

Effect of Instructional Scheme on Health Outcomes among Patients with Hepatocellular Carcinoma

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Abstract:

Background: Hepatocellular carcinoma (HCC) is the 4th most common cancer in Egypt and is the 2nd leading cause of cancer-related death in both men and women. **Aim:** To evaluate the effect of the instructional scheme on health outcomes among patients with hepatocellular carcinoma. **Research design:** A quasi-experimental research design was used for this study (Pre-test post-test design). **Sample:** A convenient sample of 50 patients of both sexes with hepatocellular carcinoma. **Setting:** The study was applied in the Tropical Medicine & Gastroenterology Department and outpatient clinic at Sohag University Hospital. **Tools:** (I) Personal and Health related data Questionnaire, (II) The Karnofsky Performance Scale, (III) Functional Assessment of Cancer Therapy- for Hepatobiliary cancer patients (FACT-Hep Questionnaire). **Results:** Following the implementation of the instructional scheme, patients' Karnofsky Performance Scale (KPS) scores significantly increased compared to the instructional scheme implementation (p-value <0.001). **Conclusion:** instructional scheme implementation effectively improves health outcomes among patients with hepatocellular carcinoma. **Recommendations:** Incorporate instructional scheme implementation about hepatocellular carcinoma to improve patients' health outcomes. Replication of nursing intervention of this study on a larger probability sample

Keywords: Hepatocellular carcinoma, instructional scheme, Health outcomes

Introduction

Hepatocellular carcinoma (HCC) ranks third in terms of cancer-related mortality and is the fifth most prevalent kind of cancer (Verma et al., 2023). HCC accounts for around three-quarters of all liver cancers (Bray et al., 2018). In Egypt, HCC has become more common. In 2018, HCC accounted for 19.7% of all cancer cases, an increase in incidence. According to Ferrlay et al. (2019), the Aswan, Damietta, and Minya Cancer Registries provided the 2018 incidence data. Advances in screening programs and diagnostic techniques, as well as the increased prevalence of HCV and its consequences, could cause this rising incidence of HCC (Omar et al., 2019).

Hepatocellular carcinoma (HCC) is among the most deadly malignancies that people can get. This is the most common and aggressive type of primary liver cancer. The sixth most common and fourth most lethal type of cancer, primary liver cancer, still poses a major global health risk to people. Liver cancer is expected to contribute to more than a million fatalities

by 2030, according to WHO estimates, and the number of liver cancer cases and deaths may rise by more than 55% by 2040 (Rumgay et al., 2022). According to Campani et al. (2023), hepatocellular carcinoma (HCC) is responsible for 90% of primary hepatic malignancies and is one of the main causes of cancer-related deaths.

Hepatocellular carcinoma has a high rate of metastasis and recurrence following surgical resection, making it one of the most deadly malignancies. Due to a lack of early-stage symptoms and a lack of screening programs, HCC has a high death rate, especially among those who receive a late diagnosis, especially in poor nations. Although hepatitis B and C viruses are the most common causes of hepatocellular carcinoma (HCC), aging, metabolic diseases including diabetes and obesity, and persistent alcohol consumption can all contribute to the development of HCC about 80% of HCC cases are caused by HBV and/or HCV infections, particularly if liver cirrhosis develops (Gomaa et al., 2019).

Between 60 and 80 percent of people infected with HCV will develop chronic hepatitis, and 10 to 20 percent will develop cirrhosis within 20 to 30 years. 1–5% of patients with cirrhosis may develop HCC. In Egypt, cirrhosis and the death rate from HCC remain serious issues. Individuals with an HCV infection are seventeen times more likely to develop HCC. The prevalence of HCV was among the highest in Egypt, where 14.7% of the population was infected (Amer et al., 2022).

Approximately 80 percent of cases of HCC are associated with a severely damaged cirrhotic liver that has already started to accumulate molecular changes. Aflatoxin, aristolochic acid, and tobacco are examples of environmental factors that have been linked to distinct pathways in the development of cancer, as have hepatitis C and B viruses, alcohol use disorder, and non-alcoholic steatohepatitis (NASH) (Llovet et al., 2022). For HCC, interventional therapy is the first non-surgical treatment choice. Image-guided locoregional therapy treatment plans (Criss and Makary, 2023). To monitor patients at the individual and group levels and identify those who need care, they are used to collect information about the symptoms that patients feel and how these impact their quality of life (Serper et al., 2022).

Significance of the study:

Hepatocellular carcinoma is accounting for almost 85% of all cases worldwide (Sung et al., 2021). According to Rashed et al. (2020), HCC is the second most common cancer in men and the sixth most common cancer in women in Egypt. When combined with interventional therapy, quality nursing can improve patients' quality of life, decrease anxiety and discomfort, and lessen the likelihood of unfavorable reactions related to health conditions. Therefore, Researchers suggest this study to evaluate the effect of instructional schemes on health outcomes among patients with hepatocellular carcinoma.

The aim of the study

To evaluate the effect of instructional scheme on health outcomes among patients with

hepatocellular carcinoma

Hypotheses:

Patients with hepatocellular carcinoma who received an instructional scheme are expected to have improvement in health outcomes post-implementation compared to pre-implementation.

Patients and methods:

Research design: -

A quasi-experimental research design was used to conduct this study (Pre-test and post-test design).

Setting: -

The study was applied in the tropical Medicine & Gastroenterology department and outpatient clinic at Sohag University Hospital.

Sample

A convenient sample of 50 patients of both sexes with hepatocellular carcinoma within six months

Tools of data collection:

Three tools were used to fulfill the study's aim.

Tool (I): Personal and Health related data Questionnaire

It was developed by the researchers to assess the personal data of patients: It included three parts.

Part (one): Personal data for the patient: It included (5) items related to patients (age, gender, occupation, residence, level of education).

Part (two): Child-Pugh score: It is a universal scoring system for the degree of liver failure in patients with cirrhosis. It was modified by Pugh et al. in 1973. It was adopted by researchers to assess the severity of the disease. This score includes three biochemical markers (serum albumin, total bilirubin, prothrombin time, INR)

and clinical features such as the presence of ascites and hepatic encephalopathy.

The Child score ranges from 5-15 with individual scoring; 5-6 being class A, 7-9 being class B and 10-15 class C.

Part (three): Medical data such as Body Mass Index (BMI) and length of hospital stay.

Tool II: The Karnofsky Performance Scale (KPS): It was developed by (Karnofsky & Burchenal, 1949) and adopted by researchers to assess the functional status of patients. The general state of a patient was graded on this scale from 0 to 100, with each increment of 10 points denoting a grade: 100 indicated the patient's best performance level (healthy), while 0 (nil) indicated the patient's death.

On the day of admission and one month later, the KPS scores were assessed (i.e., before and after the instructional scheme).

Scale	Percent	Description
5	85 – 100	Excellent
4	70 – 84	Very Good
3	55 – 69	Good
2	40 – 54	Fair
1	39 and below	Poor

Scoring system

The scoring outcomes were separated into three categories: poor (10–40 points), medium (50–70 points), and good (80–100 points).

Tool (III) Functional Assessment of Cancer Therapy- for Hepatobiliary cancer patients (FACT-Hep Questionnaire). It was developed by (Heffernan et al., 2002). It is a self-reported questionnaire designed especially to address the health-related quality of life (HRQoL) of patients with hepatobiliary carcinoma. Researchers started using it to assess patients' health-related quality of life.

It comprises the FACT-G, which has four dimensions: emotional (six items), social/family (seven items), physical (seven

items), and functional (seven items) well-being; additionally, it includes an 18-item hepatobiliary cancer subscale (HCS) which evaluates gastrointestinal symptoms such as anorexia, weight loss, and jaundice, as well as back and stomach pain.

The patient's quality of life was assessed both on the day of admission and one month later (i.e., before and after the nursing teaching protocol).

Scoring system

It is a five-point Likert scale ranging from

Not at all	0
A little bit	1
Some-what	2
Quite bit	3
Very much	4

Physical well-being (PWB)

Range of scores: 0–28

Social/family well-being (SWB) Range of scores: 0–28

Emotional well-being (EWB) *R*

Functional well-being (FWB)

Range of scores: 0–28

Hepatobiliary cancer subscale (HCS)

Range of scores: 0-72. The tool's total scores range from 0 to 180, where higher numbers indicate a higher quality of life.

Content validity and reliability: Content validity:

A group of five experts from, the faculty of nursing's medical-surgical nursing department concluded. No changes were made to the experts' assessments.

Reliability:

Cronbach's Alpha, a model of internal consistency with a normal range of 0 to 1 (value more than 0.5 acceptable reliability),

was used to statistically test the reliability of the instruments, Tool III: The Karnofsky Performance Scale (KPS) was reliable at 0.97, Tool IV: Functional Assessment of Cancer Therapy- for Hepatobiliary cancer patients (FACT- Hep Questionnaire) was reliable at 0.94.

Procedure

The following stages were used to carry out the current study:

Preparatory phase

Administrative approval:

Authorized approval and administration permission was received from the head of the Tropical Medicine and Gastroenterology Department at Sohag University Hospital to gather the needed data after the study aims explanation.

Ethical Consideration:

The faculty of nursing's ethics committee authorized the research proposal. Before the conduct of the pilot study and the actual study, after outlining the nature and purpose of the research, official permission and consent were obtained from the dean of the Faculty of Nursing, as well as the selected department. Patients under study had the right to decline participation or to leave the trial at any moment for any reason. Participants received guarantees that all of their data would be kept extremely private. Before beginning data collection, the patients were informed of the study's purpose. Patients who agreed to participate gave their oral agreement after being reassured that the information would be kept private and used only for the intended research. When the study was being applied, there was no risk to the study subjects.

Pilot study

After developing the tools, a pilot study was conducted on 10% (5 patients) of cases to test the feasibility and applicability of the tools used in the current study for data collection as well as to determine the time required to be applied and no modifications were done of the questionnaire and the pregnant women who were tested in the pilot study were included in

the study sample.

Fieldwork

The research was conducted over ten months, from in January 2023 to June 2023.

Instructional scheme

The researcher created an instructional scheme and instruments to improve patient outcomes after analyzing relevant literature both domestically and abroad (**Bischoff et al., 2020, Finn et al., 2019, Deng et al., 2021**). There were two parts to the teaching scheme: theoretical and applied. The researcher produced an illustrated guideline booklet in basic Arabic so that patients may review the provided material and achieve the study's objective.

Assessment phase:

The researcher initially selected the sample based on eligibility criteria. People who gave their consent were interviewed one-on-one using the data collection form. The data served as baseline or pretest information and aided the researcher in creating the educational plan. Each patient had their first meeting with the researchers before their presentation to the interdisciplinary committee. They delivered a brief overview of the study's purpose and nature during this meeting, along with their introductions. The tool I (Personal and Health-Related Data Questionnaire) was used by the researchers to collect each participant's demographic information, medical records, and disease severity. Every patient was also given an evaluation utilizing tool III, the Karnofsky Performance Scale (KPS), which measures the functional status of patients, **Tool IV** (Functional Assessment of Cancer Therapy- for Hepatobiliary cancer patients (FACT- Hep Questionnaire) to assess quality of life. Depending on the patient's responses, the research tool-filling process took an average of 40 to 50 minutes.

Implementation phase

To recall and encourage the patients to follow the directions in three sessions, the researcher met with each patient separately and gave them the instructional scheme plan while their family members were present to include them in the care. Simple language suitable for the patient's educational background was used by

the researcher. A copy of the teaching plan and instructional multimedia video clips were provided to each patient for their records. Instructional schemes were presented using motivation and reinforcement to increase adherence and follow-through. The patients had the opportunity to talk about their sentiments and concerns as well as ask questions. Give them instructions on how to take their prescriptions and keep to their follow-up appointment schedule.

The first session: concentrated on hepatocellular carcinoma's theoretical aspects, such as its definition, causes, symptoms, risk factors, diagnosis, and treatment; preoperative preparation and examination; preoperative fasting; health education about complications; education about diet; other strategies to prevent adverse events; guidance on managing post-embolization syndrome and other complications; the follow-up method; and the discharge plan. 30 to 40 minutes were spent in this session.

The second session: Nurses gave postoperative instructions on how to care for the insertion site, address symptoms, and provide medicine. The patients were instructed to remain in bed for 12 hours and to remain immobilized on the puncture side for an additional 6 hours after the procedure. Patients were instructed to stay hydrated for four hours following surgery, and as soon as they were pain-free, they were to gradually return to their normal diet. Stair climbing and rapid walking were part of stepwise exercise treatment. The intensity of the exercise was based on the patient's comfort level; if the patient started to feel too uncomfortable, the exercise was quickly stopped. This was a 35-45 minute session.

Third session: The practical component of this session was covered, and applied training was used to lower adverse events and enhance patient outcomes. TACE (deep breathing exercises, body temperature measurement, cold and hot compress application, incentive spirometer use, and symptom assessments) was followed by gradual muscle relaxation. 30 to 40 minutes were spent in this session.

Evaluation phase:

One month following the introduction of the instructional scheme, health outcomes were reviewed (post-tested) using the aforementioned methods to assess the impact of the instructional scheme on patients with hepatocellular carcinoma. Sohag University Hospital's outpatient clinic served as the site of this assessment.

Statistical analysis:

The collected data was analyzed, processed, tabulated, and prepared for input into a computer. An analysis of variance (chi-square test, P-Value <0.05) and descriptive statistics (frequencies, percentages, averages, and standard deviations) were conducted using computer-intervention SPSS version 22, Excel 2016. A two-tailed p-value of less than 0.05 was considered statistically significant. Whereas the Correlation Coefficient test was used to compare continuous data and uncover the relationship between scores, the T-test was used to compare categorical variables. All of the analyses were performed using IBM SPSS.

Results:

Table (1): Demonstrates that 36% of the studied patients were between the ages of 60 and 65. The majority of them (88%) were males. Relating to residence, more than half of them (52 %) were from rural areas. According to education, less than half of the studied patients were read and write (48%). Relating to Occupational status, more than two-fifths of them (44%) were retired.

Figure (1): Identifies that three fifths of the studied patients (60%) were in class A related to Child Pugh score.

Table (2): Displays that; the majority of the studied patients (82%) stayed at the hospital for about one day. As regards BMI, more than one-half of them (52%) had normal weight.

Table (3): Shows that after one month there was a statistically significant difference in functional status mean scores between the studied patients on admission was 57.22 ± 17.99 and after one-month post

instructional scheme increased to 91.33 ± 11.77 .

Figure (2) illustrates that there was a significant improvement in the **functional status**, where the majority of the studied patients had good functional status (88%) **post**-instructional scheme compared to 48% **pre**-instructional scheme.

Table (4): Illustrates that there was a statistically significant difference among the studied patients related to quality of life Fact-Hep domains (physical, social, emotional,

functional, and Hepatobiliary cancer subscale) between on-admission and after one month of the instructional scheme with p -value < 0.001 .

Table (5): Reveals that there is a positive correlation between patient nursing care quality and functional status and quality of life with a statistically significant difference on admission and after one month of instructional scheme with p -value < 0.001 .

Table (1): Personal data among the studied patients (n=50).

Personal data	Study (n=50)	
	No	%
Age		
30>40	4	8
40>50	15	30
50>60	13	26
60-65	18	36
Gender		
Male	44	88
Female	6	12
Residence		
Urban	24	48
Rural	26	52
Level of education		
Preparatory school	2	4
Secondary school	4	8
University	16	32
Illiterate	4	8
Read and write	24	48
Occupational status		
Employer	12	24
Housewife	3	6
Not work	13	26
Retired	22	44

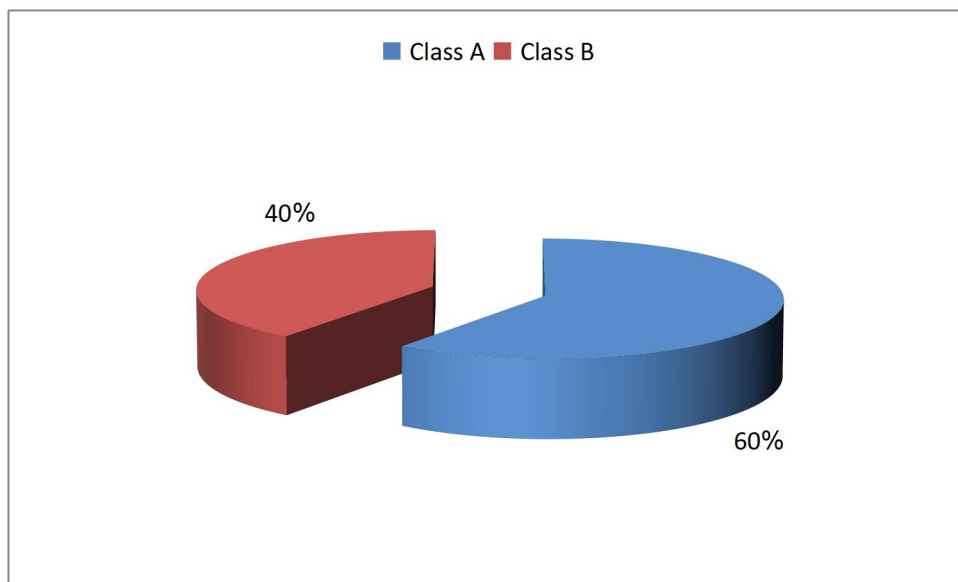


Figure (1) Patient distribution regarding to Child-Pugh score (n=50)

Table (2): Medical data among the studied patients (n=50).

Medical data	Study (n=50)	
	No	%
Length of hospital stay		
1 day	41	82.0
From 2-3 day	9	18.0
More than 3 days	0	0.0
BMI		
Underweight	12	24
Normal Weight	26	52
Overweight	10	20
Obese	2	4

Table (3): - Differences in mean scores between the studied patients with hepatocellular carcinoma related to functional status based on Karnofsky Performance Scale (KPS) on admission and after one-month post instructional scheme (n=50)

Functional status	On admission	After one month	X ²	P. value
Mean \pm SD	57.22 \pm 17.99	91.33 \pm 11.77	T=8.95	<0.001**

The chi-square test for qualitative data between the two groups

***Significant level at P value < 0.001*

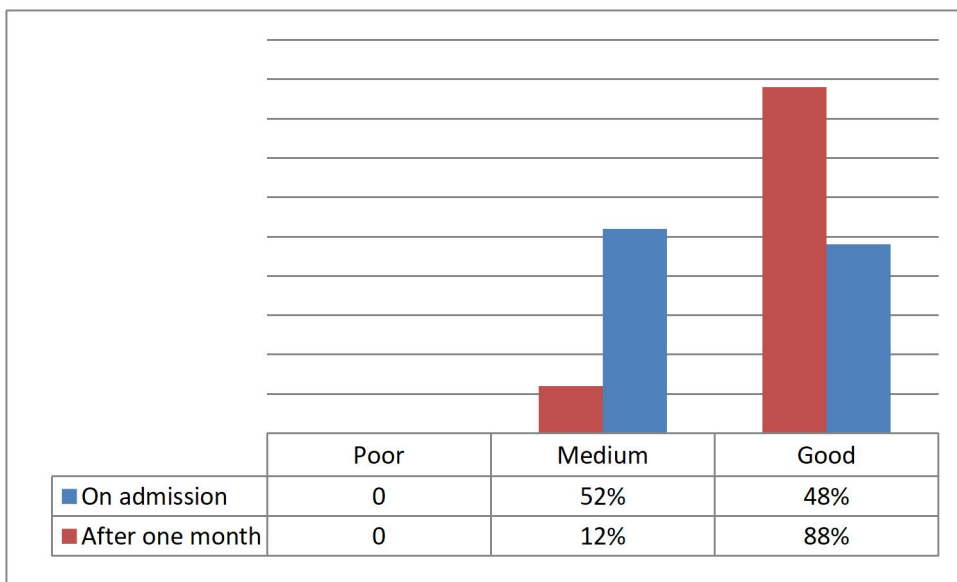


Figure (2): Total the studied functional status among patients with hepatocellular carcinoma on admission and after one-month post instructional scheme (n=50)

Table (4): Differences in mean scores between the studied patients' quality of life on admission and after one-month post-instructional scheme based on FACT-Hep score (n=50)

Quality of life	On admission	After one month	T	P. value
	Mean±SD	Mean±SD		
Physical well-being	8.8±2.58	22.33±2.4	10.52	0.000**
Social/family well-being	14.67±3.46	26.33±2.4	8.12	0.000**
Emotional well-being	2.47±1.38	19.53±3.46	20.10	0.000**
Functional well-being	6.73±3.41	22.47±4.85	14.03	0.000**
Hepatobiliary cancer subscale (HCS)	37.47±3.79	61±6.11	10.25	0.000**
Trial outcome index (TOI)	53±8.03	105.8±12.97	13.83	0.000**
FACT-GTotal score	32.67±8.36	90.67±12.38	16.22	0.000**
FACT-Hep Total score	70.13±11.09	151.67±18.39	15.80	0.000**

-* Independent T-test quantitative data between the two groups

*Significant level at P value < 0.05, **Significant level at P value < 0.01

Table (5): Correlation between functional status and quality of life

Functional status	Quality of life			
	FACT-Hep Total score After one month		FACT-Hep Total score on admission	
	R	P	R	P
KPS On Admission	0.783	0.000	0.495	0.005
KPS after one month	0.884	0.000	0.237	0.206

Discussion:

Hepatocellular carcinoma (HCC) accounts for over 850,000 new cases annually and is the second most common cause of cancer-related deaths worldwide. Approximately 90% of all primary liver cancer cases are HCC (American Society of Cancer,

2023). Six months to a year after diagnosis, hepatocellular carcinoma usually results in mortality and drastically lowers quality of life. With an increasing occurrence in Egypt, it ranks as the third main cause of cancer-related deaths worldwide and the fifth leading cause of cancer overall. Hepatitis B virus (HBV),

hepatitis C virus (HCV), and persistent alcohol use are the main risk factors for hepatocellular carcinoma (HCC) (**American Cancer Society, 2020**).

The most prevalent type of primary liver cancer, accounting for around 90% of all occurrences, is hepatocellular carcinoma. HCC has become the fifth most frequent cancer globally and the third biggest cause of cancer-related death, with only stomach and lung cancers surpassing it. Its incidence is rising (**Johnson, 2019**). **Hence the study was done to evaluate the effect of the instructional scheme on health outcomes among patients with hepatocellular carcinoma**

Regarding the personal information of the patients under investigation, the findings of this study indicated that a significant proportion of the patients were in the 60–65 age range. One possible explanation for this could be that middle-aged and older people are more likely than younger people to have liver disease. (**Pirisi et al., 2019**) Provided support for this, revealing that the median age of their HCC patients was 52 years. The increased incidence of HBs Ag carrier condition and greater vulnerability to environmental carcinogenesis factors may be the cause of the rising liver cancer rates among older patients.

Similar findings were made by **Elkenawy et al. (2022) in their study**, which showed that patients above 50 had a higher incidence of HCC. According to **Yuli et al. (2019)**, the mean age of patients in the observation group was 51.32 ± 6.14 years, while the mean age of patients in the control group was 52.14 ± 8.25 years. These findings also supported those findings. In the same sentence, **Gu and Liang (2022)** noted that there was no discernible difference in the mean age of the patients in the clinical nursing pathway group, which was 52.4 ± 3.5 years old, and the control group, which was 52.2 ± 2.9 years old.

The current study showed that men made up the majority of the patients. This conclusion might be explained by the fact that in rural areas, liver illness is more common in men than in women. A larger number of

married people may be explained by cultural characteristics in the society under study. According to **Shaaban (2021)**, who examined the impact of supportive nursing care on the severity of symptoms and quality of life of patients with hepatocellular carcinoma undergoing transarterial chemoembolization, males were more common than females, and the majority of participants in both groups were married. This finding is consistent with the findings of that study. **Mahgoub et al.'s (2020)** findings, which showed a male majority in both groups, are likewise consistent with this. This result is in line with **Kew, (2022)** in a study entitled "Epidemiology of Hepatocellular Carcinoma" who found that The incidence of HCC generally increases with increasing age.

Gender disparities were noted, with men having higher rates of HCC than women, according to another study by **Lampimukhi et al. (2023)**. These variations may be brought about by several biological and environmental variables, including androgen hormone levels, alcohol use, and smoking. Additionally, the findings of **Yenjai et al. (2022)** were consistent with The majority of participants were married, they said, and both groups had more male patients than female patients. The work of **Abdullah et al. (2021)**, who evaluated the quality of life among senior people with chronic liver disorders at Al-Rajhy Liver Hospital, Assiut University, is supported by this observation. They also discovered that the majority of their study sample was male. This result is at odds with that of a study by **Pirisi et al., (2019)** titled "Hepatocellular Carcinoma Incidence, Mortality, and Survival Trends in the United States," which found that throughout this period, the incidence rates among males were roughly three times greater than those among women. This is in line with the finding that over half were men (**Nordenstedt et al., 2020**). According to the study, gender-specific variations in exposure to risk variables may be the cause of the higher incidence of liver cancer in males. Men are more likely than women to smoke cigarettes, have HBV and HCV infections, and be affected by community culture.

In terms of place of residence, almost 50% of them came from rural regions. **Fekry et al. (2023)** found that nearly two-thirds of the patients lived in rural areas, and these findings supported their findings. This observation could be explained by the hospital's geographic position, which serves several of the governorate's rural counties. The great majority of the subjects in the study were from rural areas and had previously worked as farmers. This result contradicted the findings of **Hassan et al. (2019)**, who claimed that most cases were from urban regions in their study "The role of hepatitis hepatocellular carcinoma: a case-control study among Egyptian patients."

The current study's findings demonstrated that fewer than half of the patients under investigation could read and write. The study's findings may be explained by the patients' primarily rural upbringing. This observation is consistent with the findings of **Sheta & Abo El-Fadl. (2023)**, who report that slightly less than half of the patients in their study have basic literacy skills (reading and writing) and examine the impact of self-care practices on the health outcomes of patients with hepatocellular carcinoma. In the study "Prevalence of Hepatitis B Virus and Hepatitis C Virus among chronic liver disease Patients," **Kundu et al. (2019)** reported that the majority of the study participants were educated, which contradicted this finding.

In terms of occupational status, almost two-fifths of them were retired, whereas a third of the patients in the control group were both employed and retired. This result was consistent with **Chen et al.'s (2022)** assertion that the largest proportion of patients were retired. In the study titled "Knowledge of Patients with Liver Cirrhosis Regarding Ascites Self-management Instruction Nursing Guidelines," **Abdelrehaim (2019)** provided support for this finding by pointing out that almost two-thirds of the participants were not employed.

Three-fifths of the patients in the current study fell into class A according to their Child-Pugh score. This finding is consistent with that of **Elkenawy et al. (2022)**,

who discovered that over 50% of the patients were Child A. This also was in agreement with **Mahmoud et al., (2022)** who illustrated that the highest percentage of patients were in class A.

Based on the medical records of the patients under study, the majority of them (82%) spent around one day in the hospital. This is consistent with the findings of **Min Hu et al. (2022)**, who reported that hospital stays for the observation group were considerably ($P < 0.05$) shorter than those for the control groups. In this regard, **Gardini et al. (2018)** found that, when taking into account the length of hospital stays of the patients they were studying, the majority of the study group's patients stayed in the hospital for less than two days following the nursing protocol's implementation, while the control group's patients stayed longer than two days. **Jing & Guoyun (2020)** studied liver cancer patients who had interventional surgery. The study's authors found a correlation between higher nursing care and a shorter length of stay in the hospital following surgery.

After a month, the functional status mean scores of the patients under research showed a statistically significant difference. At admission, the mean scores were 57.22 ± 17.99 , but after a month of instruction, they rose to 91.33 ± 11.77 . From the researcher's perspective, it confirmed that the implementation of the instructional scheme was successful in achieving the current study's goal.

Regarding the patients under study functional status, Less than half of the patients in this study had good functional status before the instructional scheme, whereas the majority had high functional status after the program. According to the study, this improvement was brought about by providing patients with a vibrant booklet that had a variety of instructions to help them remember and make it simpler for them to obtain information when they needed it. **Yenjai et al. (2022)** found that patients who received arterial chemoembolization for hepatocellular carcinoma had better functional status after a comprehensive discharge program. In addition, **Wang et al. (2022)** found that the KPS and care satisfaction scores of the intervention

group were significantly higher than those of the control group ($p < .05$). Patients' physical function improved, which improved their social and familial functioning and, ultimately, their general functional status.

Regarding living quality, the current study reveals that the quality of life Fact-Hep domains (physical, social, emotional, functional, and hepatobiliary cancer subscale) varied statistically significantly between the patient's admission and one month into the educational program. This observation could be explained by the patient's adherence to the nursing training regimen and the researcher's ongoing monitoring. This observation is consistent with **Fekry et al.'s (2023)** findings, which showed statistically significant improvement in all dimensions of the FACT hep domains (physical, social, emotional, functional, and Hep-concern) and a P. value of 0.001 for the patients' total FACT-HEP score in the post-intervention phase compared to the pre-intervention phase.

Similarly, the results of the study by **Elkosier et al. (2022)** revealed that there were no statistically significant differences in FACT-Hep between the two groups before the intervention. According to the results of the most current study, the FACT-Hep score at two weeks after the start of early palliative care showed extremely significant differences between the study and control groups, except for emotional wellbeing. Furthermore, at the one-month follow-up, all items on the FACT-Hep score showed astonishingly significant differences between the research and control groups. Furthermore, the results of the study align with those of **Shaaban (2021)**, who discovered a noteworthy shift in the FACT-Hep domains and overall FACT-Hep score between the study and control groups two weeks post-intervention and at follow-up. Similarly, **Min Hu, et al., (2022)** found that the observation group's quality of life scores were significantly ($P < 0.05$) higher than those of the control group. In a similar vein, **Krakauer, (2019)** noted that giving patients palliative care enhances their quality of life.

The results of this study showed that patient functional status and quality of life are positively correlated, with a statistically

significant difference between the two groups at admission and one month into the educational program. According to the researchers, this result can be ascribed to the instructional plan that effectively raised participants' comprehension of the process, enabling patients to actively participate in their care and follow their instructions. This enhanced patients' knowledge and then improved their general quality of life and functional status.

Similar to **Min Hu et al. (2022)**, these found that PHC patients' functional status is improved and their quality of life is enhanced when comprehensive nursing interventions are used during surgery. This finding is supported by a study by **Li & Li (2018)** on "comprehensive nursing of hepatocellular carcinoma patients after TACE," which highlighted how comprehensive nursing improves functional status and quality of life while effectively lowering TACE-related pain in HCC patients.

A positive link between FACT and KPS scores can confirm that an instructional system improves patient outcomes. Higher FACT scores showed better performance, while higher KPS scores suggested improved functioning in patients. According to **Laube et al., (2021)**, high-quality nursing care has been shown to significantly enhance the quality of life for patients with HCC. These findings are in line with their findings. Based on the same results as **Elkosier et al. (2022)**, the positive outcomes of the patients in the study were statistically significantly correlated with practice. Furthermore, **Wang et al. (2022)** discovered that obtaining excellent nursing care through a symptom management program can significantly enhance patients' functional status.

Conclusion:

In the light of the present study, it can be concluded that instructional scheme implementation effectively improves health outcomes such as functional status, and quality of life among patients with hepatocellular carcinoma.

Recommendations:

In the light of the findings of the current study, the following measures were recommended:

- Incorporate instructional scheme implementation about hepatocellular carcinoma to improve patients' health outcomes.
- Patients with hepatocellular carcinoma should have access to the instructional illustrated booklet, handouts, films, and posters.
- Replication of nursing intervention of this study on a larger probability sample

References

- **Abdelrehaim, R. (2019).** Knowledge of patient with liver cirrhosis regarding self-management instruction nursing guidelines, Published Master Thesis. Medical- Surgical department. Faculty of Nursing. Ain Shams University.
- **Abdullah, Z. S., El-aziz, A., Mahmoud, N., & Medhat, M. A. (2021).** Quality of Life among Elderly Patients with Chronic Liver Diseases at Al-Rajhy Liver Hospital, Assiut University. *Assiut Scientific Nursing Journal*, 9(24.0), 1-7.134. https://doi.org/10.1200/edbk_200383
- **Amer FA, Gohar M, & Yousef M. (2022).** Epidemiology of hepatitis C virus infection in Egypt. *International Journal of Tropical Disease & Health*; 15:119-131.
- **American Cancer Society (2020).** Liver cancer risk factors <https://www.cancer.org/cancer/liver-cancer/causes-risks-prevention/riskfactors.html>, 2020
- **American Cancer Society (2023).** Key Statistics about Liver Cancer. Available at: <https://www.cancer.org/cancer/liver-cancer/about/what-is-key-statistics.html>.
- **Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA., & Jemal A. (2018).** Global cancer statistics GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2018; 68(6):394-424.
- **Campani, C., Zucman-Rossi, J & Nault, J. C. (2023):** Genetics of hepatocellular carcinoma: from tumor to circulating DNA. *Cancers*, volume (15), NO (3), P.817.
- **Chen, N. Y., Chen, K. H., Wang, Y. W., Tsai, H. H., Lee, W. C., & Weng, L. C. (2022).** The impact of symptom distress on health-related quality of life in liver cancer patients receiving arterial chemoembolization: the mediating role of hope. *BMC gastroenterology*, 22(1), 456.
- **Criss, C. R and Makary, M. S. (2023).** Recent Advances in Image-Guided Locoregional Therapies for Primary Liver Tumors. *Biology*, 12(7),999.
- **Elkenawy, I. M., El-Bendary, M., EL-Gilany, A. H., & Shabana, W. (2022).** Characteristics of Hepatocellular Carcinoma in Egyptian Patients: A Single Center Pilot Study. *Afro-Egyptian Journal of Infectious and Endemic Diseases*, 12(4), 402-409.
- **Elkosier NYE, Shebl AM and Shaaban AEA (2022):** Effect of Implementing Early Palliative Care on Hepatocellular Carcinoma Patients' Outcomes, *Port Said Scientific Journal of Nursing*, Vol.9, No. 2, Pp: 125-146.
- **Fekry A., Mohamed Taha N., Mohamed F., & Hemed A. (2023):** Effect of Discharge plan on Patient's Outcomes Undergoing Trans-Hepatic Arterial Chemoembolization. *Journal of Pharmaceutical Negative Results*. Volume 14, Issue 3.
- **Ferlay, J., Colombet, M., Soerjomataram, I., Mathers, C., Parkin, D., & Piñeros, M. (2019).** Estimating the global cancer incidence and mortality in 2019: GLOBOCAN sources and methods. *Int J Cancer.* 2019; 144(8):1941-53.
- **Gardini, A., Tamburini, E., & Inarrairaegui, M. (2018):** Radioembolization versus chemoembolization for unresectable hepatocellular carcinoma: A meta-analysis of randomized trials. *Onco Targets Ther*; 11:7315-7321.
- **Gomaa, A., Allam, N., Elsharkway, A., El Kassas, M., & Waked, I. (2019).** Hepatitis C infection in Egypt: prevalence, impact and management strategies. *Hepatic medicine: evidence and research*; 9:17.

- **Gu, J., & Liang, Y. (2022).** Clinical Nursing Paths Benefit Patient Outcomes Undergoing Transcatheter Arterial Chemoembolization for Hepatocellular Carcinoma. *Evidence-Based Complementary and Alternative Medicine*, volume (22)ArticleID 4655293/<https://doi.org/10.1155/2022/4655293>
- **Hassan, M.M., Zaghloul, A.S. & El-Serag, H.B. (2019).** The role of hepatitis C in hepatocellular carcinoma: a case-control study among Egyptian patients. *Clin Gastroenterol.* (2); 33: 123–6.
- **Heffernan, N., Cella, D., Webster, K., Odom, L., Martone, M., Passik, S., Bookbinder, M., Fong, Y., Jarnagin, W., & Blumgart, L. (2002).** Measuring health-related quality of life in patients with liver cancer. *Journal of Clinical Oncology*, 20(12), 3113–3120.
- **Jing, S., & Guoyun, Z. (2020).** A study on the efficacy of high-quality nursing on alleviating adverse reactions and cancer pain, and its effect on QOL of patients with liver cancer after interventional surgery. *International Journal of Clinical and Experimental Medicine*, 13, 925–932.
- **Johnson, P. (2019).** Malignant tumors of the liver. In Bacon B, O'Grady G, Di Bisceglie A, Lake J, eds. *Comprehensive Clinical Hepatology*, 2nd ed. Philadelphia, PA: Elsevier Mosby publications, 453–85.
- **Karnofsky, D., & Burchenal, J. (1949).** In: *Evaluation of chemotherapeutic agents*. MacLeod CM, editor. New York: Columbia University Press; The clinical evaluation of chemotherapeutic agents in cancer; pp. 191–205.
- **Kew, M.C. (2022).** Epidemiology of Hepatocellular carcinoma. *Toxicology*, 181, 35-38
- **Krakauer, E., (2019).** Palliative care; toward a more responsive definition. *Textbook of palliative care*, pp.105- 109. DOI:10.1007/978-3-319-77740-5_1.
- **Kundu, G., Mehta, B., & Agrawal, A. (2019).** Prevalence of Hepatitis B virus and Hepatitis C virus among chronic liver disease patient; *Journal of Clinical Hepatology*, 67(1): 87-89.
- **Lampimukhi, M., Qassim, T., Venu, R., Pakhala, N., Mylavaram, S., Perera, T., & Pakhala, Jr, N. (2023).** A Review of Incidence and Related Risk Factors in the Development of Hepatocellular Carcinoma. *Cureus*, 15(11).
- **Laube, R., Sabih, A., Strasser, S., Lim, L., Cigolini, M., & Liu, K. (2021).** Palliative care in hepatocellular carcinoma, *Journal of Gastroenterology and Hepatology*, Volume 36, Issue 3, Pp: 618-625.
- **Li, Y., He, R., & Li, Y. (2018).** Comprehensive nursing of hepatocellular carcinoma patients after TACE. *Chinese Journal of Interventional Imaging and Therapy*, vol.15(4), Pp.226-229.
- **Llovet, J. M., Castet, F., Heikenwalder, M., Maini, M. K., Mazzaferro, V., Pinato, D. J & Finn, R. S. (2022).** Immunotherapies for hepatocellular carcinoma. *Nature reviews Clinical oncology*, 19(3), 151-172.
- **Mahgoub A, Abd Elnaem M and Abdelmohsen S, (2020).** Effect of Implementing A nursing Protocol on Patients' Outcomes Undergoing Trans-Hepatic Arterial Chemoembolization. *Assiut Scientific Nursing Journal*. Vol,(8) No, (23) December 2020, pp (132- 140).
- **Mahmoud, O. M., El-Sharkawy, M.A., Abdurabou, A. M., Atta, H., Zidan, M., Taha, M. J., and Amin, S. E. (2022).** The Advantage of Drug-Eluting Trans-Arterial Chemoembolization in the Treatment of Hepatocellular Carcinoma. *Journal of Clinical Hepatology*, 68(1): 1-10.
- **Min, H., Ziyang, F., & Yu, H. (2022).** Effect of Perioperative Comprehensive Nursing Intervention on Transcatheter Arterial Chemoembolization in Patients with Primary Hepatic Carcinoma, *Evidence-Based Complementary and Alternative Medicine*, *Evidence-Based Complementary and Alternative Medicine*. Volume 2022, Article ID 9000331, 7 pages: <https://doi.org/10.1155/2022/9000331>.
- **Nordenstedt, H., White, D., & El-Serag, H., (2020).** The changing pattern of epidemiology in hepatocellular carcinoma. *Digestive and Liver Disease*, 42, S206-S214.
- **Omar A, Abou-Alfa GK, Khairy A, & Omar H. (2019).** Risk factors for developing hepatocellular carcinoma in Egypt. *Chin Clin Oncol*; 2(4).
- **Pirisi, M., Avellini, C., Fabris, C., Scott,**

- C., Bardus, P., Soardo, G. & Bartoli, E. (2019). Portal vein thrombosis in hepatocellular carcinoma: age and sex distribution in an autopsy study. *Journal of cancer research and clinical oncology*, 124(7), 397-400.
- Pugh, RN., Murray-Lyon, IM., Dawson, JL., Pietroni, MC, & Williams, R. (1973). "Transection of the esophagus for bleeding oesophageal varices". *The British Journal of Surgery*. 60 (8): 646–9.
 - Rashed, W. M., Kandeil, M. A. M., Mahmoud, M. O and Ezzat, S. (2020). Hepatocellular Carcinoma (HCC) in Egypt: A comprehensive overview. *Journal of the Egyptian National Cancer Institute*, volume (32), NO (1), P.p 1-11.
 - Rungay, H., Arnold, M., Ferlay, J., Lesi, O., Cabasag, C. J., Vignat, J and Soerjomataram, I. (2022). Global burden of primary liver cancer in 2020 and predictions to 2040. *Journal of Hepatology*, volume (77), NO (6), P.p 1598-1606.
 - Serper, M., Parikh, N. D., Thiele, G., Ovchinsky, N., Mehta, S., Kuo, A., & Tapper, E. B. (2022). Patient-reported outcomes in HCC: a scoping review by the Practice Metrics Committee of the American Association for the Study of Liver Diseases. *Hepatology*, 76(1), 251-274.
 - Shaaban, A. (2021). Effect of Supportive Nursing Care on Symptom Intensity and Quality of Life of Hepatocellular Carcinoma Patients undergoing Transarterial Chemoembolization. *Mansoura Nursing Journal*, 8(3), 163-181.
 - Shaker, M., Abdella, H., Khalifa, M., & Dorry, A. (2023). Epidemiological characteristics of hepatocellular carcinoma in Egypt: a retrospective analysis of 1313 cases. *Liver International*, 33(10), 1601-1606.
 - Sheta, H. A., & Abo El-Fadl, N.M. (2023). Effect of Self-Care Strategies on Health Outcomes of Patients with Hepatocellular Carcinoma. *Evidence-Based Nursing Research*, 5(3), 57-71.
 - Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021). Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: a cancer journal for clinicians*, 71(3), 209-249.
 - Verma, S., Sahu, B. D., & Mugale, M. N. (2023). Role of lncRNAs in hepatocellular carcinoma. *Life Sciences*, volume (325), 121751.
 - Wang, X., Ling-Fang, Sun., Mei-E, N., Jian-Zheng, C., & Hai-Fang, W. (2022). The Effect of Nursing Management of Patients Undergoing Interventional Therapy for Liver Cancer Compared with Standard Care on Patient-Reported Outcomes. *Clinical Nursing Research* 31(6), Vol. 31(6) 1100 –1106.
 - Yenjai, N., Asdornwised, U., Wongkongkam, K., & Pinjaroen, N. (2022). A comprehensive discharge planning program on fatigue and functional status of patients with hepatocellular carcinoma undergoing transarterial chemoembolization: A randomized clinical controlled trial. *Belitung Nursing Journal*, 8(4), 287-295.
 - Yuli, G. O. U., Jing, Y. I., Jiang, M., & Chunhong, C. A. O. (2019): Analysis on effects of comprehensive nursing care applied in interventional therapy for patients with liver cirrhosis and liver cancer. *Iranian Journal of Public Health*, 48(3), 494.