what was reported by **Mohamad, Mohamad, & sayed, (2014)** who revealed in the study which was entitled: "Esophago-gastro-duodenoscopy: Impact of a designed nursing teaching protocol on nurse's performance and patient's outcome" that, all studied patients had difficulty of swallowing, and sore throat after upper GI endoscopy procedure.

Also, about two third of the control group and half of the study group had abdominal pain and the minority of patients in both groups had bleeding from mouth. These results were comparable to **Bini, Firoozi, Choung, Ali, Osman, & Weinshel, (2013)** who stated in the study which was entitled: "Systematic evaluation of complications related to endoscopy" that, near half of the studied samples had negative outcomes abdominal pain and the majority of them had sore throat and

mentioned that perforation is the rare complications of upper GI endoscopy.

Regarding anesthesia related complications, near one third and near one quarter of control group and study group suffered from headache, near one quarter and near one fifth of the control and study group suffered from nausea as well as, the minority of two groups had hypotension and bradycardia, chest pain, difficult of breathing and vomiting. In the same context, these study findings were supported by **Simon, Orłowska, & Pazgan-Simon, (2017)** who reported in the study which was entitled: "The risk of complications of endoscopic procedures in patients with liver cirrhosis" that, the various post GI endoscopy complications are desaturation, hypotension, arrhythmias, bradycardia, tachycardia, hypertension, bradypnea and respiratory distress.

Regards total satisfactory level in study group of patients undergoing upper GI endoscopy regarding the received care improved post the designed guidelines implementation. This finding come in agreement with **Bayumi, (2016)** who stated that, the total mean score regarding level of satisfaction of the study group after application of nursing intervention was improved.

By studying the relation between total nurses' knowledge and their demographic characteristics the result of the current study revealed that there was statistically significant relation between total nurses' knowledge mean score and level of education pre the designed guidelines implementation. This indicates that education has a vital role in improving the knowledge of the nurses and

consequently improving the quality of care rendered to patient undergoing upper GI endoscopy.

Also, there was statistically significant relation between their knowledge mean score and their demographic characteristics including age, educational level, years of experience and training courses post implementation of the designed guidelines. This may explain that increasing age of the nurses accompanied with increasing experience until reach the level of automatism, education and training has a vital role in improving the knowledge of the nurses and consequently improving the quality of care.

These results are consistent with **Metwally, Abou Donia, & Abdel-Aziz (2016)** who found that, there was statistically significant relation between nurses' performance and years of experience, training courses and level of education.

By studying the relation between total nurses' practice mean score and their demographic characteristics, it found that, there was statistically significant relation between total nurses' practice and their years of experience pre implementation of the designed guidelines and their demographic characteristics including age, educational level, years of experience and training courses post the designed implementation.

This is in agreement with **Mohamed, Mohamed, Abo El-ata, & Abd El-latef (2018)** who found in the study which was entitled: "Assessment of Nurses knowledge and Practice Regarding the Care of Patients Undergoing

Gastrointestinal Endoscopy" that, there was statistically significant relation between nurses' performance and their demographic characteristics regards age, experience and level of education.

Regarding the correlations between studied variables the current study represented that, there was positive correlation between total level of nurses' knowledge regarding caring of patients undergoing upper GI endoscopy and their total level of practice pre and post the designed guidelines implementation. These findings supported by **El-Maghawry H.A. & El-Hawy L.L., (2019)** who clarified in the study which was entitled: "Effect of Training Educational Program on Nurses' Performance as Regarding Infection Control Procedures and Endoscopies Reprocessing Techniques in GIT Endoscopy Unit" that, there was positive correlation between nurses' knowledge and practice regarding patients care and infection control measures in endoscopy unit.

Nurses' performance had noticeable effect on patients' satisfaction regarding the received care as the nurse provide direct care to the patient throughout all phases of upper GI endoscopy. This result is congruent with **Abyaneh, S. K. & Rezaei, (2017)** who showed in the study which was entitled: "Assess patient's satisfaction of nurse's performance" that most of the patients were satisfied regarding nursing skills and emotional communication and training services and they will recommended this hospital to their families and friends.

While the current study revealed that, there was negative correlation between

total level of nurses' performance (knowledge and practice) regarding caring of patients undergoing upper GI endoscopy and patients' complications pre and post the designed guidelines implementation. This means that, if the level of nurses' performance improved, the patients' complications levels decreased and vice versa.

This result is congruent with Mohamad, Mohamad, & sayed, (2014) who noted slightly decrease in percentages of complications post teaching protocol for nurses working in GI endoscopy unit.

Conclusion

The results of this study concluded that:

-The designed guidelines implementation for nurses caring of patients undergoing upper GI endoscopy had statistically significant positive effect on outcome regarding level of nurses' performance (knowledge and practice) and patients' satisfaction level, but the results didn't reveal any statistically significant difference between control and study groups regarding complications.

Recommendations:

The result of this study projected the following recommendations:

- Replication of the current study on a larger probability sample and different hospitals settings is recommended to achieve generalization of the results and wider utilization of the designed guidelines for nurses caring of patients undergoing upper GI endoscopy.

- Further researches are recommended periodically to be carrying out using new approaches in the area of caring of patients undergoing upper GI endoscopy for improving the outcome of the endoscopy.

- Implementation of an educational training program for patients undergoing upper GI endoscopy regarding upper GI endoscopy and self-care to improve patients' outcomes.

- Endoscopy unit should be supplied by guided checklists or a protocol for nurses' caring for upper GI endoscopic patients.

- Patients care guidelines for patients undergoing upper GI endoscopy should be applied in endoscopy unit and should be updated periodically to enhance patients outcome.

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