Effect of Nursing Health Education for Patients Undergoing Plastic Biliary Stent on Clinical Outcomes and Lifestyle

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Abstract

Background: Plastic biliary stent (PBS) represents a significant advancement in endoscopic retrograde cholangiopancreatography (ERCP). ***Aim:*** was to assess the impact of nursing health education for patients undergoing PBS on clinical outcomes and lifestyle. **Design:** Quasi experimental research design had been utilized. **Sample and setting**: Purposive sampling of (60) adult patients of both sexes at the endoscopy unit at New Surgeries Hospital at Tanta University Hospitals, for three months; the sample was divided into two groups equally. **Tools**: three tools had been utilized: **tool (I)** A structured interview schedule and Patient's Knowledge Questionnaire, **tool (II)** Health promotion Model-Instruments to assess health-promoting lifestyle (HPL)and **tool (III)** Post Endoscopic Retrograde Cholangiopancreatography (ERCP) Patients' Clinical Outcomes**. Results:** there were highly improvement in total knowledge level, health promoting lifestyle level only for study group after giving nursing health education, there were an improvement in study and control group in post ERCP clinical outcomes but there was highly improvement in study group after giving nursing health education. Also, it was observed that there were more complications in control group compared to study group. C***onclusion:*** A highly statistically significance difference existed among study and control group regarding total level of knowledge, all items of life style, post ERCP clinical outcomes and patients' complications before and after giving nursing health education. **recommendation:** Continuous educational programs to improve patient's knowledge about plastic biliary stent.

Key words: Biliary obstruction, Clinical outcomes, lifestyle, Nursing health education, Plastic biliary stent.

Introduction

Biliary stricture refers to the constriction and narrowing of the lumen of the bile duct, that may result from several reasons like intraoperative biliary injury, cancer, inflammation and gallstone scarring **(Dinescu et al., 2023) .**

Biliary strictures are categorized as malignant biliary strictures (MBS) or benign biliary strictures (BBS). BBS often arises from damage to the bile duct or benign biliary disease, while MBS usually results from malignant bile duct tumors **(Bektas et al., 2024).** Biliary strictures obstruct the passage of bile from the liver and gallbladder to the small intestine, leading to impaired digestion and potentially severe consequences like cirrhosis and jaundice **(Farani et al., 2024).** The implementation of biliary stent (BS) placement to avert blockage throughout ERCP is one of the most significant accomplishments in the history of therapeutic pancreatobiliary endoscopy. This has been recognised as a non-surgical therapy for obstructive jaundice **(Dumonceau et al., 2023).**

Biliary stenting involves the placement of stents, that are tubes composed of metal or plastic, to alleviate obstructions in the biliary tree or to address biliary leaks **(Chiba et al., 2024).**

The implementation of plastic biliary stent (PBS) represents a significant advancement in ERCP, providing minimally invasive and extremely efficient alleviation of biliary obstruction **(Sohn, Park, Kim & Kim, 2022).**

The main limitation of plastic stents is their restricted diameter. Patients experiencing early stent occlusion prior to planned replacement may encounter abrupt bile flow blockage and report manifestations indicative of recurrent biliary obstruction. This condition may also precipitate acute cholangitis and sepsis, posing a life-threatening risk **(Lyu, Ye & Wang, 2023).**

Frequent stent replacement elevates medical expenses and diminishes the quality of life for people with chronic conditions. So, patient education and care after ERCP and insertion of plastic biliary stent is very important to prevent early and late complications **(Duman & Hulagu,2024)**.

Patients' quality of life is affected by treatment problems and insufficient understanding about the management of their stents. So, patients need to learn nursing guidelines and also need to know what will happen and have the chance to ask questions and preparation of a patient through pre-procedure education about plastic biliary stent**.** Also, it is very important

for patients to take guidelines about discharge plan to prevent any complications **(Taha, Sayed, Azer & Abd-Al Mageed, 2023)**.

Significant of the study

It had been revealed that individuals who had PBS placement represented 35% of total endoscopic procedures performed every month in the endoscopy unit at New Surgeries Hospital affiliated at Tanta University Hospitals. It was shown that over fifty percent of these individuals had stent blockage and migration attributable to lack of knowledge and poor lifestyle choices. Hence, this work was performed to reduce the patient complications, promote life style and knowledge for patients with PBS.

The aim of this work was to assess the impact of nursing health education for patients undergoing PBS on clinical outcomes and life style.

Research Hypotheses

The study group who got nursing health education is expected to have improvement of their knowledge about plastic biliary stent, better life style and have reduction of plastic biliary stent related complications contrasted to control group who receive routine hospital care.

Subjects and Method

Design: Quasi experimental research design had been utilized to perform this work.

Study settings

This study was conducted at the endoscopy unit at New Surgeries Hospital at Tanta University Hospitals, affiliated to Ministry of Higher Education and Scientific Research.

Study subjects

Purposive sampling of (60) adult patients of both sexes scheduled for undergoing plastic biliary stent in the above previously mentioned setting. The sample size had been calculated depending on Epidemiological Information Program, depending on the overall number of patients per year depending on review of Tanta Main University Hospital Statistical Records, and according to inclusion and exclusion criteria.

The subjects were divided into two groups; each group comprised of (30) participants as follow

The control group, it comprised of (30) patients who got the routine hospital care by nursing staff.

The study group comprised of (30) patients who got the routine hospital care and nursing health education proposed by the researcher.

Inclusion criteria

- Age range from 21 to 60 years old and able to participate in the work, Individuals from both sexes and undergoing endoscopic plastic biliary stent insertion (through ERCP) for the first time.

Exclusion Criteria

-Patients with uncontrolled coagulopathy, Inability to tolerate general anesthesia, Malignant bile duct tumors, Mental disorders and Pregnancy

Study tools

Three tools have been utilized in this work: -

Tool I: A Structured Interview Schedule and Patient's Knowledge Questionnaire.

A systematic interview schedule created by the researcher following the review of relevant literature **(Kim et al.,2023); (Taha, Sayed, Azer & Abd-Al Mageed, 2023); (*Bofill & Cardenas,2024)*.** It is comprised of the following parts:

Part I: Patient's Sociodemographic Data

This part contained pertinent data regards to the subjects of the work like: the participant's code, sex, age, marital status, education level, occupation status, income and residence.

Part II: Patient's Clinical Data

It included prior medical and surgical histories, body height, weight, body mass index (BMI), causes of biliary obstruction, complain on admission, last laboratory tests and previous imaging studies.

Part III: "Patient's Knowledge Assessment Questionnaire Regarding Plastic Biliary Stent".

This tool had been developed via the researcher depending on literatures review **(Aryanti, Mahayasa, & Mulyawan,2023); (Rudiman, Hanafi & Halim, 2023); (Shehab & Soultan,2024)** to assess patient's knowledge regarding plastic biliary stent and discharge plan before and after receiving nursing health education.

Total Scoring system

The total numbers of questions were 30 questions. Regarding knowledge scores, Correct and complete answer scored 2, correct and incomplete scored 1 and incorrect or no answer was scored Zero.

Total level of patients' knowledge score was calculated and categorized as follows

-High level of knowledge ⟶
> 75% of the total score

-Moderate level of knowledge ⟶
≥ 50% -75% of the total score

-Low level of knowledge ⟶
< 50 % of the total score

Tool II: Health promotion Model-Instruments to measure health promoting lifestyle (HPL)

The HPL Model-Instruments had been created and revised via **(Walker, Sechrist& Pender, 1987)** to assess HPL of patient with PBS. The health

promotion instrument has 52 questions designed to assess HPL subscales, categorised into six subscales: Health Responsibility, Interpersonal Relations, Physical Activity, Nutrition, Spiritual Growth, and managing stress. The researcher took on and translated it into Arabic, thereafter administering it via personal interviews with the patients.

Scoring system

It comprised 52 items which are rated on a four-point Likert-type scale:

1 ⟶ (never), 2 ⟶ (sometimes),

3 ⟶ (often), 4 ⟶ (routinely).

Total scores for all items: range between 52 and 208.

Poor level of HPL ⟶ <60%

Fair level of HPL ⟶ 60-80 %

Good level of HPL ⟶ >80%

Tool III: " Post Endoscopic Retrograde Cholangiopancreatography (ERCP) Patients' Clinical Outcomes

Part I: Signs and Symptoms Post ERCP

It had been created following the review of the relevant literature **(Merchan et al., 2024); (Aryanti, Mahayasa, & Mulyawan,2023); (Rudiman, Hanafi & Halim, 2023).** It had been evaluated to assess the existence or absence of plastic biliary stent patients' symptoms and signs for their complications such as sore throat, difficult of swallowing, abdominal distension, tummy pain, fever, shivering, sore muscle, anorexia, yellow eye, dark urine, itching, pallor skin, nausea, vomiting, altered body movement and bleeding. It comprised of 16 items.

Scoring system

- (one mark) for presence of plastic biliary stent sign and symptom.
- (zero) for absence of sign and symptom.

Total scoring system

None ⟶ 0 Low level ⟶ <50%

Moderate level ⟶ 50-80 %

High level ⟶ >80%

Part II: Plastic Biliary Stent Complications Post ERCP After 3 Months

It had been created following the review of the relevant literature **(Aryanti, Mahayasa, & Mulyawan,2023); (Rudiman, Hanafi & Halim, 2023).** It had been employed to measure the existence or absence of plastic biliary stent complications for study and control group such as stent obstruction and stent migration.

Scoring system

- (one mark) for presence of plastic biliary stent complication.
- (zero) for absence of complication.

Method:

Ethical consideration

This work had been approved by the ethics committee on faculty of nursing university with code no 284/8/2023.

Each subject provided informed consent following the clarifying of the procedures and the objective to take a part in the work. Participants were apprised of the data collection confidentiality, their right to decline participation, and their ability to withdraw at any moment without repercussions. A code number has been employed in replacement of their names.

An official permission was gathered to perform this work from the faculty authorities and from the Manager of the endoscopy unit at New Surgeries Hospital that is affiliated to Tanta Main University Hospital.

Content validity

Each tool was evaluated for content validity by a panel of five specialists in medical-surgical nursing from the college of nursing, as well as academics specializing in endoscopy, and necessary revisions were implemented appropriately.

A pilot study

-A pilot study was performed on 10% of patients to evaluate the feasibility, clarity, and applicability of the tools, as well as to identify any challenges the researcher might face throughout data collection.

Reliability of the tool

All research instruments were evaluated for reliability using Cronbach's alpha.

Reliability statistics

-Cronbach's Alpha for tool I is 0.881 for 49 items, tool II is 0.922 for 52 items, tool III is 0.906 for 18 items and the sheet in total is 0.878 for 119 items established on 6 subjects.

Data collection

-Data was collected over 12-months duration (beginning from the first of January, to the end of December 2024).

- The work has been performed through four main phases which are (assessment, planning implementation and evaluation)

1-Assessment phase

Assessment of the patient baseline data from patients and their hospital files employing tool I part (I) and (II) for both control and study groups prior the administration of the intervention.

Moreover, patient's knowledge regarding plastic biliary stent was assessed three times for both study and control group; before giving nursing guidelines before endoscopic plastic biliary stent procedure, immediately after giving nursing guidelines, after three months from endoscopic plastic biliary stent procedure by using (Tool I part III).

Health promoting lifestyle of patients with plastic biliary stent was assessed two times for both study and control group; before giving nursing guidelines before endoscopic plastic biliary stent procedure and after three

months from endoscopic plastic biliary stent procedure by using (Tool II).

Assessment for presence or absence of plastic biliary stent complications for both control and study groups by employing (Tool III) three times; immediately post endoscopic plastic biliary stent procedure, after one week from endoscopic procedure and after three months from endoscopic plastic biliary stent procedure.

2-Planning Phase

This phase had been formulated depending on assessment phase and literature review.

Development of the nursing health education depending on data of the phase of assessment, literature review and patient's needs. Designing nursing health education considered patients' goal, priorities and expected outcomes criteria which included improvement in patient's knowledge, lifestyle and reduce the complications.

In order to give the nursing health education to studied patients, the researcher used various methods which included power point presentation, pictures, videos which facilitate reach of information to the patient and designing a booklet containing pictures and diagrams that had been designed via the researcher in Arabic Language and distributed to each patient as teaching aids to attain comprehensive picture of all facets pertaining to plastic biliary stent.

Preparing the environment for patients; had been conducted to preserve the privacy of the subjects, good ventilation was maintained and noise minimized to its minimum level.

Expected outcomes included:

The main purpose of nursing health education was to enhance knowledge, lifestyle and reduce the complications for patients undergoing plastic biliary stent.

3-Implementation Phase:

Control group got routine nursing offered to the patients via nurses, and under their prescribed hospital routine treatment.

The study group received nursing health education which had been designed by the researcher for each study group (represented in 6 subgroups, each group containing 5 patients) after introducing self to initiate communication.

Teaching guidelines were given to study group in 2 sessions in the same day of endoscopic plastic biliary stent insertion before ERCP; each session takes duration of 30-35 minutes, in addition to the pre assessment session.

Every session began with a recap of the last session's content and an enumeration of the current session's goals. Feedback and discussion

commenced for five minutes following each session.

The first session

The content of the session: the researcher met each group of patients in the waiting room at the Endoscopy Unit at New Surgeries Hospital.

The first session covered simple anatomy of the gastrointestinal system, types of GIT endoscopies, definition, causes, signs and symptoms of biliary obstruction and specific information about biliary stent especially plastic biliary stent: (definition, types, indications, complications, patient position, type of anesthesia used, preparation of patient before ERCP and what was actually happening during the procedure). **Method**: Power point presentation and pictures. **Time**: 30-35 minutes.

The second session

The content of the session

-Second session covered guidelines about nursing care and instructions after ERCP and discharge plan (Follow-up, assessing symptoms and signs of complications related to PBS, conducting laboratory tests and ultrasound, monitoring types and quantities of food and fluids, evaluating activities of daily living, engaging in exercise, and reviewing medication information regarding type, route, precautions, and side effects, along with self-management strategies at home to prevent any complications.

-**Method**: Power point presentation, videos and booklet. **Time**: 30-35 minutes.

4-Evaluation Phase

Each subject in the two groups (study and control) had been evaluated five times, **first time**: before giving nursing guidelines before endoscopic plastic biliary stent procedure by using Tool I (part I, part II and part III) and Tool II, **second time**: immediately after giving nursing guidelines employing Tool I (part III), **third time**: immediately post endoscopic plastic biliary stent procedure before patient discharge by using Tool III (Part I) , **fourth time**: after one week from endoscopic procedure by using Tool III (Part I) , and **the fifth time**: after three months from endoscopic plastic biliary stent procedure employing Tool I (part III), Tool II and Tool III (Part I and part II) to evaluate the efficiency of the nursing health education to compare between pre and post implementation of nursing health education.

Results

Table (1): Distribution of The Studied Patients regarding Their Socio-demographic Characteristics.

Regarding age, half of the control group (50%) and (40%) of the study group were in age group of (50-60) years with mean age 48.07±9.292 in

control group and 45.93±8.646 in the study group. **Concerning marital status**, most of the studied sample (80% of control group and 73.33% of study group) were married. **Related to educational level**, less than one third in the control group (26.67%) had secondary education and in the study group (26.67%) had basic education. **As for occupational status**, < half of the studied patients in the control group had been housewives but in the study group had been farmers (46.67% and 43.33%, correspondingly).

In relation to residence, most of the control and study group (70% and 76.67%, respectively) were living in rural area. **Also, this result represented height and weight** of the studied sample, the mean height of control group was 165.53±8.007 while in study group was 170.13±8.212 and the mean weight in control group was 72.23±8.316 while in study group was 78.67±11.059, and it was observed that significant difference existed between the two groups in relation to height and weight since (p= 0.032 and p= 0.014, correspondingly).

Finally, in relation to body mass index, it represented that <half of the studied patients (46.67% of control group and 43.33% of study group) had been overweight (25.0-<30) with mean BMI level in control group was 26.57±3.807 and in study group was 27.26±4.021, and it was observed that there were no significant difference existed between both groups in relation to body mass index since p= 0.456.

Table (2): Distribution of The Studied Patients regarding their Total Knowledge Level about Plastic Biliary Stent.

This table revealed that most of the control group (93.33%) and study group (90%) had low level of knowledge about plastic biliary stent before giving nursing guidelines. On the contrary, a highly improvement existed in total knowledge level only for study group after giving nursing health education as it was noted that majority of study group exhibited a high level of knowledge immediately after giving nursing guidelines and after three months from endoscopic plastic biliary stent procedure (80% and 73.33%, respectively), but in control group, minority of patients had high level of knowledge immediately after giving nursing guidelines and after three months from endoscopic plastic biliary stent procedure (3.33% and 6.67%, respectively).

Generally, there were highly significant difference among study group during the period of the work where P=0.000 (P<0.01) but, there were no significant difference between control group during the period of the study where P=0.106.

Figure 1: Distribution of The Studied Patients regarding Their Total Level of Health Promoting Lifestyle (HPL).

This figure revealed that most of the control group (90%) and study group (83.33%) exhibited poor HPL level before giving nursing guidelines. **On the contrary**, there were highly enhancement in total health promoting lifestyle (HPL) level only for study group after giving nursing health education as it was noted that (86.67%) of study group had good level of HPL after three months from endoscopic plastic biliary stent procedure, but in control group, minority of patients (6.67%) had good level of HPL and majority of them (76.67%) had poor level of HPL after three months from endoscopic plastic biliary stent procedure.

Generally, there were highly significant difference among study group during the period of the work where P=0.000 (P<0.01) but there were no significant difference among control group throughout the period of the study where P=0.705 (P>0.05).

Table (3): Distribution of The Studied Patients regarding Their Total Level of Post Endoscopic Retrograde Cholangiopancreatography (ERCP) Clinical Outcomes.

This table found that study group had low level of total post ERCP clinical outcomes immediately post endoscopic procedure, after one week and after 3 months from endoscopic procedure (70%, 100% and 6.67%, respectively) compared to control group that had (30%, 96.67% and 40%, respectively).

Moreover, after 3 months of endoscopic procedure, it was found that (53.33%) of control group exhibited high level of post ERCP clinical outcomes (signs and symptoms of complications), but no one in study group (0%) had high level of post ERCP clinical outcomes (signs and symptoms of complications). **Generally**, there was an improvement in study and control group in post ERCP clinical outcomes, but there were highly improvement in study group after giving nursing health education about plastic biliary stent and ERCP, where P=0.000.

Table (4): Distribution of The Studied Patients regarding Their Plastic Biliary Stent Complications of Post Endoscopic Retrograde Cholangiopancreatography (ERCP) Clinical Outcomes After 3 Months

This table clarified that half of control group (50%) had stent obstruction after 3 months from endoscopic procedure, while minority of study group (6.67%) had stent obstruction after 3 months

from endoscopic procedure. **Also**, this table showed that (10%) of the control the group had stent migration after 3 months from endoscopic procedure, but no one in study group had stent migration after 3 months from endoscopic procedure.

Table (5): Correlation between Knowledge Score of the Studied Patients and their Health Promotion Lifestyle

This table revealed that a positive association existed between total knowledge score of studied groups and their level of health promotion life style.

Table (6): Correlation between Knowledge Score of the Studied Patients and their Post Endoscopic Clinical Outcomes.

This table showed that a negative association existed between total knowledge score of studied groups and their level of post ERCP clinical outcomes.

Table (1): Distribution of The Studied Patients regarding Their Socio-demographic Characteristics.

Characteristics	The studied patients (n=60)				χ^2 P
	Control group (n=30)		Study group (n=30)		
	N	%	N	%	
Age (in years)					
- (21-<30)	2	6.67	1	3.33	
- (30-<40)	5	16.67	7	23.33	1.231
- (40-<50)	8	26.67	10	33.33	0.745
- (50-60)	15	50.00	12	40.00	
Range	**(28-60)**		**(27-59)**		t=0.848
Mean ± SD	**48.07±9.292**		**45.93±8.646**		P=0.361
Marital status					
- Single	2	6.67	1	3.33	
- Married	24	80.00	22	73.33	1.272
- Divorced	1	3.33	2	6.67	0.736
- Widow	3	10.00	5	16.67	
Educational level					
- Illiterate	6	20.00	6	20.00	
- Read and write	7	23.33	6	20.00	0.794
- Basic education	6	20.00	8	26.67	0.939
- Secondary	8	26.67	6	20.00	
- University	3	10.00	4	13.33	
Occupation status					
- Not work	1	3.33	1	3.33	
- Farmer	11	36.67	13	43.33	
- Student	0	0.00	1	3.33	4.115
- Professional	3	10.00	5	16.67	0.533
- House wife	14	46.67	10	33.33	
- Retired	1	3.33	0	0.00	
Residence					
- Rural	21	70.00	23	76.67	FE
- Urban	9	30.00	7	23.33	0.771
Height (in cm)					
Range	(150-180)		(150-180)		**t=4.826**
Mean ± SD	165.53±8.007		170.13±8.212		**P=0.032***

Weight (in kg) Range Mean ± SD	(60-90) 72.23±8.316		(60-98) 78.67±11.059		**t=6.485** **P=0.014***
Body mass index level - Healthy weight (18.5–<25.00) - Over-weight (25.0–<30) - Obesity (≥30.0)	11 14 5	36.67 46.67 16.67	10 13 7	33.33 43.33 23.33	0.420 0.811
Range **Mean ± SD**	**(21.45-36.89)** **26.57±3.807**		**(21.47-38.05)** **27.26±4.021**		t=0.562 P=0.456

FE: Fisher' Exact test

* Significant at level P<0.05 .

Table (2): Distribution of The Studied Patients regarding their Total Knowledge Level about Plastic Biliary Stent.

Total knowledge level	**The studied patients (n=60)**												
	Control group (n=30)						**χ^2 P**	**Study group (n=30)**					**χ^2 P**
	Before		**Immediately**		**After 3 months**			**Before**		**Immediately**		**After 3 months**	
	N	**%**	**N**	**%**	**N**	**%**		**N**	**%**	**N**	**%**	**N**	**%**	
- Low	28	93.33	27	90.00	23	76.67		27	90.00	1	3.33	2	6.67	
- Moderate	1	3.33	2	6.67	5	16.67	4.486 0.106	3	10.00	5	16.67	6	20.00	**114.57** **0.000***
- High	1	3.33	1	3.33	2	6.67		0	0.00	24	80.00	22	73.33	
Range **Mean ± SD**	**(10-46)** **15.63±3.57**		**(10-50)** **16.20±3.35**		**(12-50)** **20.93±3.96**		**F=19.43** **P=0.000***	**(6-46)** **16.90±4.73**		**(55-60)** **58.70±1.34**		**(51-58)** **54.80±1.97**		**F=79.88** **P=0.000***

<50% Low (50-75) % Moderate >75% High

χ^2: Chi-square test F: ANOVA-value test

* Significant at level P<0.05 ** Highly significant at level P<0.01

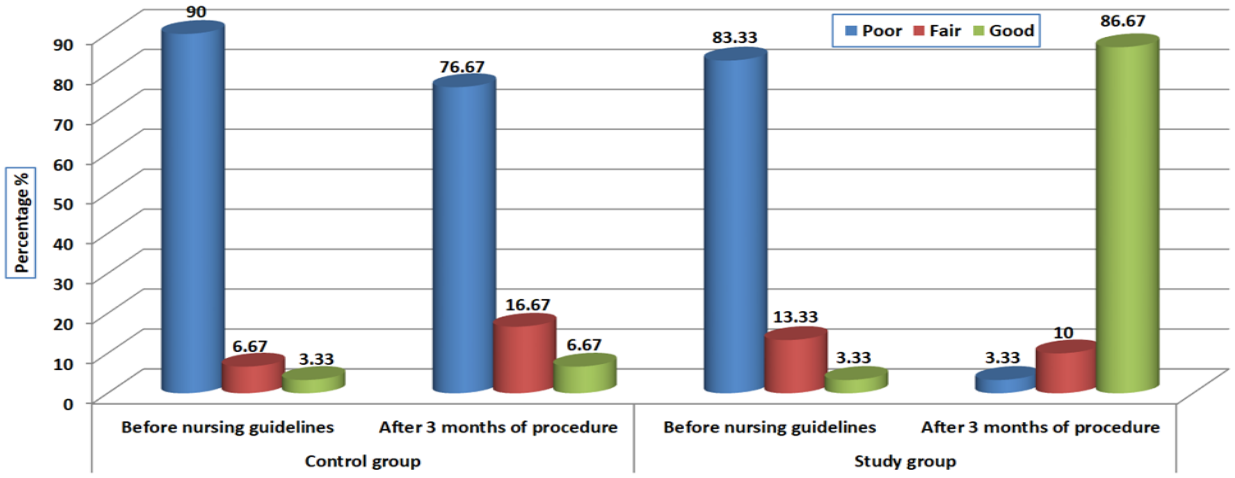

Figure 1: Distribution of The Studied Patients regarding Their Total Level of Health Promoting Lifestyle (HPL).

Table (3): Distribution of The Studied Patients regarding Their Total Level of Post Endoscopic Retrograde Cholangiopancreatography (ERCP) Clinical Outcomes.

Total post ERCP level	The studied patients (n=60)													
	Control group (n=30)						χ^2 P	Study group (n=30)						χ^2 P
	Post endoscopic Procedure		After a week of procedure		After 3 months of procedure			Post endoscopic Procedure		After a week of procedure		After 3 months of procedure		
	N	%	N	%	N	%		N	%	N	%	N	%	
- None	0	0.00	0	0.00	0	0.00		0	0.00	0	0.00	28	93.33	
- Low	9	30.00	29	96.67	12	40.00	**50.95**	21	70.00	30	100.00	2	6.67	**21.86**
- Moderate	20	66.67	1	3.33	2	6.67	**0.000***	9	30.00	0	0.00	0	0.00	**0.000***
- High	1	3.33	0	0.00	16	53.33		0	0.00	0	0.00	0	0.00	
Range Mean ± SD	**(4-11) 7.80±1.69**		**(0-5) 1.43±1.43**		**(0-8) 3.43±2.81**		**F=74.47 P=0.000 ***	**(2-10) 6.13±2.09**		**(0-0) 0.00±0.00**		**(0-4) 0.23±0.89**		**F=29.04 P=0.000 ***

(0) None <50% Low (50-80)% Moderate >80% High

χ^2: Chi-square test F: ANOVA-value test

* Significant at level P<0.05 ** Highly significant at level P<0.01.

Table (4): Distribution of The Studied Patients regarding Their Plastic Biliary Stent Complications of Post Endoscopic Retrograde Cholangiopancreatography (ERCP) Clinical Outcomes After 3 Months

Complications of Plastic Biliary Stent	The studied patients (n=60)				
	Control group (n=30)		Study group (n=30)		χ^2 P
	N	%	N	%	
1. Stent obstruction					
- Absent	15	50.00	28	93.33	FE
- Present	15	50.00	2	6.67	0.829
2. Stent migration					
- Absent	27	90.0	30	100.0	FE
- Present	3	10.0	0	0.00	0.330

FE: Fisher' Exact test

Table (5): Correlation between Knowledge Score of the Studied Patients and their Health Promotion Life Style.

	The studied patients (n=60) Total knowledge score											
	Control group (n=30)						Study group (n=30)					
	Before		Immediate		Post 3 months		Before		Immediate		Post 3 months	
	r	P	r	P	r	P	r	P	r	P	r	P
Health Promotion Life Style	0.327	0.077	-		0.077	0.687	0.176	0.353	-		0.084	0.657

r: Pearson' correlation coefficient

Table (6): Correlation between Knowledge Score of the Studied Patients and their Post Endoscopic Clinical Outcomes.

	The studied patients (n=60) Total knowledge score											
	Control group (n=30)						Study group (n=30)					
	Before		Immediate		Post 3 months		Before		Immediate		Post 3 months	
	r	P	r	P	r	P	r	P	r	P	r	P
Post ERCP Clinical Outcomes	-		-		-0.072	0.707	-		-		-0.197	0.296

r: Pearson' correlation coefficient

Discussion

The outcomes of the current work demonstrated that half of the control group and less than half of the study group were in the age group of (50-60) years with mean age 48.07±9.292 in control group and 45.93±8.646 in study group. This may be elucidated by the fact that this age signifies the last phase of the working-age population, that is susceptible to various age-related chronic ailments, unhealthy lifestyles including stressful life events and heightened intake of fast food, spicy and high fat diets **(Jaleel et al., 2023)**.

The outcomes had been in line with **(Ramadan et al., 2024)** who revealed that the median age of patients who had placed plastic biliary stents was 52 years (range =22-79). In contrast, this result was contradicted by **(Kazi et al., 2022)** who demonstrated that the mean age of study group was 39.26±11.13 but in control group was 49.20±13.31.

Concerning marital status, the present work showed that most of the studied sample had been married. From the researcher's point of view, this may be due to age factor as married patients are often older and the risk for biliary issues generally increases with age, also marriage often leads to lifestyle changes such as diet and physical activity which can contribute to obesity which is a substantial risk factor for gallstones and biliary obstruction. This result was supported by **(Rudiman, Hanafi, & Halim, 2023)** who demonstrated that nearly > two third of participants in control and study group had been married without any significant difference among both groups.

As regard to educational level, the current study illustrated that < one-

third of the studied patients in the control group had secondary education and in the study group had basic education, hence, there is a deficiency of knowledge as regard better health awareness, better access to healthcare services, engaging in healthier lifestyles reducing the risk of gallstones which is a major contributor to biliary obstruction. **Also**, this study represents that less than half of the studied patients in the control group were housewives but in the study group were farmers, this might be due to living in rural area. These results were supported by **(Taha, Sayed, Azer, & Abd-Al Mageed, 2023)** who revealed that more than half of the study group possessed a secondary education, whereas approximately one-third of the control group had primary and university education. A statistically significant difference existed between the two groups. Additionally, over half of the study group were housewives, while only one-third of the control group had been engaged in farming. However, those finding were contradicted with **(Ragab et al., 2023)** who reported that the majority of studied patient had high educational level, additionally, this finding was in contrast with **(Petit et al.,2022)** who stated that < half of the studied groups had been civil servant.

Regarding residence, the current present work stated that most of control and study group had been lived in rural area, this may be justified by that rural populations face challenges in accessing timely medical care which can increase the risk of complications that necessitate biliary stenting. These findings in line with **(Alhaidari et al., 2024)** who states that most of studied patients came from rural areas. This result contradicted to result of **(Hristov et al., 2024)** who found that majority of studied patients came from urban areas.

In concern of weight and BMI, the present work represented that less than half of the studied sample were overweight (25.0-<30) with mean body mass index level in control group was 26.57±3.807 and in study group was 27.26±4.021, this can be justified by that increased body weight is associated with a higher risk of gallstone formation which can lead to obstruction of the bile ducts. This is in agreement with (**Al-Shaleel, Thabet & Alshehri, 2020)** who stated that patients with overweight had 50% more risk for having biliary obstruction than patients with normal weights. In addition, obese patients had five times more risk to have biliary obstruction than normal weighted.

In relation to the studied patients regarding their total knowledge level

about plastic biliary stent, this study illustrated that there was highly significant difference between study group during the period of the work where P=0.000 (P<0.01) but there were no significant difference between control group throughout the period of the study where P=0.106. This study also illustrates that most of the control group and study group had low level of knowledge about plastic biliary stent before giving nursing guidelines. On the contrary, there were highly enhancement in total knowledge level only for study group after giving nursing health education. These findings supported with **(Alhaidari et al., 2024)** who reported that a highly significant difference in the mean of the study group regards their knowledge about biliary stent throughout pre and post-test with P value = .000, which shown significant increase in their knowledge, while no substantial variation was seen in the control group between the pre- and post-test, with P = .078. This result was in contrast with **(Chauhan, Kumar& Thakur, 2019)** who stated that most of the studied group had good knowledge.

Concerning the Studied patients regarding their total level of health promoting lifestyle (HPL), results clarified that there were highly significant difference among study group during the study period where P=0.000 (P<0.01) but, there were no significant difference among control group during the period of the work where P=0.705 (P>0.05), this can be due to lack of knowledge about how to adopt a lifestyle that supports the proper function of a plastic biliary stent as empowered patients who are educated about their condition, diet, self-care and follow up are more likely to experience positive outcomes and avoid complications **(Driskill et al., 2020)**.

The findings aligned with **(Solhi et al., 2020)**, who identified a statistically significant difference among the study and control groups for all lifestyle items before and after the implementation of the nursing training protocol on lifestyle adjustments.

According to the studied patients regarding their total level of post endoscopic retrograde cholangiopancreatography (ERCP) clinical outcomes, the outcomes revealed that an enhancement existed in study and control group in post ERCP signs and symptoms (clinical outcomes), but there were highly improvement in study group after giving nursing health education about plastic biliary stent and ERCP, where P=0.000, also it was observed that there were more complications in control group than study group (stent obstruction and migration) as half of

control group had stent obstruction after 3 months from endoscopic procedure, while minority of study group had stent obstruction after 3 months from endoscopic procedure. Also, this result showed that (10%) of control group had stent migration after 3 months from endoscopic procedure, but no one in study group had stent migration after 3 months from endoscopic procedure. From the researcher's perspective, this might be justified by poor lifestyle and lack of knowledge can significantly affect clinical outcomes and lead to various complications in patients with plastic biliary stents. This finding had been in line with **(Meseeha & Attia, 2023)** who stated that educating patients and promoting a healthier lifestyle are essential in enhancing the long-term and short-term clinical outcomes for individuals with biliary stents. These finding of current study also matched with **(Shehab & Soultan,2024)** who noticed that there was statistical difference before and after implementation of guidelines regarded to patients' complications as abdominal distension and abdominal pain.

Also, the correlation between knowledge score of the studied patients and their health promotion lifestyle clarified that there was positive correlation between total knowledge score of studied groups and their level of health promotion life style. These results in agreement with **(Taha, Sayed, Azer, & Abd-Al Mageed, 2023)** who reported that there was positive correlation between patient knowledge and their level of health promotion lifestyle.

Moreover, correlation between knowledge score of the studied patients and their Post endoscopic clinical outcomes, the current work revealed that a negative correlation existed between total knowledge score of studied groups and their level of post endoscopic retrograde cholangiopancreatography (ERCP) clinical outcomes. These results were supported by **(Helba, Abdelaziz, Selim & Salem, 2024)** who stated that a negative correlation existed among patient knowledge and occurrence of complications after endoscopy.

Conclusion

It can be concluded that a highly statistically significant difference existed among study and control group in terms of overall level of knowledge, all items of life style, post ERCP clinical outcomes and patients' complications before and after implementing nursing health education on patients' knowledge, clinical outcomes, lifestyle modifications and patients' complications.

Recommendations

Depending on the results of the present study, the following suggestions are proposed:

For Patients

-Continuous educational programs to enhance the knowledge of the patients about plastic biliary stent and its types, indications and complications.

-Inform patients on the significance of consistent follow-up at scheduled intervals, which is essential for treatment efficacy and safety.

-Distribution of researcher booklet to all patients prior the endoscopic procedure at endoscopic unit at Tanta Hospitals.

For Nurses

-Nurses ought to include the frequent review of current references (periodicals, textbooks, etc.) into their everyday responsibilities. They ought to consistently be motivated to participate in scientific meetings and conferences to be abreast of the rapidly expanding body of knowledge and practices essential for effective nursing care.

For further research works

- Replication of the present research with an expanded cohort of patients across diverse settings is necessary for the generalization of the findings.

References

Alhaidari S, Alzahrani I, Alhanaee M, Decanini A, Mohamed M, Gomez S, Mathura P, Zhang J & Sandha G (2024). Optimising the indications for biliary stent placement during endoscopic retrograde cholangiopancreatography: a quality improvement initiative to enhance patient care and reduce healthcare resource utilization. *BMJ Open Gastroenterol,11(1),1-8.Doi:*10.1136/bmjgast-2024-001375.

Al-Shaleel A, Thabet T& Alshehri M (2020). The relation between obstructive jaundice and body mass index in Aseer Central Hospital, Saudi Arabia. *International Journal of Medicine in Developing Countries,4(*10), 1533-36. Doi: https://doi.org/10.24911/IJMDC.51-1592996761.

Aryanti C, Mahayasa I ,& Mulyawan I(2023). A Bayesian Network Meta-Analysis Comparing Biliary Stent Types' Outcome and Complications in Unresectable Malignant Biliary Obstructions. *Asian Pacific Journal of Cancer Prevention,*24 (3):791-800. DOI: 10.31557/APJCP.2023.24.3.791

Bang S (2024). Endeavors to prevent stent malfunction: new insights into the risk factors for recurrent biliary obstruction. Clinical Endoscopy Journal, 57(1), 56–57. Doi: 10.5946/ce.2023.274.

Bektas H, Gurbulak B, Sahin Z, Colak S, Gunes M, & Cakar E (2024). Multiple plastic biliary stent placement in the management of large and multiple choledochal stones. Videosurgery Journal, 12 (3), 231-237. DOI: 10.5114/wiitm.2022.69107.

Bofill A, & Cardenas A(2024). A practical approach to the endoscopic management

of biliary strictures after liver transplantation. *Annals of Hepatology journal, 29(2024),1-6.* DOI: Annals of Hepatology 29 (2024) 101186.

Chauhan R, Kumar R & Thaker S (2019). A Study to Assess the Knowledge, Attitude and Pre-Procedure Anxiety Level of Patient Undergoing Upper GI Endoscopy in Krishna Hospital, Karad. Journal of family medicine and primary care, 5(6),243-49. Doi: https://doi.org/10.3748/wjg.v26.i4.433.

Chiba M, Kato M, Kinoshita Y, Shimamoto N, Abe T, Kawahara Y, Koyama S, Sumiyama K & Tomita Y (2024). Best period to replace or change plastic stents with self-expandable metallic stents using multivariate competing risk regression analysis. Scientific Reports,10(1), 1-14. DOI: https://doi.org/10.1038/s41598-020-70081-3.

Dinescu B, Voiosu T, Bengus A, Mateescu R ,Voiosu A, & Radu M (2023). The perfect biliary plastic stent. *Annals of Gastroenterology journal,36(8),490-496.* DOI: https://doi.org/10.20524/aog.2023.0826

Driskill K, Pratt M, Drapek L, Lyer R, Pinheirro N &Acquisto S (2020). Nursing Care and Education for Patients with Biliary Stents and Drains: An Ongoing Multi-Center Quality Improvement Project. World Journal of Gastroenterology, 26(4), 433–447.Doi: https://doi.org/10.3748/wjg.v26.i4.433

Duman A, & Hulagu S (202.4). Management of migrated plastic biliary stents in patients with benign biliary diseases. Laparosc Endosc Surg Sci journal, 29(1),29-35. DOI: 10.14744/less.2024.95777.

Dumonceau J, Heresbach D, Deviere J, Costamagna G, Beilenhoff U, & Riphaus A (2023). Biliary stents: Models and methods for endoscopic stenting. Endoscopy journal, 43(7),617-26. DOI: 10.1055/s-0030-1256315.

Farani M, Saldi S, Maulahela H, Abdullah M, Syam A, & Makmum D (2024). Survival, stent patency, and cost-effectiveness of plastic biliary stent versus metal biliary stent for palliation in malignant biliary obstruction in a developing country tertiary hospital. Journal of Gastroenterology and Hepatology Foundation,5(2024),959-965. DOI: 10.1002/jgh3.12618.

Helba K, Abdelaziz A, Selim M & Salem F(2024). Effect of Nursing Instructions on Clinical Outcomes for Patients Undergoing Upper Gastrointestinal Endoscopy. Tanta Scientific Nursing Journal,33(2),223-44. Doi: https://doi.org/10.21608/ejhc.2024.271424.

Hristov B, Doykov D, Andonov V, Doykov M, Kraev K, Valova S, Sandeva M & Kostov G (2024). Interventional treatment of malignant biliary obstruction: Is it Time to change the paradigm?. *Gastroenterol Journal, 15*(2), 266-84. Doi: https://doi.org/10.3390/gastroent15020020.

Jaleel R, Simon E, Gupta P, Patnaik I, David D & Chowdhury S (2023). Retained biliary plastic stents-lest we forget. SAGE Journal, 51(2), 177-80. DOI: 10.1177/0049475520945443 .

Kazi F, Ghosh S, Sharma J, Saravanan S& Patil S (2022). Trends in Gallbladder Disease in Young Adults: A Growing Concern. World Journal of Gastroenterology,14(8),1-6. DOI :10.7759/cureus.28555.

Kim S, Ohanian E, Lee F, Nam B, Laine L, & Che K (2023). Predictors and outcomes of delayed plastic biliary stent removal following endoscopic retrograde cholangiopancreatography. Scand J Gastroenterol journal, 52(10),1128-1132. DOI: 10.1080/00365521.2017.1342138 .

Lyu Y, Ye S & Wang B (2023). Comparison of metal versus plastic stent for preoperative biliary drainage in patients with pancreatic cancer undergoing neoadjuvant therapy: a meta-analysis and systematic review. BMC Gastroenterology journal,1(40),2-8. DOI: https://doi.org/10.1186/s12876-023-02874-5.

Merchan M, Moura D, Oliveira G, Proeca I, Ide E, Moll C, Luna S, Moura E, Bernardo W, & Junior E (2024). Antibiotic prophylaxis to prevent complications in endoscopic retrograde cholangiopancreatography: A systematic review and meta-analysis of randomized controlled trials. World Journal of Gastrointestinal Endoscopy, 14(11), 718–730.DOI: 10.4253/wjge.v14.i11.718.

Meseeha M& Attia M (2023). Biliary Stenting. Journal of Gastroenterology, 221(3),265-71. Doi: 10.1097/00000658-199503000-00008.

Petit S, Puyade M, Pichon M, Wangerme M, Roblot F&Rammaert B (2022). Risk factors for biliary stent infections in malignant biliary obstruction secondary to unresectable malignancies. HAL Science Journal, 30 (8), 6937-46. DOI: https://doi.org/10.1007/s00520-022-07106-2.

Ragab L, Abdel-Hameed M, Gouda M, Katamish H, Atalla H, Shiha G, Abdallah O, Ghoneem E, & Madkour A (2023). Endoscopic ultrasound-guided biliary drainage for distal malignant biliary obstruction: a prospective 3-year multicenter Egyptian study. Acta Gastro-Enterologica Belgica,86(1),26-35. DOI: 10.51821/86.1.10828.

Ramadan N, Muhammed M, Gaffar A, Atef S, Abdelrhman N, Salib M & Azab T (2024). Association between bacterial colonization and stent occlusion in plastic biliary stents. Benha Medical Journal, 41(5),303-13.

Rudiman R, Hanafi R, & Halim F (2023). Complications of biliary stenting versus T-tube insertion after common bile duct exploration: asystematic review and meta-analysis. Plos one journal,18(1),1-15. DOI: e0280755. https://doi.org/10.1371/journal.pone.0280755.

Shehab M & Soultan A (2021). Impact of Application of Nursing Guidelines on Health Outcomes for Patients Undergoing Gastrointestinal Endoscopes. Egyptian Journal of Health Care, 12(2),195-208.Doi: https://doi.org/10.21608/ejhc.2019.271424.

Shehab M, & Soultan A (2024). Impact of Application of Nursing Guidelines on Health Outcomes for Patients Undergoing

Gastrointestinal Endoscopes. Egyptian Journal of Health Care,12(2),195-208.

Sohn S, Park J, Kim K ,&Kim T (2022). Complications and management of forgotten long-term biliary stents . Complications and management of forgotten long-term biliary stents. *World Journal of Gastroenterol* ,23(4), 622-628.DOI: 10.3748/wjg.v23.i4.622.

Solhi M, Azar F, Abolghasemi J, Maheri M, Irandoost S& Khalili S(2020). The effect of educational intervention on health promoting lifestyle: Intervention mapping approach. Journal of Education and Health Promotion ,9(31),1-7. Doi: 10.4103/jehp.jehp_768_19.

Taha A, Sayed Z, Azer S, & Abd-Al Mageed A (2023). Effect of Implementing Nursing Teaching Protocol on Health Promotion Lifestyle for Patients with Plastic Biliary Stent. *Assiut Scientific Nursing Journal,9(25), 165-173. DOI: 10.21608/ASNJ.2023.74259.1172.*

Walker S, Sechrist K and Pender N. (1987). Health promotion model-instruments to measure health promoting lifestyle: Health-promoting lifestyle profile [HPLP II], (Adult version).