Mansoura Nursing Journal (MNJ) Vol. 9. No. 2 – 2022
Print ISSN: 2735 – 4121 Online ISSN : 2735 – 413X

Original Article

Effect of Nursing Strategies on the Performance and Satisfaction of Patients with Hepatocellular Carcinoma undergoing Radiofrequency Ablation Therapy

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1.ABSTRACT

Abstract: Hepatocellular carcinoma (HCC) is the most prevalent type of cancer in Egypt. For individuals with early-stage hepatocellular carcinoma, Radiofrequency ablation (RFA) is a safe and efficient initial-line therapy (HCC). **Aim:** The purpose of this study was to evaluate the effect of nursing strategies on the performance and satisfaction of Patients with Hepatocellular Carcinoma Undergoing Radiofrequency Ablation Therapy. **Design**: A quasi-experimental research design was taken. **Setting:** Interventional Radiology and Arterial Catheterization Center of the New Surgical hospital and the Internal Medicine Outpatient Clinic affiliated to Zagazig University Hospitals in Egypt served as the study's location. Sample: A purposeful sample of 60 hepatocellular carcinoma patients, 30 of whom were randomly allocated to each group study and control groups. **Tools**: 1) Patients' interview questionnaire (pre/post-tests) to assess socio-demographic data, medical data and patients' knowledge, practice, and **2)** Patient Satisfaction questionnaire (post-test). **Results:** Majority (86.7%) of patients in study group had satisfactory level of practice post nursing strategies, while nearly more than one fifth (23.3%) of patients in control group had satisfactory level of practice post nursing strategies. Most (93.3 %) of patients in the study group had satisfactory level of satisfaction post implementation of nursing strategies, there were statistically significant differences between the study and control groups regarding their knowledge about RFA therapy and their practice post nursing strategies. Additionally, there are statistically significant differences of study group patients' satisfaction post nursing strategies. **Conclusion**: Application of nursing strategies for hepatocellular carcinoma patients receiving RFA therapy improved patients' knowledge, practice, and satisfaction in a statistically significant manner, supporting the stated hypothesis. **Recommendations:** It is important to hold more training sessions on radiofrequency ablation therapy for patients on a wide range of subjects for confirmation of findings and usability issues.

Key words: Hepatocellular Carcinoma, Nursing Strategies, Performance, Radiofrequency Ablation Therapy, Satisfaction.

2.Introduction:

One of the highest rates of liver tumors are seen worldwide. Up to 90% of all liver tumours are caused by HCC. HCC is a significant public health issue in Egypt. For males and women, it is to blame for 33.63% and 13.54%, respectively, of all malignancies. Hepatitis C and B, alcoholic and non-alcoholic cirrhosis, and other pre-existing diseases are frequently associated with hepatocellular cancer. After being discovered, it has a bad prognosis because it typically happens later in the illness. This was tightly connected to the hepatitis C virus epidemic, which over the past three decades has impacted between 10% and 15% of the Egyptian population and is currently noted with greatest incidence of hepatitis worldwide (***Elghazaly et al., 2018).***

A procedure called ablation eliminates liver tumours without surgically removing them. These procedures can be utilized on patients who have tumours that are less than 3 cm (a little over an inch) in diameter; embolization is necessary for tumours that are slightly larger (one to two inches or three to five centimeters in diameter). When surgery is not a good option, it can be used (often due to health problems or liver failure). Despite having a lower chance of curing cancer than surgery, they can nevertheless be extremely beneficial for some patients. Additionally, some patients awaiting liver transplants utilize these therapies. (***Violi et al., 2018)***.

The extremely popular ablative method is RFA, which generates heat and ionic movement as a result of the tissue's electrical resistance (***Lurje et al., 2019)***. RFA has been demonstrated to be a successful treatment method for eliminating unrespectable primary and metastatic liver tumours of different sizes and sites when carried out transcutaneously, by laparotomy, laparoscopy,

guided by ultrasound, or utilising computed tomography (***Künzli et al., 2011)***.

The following conditions are contraindicated for RFA: untreated coagulopathies, uncontrolled infections, incursion of the biliary tract and foremost vessel, substantial extrahepatic disorder, type C liver damage "fibrosis" in children, energetic contagion, decompensated hepatic problem, sores of the attire with the cushions, or if the placement of the pads is affected. Additionally, it is not safe to remove tumours that take up more than 40% of the liver's volume. Additionally, tumours greater than 5 cm and closeness to important structures including nearby organs and lesions are comparative contraindications for RFA. (***Salah et al., 2012).***

RFA may result in consequences such as bleeding, infections, biliary tract problems, hepatic dysfunction, pneumothorax, pneumonia, pleural effusion, skin irritation, and vasculitis (portal vein thrombosis, vein injury, hepatic artery damage and visceral damage) (***Fonseca et al., 2014).***

RFA is one of those Therapeutic remedies for early-stage HCC. However, the tumor recurrence rate one year after RFA continues elevated. A self-limited post-ablation syndrome, including mild fever, nausea, vomiting, and malaise, has been reported in one-third of patients who treated within 10 days of RFA ***Ping-Hung et al., (2020).***

Patient education should be viewed as an interactive process involving the assessment of the individual's learning needs, preferences, and willingness to learn. Patient education is a crucial and challenging aspect of care. To ensure effective education, the patient's age and level of development (physical/cognitive ability and psychosocial development) determine the most effective teaching strategies. Nurses play an important role in the early detection and management of clinical aggravation, as they constitute a group of professionals with the highest level of contact with patients. In particular, Advanced Practice Nurses (APNs) have been shown to improve quality of care and improve patient health ***(Ali & Hamed ,2019).***

Patient satisfaction is the most important indicator of high-quality healthcare and is used to evaluate and plan healthcare activities. Nursing is one of the most important healthcare services that contributes significantly to the patient's healing process. Nurses have 24-hour contact with patients while in close proximity to them. Patient satisfaction is often determined by the quality of nursing care provided in a healthcare facility ***(Abd-Ella , ELsenousy, Abdelatief, & Marzouk 2021).***

Patient satisfaction is now considered as important as clinical outcomes. Patient satisfaction includes the patient's perceived needs, their expectations of the healthcare system, and their experiences of healthcare. A patient with positive perceptions is more likely to translate them into positive outcomes. While negative patient attitudes and dissatisfaction with the medical care provided lead to poor adherence ***Mukhtar et al., (2013).***

Significance of the study:

HCC is the sixth most common cancer in the world and the fourth leading cause of cancer-related death. HCC is a significant public health issue in Egypt. The most popular thermal ablation method in use today is radiofrequency ablation. According to the Statistical Research of the Zagazig University Hospital, a review of the admission rate of patients in the Interventional Radiology and Arterial Catheterization Center affiliated with New Surgical Hospital revealed that approximately 100 patients experienced RFA among patients with HCC for one year (2018).

The most of these patients complained of adverse effects of the RFA that hindered their ability of resume normal activity and lead to subsequent financial load on the patients and their families, as well as the healthcare system. The nurses had the responsibility to explain to patients and their families what to expect during and after a treatment period and give them the sufficient information and practices about adverse effects and how to manage them. The researchers intended that the findings of this study would contribute to the availability of data that might enhance nursing practice and research.

Aim of the study:

To evaluate the effect of nursing strategies on the performance and satisfaction of patients with Hepatocellular Carcinoma undergoing Radiofrequency Ablation Therapy. It was achieved through:

-Assess patient's knowledge related to radiofrequency ablation therapy.

-Assess self-reported practices for patients with hepatocellular carcinoma undergoing radio-frequency ablation.

-Develop and implement nursing strategies based on patients' assessments.

Hypotheses

To join the aim of this study, the subsequent research hypotheses were devised:

H1: The level of patients' knowledge in the study group will be higher than that of patients in the control group after the implementation of the nursing strategies.

H2: The Mean practice score of patients in the study group will be higher than that of patients in the control group after implementation of the nursing strategies.

H3: Study group Patients' satisfaction will be high after implementation of the nursing strategies.

Operational definitions:

Nursing strategies: do best to provide quality patient care at the right time and in the right place.

Performance: are included in this study to assess patients' knowledge & practice.

Patient satisfaction: The extent to which patients perceive the nursing strategies provided by researchers in the selected department as helpful, effective, or beneficial, as measured by the Patient Satisfaction Questionnaire. It is the patient's feeling of satisfaction when their needs and expectations have been met.

Radiofrequency ablation Therapy: This is a treatment that uses radio waves to generate heat and destroy part of a nerve. Ablation is a remedy that destroys liver tumors without eliminating them.

Hepatocellular Carcinoma (HCC) : Hepatocellular carcinoma (HCC) is a primary malignant tumor of the liver that occurs mainly in patients with underlying chronic liver disease and cirrhosis.

3-Sample and Methods:

3.1Research Design:

The study was carried out using quasi-experimental research design.

3.2Setting: The study was carried out in an outpatient internal medicine clinic and in the Interventional Radiology and arterial catherization center affiliated with New Surgical Hospital connected to the Zagazig University Hospitals in Egypt on the first floor, which has two rooms (Operating room and recovery room with two beds).

3.3Subject

Sixty outpatients who were hospitalized to Interventional Radiology and Arterial Catheterization Center and receiving radiofrequency therapy made up the purposive sample. For 80% power, the sample was determined using the Power and Sample Size Calculator. Following their admission for outpatient treatment, these patients were admitted in sequence. Patients with HCC whose tumour size was less than 3 cm were included in the study, and who had previously undergone chemotherapy or both chemotherapy and radiation were omitted from the study. Sample of this study was then distributed into two similar groups at random, each with 30 patients (study and control). The control group obtained standard treatment., such as an RFA session and medical support, while the study group was the only one to get nursing strategies**.**

3.4Tools of data collection:

***Tool I:* Patients' interview questionnaire.**

It was created by researchers based on a review of the literature and the recommendations of subject matter specialists for content validity.It has been translated into Arabic to avoid misunderstandings. It was used in all patients in the study and control groups before (pre-test) and after (post-test) the implementation of care strategies. The questionnaire consisted of the following three main parts:

Part I: Patient assessment* questionnaire**. This part consisted of two sections: ***Section 1: ***Demographic characteristics***. Consisted of seven personal demographic characteristics about the patient, including their age, gender, marital status, education degree, occupation, place of residence, and smoking habits.

Section 2: Medical Data: This comprises five questions concerning the patient's medical history, such as the diagnosis, onset, any coexisting condition, family history of liver disease, and if the patient ever has experienced RF. It is an adaptation of ***(Awad, 2013).***

Part II:* Patient's knowledge assessment questionnaire (Pre/ Posttest):** To assess the patient's current knowledge of radiofrequency ablation therapy for hepatocellular carcinoma. It was used in both groups (study and control); and filled out by researchers; It consisted of three sections. ***Section 1 included 8 questions on radiofrequency ablation therapy such as RFA definition, usage, indications, contraindications, side effects, advantages, complications and RFA equipment (MCQ). ***Section 2*** contained (13) questions about the patient's knowledge of pre- and post-procedure instructions. ***Section 3*** contained (8) questions about the patient's nutritional knowledge in hepatocellular carcinoma. It was adapted from

(Marrero, (2018); Ibrahim and Ahmad, (2013); Sommer, (2013); Locklin, and Wood, (2005).

The scoring system:

The total knowledge score was 104 points. Scoring of questions (15,22,23,24,27,29) each question has a correct answer, if the patient's answer is correct, the patient gets one grade. For the other questions, each correct option has a score of 1, then all selected options are collected and given a score. The "I don't know" option has a rate of zero. According to the statistical evaluation, the level of knowledge was rated as satisfactory for a threshold of ≥ 60% and as unsatisfactory for a threshold of < 60%.

***Part III*: Hepato cellular carcinoma patients' self-reported practice (Pre/Posttest):**

This tool was developed by researchers. It was used to assess the self-reported practice of patients with hepatocellular carcinoma and the management of post-ablation syndrome and complications, including deep (controlled) cough and breathing technique, fever management, and oral hygiene.

Scoring system:

Each element of each technique was marked as "done" and "not done." These were each rated from one to zero, with a higher score indicating better performance. The total scores for all techniques were added and divided by the number of steps to calculate a mean score. Means and standard deviations for the study and control groups were calculated before and after the implementation of the nursing strategies.

Tool II: Patient Satisfaction questionnaire related to educational nursing strategies. It was adapted form ***(Awad, 2013)***. The questionnaire included 14 items to measure patient satisfaction. Each question has three answers; "yes, to some extent, no", rated 2,1,0 consecutively based on statistical analysis. The total score for all items was added and divided by the number of steps to calculate a mean score. Means and standard deviations were calculated for implementation of nursing strategies by the study group.

Testing validity and Reliability: Of the proposed tools by using face and content validity. Face validity aimed at inspecting the items to determine whether the tools measure what supposed to measure. Content validity was conducted to determine whether the content of the tools cover the aim of the study. Tools were revised by five experts in each specialty & academic position "two of them professors and three assistant professor of medical surgical nursing "who reviewed the tool's content for clarity, relevance, comprehensiveness, understanding, and ease for implementation. According to their opinions, minor modifications were made, and the final form was developed. The reliability of the tools was tested using the internal consistency method. It was found that Cronbach's alpha reliability coefficient was 0.810, 0.837, and 0.871, for Patient's knowledge assessment questionnaire, Hepatocellular carcinoma patients' self-reported practice, and ssatisfaction related to nursing strategies respectively.

3.6Ethical considerations and human rights

Before the initial interview, an oral consent was secured from each subject after being informed about the nature, purpose and benefits of the study. Patients were also informed that participation is voluntary and

about their right to withdraw at any time without giving reasons. Confidentiality of any obtained information was ensured through coding of all data. The researchers reassured patients that the data would be used for only the research purpose. The control group received the same nursing strategies booklet at the end of the study.

3.7Pilot study:

A pilot study was carried out on six patients (10%) of the total study sample to test the clarity and practicability of the tools and to estimate the needed time to fill in each form. Necessary modifications were made according to the pilot study results. Pilot subjects were later excluded from the main study sample.

3.8Field work:

Approval was obtained through formal letters to the Director of the New surgical Hospital and the Outpatient Hospital before implementation of the nursing strategies began, and they were informed of the time and date of data collection. Tools have been reviewed by experts in the various fields of nursing and radiofrequency specialties. Content validity and reliability tests were performed before data collection began.

Pre/post data collection was performed by researchers who were available 2 days a week during the morning shift in study setting. The data collection period began in April 2019 and continued until September 2019. Nursing strategies were designed based on the analysis of patients' actual needs from pre-testing (patients' knowledge sheet and patients' self-reported practice). Nursing strategies have been allotted into four phases:

Assessment phase: -

Preceding radiofrequency ablation, each patient underwent a 30- to 45-minute individual interview during which the researchers discussed the objectives of the study. Then, as a pre-test, they requested that each patient complete the interview questions written in straightforward Arabic. The tool took 15 to 20 minutes to fill. Based on how each patient responded to the over mentioned tool, the patient's needs were determined. In order to contact patients and schedule more sessions in order to complete the data collection process, the first step was to gather their phone numbers.

Planning phase:

Based on the patient's actual, verified needs, nursing strategies for radiofrequency ablation therapy were established. For three weeks, the content matched the patients' needs [before, during, and after the procedure. The Arabic-language nursing strategies were divided into the following three sections:

The first Section covers the definition of radiofrequency ablation therapy, as well as its indications, contraindications, complication, benefits of RFA, and Post ablation syndrome.

The second section contains instructions for patients before, during, and after the procedure. These instructions cover pre-assessment for the patients, diet, fluid, and pain-relieving measures, patients' investigation prior to the procedure, and postures for the patients throughout the procedure.

Section 3 covers home-based care instructions, how to assess post-ablation complications, medication consumption, orders on how to deal with nausea, vomiting, and pain, as well as tips on how to resume regular daily activities like grooming, movement, diet regimen and exercise, and starting to work, as well as couple interactions.

Small group instruction was designed using a variety of instructional techniques, including lectures, group discussions, demonstrations, and re-demonstrations. PowerPoint presentations, video-films, coloured posters, and graphic images comprised the teaching materials.

Implementing phase: -

Two days a week, sessions were provided in the study sites for the study group patients to implement the strategies (Sunday and Tuesday). The patients in the study group were split up into smaller parties of five each. The strategies' content was presented over the course of six sessions, four sessions covering the theoretical part and two sessions practical. The 1st theoretical session served as an orientation, including purpose and content of the strategies, the overall goals, teaching tactics, activities for learners, and evaluation techniques for the strategies. The 2nd theoretical session involved knowledge about RFA therapy as the definition of RFA, indications, contraindications, benefits of RFA, and complications following ablation.

The 3rd theoretical session regards diet, hydration, pre-technique pain management, pre-procedure investigation, and patient positions throughout the procedure. Assessment of post-ablation complications, medication administration was covered in the 4th session for home care. Two practical sessions on nausea, vomiting, and pain relief methods (breathing exercises), fever control, daily activities like (hygiene, physical activities, diet, and exercise regimen, come back to work), and relationships were covered. Additionally, the researchers provided a handbook with nursing strategies to every patient in the study group. Each session lasted for 40 to 45 minutes.

Evaluation phase*: (three weeks following procedure).*

The final phase was carried out by the researcher for both groups using the same tools. The knowledge of patients in both groups was assessed twice using Tool 1, Part 2. The self-reported practices of patients in the study and control groups were assessed twice using Tool 1, Part 3. Tool II was used for patients in the study group once after implementing the nursing strategies. The researchers tested the control group first and then the study group to ensure the fairness of the results.

3.9Statistical Design: -

Statistical Package for Social Science (SPSS) version 25 for Windows, operating on an IBM compatible computer, was used to coordinate, tabulate, and statistically analyse the obtained data. We used descriptive statistics (e.g., frequency, percentages, mean and standard deviation). The independent (t) test was used to compare the mean score between two groups. Qualitative variables were assessed using the qui square test (x2) as the measure of significance. To examine the link between the variables under study, the correlation coefficient test (r) was applied. Cronbach's Alpha was used to assess the study tools' dependability. When $p < 0.05$, a level value was deemed significant, and when $p < 0.01$, a level value was deemed extremely significant. When $p > 0.05$, a statistical difference was not taken into account.

4-Results:

Rendering to the existing study ***table (1)*** reveals that, more than three-fifths of the patients had a secondary education (66% in the study group and 60% in the control group), and both the study and control group's mean ages were 58.51 7.23 & 59.24 7.91, respectively. The study's patients were also male (70% in the study group and 80% in the control group). There were no statistically significant differences between the two groups (p value > 0.05), to sum up.

Table (2): explore that that 50% of patients in the control group and just under two thirds (60%) of patients in the study group had disease onset under one year. Also 70%, 60% of the study's patients and control group participants respectively their families had liver disease. Concerning prior RF procedure, 70.0 %, 76.6 % of study and control groups patients correspondingly had not prior procedure of RF. there were no statistically significant differences between research participants' patients and the control group (p value > 0.05).

As shown in ***Table 3,*** Following the implementation of nursing strategies, a highly statistically significant difference concerning knowledge level about radiofrequency ablation therapy was discovered in both the study and control groups (X2=26.74 at p ≤ 0.01).

Table (4): As regards total self-reported practice, this table clarified that the majority (86.7%) of patients in study group had satisfactory level of practice post nursing strategies, while less than one quarter (23.3%) of patients in control group had satisfactory level of practice post nursing strategies. The mean scores of total self-reported practices were better in the study group compared to patients in the control group post nursing strategies. There were highly statistically significant differences between the study and control groups after nursing strategies (t=39.77 at p ≤ 0.01).

Table (5): concerning patients' satisfaction related to the nursing strategies, most (93.3 %) of patients in the study group were satisfied with nursing strategies compared to only less than one tenth (6.7 %) of them were unsatisfied. The Mean scores of patient satisfaction among studied patients was 26.24.

As demonstrated in ***table 6,*** a positive correlation coefficient was found between total reported practice and total knowledge (r =.697 at p =.000**).

Table (1): Demographic Characteristics of Patients in the Study and Control Groups were Distributed Frequently and by Percentage in Both Groups. (n=60).

Socio-demographic data	Study group (n=30)		Control group (n=30)		X^2	P-Value
	No.	%	No.	%		
Age (Year)						
50-<60	18	60	16	53.3	**0.899**	**0.455**
60-<70	10	33.3	12	40		
≥70	2	6.7	2	6.7		
$\bar{x}$ S. D	٥٨.٥١ ± 7.٢٣		٥٩.٢٤ ± ٧.٩1		t=0.٧٦٩	0.٤٠٣
Sex						
Male	21	70	24	80	**0.214**	**0.902**
Female	9	30	6	20		
Educational level						
Illiterate	3	10	2	6.7		
Read and write.	3	10	5	16.7	**0.805**	**0.422**
Secondary education	20	66.7	18	60		
High education	4	13.3	5	16.7		
Marital Status						
Single	6	20	4	13.3	**0.441**	**0.854**
Married	24	80	26	86.7		
Occupation:						
Working	16	53.3	12	40	**0.511**	**0.788**
Not working	14	46.7	18	60		
Residence						
Rural	18	60	15	50	**0.450**	**0.861**
Urban	12	40	15	50		
Types of smokers						
Smoker	**7**	23.3	6	20	**0.400**	**0.901**
Previous smoker	**8**	26.7	10	33.3		
Nonsmoker	**15**	50	14	46.7		

X^2: Chi-square **No statistically significant at p > 0.05.**

Table (2): Frequency and Percentage Distribution of Medical history for Patients in the Study and Control Groups (n=60).

Medical history	Study group (n=30)		Control group (n=30)		X2	P-Value
	No.	%	No.	%		
Diagnosis:						
Hepatic focal lesion	30	100	30	100	**0**	**0**
Onset of disease						
< 1 year	١٩	٦٣.0	15	50		
1-<5 years	5	16.6	8	26.7	**0.561**	**0.314**
5-<10 years	4	13.3	5	16.7		
≥10 years	2	6.7	2	6.7		
Associated Medical disease.						
Yes	30	100	30	100	**0**	**0**
No	0	0.0	0	0.0		
If yes,						
Hypertension	14	46.7	16	53.4		
Diabetes	15	50	13	43.3	**0.247**	**0.997**
Renal disease	1	3.3	1	3.3		
Rheumatic heart failure	0	0.0	0	0.0		
Previous cerebral stroke	0	0.0	0	0.0		
psychological stress	0	0.0	0	0.0		
Family history suffering from liver disease						
Yes	21	70	18	60	**0.417**	**0.622**
No	9	30	12	40		
Previous RF session						
Yes	9	30.0	7	23.3	**0.375**	**0.511**
No	21	70.0	23	76.6		

X^2: Chi-square **No statistically significant at p > 0.05**

Table (3): Comparison Between the Total Knowledge Among the Patients in the Study and Control Groups at Pre and Post Nursing Strategies (n= 60)

Items	Study group (n=30)								Control group (n=30)								(p_1)	(p_2)	(p_3)	(p_4)
	Pre				Post				Pre				Post							
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory					
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%				
Patients' knowledge about RF ablation therapy.	5	16.7	25	83.3	24	80	6	20	3	10	27	90	7	23.3	23	76.7	X2=١٧.٢٠ P=.000**	X2=1.414 p=٠.٢01	X2=٠.٢٢٢ p=٠.811	X2=15.41 p=.000**
Patients' knowledge about procedure" before, and after the procedure	3	10	27	90	23	76.7	7	23.3	2	6.7	28	93.3	6	20	24	80	X2=١٦.٠6 P=.000**	X2=1.654 p=٠.١09	X2=٠.111 p=٠.963	X2=14.87 p=.000**
Patients' knowledge about nutrition for Hepatocellular Carcinoma patients.	7	23.3	23	76.7	26	86.7	4	13.3	6	20	24	80	8	26.7	22	73.3	X2=17.00 P=.000**	X2=1.004 p=٠.١94	X2=٠.104 p=٠.914	X2=15.26 p=.000**
Total knowledge	**5**	**16.7**	**25**	**83.3**	**24**	**80**	**6**	**20**	**3**	**10**	**27**	**90**	**7**	**23.3**	**23**	**76.7**	X2=24.29 P=.000**	X2=1.114 p=.٢96	X2=0.524 p=0.457	X2=26.74 p=.000**

X^2: Chi-square **p= p-value** No statistically significant at $p > 0.05$. ******: Highly statistically significant at $p \leq 0.01$.

P_1: p value for comparing between the (**Study group**) in pre and post intervention.

P_2: p value for comparing between the (**Control group**) in pre and post intervention.

p_3: p value for comparing between the **(Study and Control group)** in pre intervention.

p_4: p value for comparing between the **(Study and Control group)** in post intervention.

Table (4): Comparison Between the Total Self- Reported Practice Among the Patients in the Study and Control Groups at Pre and Post Intervention.

Items	Study group (n=30)								Control group (n=30)								(p_1)	(p_2)	(p_3)	(p_4)
	Pre				Post				Pre				Post							
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory					
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%				
Deep (Controlled) Coughing & breathing	2	6.7	28	93.3	23	76.7	7	23.3	3	10	27	90	6	20	24	80	**X^2=16.99 P=.000****	**X2=1.624 p=٠.187**	**X2=٠.231 p=٠.825**	**X2=15.01 p=.000****
Fever management	6	20	24	80	27	90	3	10	5	16.7	25	83.3	8	26.7	22	73.3	**X^2=15.00 P=.000****	**X2=1.352 p=٠.214**	**X2=٠.197 p=٠.810**	**X2=14.11 p=.000****
Oral hygiene	4	13.3	26	86.7	25	83.3	5	16.7	3	10	27	90	7	23.3	23	76.7	**X^2=18.14 P=.000****	**X2=1.697 p=٠.١25**	**X2=٠.214 p=٠.831**	**X2=16.98 p=.000****
Total self-reported practice	**3**	**10**	**27**	**90**	**26**	**86.7**	**4**	**13.3**	**4**	**13.3**	**26**	**86.7**	**7**	**23.3**	**23**	**76.7**	**X^2=27.41 P=.000****	**X2=2.314 p=.114**	**X2=0.324 p=0.678**	**X2=24.01 p=.000****
$\bar{x}$ S. D	**14.25±4.36**				**46.28 ±10.27**				**13.91±4.11**				**18.02±7.25**				**t=45.36 P=.000****	**t=3.527 p=.107**	**t=1.028 p=0.153**	**t=39.77 p=.000****

X^2: Chi-square t= t. test p= p-value No statistically significant at $p > 0.05$. **: Highly statistically significant at $p \leq 0.01$.

P_1: p value for comparing between the (**Study group**) in pre and post intervention.

P_2: p value for comparing between the (**Control group**) in pre and post intervention.

p_3: p value for comparing between the **(Study and Control group)** in pre intervention.

p_4: p value for comparing between the **(Study and Control group)** in post intervention.

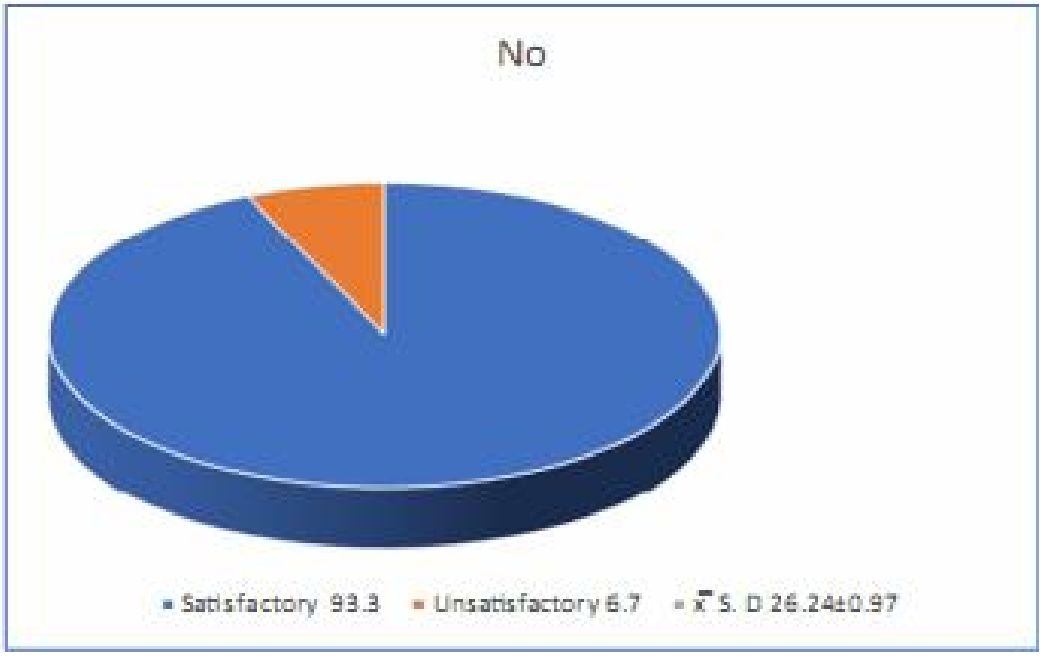

Figure (1) Frequency Distribution, Mean and Standard Deviation of Patients' Satisfaction in the Study Group Related to Implemented Nursing Strategies

(n=30).

Table (6): Correlation Between Total Knowledge and Total Reported Practice of patients in the Study Group Post- Nursing Strategies.

Variables		Total knowledge	Total reported practice
Total knowledge	**r** **p**		
Total reported practice	**r** **p**	**.697** **.000****	

****highly significant at p ‹ 0.01** **r=correlation coefficient test**

5-Discussion:

The Hepatocellular carcinoma (HCC) is a malignant tumor with high-ranking worldwide incidence as the 7th highest occurrence among malignant tumors in male and 5th in female. Primary HCC has the 2nd highest incidence in malignant

tumors and the mortality are in the third position among global malignant tumors. As a remedial therapy, interventional ablations are used more often in clinical practice for HCC, e.g. RFA, microwave ablation, laser ablation, and cryotherapy ***(Jin, Chen, & Zheng 2019).***

Regarding current research, the demographics characteristics of patients in the study and control groups showed that approximately three-quarters of the patients in the study group and males made up the majority of the patients in the control group., were more than fifty years old, and had at least a secondary education. Between either groups, No differences were statistically different. This was necessary to guarantee the both groups could be compared and show that the randomization of the two groups had been successful.

According to the findings of the current study, after considering medical history, nearly fewer than two thirds of patients in the study group were within a year of the disease's onset, which is equivalent to 50% of patients in the control group. This may be because the researchers chose HCC patients with recent diagnoses who unintentionally developed tumours. The findings were in harmony with ***Salah, et al. (2012),*** who found that nearly two thirds of the patients in the study had been diagnosed within a year, corroborated this result. Additionally, according to the **American Cancer**

Society (2017), detecting HCC disease as soon as possible frequently results in further treatment alternatives and enhanced patient outcomes.

Correlated to Previous RF session, over two thirds, almost three quarters of the patients in the study and control groups, in turn, never received radiofrequency session previously. ***Ongiem, et al. (2016)*** refuted this conclusion in their study titled "Assessment of Pain Severity after Radiofrequency Ablation in Patients with Hepatocellular Carcinoma," which revealed that approximately over than two thirds of the individuals were only received one RFA treatment.

The present study found that; before strategies application, the majority of studied patients in study and control groups had inadequate knowledge regarding radiofrequency ablation therapy while, after strategies implementation, there was a highly significant difference between two groups. On the same line, ***Goda et al, (2020)*** revealed that the majority of studied patients have lack of knowledge on the subject of their disease and RFA procedure. This might be as a result of patients not having access to an Arabic instruction booklet in the unit and a lack of Knowledge.

The previous finding is consistent with ***Khalil et al, (2018*)** who discovered that there was a great significant difference between study and control groups regarding patients' knowledge before and after instructions application. According to patients' demands and level of comprehension, ***Violi et al. (2018)*** expressed that patient teaching and appropriate guidelines about radiofrequency ablation therapy are crucial.

Concerning the total self-reported practice, the current study clarified that the majority of patients in study group had satisfactory level of practice post nursing strategies, while nearly more than one fifth of patients in control group had satisfactory level of practice post nursing strategies. This finding might be attributed to the influence of nursing strategies on improving patients' self-care practices. On the other hand, this result may be due to the positive influence of nursing strategies which improved their knowledge, added to that practicing the self-care practices helped patients to deal with the adverse effects at home.

This result is approved with ***Zaki, Hassan, Soliman ,& Mohamed (2021)*** in the study entitled **"**Effect of Self-Care Guidelines on Quality of Life for Patients with Hepatocellular Carcinoma Undergoing Radiofrequency Ablation" reveals that less than two-thirds of study and control groups had a satisfactory level of total self-care practices with no statistically significant differences between both groups pre self -care guidelines implementation , which improved to the majority of patients in the study group compared to the controls with a statistically significant difference between both groups post-implementation self-care guidelines . In addition, this finding is supported by the finding of ***Loerzel (2018)*****,** who found a positive effect 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 patient satisfaction with nursing strategies, less than one tenth of the study group's patients reported dissatisfaction with nursing strategies, in contrast to the most of patients who expressed satisfaction with nursing strategies. This result goes in the same way with ***Abd- Ella, ELsenousy, Abdelatief, & Marzouk, 2021*** entitled "Effect of Discharge Plan on Satisfaction of Patients with Lumbar Disc Herniation Surgery" who pointed that; more than four fifth of the patients under study had high level of satisfaction which improved immediately and three months after implementing discharge plan.

This finding is consistent with ***Eastwood et al., (2018),*** entitled″ improving post-operative patient reported benefits and satisfaction following spinal fusion with a single pre-operative education session. ″ Who reported that, the patient satisfaction was enhanced following sharing in educational session prior surgery and had their prospects met, compared to patients do not participate. Furthermore, this finding may be attributed to the effect of the provision of an educational booklet with clear and simple written information which is given to subjects. In addition to the interest of the study participants to know how to deal to make them more satisfied with information given to them about their diagnosis.

The present research revealed that there was a highly statistically significant positive correlation between total reported practice and total knowledge of the study group post-implementation of nursing strategies at ($p<0.001$). This finding might be attributed to the positive impact of nursing strategies on improving patients' knowledge and practices. This result is supported by the finding of ***Zaki et al, (2021)*** who found a positive influence of self-care guidelines on improving patients' self-care practices.

6-Conclusion

According to the findings of the existing study, it has been decided that the application of nursing strategies for hepatocellular carcinoma patients receiving RFA therapy improved patients' knowledge, practice, and satisfaction in a statistically significant manner, supporting the stated hypothesis.

7-Recommendations

- All hepatocellular carcinoma patients receiving radiofrequency ablation should be provided with a simplified, illustrated, thorough Arabic booklet with colored illustrations that explain radiofrequency ablation nursing strategies.
- It is important to hold more training sessions for patients on RFA .
- More research must be done on a wide range of topics for confirmation of findings and generalization.

Acknowledgements

All the patients that participated in this study are all thanked by the authors for helping to gather the data.

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