Effect of Nursing Instructions on Knowledge and Anxiety of Patients Undergoing Endoscopic Retrograde Cholangiopancreatography



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1- ABSTRACT

Background: Endoscopic retrograde cholangiopancreatography (ERCP) is an innovative technique used to identify and treat many biliary and pancreatic duct disorders. Patients' fear and anxiety from endoscopic procedures can result in more uncomfortable, incomplete or even cancellation of the procedure. Accordingly, specialized patient education and preparation are required. Aim: this study aimed to Evaluate the effect of nursing instructions on knowledge and anxiety of patients undergoing endoscopic retrograde cholangiopancreatography. Method: A quasi-experimental study design was used at the endoscopy ward at gastrointestinal surgery center at Mansoura university. Sample: A purposive sample of sixty patients undergoing ERCP was classified randomly into two groups: the study group had nursing instructions designed by the researcher and the control group got routine hospital care. Tools: Data were collected using two tools, tool I: Structured interview questionnaire which contained two parts, part I: patient's demographic characteristics and medical data, part II: Patient's knowledge regarding ERCP procedure. Tool II: State anxiety assessment Results: Patients undergoing ERCP who received nursing instructions had a highly significant improvement in knowledge level with $p \leq 0.001$ and reported a highly significant reduction in anxiety scores than those who received routine care with $p \leq 0.001$. Conclusion: Nursing instruction had a positive effect on knowledge improvement and anxiety reduction in patients undergoing ERCP. Recommendations: The developed nursing instructions booklet should be available at the endoscopy unit for all patients undergoing the ERCP procedure.

Keywords: Anxiety, ERCP, Instructions, knowledge, Nursing.

2- Introduction:

The hepatopancreatobiliary system has complex formation and functions. Biliary and pancreatic ducts disorders are some of the commonest disorders of the hepatopancreatobiliary system. It includes choledocholithiasis with or without cholangitis, biliary tract cholangiocarcinoma, periampullary mass, biliary atresia, Oddi's sphincter disease, pancreatitis and pancreatic pseudocyst. (Dave, Shumway & Al Obaidi, 2022). Endoscopic retrograde cholangiopancreatography is the treatment of choice for most of these disorders. (Younis et al., 2022)

Endoscopic retrograde cholangiopancreatography (ERCP) procedure is regarded as the best choice for diagnosis and management of choledocholithiasis. It is an advanced technique in endoscopy used to diagnose and treat many diseases of the pancreas and gallbladder. It allows for visualization of pancreatobiliary ductal anatomy using fluoroscopy and contrast, obtaining tissue samples, and quickly repairing biliary obstruction and pancreatic obstruction. (**Yang et al., 2022**) The success of the endoscopic procedure and the good health outcomes of the patient depend on the patient's preparation and education. (Sharma, 2021)

Canceled and missed endoscopy appointments related to inadequate preparation, anxiety and fear from the procedure are issues faced daily in the endoscopy units globally and it can negatively influence the patient's outcomes (Alnasser, Alkhowaiter, Alhusaini, & Aljarallah, 2020). A heavy responsibility lies on the endoscopy nurse in patient preparation through acknowledging the patients' individual needs, decreasing anxiety and fear of the patient and facilitate patient participation in the treatment plan. (Dubois, Creutzfeldt, Törnqvist, & Bergenmar, 2020) Preparation of the patient before endoscopy depends on the instructions that patients should follow regarding diet, medication, cessation of smoking, consent, laboratory and radiological investigations. (Khan et al., 2023; Lai, 2018; Everett et al., 2023)

Endoscopy patient education is a cornerstone of effective healthcare; it could help patients manage their treatment and prevent

avoidable complications and hospital re-admissions while keeping or improving their quality of life. (Ricci, Villegente, Loyal, Ayav, Kivits, & Rat, 2022) Nursing instructions are important for expanding the patients' knowledge and influencing self-care behaviors of the patients. (El-Rahman, Mekkawy, & Ayoub, 2020)

2.1 Aim of the study

This study aimed to evaluate the effect of nursing instructions on knowledge and Anxiety of patients undergoing endoscopic retrograde cholangiopancreatography.

2.2 Research Hypothesis

H1: Patients' knowledge regarding endoscopic retrograde cholangiopancreatography will be improved after provision of nursing instructions.

H2: Patients' anxiety associated with endoscopic retrograde cholangiopancreatography will be reduced after provision of nursing instructions.

3. Method

3.1 Research Design

A quasi-experimental research design was utilized.

3.2 Research setting:

This study was conducted at the endoscopy ward of gastrointestinal surgery center at Mansoura University

3.3 Research subjects:

A purposive sample of sixty patients underwent ERCP. The Patients were classified randomly into two groups: the study group had nursing instructions and routine hospital care by the researcher after agreement of the physician and the control group got routine hospital care only and fulfilled the following criteria:

Criteria of Inclusion

- Patients aged from twenty to less than sixty years old and of both sexes.
- Conscious and cooperative patients.
- Patients who had undergone ERCP for the first time.

Criteria of Exclusion

- Patients taking anti-anxiety drugs.

3.4 Data Collection Tools

Two tools were utilized for gathering data relevant to this study:

Tool I: A structured Interview Questionnaire

The researcher developed this tool after reviewing relevant literature. (Cotton, 2020; Anwar, Basal, Selim, & Al-Metyazidy, 2018) It consisted of the following two parts:

Part (I): Patients' demographic characteristics and medical data:

It was used to collect the demographic data and medical data of the studied patients. Demographic data included the following items: Age, education level, gender, occupation, and marital status, while medical data consisted of medical diagnosis, chief complaint, history of pancreaticobiliary disorders, treatment method, history of chronic illness, type of chronic illness and family history of pancreaticobiliary disorders.

Part (II): Patients' knowledge regarding ERCP procedure:

It was used to assess the patients' knowledge regarding ERCP in the form of multiple-choice questions (MCQ) and a true/false/don't know question with a total number of 17 questions: 16 MCQ and 1 true/false/don't know question. The 17 questions were categorized into 6 broad categories: Overview about ERCP, pre-endoscopy instructions, post-endoscopy instructions, ERCP stents, complications and side effects, and follow-up instructions. The correct answer got true, while the wrong/don't know answer got false. (**Cotton, 2020**)

Scoring system for patients' knowledge about ERCP

Each of the knowledge questions had a set of answers and each question had one correct answer. The correct answer had one point. but the answers that were wrong, missed, or unknown were given zero points. The total score of patients' knowledge about ERCP was calculated by summing up the scores obtained from all questions. (Jothi, Rammoorthy, & Nair, 2020)

Scale	%	points	
Good	$\geq 75\%$	≥ 12.75	
Faire	50 - <75%	8.5 - 12.74	
Poor	< 50%	< 8.5	

Tool II: State anxiety inventory:

State anxiety inventory was adopted from (Shu, Peng, & Wang, 2023). It was used to assess

anxiety level and evaluate qualities of tension, nervousness, worry, and apprehension. An Arabic version of state scale was used. It contained direct scale and inverted scale elements. State scale required people to indicate how they felt at the certain past moment, it consisted of 20 questions, and it contained a four-points scale (not at all, sometimes, moderately so and very much so). There were 10 direct scale items and another 10 inverted scale items. The inverted scale elements were 1, 2, 5, 8, 10, 11, 15, 16, 19 and 20.

Scoring System

Direct State Scale	Inverted State Scale			
Score 1: Not at all	Score 4: Not at all			
Score 2: Sometimes	Score 3: Sometimes			
Score 3: Moderately so	Score 2: Moderately so			
Score 4: Very much so	Score 1: Very much so			

Anxiety levels

Range of scores for state scale was (20-80)

Mild: It ranged from 20 to less than 40 points.

Moderate: It ranged from 40 to less than 60 points. Severe: It ranged from 60 to less than 80 points.

Data Collection Process

- Administrative preparation:
- Ethical permission was granted by the scientific research ethics committee at the Mansoura University faculty of nursing.
- A written official acceptance for conducting this study was received from the director of the gastrointestinal surgery center at Mansoura University.
- Tools development:
- The researcher developed tool 1 after reviewing the related literature. (Cotton, 2020; Anwar, Basal, Selim, & Al-Metyazidy, 2018)
- Tool 2 was adopted from (Shu, Peng, & Wang, 2023).
- Content validity: Five medical-surgical nursing department experts served as the jury, and they evaluated the developed tools' content validity, and then the required adjustments were carried out.
- Reliability: Data collection tools were examined for reliability using Cronbach's alpha test which showed a satisfactory level of reliability of knowledge and anxiety (0.702 & 0.888) respectively.
- Pilot study: Ten percent of the study sample (6 patients) participated in the pilot study to verify that the developed tool is feasible, clear,

relevant, comprehensive, applicable, and without any mistakes and they were excluded from the sample of the study. The pilot study allowed for making necessary adjustments before carrying out the study on a large scale, determining any unexpected obstacles in data gathering, and estimating the needed time for filling out the questionnaire. The questionnaire took about 20 - 30 minutes to be filled out.

- The researcher created a colorful booklet in a simple Arabic language.
- Data collected from the beginning of October 2023 till the end of January 2024.

Fieldwork: This study was conducted through three phases assessment, implementation, and evaluation.

Assessment phase:

- It started with introducing the researcher himself to the ERCP patients and providing them with a brief idea about the study and it's aims.
- The researcher collected assessment data from the control group followed by study group using tool 1 and tool 2 as a pre and post intervention for patients who fulfilled the inclusion and exclusion criteria of the study.

Implementation phase:

- This phase started with implementing nursing instructions intervention on the day before ERCP in form of one educational session for study group.
- The session covered general knowledge about ERCP procedure including (definition, purpose, complications, side effects, warning signs, patient preparation, post ERCP common patient complaints and its management.)
- Each patient was interviewed individually, different media and teaching tools was used such as presentation PowerPoint and colored booklet.
- The educational session lasted for 30-45 minutes, including discussion periods.
- Arabic colored booklet was given to the patients as a guide including some information regarding ERCP procedure including definition, purpose, preparation instructions, complications, side effects, warning signs and ERCP stents.
- The control group got routine hospital care.

Evaluation phase:

• Effectiveness of nursing instructions was evaluated using the tool 1 part 2 and tool 2 between the study and control group as a post test.

3.5 Ethical Considerations:

The research scientific ethical committee of the faculty of nursing, Mansoura University granted an ethical approval for conducting this study. All relevant possible ethical aspects were considered. Informed oral consent was taken from patients enrolled in the study after thoroughly explaining the purpose and nature of the study. The researcher stressed that participation in the study was voluntary. Participants were told that they had the right not to participate in the study, give up at any time, and that declining participation in the study would not affect on their work. Throughout the whole study, confidentiality, safety, privacy, and anonymity were guaranteed.

3.6 Statistical Analysis

The collected data were organized, tabulated, and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version twenty-six, SPSS Inc. Chicago, IL, USA), Frequency and percentage were used to express the categorical variables, while mean and standard deviation were used to represent parametric continuous variables whereas median and interquartile range (IQR) displayed nonparametric and ordinal variables. A chi square test, Fisher exact test, Monte Carlo test, independent ttest, paired t-test, Mann-Whitney test and Wilcoxon signed rank tested were utilized in this study. Sperman correlation analysis was employed to evaluate the correlations between the quantitative variables not following normal distribution. Statistically significant was deemed with a p-value less than 0.001 and 0.05.

4. Results

Part I: Demographic characteristics of the studied groups:

Table 1 illustrates the demographic characteristics of the study group and the control group. Concerning gender, women were more likely than men to participate in this study. The percentage of female patients in the study group and control group was 60 % and 63.3% respectively. Regarding age, almost two-thirds of the studied patients ranged from 50 to less than 60 years old with a mean age of 48.80 ± 9.193 for the study group and 50.47 ± 8.476 for the control group. The marital status of most of the studied patients were married with a percentage of 90 % for the study group and 80 % for the control group. About level of education, more than one third of the study group and one third of the control group could read and write (40 % & 33.3%) respectively. As for occupation, most patients in the study group and control group were working (80% & 83.3%) respectively. The two groups were matched, and demographic characteristics were nearly the same in the study and control group with no significant difference between them where P>0.05.

Items	Study Group (n = 30)		Control Group (n = 30)		χ2 / MC	Р
	n	%	n	%		
Gender						
 Men 	12	40	11	36.7	0.071	0.791
 Women 	18	60	19	63.3	0.071	
Age						
■ 20 - < 30	3	10	0	0		MCE P= 0.449
■ 30 - < 40	4	13.3	4	13.3	2 01 1	
■ 40 - < 50	4	13.3	5	16.7	5.211	
■ 50 - < 60	19	63.3	21	70		
$\mathbf{x} \pm SD$	48.80 ± 9.193		50.47 ± 8.476			
Min.	28		27		t= 0.73	0.46
Max.	59		59			
Marital Status						
 Single 	0	0	4	13.3		MOL
 Married 	27	90	23	76.7	4 220	MCE D-
 Widow 	1	3.3	1	3.3	4.320	P= 0.236
Divorced	2	6.7	2	6.7		

Table 1. Demographic characteristics of the studied groups (N=60)

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Education level								
•	Illiterate	3	10	2	6.7	0.253	MCE P= 0.100	
	Read and write	12	40	10	33.3			
	Secondary and what equals	6	20	8	26.7			
	University education	9	30	10	33.3			
Occu	Occupation							
-	Working	24	80	25	83.3	0.111	0.739	
•	Not working	6	20	5	16.7			

 $\begin{array}{lll} p \mbox{ significance } \chi 2 \mbox{ for Chi-squared test } t \\ \mbox{for independent t test } MC \mbox{ for Monte Carlo test } \\ MCEP \mbox{ for Monte Carlo estimated p value.} \end{array}$

Figure 1 introduces a comparison between studied groups, pre and post-intervention in relation to total knowledge levels regarding ERCP. Preintervention, there was no statistically significant difference between studied groups in relation of knowledge level where (*p*-value> .05). Despite post-intervention, there was a highly significant difference between the studied groups where (p-value < 0.001). In addition, the comparison between control group before and after intervention in relation to total knowledge levels revealed that there was no significant difference (p-value> .05), on the other hand, there was a highly statistically significant difference between study group in relation of knowledge level at pre and post-intervention where (p-value < 0.001).





Chi-squared tests for the study group = $\chi 2$ = 33.981, MCEP= 0.000**

Figure 2 introduces comparison between study group and control group at pre and postintervention in relation to mean anxiety scores. At the pre-intervention phase, there was a near similarity in mean anxiety scores between the studied groups where the *p*-value> 0.05. Meanwhile, at the post-intervention phases, the control group had witnessed an increase in mean anxiety scores compared to its pre intervention value (40.5 & 40.36) respectively. The increase in control group was not significant where p-value> 0.05. About the study group, there was a significant reduction in anxiety scores compared to pre-intervention value and the control group where p-value <0.001.



Figure 2. Comparison Between Study Group and Control Group at Pre- and Post-Intervention in Relation to Mean Anxiety Scores (n=60)

 t_1 = independent t test at the pre-intervention phase, t_2 = independent t-test at the post-intervention phase, t_3 = paired t-test for the control group, t_4 = paired t-test for the study group.

Figure (3) shows correlation between knowledge scores and anxiety scores for control group post intervention regarding endoscopic retrograde cholangiopancreatography. There was a non-significant, negative and mild correlation between total knowledge score and total anxiety score (rs = - 0.276, p < 0.140), this means that increasing knowledge score is correlated with decreasing anxiety score.





Figure (4) shows correlation between knowledge scores and anxiety scores for study group post intervention regarding endoscopic retrograde cholangiopancreatography. In the study group, there is a significant, negative and moderate correlation between total knowledge score and total anxiety score (rs= - 0. 675, p < 0.001), this means that increasing knowledge score is correlated with decreasing anxiety score.



Figure 4. Correlation Between Knowledge and Anxiety Scores for the study Group Regarding Post-Intervention Endoscopic Retrograde Cholangiopancreatography (N=60). rs for spearman correlation test

5- Discussion

retrograde

Endoscopic cholangiopancreatography is an innovative technique used to identify and treat many biliary and pancreatic duct disorders. It is associated with a higher frequency of serious complications than other endoscopic procedures. (Yang et al., 2022) The lack of knowledge of the patients regarding endoscopic procedures can lead to anxiety which is in turn will lead to inadequate preparation, difficult, more uncomfortable, and incomplete procedure, in addition to increased sedative drug usage. Accordingly, specialized patient education and preparation are required. (Kim, Yoo, Chun, Kim, Youn & Park. 2023) Preprocedural education can relieve both physical and psychosocial problems, promoting patients' responses to procedure side effects. (Tringali, Loperfido and Costamagna, 2023) Therefore, this aim of this study was to evaluate the effect of nursing instructions on knowledge and minimizing complaint of patients undergoing endoscopic retrograde cholangiopancreatography.

As regarding gender, the present study found that approximately two thirds of the study participants were female. This result is aligned with a study conducted by Ghonaem and Ibrahim (2019) who found that majority of their sample was female. On the other hand, Abd Elnaby, Soliman and Elmetwaly (2023) contradict with the results of the current study as they reported that more than half of the study participants undergoing endoscopy were male. From the perspective of researcher, females are at high risk for developing choledocholithiasis because females are naturally higher in estrogen levels, multiparty or ingestion of estrogen-based oral which is the most common indications of ERCP (Baddam et al., 2023).

In relation to age, the cuurent study showed that approximately two-thirds of the study participants were aged between fifty and less than sixty years old. This result is in line with Anwar, Basal, Selim, and Al-Metvazidy (2018). who reported that less than two thirds of study participants who underwent upper gastrointestinal endoscopy aged from fifty to fifty-nine years old. Conversely, this finding varied from the results of Shehab and Soultan (2021) who found that half of patients aged from forty to less than fifty years old. These findings may be related to normal physiological changes that occur with advancing in age such as changes in gallbladder motility, alterations in bile composition, and decreased bile

acid synthesis could contribute to stone formation (Baddam et al., 2023).

Concerning marital status, most of the study participants were married. This finding agreed with Ghonaem & Ibrahim, (2019) whose result demonstrated that the majority of the patients under study were married. This result is opposite to a study conducted by Moghaddam, Khorram, Bonjar, Mohammadi, and Ansari (2016) who reported that unmarried individuals are three times higher than married ones for the risk of getting biliary disorders

Pointing to education level, more than one third of the study group patients and one third of the control group patients could read and write, this result goes side by side with the result revealed by Ghonaem and Ibrahim (2019) that nearly one third of participant were primary educated. However, research conducted by Xia et al. (2019) demonstrated that more than half of the patients under the study who underwent ERCP were highly educated. From the researcher's perspective, the results of the researcher study could be accepted as education below secondary level in Egypt is not concerned a lot about health literacy.

Regarding occupation, most of the patients in the study were working, this finding was in line with Abd Elnaby, Soliman and Elmetwaly (2023) who found that about half of the studied patients were working. Controversially, Shehab and Soultan (2021) reported that about two thirds of the studied patients were not working. From the perspective of the researcher, the uprise in the cost of living obligates large number of populations especially females to seek jobs.

<u>Part II</u>: Patients' knowledge regarding endoscopic retrograde cholangiopancreatography between study group and control group, pre and post nursing instructions.

This study illustrated that most of the study participants had poor knowledge pre-intervention. while more than two thirds of the study group had a good knowledge compared to control group post intervention. This result is in the same line with the study conducted by (Bremer, Brown, Schenkel, Walters, & Nandipati, 2024) who found that there was a significant improvement of patient's knowledge after educational intervention. Additionally, it was consistent with research by Elhy and Elalem (2017), which found that despite the majority of the examined sample had inadequate endoscopic pre-knowledge preparation, over half of the study group had good knowledge than the control group after the intervention. conversely, **Prabhuswami et al. (2016)** mentioned that most of the research subjects who had upper gastrointestinal endoscopies had good knowledge on a study aimed to determine knowledge level of patient undergoing upper GI endoscopy. From the researcher opinion, cultural factor and level of education might affect the patient's ability to reach information needed about the endoscopy and that colored booklet introduced by the researcher affected the knowledge level of the study group.

<u>Part IV</u>: Anxiety of the studied groups regarding endoscopic retrograde cholangiopancreatography at the pre and post intervention phase

The present study demonstrated that less than two thirds of the control group and two thirds of the study group had moderate level of anxiety at pre-intervention. While post intervention there was a highly statistically significant reduction in the study group compared to control group. This finding is consistent with the findings of Khan et al. (2022), who found that prior to the educational intervention, half of the study group and two thirds of the control group had moderate levels of anxiety; following the intervention, however, this proportion improved with a change in the study group that was highly statistically significant.

Also, this study was supported by **Alam and Elashri (2020)** who demonstrated that all studied subjects had severe anxiety before nursing intervention which subsided to normal following the intervention. (**Albayrak, Göktaş, Eyüpoğlu, Muhtaroğlu, & Dulger, 2024**) from the researcher's point of view, the finding of the current study patient's fear from the procedure, lack of knowledge about the procedure and its potential complications.

6- Conclusion of the study

According to the findings of this study, there was a highly statistically significant improvement in patient's knowledge level and a highly statistically significant reduction in total anxiety scores regarding endoscopic retrograde cholangiopancreatography (ERCP) post nursing instructions in the study group compared to control group.

7- Recommendations

For patients:

• The developed nursing instructions booklet should be available at the endoscopy unit for all patients undergoing the ERCP procedure.

Further research:

• A large sample of patients in different clinical settings might participate in a replication of the same study.

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