Original Article

Effect of Discharge plan on Patient's Outcomes Undergoing Trans-Hepatic Arterial Chemoembolization

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Abstract

Background: Hepatocellular carcinoma (HCC) is the most common primary liver cancer, with more than 1 million deaths expected worldwide in 2030. Transhepatic arterial chemoembolization (TACE) is one of the most commonly used non-surgical therapeutic methods for HCC. Prompt discharge nursing planning is aimed to expand knowledge concerning TACE, promote self-care practices, improve clinical outcomes and minimize readmission. The aim of this study was to evaluate the effect of discharge plan on patient's outcomes TACE. Research design: A quasi experimental research design was used. Setting: The study was conducted in interventional radiology center and arterial catheterization at surgical Zagazig University Hospitals. The study sample composed of seventy adult patients, purposeful selected from both sexes. Tools: Four tools were utilized for data collection, pertinent as follow: Self-administered questionnaire, self-reported practice, assessment quality of life by using Functional Assessment of Cancer Therapy-Hepatobiliary (FACT-Hep) version 4 and Patient's Outcomes Assessment Complications Questionnaire. Results: revealed that, majority of the studied patients were male, 41.4% aged from 50-60 years and 38.3% of studied patients made TACE before. There were statistically significant improvements in patients' knowledge, practice, therapeutic effect, quality of life and good outcome. Conclusion: the discharge plan had positive effect on improving patient's outcomes undergoing TACE through the enhancement of their knowledge and practices. Recommendations: Regular follow-up for all patients with HCC undergoing TACE to evaluate their health conditions, detect the complications early and improve their quality of life.

Keywords: Discharge plan, Hepatocellular carcinoma, Outcomes and Transhepatic arterial chemoembolization.

INTRODUCTION

Hepatocellular carcinoma (HCC) is the 6 th among the tumors occurring globally, and the 2nd principal factor to mortality caused by malignancies. In fact, the incidence of HCC continuously increases all over the world, particularly as a result of the increase in the incidence of nonalcoholic fatty liver disease (NAFLD) in addition to the increase in the number of patients suffering hepatitis C-induced cirrhosis. Approximately 80% of HCC patients suffer cirrhosis (1). HCC is a major public health issue in Egypt. Liver cancer is the most prevalent cancer in men and the second most common cancer in women, according to numerous Egyptian regional registries (2). Transcatheter arterial chemoembolization (TACE) is a minimally invasive procedure performed by interventional radiologists who inject highly concentrated doses of chemotherapeutic agents into the tumor tissues and embolic agent(s) to restrict tumor blood supply. The embolic agent(s) causes ischemia and necrosis of the tumor and slows anticancer drug washout. The most common anticancer drugs used in published TACE studies for HCC include doxorubicin (36%), followed by cisplatin (31%), epirubicin (12%), mitoxantrone (8%), and mitomycin C (8%) (3).

Trans-hepatic arterial chemoembolization (TACE) is the primary therapy of choice for patients with liver cancer who cannot undergo surgical resection; it can also be used as an adjuvant therapy for liver cancer patients after surgery, unresectable multinodular lesions, without vascular invasion or extrahepatic spread and who have well-preserved liver function. TACE has been reported as an effective procedure for local and advanced liver cancer. The median survival time by cancer stage ranged from 15.8 to 49 months among patients receiving TACE. TACE alone or combined with other therapy had better overall survival and time to progression than other treatments of liver cancer (4). Absolute contraindications to TACE include decompensated cirrhosis, extensive tumor replacing both lobes of the liver, uncorrectable coagulopathy, renal insufficiency (creatinine clearance <30 mL/m) and severely reduced portal venous flow. Relative contraindications to TACE include tumor size >10 cm, untreated biliary obstruction, untreated varices at high risk of bleeding, active cardiopulmonary dysfunction and an incompetent papilla (5).

Before the procedure, the patency of the portal vein must be demonstrated to ensure an adequate posttreatment hepatic blood

supply. With the patient under local anesthesia and mild sedation, a super selective catheter is inserted via the femoral artery and threaded into the hepatic artery. Angiography is then performed to delineate the hepatic vasculature, followed by injection of the embolic chemotherapy mixture (6). As post-embolization or post–ablation syndrome was considered a side effect of TACE, not a complication, patient discomfort requiring medication (i.e., pain, nausea, vomiting) and duration of hospitalization after treatment were evaluated. Complications were classified according to the guidelines of the Society of Interventional Radiology. A major complication was defined as any event that necessitated therapy with hospitalization or involved permanent adverse sequelae, including death. All other complications were classified as minor. Tumor responses at 1-month, 6-month, and 1-year after each treatment were also evaluated and classified according to the modified Response Evaluation Criteria in Solid Tumor (mRECIST) for HCC (7).

Postoperative surveillance and management protocol of patients were uniformly formulated. Generally, patients were regularly followed up at the outpatient clinic once every one to two months after discharge until death or dropout from the follow-up program. The routine follow-up items included laboratory tests (complete blood count, biochemical index, AFP, hepatitis viral screening) and abdominal US. If recurrence was highly suspected, contrast-enhanced CT or MRI was necessary to be undertaken (8).

TACE is similar to systemic chemotherapy, which may cause systemic side effects and uncomfortable symptoms such as pain, nausea, vomiting, fever, fatigue, poor appetite, abdominal fullness, sadness, anxiety, and sleep problems. Symptom distress is a subjective gauge of one's discomfort from symptoms that could seriously impair QOL after TACE. As these patients often have a broad range of needs relating to their health and any care that is needed to support them in their own homes or in community care homes. Discharge planning is the development of an individualized plan that primarily focuses on improving the quality of discharge patients' compliance, education/counseling, and structured follow-up (9,4).

Accordingly; the discharge nursing plan is a continuous process starts early during hospitalization and continues post-discharge; aiming to reduce hospital readmissions, and contributing to clinical stability through improving patients' knowledge and promoting self-care capabilities in order to enhance their self-care maintenance, management, and confidence in managing their condition, which in turn enrich their quality of life (QOL) and improving patient outcome (10).

Radiology nurses are responsible for promoting health, comfort, and safety during imaging procedures, patient assessment, education, monitoring of vital signs, patient positioning, and medication administration, including the administration of moderate sedation. As nurses have more contact with patients than any other provider, they have the potential to make a significant impact on patient outcomes in radiology areas (11).

Significance of the study:

Interestingly, it has been found that even hepatic tumors with an abundant blood supply can be significantly reduced or even eliminated by TACE treatment. Therefore, TACE treatment can improve the survival of patients with liver cancer who are unsuitable for resection or transplantation. Unfortunately, the treatment carries risks of serious complications, with potentially life threatening including severe postembolization syndrome, hepatic insufficiency, abscess, or infarction (12). Discharge education with the teach-back method resulted in a 45% reduction in 30-day readmission(13). In an attempt to improve patient outcomes, discharge instructions provide a permanent reference for patients with details about their medical condition, ongoing management of their illness and recommended follow-up. Through improving patients' knowledge and promoting self-care capabilities in order to enhance their self-care maintenance, management, and confidence in managing their condition, which in turn enrich their QOL.

Aim of the study: Was To evaluate the effect of discharge plan on patient's outcomes undergoing trans-hepatic arterial chemoembolization.

Research hypothesis:

- This study achieved the following hypothesis:

H1: The mean knowledge scores of patients' post discharge plan are higher than that of their pre discharge plan scores.

H2: The mean practice scores of patients' post discharge plan is higher than that of their pre discharge plan scores.

H3: Positive effect of the discharge plan on improvement of patients' outcomes.

SUBJECTS AND METHODS:

Research design: A quasi experimental research design with pre-post test was conducted to achieve the aim of the study.

Setting: The study was conducted in interventional radiology center and arterial catheterization that consist of operating room, examination room, recovery room, and waiting area which located in the first floor at surgical Zagazig University Hospital.

Subjects: A purposive sample of 70 patients undergoing Trans-Hepatic Arterial Chemoembolization with one group (Pre/Post-test) approach was selected to conduct this study and fulfill the following criteria:

- Inclusion Criteria

Patients who are diagnosed with HCC, have unresectable tumors, medically inoperable status, or refusal of surgery, age between 20 - 60 years old and agree to participate in the study.

- Exclusion Criteria

Advanced liver disease level III, active GI bleeding, encephalopathy, refractory ascites, presence of vascular invasion or portal vein occlusion due to liver tumor, extra hepatic metastases, proto-systemic shunt, end stage tumor disease, auditory deficits and psychological problems.

Sample size:

The sample size was calculated by statistical computer program Epidemiological information system (Epi-Info software version 6.04) at power 80% and at confidence limit 95% and assuming the prevalence of hepatocellular carcinoma patients undergoing Trans-Hepatic Arterial Chemoembolization among 360 patients to be 22.0% (14) and the least percentage of improvement after the intervention plan will be 10% then the sample should include 70 patients.

Tools of data collection:

Four Tools were used for data collection, pertinent to this study as follow:

I. Self-administered questionnaire.

II. Self-reported practice.

III. Assessment quality of life by using Functional Assessment of Cancer Therapy-Hepatobiliary (FACT-Hep) version 4.

IV. Patient's Outcomes Assessment Complications Questionnaire

Tool I: Self-administered questionnaire

This tool was designed by the researcher after extensive review of the relevant literature. (15, 16, 17) The questionnaire covered three parts as the following:

Part I: Socio-Demographic Questions: concerened with assessment of socio-demographic characteristics of the patients, it was contained 13 questions covered age, gender, marital status, occupation, level of education, Living condition, crowding index (family members and number of rooms in the house), monthly income, area of residence, treatment costs, and body mass index (height in m2 and weight in kg).

Part II: Patients' Medical Health Assessment Questionnaire it was included: -

1. Past, Family and Medical History of Patient e.g. history of previous liver diseases, presence of genetic and metabolic diseases affecting liver, history of onset and progression of symptoms, information from patient such as (Jaundice, abdominal pain, nausea, vomiting …etc.) and assess degree of pain by using numerical rating scale.

2. Investigation it was included: -

2.1. Physical examination: Examination of eye, skin, chest, abdominal and limbs for any abnormality, activity and exercise, assess level of consciousness by using Glasgow coma scale and assessment of vital signs for any abnormalities...

2.2. Laboratory Assessment: It was included kidney function tests (S.urea– creatinine), liver function tests (ALT, AST, prothrombin time and concentration, total and indirect bilirubin, serum albumin),complete blood picture and baseline level of viremia HCV using polymerase chain reaction (PCR), tumor marker alpha-fetoprotein (AFP).

2.3. Imaging assessment included; abdominal ultrasonography and fibro scan to assess tumor size and assess response to treatment.

2.4. The Albumin-Bilirubin (ALBI) score:

The albumin-bilirubin (ALBI) score, by combining the serum albumin and bilirubin, is a new model for assessing the severity of liver dysfunction in patients with hepatocellular carcinoma. (18,19)

Part III: Patient's Knowledge Questionnaire: Concerned with assessment patients' knowledge regarding TACE applied as pre and post tests for the study subjects. It was consisted of (58) questions in the form of MCQ and yes or no questions, it was covered the following two sections. Section 1: It concerned with assessment of patient's knowledge regarding HCC and treatment with TACE such as definition, risk factors, types, signs and symptoms, investigations, purpose of TACE, patient preparation, indication and contraindication of TACE.

Section 2: It concerned with assessment of patient's knowledge regarding discharge plan such as complication and how to deal with it, follow up system, medication post discharge…

Scoring System for Patient's Knowledge Assessment:

Each question is scored "zero" for the incorrect and "one" for the correct answer, and these points are counted for each patient. The general patients' knowledge is classified into satisfied knowledge if the score is ≥ 60% from the maximum score and unsatisfied knowledge if it is < 60% based on statistical analysis.

Tool II: Self-Reported Practice

It was guided by (20). and modified by the researcher to evaluate patients' practices regarding the most important skills before and after the discharge plan. It was covered 7 procedures with totally 97 steps include: measurement of body temperature 11 steps, hot application to decrease pain 9 steps, cold compress application to decrease body temperature 5 steps, manage nausea and vomiting 6 steps, use of an incentive spirometer 9 steps, deep breathing exercise 6 steps and progressive muscle relaxation 51 steps.

Scoring System for Patients' Practice

Each step is scored "zero" for not done and "one" for done correctly; and these points are counted for each patient. The general patients' practice is classified into satisfied practice if the score is ≥ 60% from the maximum score and unsatisfied practice if it is < 60% based on statistical analysis.

Tool III: Assessment quality of life:

The Functional Assessment of Cancer Therapy-Hepatobiliary (FACT-Hep) questionnaire, a 45-item self-report instrument designed to measure health-related quality of life (HRQL) in patients with hepatobiliary cancers. The FACT-Hep consists of the 27-item FACT-G, which assesses generic HRQL concerns across four dimensions (physical, social/family, emotional and functional well-being), and the newly validated 18-item Hepatobiliary Subscale (HS), which assesses disease-specific issues.

Respondents of FACT-based questionnaires rate each item using a five-point Likert-type scale ranging from 0 (not at all) to 4 (very much). Thus, from the FACT-Hep scale, one can derive five subscales and an overall HRQoL score, with higher scores reflecting better HRQoL. (21, 22, 23)

Tool IV: Patient's Outcomes Assessment Complications Questionnaire

It was adopted from (24, 25) and modified by the researcher, to evaluate patient's outcomes and complications of the diseases such as ICU stay, Post embolization syndrome (PES) and site of insertion complications as bleeding and hematoma. It includes three parts with totally 24 point covered patients' complication that may occur post TACE procedure: five points, covered PES; six points, covered insertion site complications; 13 points covered major complications which may occur to patient and require hospitalization.

Scoring System for Patients' Outcomes assessment Questionnaire:

For outcomes assessment questionnaire consisted of given score one for present point and score zero for not present point and these points are counted for each patient. patients' outcome is classified into good outcome if the total score below or equal to 60% from the maximum score and poor outcome if it is above 60% based on statistical analysis.

Administrative and ethical consideration:

At the initial interview, each potential subject was informed about the nature, purpose, benefits of the study, and informed that his/her participation is voluntary. Confidentiality and anonymity of the subjects were also assured through coding of all data. The researcher assured that the data collected, and information will be confidential and would be used only to improve their health and for the purpose of the study and there was no risk for study subject during application of the research. The necessary approvals were obtained from the dean of the Faculty of Nursing and submitted to general director of Zagazig University Hospitals. Then Permission to carry out the study was obtained from the head of mentioned setting after explaining the purpose of the study and a verbal consent was obtained from patients for participation in the study.

Pilot study:

A pilot study was carried out in order to test whether the tools are clear, understandable, feasible, applicable, and time consuming. Ten percent from the total sample size that equal seven patients were selected randomly from interventional radiology center to participate in testing of the tools. The time required for ending the questionnaire was ranged between 20 to 30 minutes. Those patients were excluded from the main study sample.

Field work:

The study was implemented in 11 months beginning from September 2021 to May 2022 where the researcher was available four days weekly from 9 am to 5 pm.

According to finding of the pilot study we found the time was shortage to fallout the interviewing questionnaire so increase to 30-45 min and some questions modified according to it.

Assessment phase: The researcher started to recruit the sample according to eligibility criteria. Those who gave their consent were interviewed individually using the data collection form. The information obtained served as baseline data or pretest, and guided the researcher in the preparation to discharge plan booklet.

Planning phase: Using the assessment data and related literature, the researcher developed discharge plan to train patients and improve their knowledge and practice and outcomes post TACE. The discharge plan included a theoretical and a practical part. The researcher prepared an illustrated guideline booklet in simple Arabic language to help patients assimilate and refresh the information provided to achieve aim of the study.

Implementation phase: The researcher met with the patients individually, and administered the discharge plan in twenty two sessions each session 30-45 minutes.

The first session was for orientation about the discharge plan. The researcher used simple language to suit the level of patient's education, with motivation and reinforcement to enhance learning. A copy of the booklet was offered for each patient to use it as future reference.

The fourteen sessions were theoretical and covered TACE definition, indication, contraindication, risk factors, advantages, disadvantages, discharge plan and health education about complication, measures to decrease adverse events include patient preparation before TACE, how to deal with post embolization syndrome and other rare complication. Instruction on care for insertion site and follow up system. This was followed by seven practical sessions with applied practical training to decrease adverse events include post TACE (deep breathing exercises, body temperature evaluation, cold compress application, hot application, use of incentive spirometer, measures to manage nausea and vomiting, finally progressive muscle relaxation.

Evaluation phase: Each patient in the study was evaluated two times using the same data collection tools. This was done upon recruitment (pre-test), immediately after the end of the discharge plan (post-test).

Content validity& Reliability:

The tools were reviewed by a panel of five jury of expertise from three professors in medical surgical nursing, one professor of medical staff (liver and GIT disease) and one professor of interventional radiology staff, who were reviewed the tools for clarity, relevance, comprehensiveness, applicability, and understanding. According to the expertise's modifications and the results of the pilot study, some modifications were applied in the form of rephrasing or rewording, and sometimes changing of some questions.

Patient knowledge questionnaire and self-reported practice were tested for reliability showed 0.72%, 0,851% respectively. Functional Assessment of Cancer Therapy-Hepatobiliary reliability also was tested and showed high reliability 0.71%. Additionally, Patient outcomes was also tested in the study through measuring its alpha Cronbach coefficient this was 0.71%, indicating high level of reliability.

Statistical analysis:

All data were collected, tabulated and statistically analyzed using SPSS 20.0 for windows (SPSS Inc., Chicago, IL, USA 2011)). Quantitative data were expressed as the mean ± SD, median (range) and qualitative data were expressed as absolute frequencies (number) and relative frequencies (percentage). Mc nemar test was used to compare between two dependent groups of categorical data. Wilcoxon signed ranks test was used to compare between two dependent groups of non-normally distributed variables. Percent of categorical variables were compared using Chi-square test or Fisher's exact test when appropriate. Spearman correlation coefficient was calculated to assess relationship between study variables, (+) sign indicate direct correlation (-) sign indicate inverse correlation, also values near to 1 indicate strong correlation and values near 0 indicate weak correlation. Cronbach alpha coefficient was calculated to assess the reliability of the scales through their internal consistency. P-value < 0.05 was considered statistically significant, p-value < 0.01 was considered highly statistically significant, and p-value ≥ 0.05 was considered statistically non-significant (NS).

RESULTS:

Table1, showed sociodemographic characteristics of the studied patients. It was found that more than third of the studied patients (41.4%) aged from 50 to 60 years with mean ± SD (58.55±8.48year), (44.3%) had secondary education and (34.3%) were employee while near half (45.7) were not working or retirements. Majority of the patients were male (88.6%), married (77.1%), and rural residents (75.7%). Furthermore, most of patients lived with their families (94.3%). Additionally, less than three quarters their income was not enough to life (71.4%) and their treatment costs were depended on state expense (70%).

Table (1): Frequency and Percentage Distribution of Sociodemographic Characteristics of the Studied Patients (n=70).

Sociodemographic Characteristics	No.	%
Age (year)		
40-	12	17.1
50-	29	41.4
60-	24	34.3
>70	5	7.1
Mean± SD Range	58.55±8.48 42-77	
Gender		
Male	62	88.6
Female	8	11.4

Marital status		
Married	54	77.1
Unmarried	16	22.9
Education level		
Illiterate	1	1.4
Read & Write	7	10.0
Basic	10	14.3
Secondary	31	44.3
University	21	30.0
Occupation		
Worker	1	1.4
Farmer	8	11.4
Employee	24	34.3
Craft work	5	7.1
Does not work	32	45.7
Living condition		
Alone	4	5.7
Family	66	94.3
Crowding index		
≤2	36	51.4
>2	34	48.6
Monthly income		
Enough	20	28.6
Not enough	50	71.4
Area of residence		
Rural	53	75.7
Urban	17	24.3
Treatment costs		
State expense	49	70.0
Health insurance	21	30.0

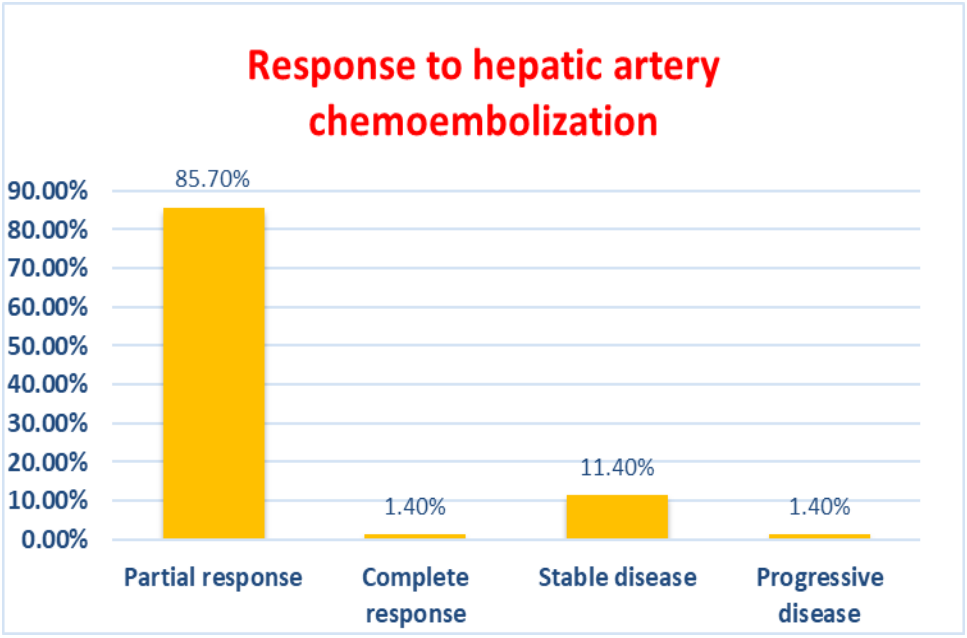

Figure (1): Bar Chart Showing Distribution of The Studied Patients according to Response to Hepatic Artery Chemoembolization.

Figure (1), illustrates that 85.70% of the patients undergoing TACE had partial response to hepatic artery chemoembolization and 11.40% had stable disease while 1.40% had progressive disease and complete response respectively.

Total score of patients' knowledge about trans-hepatic arterial chemoembolization throughout study phases was demonstrated in table (2). It was revealed that only 2.9% of studied patients had satisfactory knowledge regarding trans-hepatic arterial chemoembolization at pre-intervention phase. These were raised up post intervention to be 97.1% and these improvements were statistically highly significant (p<0.001).

Table 2 Total Score of Studied Patients' Knowledge Level Regarding Trans-Hepatic Arterial Chemoembolization Throughout Study Phases (n= 70).

Total patient's knowledge	Study phase				^{MC} p
	Pre Intervention		Post Intervention		
	No.	%	No.	%	
Satisfactory level (≥60%)	2	2.9	68	97.1	<0.001**
Un-satisfactory level (<60%)	68	97.1	2	2.9	
Mean± SD	4.25±2.64		55.81±7.14		

MC: Mcnemar test **: statistically highly significant (p<0.001)

Total score of studied patients' practice level regarding trans-hepatic arterial chemoembolization throughout study phases is demonstrated in table (3). It was revealed that there was statistically significant increase in total score of satisfactory patients' practice level with p.value at 0.001, in post intervention phase total studied patient practice was 77.1% compared to 15.7% pre intervention phase. Table 4, demonstrated mean differences scores of patients' quality of life throughout study phases. Regarding Mean ± SD for pre intervention of patient's physical, social, emotional, functional, and Hep- concern well-being were (1.24±1.83, 5.22±3.43, 1.94±1.95, 2.71±3.59 and 25.80±8.14) respectively, while post intervention were (19.48±3.83, 16.58±4.52, 16.94±1.81, 13.80±2.07 and 47.27±5.17) respectively. It was observed that there was statistically significant improvement in all dimension of FACT hep domains (physical, social, emotional, functional, and Hep- concern well-being) and total FACT-HEP score of the studied Patients in post intervention compared to pre intervention phase with P. value at 0. 001.This reveals that discharge plan had a positive effect on the QOL of hepatocellular carcinoma patients undergoing TACE. Total score of studied patients' outcome throughout study phases is demonstrated in table (5). It was revealed that there was highly statistically significant increase in total score of patients' good outcome (p<0.001), in post intervention phase total patient good outcome was (87.1%) compared to pre intervention phase (24.3%), with Mean± SD pre and post intervention were (10.30±2.79 and 6.54±3.65) respectively.

Table 3 Total Score of Studied Patients' Practice Level Regarding Trans-Hepatic Arterial Chemoembolization Throughout Study Phases. (n= 70).

Total patients' practice	Study phase				MC p
	Pre Intervention		Post Intervention		
	No.	%	No.	%	
Satisfactory level ≥60%	11	15.7	54	77.1	<0.001**
Un-satisfactory level<60%	59	84.3	16	22.9	
Mean± SD	28.82±22.98		68.11±29.41		

MC:Mcnemar test **: statistically highly significant (p<0.001)

Table 4 Mean Differences Scores of Patients' Quality of Life Throughout Study Phases. (n= 70)

Items	Study Phases		W	P-value
	Pre intervention	Post intervention		
	Mean ± SD	Mean ± SD		
Physical well-being	1.24±1.83	19.48±3.83	7.776	<0.001**
Social/family well-being	5.22±3.43	16.58±4.52	7.299	<0.001**
Emotional well-being	1.94±1.95	16.94±1.81	7.312	<0.001**
Functional well-being	2.71±3.59	13.80±2.07	7.404	<0.001**
Hepatobiliary cancer	25.80±8.14	47.27±5.17	7.274	<0.001**
Trial outcome index (TOI)	28.51±9.69	80.55±8.62	7.272	<0.001**
FACT-G Total score	9.88±6.55	66.81±8.26	7.274	<0.001**
FACT-Hep Total score	35.68±11.77	114.08±12.10	7.272	<0.001**

W: Wilcoxon Signed Ranks Test **: statistically highly significant (p<0.001)

Table 5: Total Score of Studied Patients' Outcome Throughout Study Phases (n= 70).

Outcome	Study phase				MC p
	Pre Intervention		Post Intervention		
	No.	%	No.	%	
Good (≤60%)	17	24.3	61	87.1	0.001**

Poor (>60%)	53	75.7	9	12.9	
Mean± SD	10.30±2.79		6.54±3.65		

MC: Mcnemar test , **: statistically highly significant (p<0.001)

Table 6: Correlation Coefficient between Total Scores of Knowledge, Practice, Quality of life and Outcome of Studied Patients Throughout Study phases (n=70).

Parameter		**Outcome score**			
		Pre-Intervention		**Post-Intervention**	
		(r)	**P**	**(r)**	**P**
knowledge score	Pre	0 .200	0 .098		
	Post			0 .118	0 .330
Practice	Pre	0.245	0.02*		
	Post			0.128	0.289
Quality of life	Pre	0.391	0 .001 **		
	Post			.680	0 .001 **

non significant(p>0.05), *: statistically significant (p<0.05), **: statistically highly significant (p<0.01), r: correlation coefficient

Table (6) shows correlation coefficient between total scores of patient's knowledge, practice, quality of life and outcome of studied patients throughout study phases. It was revealed that there was statistically significant positive correlation between practice and good outcome of the studied patients throughout pre-intervention phase with p.value at 0.02. Also there was highly statistically significant positive correlation between quality of life and good outcome of studied patients through pre and post intervention phase with p.value at 0.001.

DISCUSSION:

Trans-hepatic arterial chemoembolization (TACE) is the primary therapy of choice for patients with liver cancer who cannot undergo surgical resection; it can also be used as an adjuvant therapy for liver cancer patients after surgery. TACE has been reported as an effective procedure for local and advanced liver cancer. The median survival time by cancer stage ranged from 15.8 to 49 months among patients receiving TACE. TACE alone or combined with other therapy had better overall survival and time to progression than other treatments of liver cancer.(24)

Regarding sociodemographic characteristics, results of the present study revealed that the age of the studied patients ranged from 42 to 77 years old with the mean of 58.5 years. The finding of the present study is supported with .(25) in the study of "ASARA, a prediction model based on Child-Pugh class in hepatocellular carcinoma patients undergoing transarterial chemoembolization at China", the author found that the mean age of the studied patients was 59.5 years old. But on the other hand, .(26)in the study of "low bone mineral density is a prognostic factor for elderly patients with HCC undergoing TACE: results from a multicenter study at Europe", found that the age of the studied patients ranged from 60-75 years old with the mean of sixty-seven years old. Finding of the current study indicates that aged patients have high prevalence risk of HCC patients undergoing TACE.

Related to Gender, results of the present study showed that majority of the patients were males. The present study is consistent with.(27) in the study of "Preoperatively predicting early response of HCC to TACE using clinical indicators and MRI features at China", found that more than three quarters of the studied patients were males.

Related to marital status, the present study revealed that majority of the patients were married. In the same line.(28). In the study of "the impact of symptom distress on health-related quality of life in liver cancer patients receiving arterial chemoembolization: the mediating role of hope at Taiwan", found that majority of sample were married.

Regarding education, the current study revealed that nearly to half of the studied patients had intermediated or secondary educational levels. The result of the present study is consistent with .(29), who reported in the study about "quality of life after

transcatheter arterial chemoembolization combined with radiofrequency ablation in patients with unresectable hepatocellular carcinoma compared with transcatheter arterial chemoembolization alone at Minia University Hospital " that about half of the sample patients had moderate education.

The current study revealed that, majority of the patients undergoing TACE had partial response to hepatic artery chemoembolization and less than quarter had stable disease, progressive disease and complete response respectively. In the same context.(30), in study entitled "study on safety and efficacy of regorafenib combined with transcatheter arterial chemoembolization in the treatment of advanced hepatocellular carcinoma after first-line targeted therapy at China "showed that, one patient achieved CR, and 24 patients achieved PR, SD was observed in 14 patients, while PD was observed in 20 patients.

Regarding total patients` knowledge post-implementation of discharge plan, the results of the current study showed that most of the studied patients had a good total knowledge score and the minority of them had unsatisfactory knowledge. This improvement in patient's knowledge may be due to the use of different teaching strategies as lecture, discussion, a colored booklet, and video playing, in addition to the researcher's reinforcement of information received at the end of each session and pre the next session together with adherence of the subjects to the given instructions regarding TACE. Moreover, education for patients with chronic diseases have a perceptive effect on their knowledge and understanding the risk involved with carelessness about the health. These findings were matched with (31) about" role of transarterial chemoembolization (TACE) in down staging of hepatocellular carcinoma (HCC) before liver transplantation at Ain shams university" who stated that the majority of participants' knowledge about TACE improved after the intervention.

As regards to total score for the studied patients ' practice throughout the study phases, the studied patients showed marked improvement post discharge plan application where more than three quarter of the studied patients had satisfactory overall self-care practices. Also, there was a statistically, significant difference within the studied patients pre, and post discharge plan application. From the researcher's point of view, this improvement was due to the continuous follow-up of patients and re-demonstration of the self-care practices at regular intervals with continuous correction of missed or malpractices performed skills for both patients and their caregivers. Also, patients were provided with a colored booklet illustrating different self-care practices to facilitate access to information when needed and to help them to remember. This finding is supported by the finding of .(32), who found a positive influence of self-management strategies on symptom management and patient outcomes, in an article entitled "symptom self-management strategies used by older adults receiving treatment for Cancer."

Concerning the total QoL, it was shown that there was statistically significant improvement between the studied patient pre and post-intervention at ($P \leq 0.001$). The improvement in the QoL of the subjects may be contributed to compliance to the discharge plan, the treatment regimen and the continuous follow up by the researcher. These findings are consistent with the study by (33), in the study on" Palliative care in hepatocellular carcinoma at Australia" who described that high-quality nursing care has been notified to adequately prevent psychological disorder and improve the QoL in HCC patients. These results are in agreement with the study by (34) about "comprehensive nursing of hepatocellular carcinoma patients after TACE" concluded that for HCC patients, comprehensive nursing effectively reduces the pain from TACE and improves the satisfaction and QoL.

Regarding total score of patients' outcomes, the current study revealed that after one month post implementation of discharge plan, there were statistically significant improvement in total good scores of post embolization syndrome and insertion site complication in post intervention compared to pre intervention phase with p.value at 0.001. The present findings conclude that discharge planning program was significantly effective on prevent complications, improve patient outcomes, reduces hospital stay, so it is emphasized on the necessity of performing discharge planning program for patients undergoing TACE.

This findings is supported (35), who reported in the study about "Predictors of hepatic decompensation after TACE for hepatocellular carcinoma" that none of the patients in the two groups developed any serious adverse events specific to the TACE procedure, only one patient from group 1 (2.1%) developed hematemesis 1 month after TACE versus 9 patients from group 2 (16.7%), reflecting a significant difference ($p=0.01$ at 95% CI).This means that the discharge plan had a positive effect on improving the outcomes of hepatocellular carcinoma patients post TACE.

The current study revealed that there was statistically significant positive correlation between practice and good outcome of the studied patients throughout pre-intervention phase with p.value at 0.02. This finding supported by (36) in the study entitled " effect of self-care guidelines on chemotherapy associated symptoms for patients with lung cancer at Egypt" showed that, there were statistically significant negative correlations between patients' total symptom severity and practice in the study group pre and post self- care guidelines implementation ($p<0.05$). The researcher founded that once the patient felt some improvement related their symptoms as a result of following self-care guidelines, they start to participate actively in self-care activities.

Also, there was highly statistically significant positive correlation between QoL and good outcome of studied patients through pre and post intervention phase with p.value at 0.001. in the same context with (37), in the entitled study" effect of implementing early palliative care on hepatocellular carcinoma patients' outcomes, at Egypt" Regarding correlation between FACT-HEP and ESAS, it was found that FACT-Hep's total score was high significantly correlated inversely with ESAS total score at follow up one-month post intervention in the study group, that reveals an inversely correlation between QoL and

intensity of symptoms at follow up one-month post intervention.

CONCLUSION:

On the light of the present study results, there was significant improvement of patient's knowledge, practices, the therapeutic effect, quality of life and complications post implementing the discharge plan compared to pre intervention phase. It can be concluded that, the discharge plan had a positive effect on improving therapeutic effect, quality of life and complications among patients undergoing TACE through the enhancement of their knowledge and practices. There was statistically significant relation between total scores of knowledge and good outcome of studied patients. Additionally, there were highly statistically significant relation between total scores of practice, quality of life and good outcome of studied patients.

RECOMMENDATIONS:

In line with the findings of the study, the following recommendations are made:

- The educational media including: booklet, handouts, videos, posters and CDs, should be available for all patients at all times.
- Regular follow-up for all patients with HCC undergoing TACE to evaluate their health conditions, detect the complications early and improve their quality of life.
- A workshop for nurses working in liver ICU & gastroenterology department is to be organized for enriching nurses with recent guidelines related to trans-hepatic arterial chemoembolization.
- Patients and their caregivers need to be apprised of post embolization syndrome symptoms prior to TACE and provided with adequate nursing care for symptom control.
- Replication of the study on a larger probability sample from different geographical areas for generalization of the results.

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