Impact of Educational Nursing Guidelines on Knowledge and Illness Perception of Hepatocellular Carcinoma Patients Undergoing Radio Frequency Ablation

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Abstract

Background: Hepatocellular carcinoma is the most common form of liver cancer that begins in the main type of liver cells (hepatocytes) representing nearly all liver cancer cases**.** Interventional radiology is now playing an important role in the treatment of HCC specially radiofrequency ablation **Aim:** Evaluate impact of educational nursing guidelines on knowledge and illness perception of hepatocellular carcinoma patients undergoing radio frequency ablation. **Design:** A quasi-experimental study design was used to fulfill the aim of study. **Setting:** This study was conducted at internal interventional radiology department in National Liver Institute, Menoufia University, Shebin El Kom. **Subjects**: A purposive sample of all available adult patients from both genders diagnosed with hepatocellular carcinoma undergoing radio frequency ablation for twelve months (50) patients and able to communicate and participate in the study. **Tools:** Two tools were used for data collection: **Tool (I):** A structured interviewing questionnaire: **(A):** Socio demographic characteristics **(B):** Assessment of patients' medical health history: **Part two:** Assessment of patients' knowledge regarding HCC and RFA. Tool **(II):** Patients' illness perception assessment questionnaire**. Results:** There was a highly significant difference between the result of the post implementation and follow up phases compared with pre intervention about patients' knowledge and their illness perception. **Conclusion:** The implementation of the educational nursing guidelines had a positive impact on improvement of the studied patients' knowledge regarding HCC and RFA; as well their illness perception was positively changed than pre-implementation. **Recommendations:** Educational programs about RFA and HCC disease and its treatment modalities should be provided for HCC patients.

Keywords: Educational nursing guidelines, hepatocellular carcinoma, illness perception, &radiofrequency ablation

Introduction

The liver is susceptible to malignancy. Hepatocellular carcinoma (HCC), which is the most common form of liver cancer that begins in the main type of liver cells (hepatocytes) representing nearly all liver cancer cases **(Su et al., 2021).** HCC occurs in a number of pre-existing conditions, which usually include hepatitis C and B, alcoholic and non-alcoholic cirrhosis. It has a poor prognosis after detection, generally occurring late in the disease **(El Ghazali et al., 2020**.Various interventional radiological procedures have been developed and intensively investigated for treatment of inoperable HCC **(Dodd et al., 2019)**. Radiofrequency ablation (RFA) has been widely used for the treatment of HCC during the last decade. As it is minimally invasive and potentially curative, RFA is currently

considered the best option for patients with early HCC who are not candidates for surgical intervention because of other health issues e.g. (surgery to remove the tumors would be high-risk, the liver tumors are small, small tumors are spread across the liver, the tumor is in a place that makes it hard to reach with surgery, surgery to remove the tumor would destroy too much of the liver, patients have had liver tumors grow back after surgery, and liver is not working well **(Violi et al., 2020).** RFA for liver tumors may not be advised if the tumor is more than 5 cm (about 2 inches) wide or the tumor is close to blood vessels as RFA may cause damage to the vessels and bile duct invasion **(McGahan et al., 2019).**

Nurses have a role in the pre-, intra-, and post procedural care of patients undergoing RFA. A multidisciplinary team of providers works to care for patients having RFA procedures. Depending on the various goals of cure, decreasing tumor burden, or pain palliation earlier discharge, decrease readmission, effective, efficient, consistent care **(Neeman & Wood, 2020).**

Illness perception refers to a patient's cognitive appraisal and their understanding of a medical condition and its future consequences. It encompasses both positive and negative illness beliefs which can affect the patient's ability to cope with the illness, depending on whether the latter is perceived as manageable or threatening **(Broadbent et al., 2015).**

Significance of the study:

HCC is one of the most common cancers worldwide and accounts for considerable morbidity and mortality rates. The incidence of liver cancer is one of the highest in the world. HCC represents 85%—90% of primary liver tumors. In Egypt, HCC constitutes a significant public health problem, where it is responsible for 33.63% and 13.54% of all cancers in males and females respectively. HCC occurs in a number of preexisting conditions that commonly includes hepatitis C and B, alcoholic and nonalcoholic cirrhosis **(Rashed, et al., 2020).**

Aim of the Study: The study was conducted to evaluate the impact of educational nursing guidelines on knowledge and illness perception of HCC patients undergoing RFA.

Study hypotheses: H1: There will be a significantly improvement of the patients` knowledge regarding HCC and RFA after implementing the educational nursing guidelines than before. **H2:** Patients' illness perception will be enhanced among HCC patients' undergoing RFA post guidelines

Subjects & Methods

Research design: A quasi-experimental study design was used to fulfill the aim of study.

Setting: The study was conducted in internal interventional radiology department at National Liver Institute, Menoufia University, Shebin El Kom.

Sample type: A Purposive sample was used to achieve the aim of the study.

Sample size: 50 adult patients from both gender diagnosed with HCC undergoing RFA.

Tools of data collection:

Tool (I): A structured interviewing questionnaire, it was developed by researchers in Arabic language and comprised two main parts: **Part 1: (A): Socio demographic characteristics,** this part was concerned with assessment of the studied patients' socio-demographic characteristics, and **(B): Assessment of patients' medical health history**

Part two: Assessment of patients' knowledge regarding HCC and RFA: This part of tools of data collection was developed by the researchers in Arabic language based

on reviewing recent related literature and scientific books **(Llovet et al., 2021)** and **(Rizzo et al., 2022)** to assess patients' knowledge regarding HCC and RFA. It consisted of (15) closed ended questions, (7items) related to patients' knowledge regarding HCC such as (definition, risk factors, causes, symptoms, investigations, complications and methods of treatment of primary HCC) (8 items) concerned with knowledge regarding RFA such as (definition, conditions that must be met, advantages, preparations, investigations before RFA, contraindications, instructions followed after treatment with RFA, complications of treatment with RFA on liver).

Scoring system: Answers obtained from patients were scored and calculated using the model key answer sheet prepared by the researchers, each correct answer scored 1 and score zero for incorrect answer. The total scores were ranged from 0 to 15 grades then converted into a percent and categorized as follows:

Total knowledge score was classified as the following:

- ≥ 75% considered satisfactory level f knowledge (≥ 11grads of the total score)
- < 75% considered un satisfactory level f knowledge (< 11grads of the total score)

Tool II: Patients' illness perception assessment questionnaire: The Brief illness perception questionnaire (BIPQ) which adapted from **(Broadbent, et al., 2015)** was used to assess patients' illness perception pre, post & follow up of educational nursing guidelines implementation. It included three domains to assess cognitive perception, emotional perception and degree of understanding. Cognitive perception consisted of items related to effect on illness on patients' life, duration of illness, control over illness, belief about the effectiveness of treatment and experience of symptoms. Emotional perception included concern about illness and a multifaceted question about mood. Question to assess degree of understanding their illness. The final item is open-ended question asking about the three most important factors causing their illness.

Scoring system: Overall scores represented the degree to which the illness was perceived as threatening or benign. The internal consistency of this score was depended on the illness studied. Each item is scored on a 0 to 5 ordinal scale producing a total score from 0 to 40. Higher scores reflected more threatening view of the illness and indicated higher negative illness representation of disease.

Total illness perception scores were classified as the following:

- Negative illness perception ≥ 60% (≥24 grads of total score).
- Positive illness perception < 60% (<24 grads of total score).

Content validity: validity of data collection tools was investigated by panel of five experts in the field of medical-surgical nursing at Benha University to judge clarity, relevance, comprehensiveness, simplicity, understanding and applicability of tools, all of their remarks were taken into consideration and modifications were done.

Reliability of the tools: Internal consistency reliability of all items of the tools was done using Cronbach's alpha coefficient test, which was 0.899 for knowledge and 0 .90 for illness perception. This proves that this tool is an instrument with good reliability.

Ethical considerations:

Approval of the scientific research ethical committee of Faculty of nursing, Benha

University was obtained for the fulfillment of the study (REC-MSN-P54). An official permission from the selected study settings was obtained before initiating the study. The aim of the study was to explain to all participants before applying the tools to gain confidence and trust. Oral and written consent was obtained from participants, and they were informed that their participation is optional.

The researchers-maintained anonymity and confidentially of the subjects and informed them that all information gathered was used only for their benefit and for the purpose of the study. The study didn't carry any physical or psychological risk to the subjects. All participants have the right to withdrawal at any time of data collection and with no obligation.

Pilot study: The pilot study was conducted on 10% of the total studied sample (5patients) to test clarity, applicability, feasibility of the constructed tools, and the time needed for each subject to fill the questions and identify problems that may be encountered during the study.

Field work:

Preparatory phase: The researchers reviewed the local and international related literatures and different studies related to the study using textbooks, evidence-based articles, internet and journal to develop tools. This helped the researchers to be acquainted with the various study aspects of the research problem and guide the researchers to prepare the required tools of data collection.

Assessment phase (baseline phase): At the beginning of the this phase the researchers interviewed with all available patients to initiate communication and gain confidence, provided them with all information needed about the study and their approval was taken. Each patient was interviewed before applying educational nursing guidelines (**tool I part two),** and patients' illness perception **(tool II)** (pre-educational guideline implementation). Average time for the completion of each patient interview was around (25-35 minutes). The number of interviewing patients ranged 4-5 patients per week.

Planning phase: The educational nursing guidelines were designed by the researchers to accommodate the patients' knowledge deficit based on baseline data obtained from assessment phase. The contents of educational nursing guidelines were prepared according to patients' level of understanding in simple, organized Arabic language. It contained general and specific objectives.

Implementation phase: appropriate separate place was provided for patient to maintain privacy and confidentiality. At the beginning of the first session the patients were oriented with the session contents. Number of patients participated in each session were 4-5 patient. The duration of each session was (45-60) minutes according to patients' achievement and feedback. Each session started by feedback about the previous session. At the end of each session, the researchers gave five minutes to permit the patient to ask any questions to clarify the session contents and to correct any misunderstanding. Educational guidelines (booklet) were distributed to all recruited patients in the study from the first session to achieve its objectives

Evaluation phase: The evaluation phase emphasized on determining the impact of educational nursing guidelines on the patients' knowledge related to (HCC and RFA) and illness perception. It was based on the finding of differences between pre, post, and at follow-up after implementation of the educational guidelines. The evaluation was done by using the same study tools of the pretest.

Statistical analysis: Statistical Package for Social Sciences (SPSS) statistical software (version 25) was used. For determining the normal distribution of quantitative variables Kolmogorov-Smirnov test was used. Qualitative data was presented as a number and percent, quantitative data was described as mean or standard deviation, Chi-square test was used to examine the difference and relation between qualitative variables during different periods. McNemar test for differences on dependent variable between two related groups. For comparing the mean scores in two groups, Mann Whitney test for non-parametric quantitative data and Kruskal wails for more than two groups. Spearman method was used to test correlation between numerical variables. A significant levels value was considered for testing the research hypothesis. Degrees of significance of results were considered as follows: P-value > 0.05. Not significant (NS) P-value ≤ 0.05. Significant (S). P-value ≤ 0.001 highly Significant (HS).

Results:

Table (1) reveals that 66% of studied patients their age was ≥ 40-year-old with mean age and standard deviation 45.74 ± 7.613 years, 68% were male and72% were married. In relation to level of education 52% were illiterate. As well 68% of studied patients have work and 58.8% were farmers. More than half 56% of studied patients were living in rural areas and had family members from (2-5). Concerning monthly income 64% of the studied patients had insufficient income and 68% were treated at the state's expense.

Table (2) shows that 100% of the studied patients had previous hospitalization due to liver complaints, 68.0% of them were related to liver cirrhosis, and the last time of admission to hospital were from one month to <three months for 54% of patients. More than half of them (56%) were diabetic. 32% of studied patients had family history of HCC and 62.5% of them were in a first degree relationship

Table (3) shows that 64% of the studied patients had unstable medical condition 68% of them were diagnosed from 6 months to one yea, in relation to the performed diagnostic tests, 100% of studied patients performed blood and liver function tests, 80% performed CT scan, while 84%of the studied patients hadn't performed RFA sessions before.

Figure (1) reveals that 84% of the studied patients were at unsatisfactory level of total knowledge about HCC and RFA at pre-educational nursing guidelines implementation, while 96% of them were at satisfactory level of total knowledge immediately post then there were declined to 76% post 3 months and 66% post 6 months of educational nursing guidelines implantation.

Table (4) illustrates that there was a highly statistically significant difference between illness perception pre and 3 months post and pre and 6 months post educational nursing guidelines implementation as p ≤ 0.001

Figure 2 displays that liver cirrhosis is the most important factors that are believed to cause their disease as experienced by the studied patients with the highest percentage (74%).

Table (5) reveals that there was improvement in patients' total illness perception 3months, 6months post educational guidelines implementation as compared to pre- implementation with highly statistically significant (p <0.001)

Table (6) shows a highly statistically significant negative correlation between patients' total illness perception and total knowledge score post 3 months and 6 months (follow up) of educational nursing guidelines implementation observed at p ≤0.001 compared to pre implementation there was statistically significant correlation with p ≤0.05.

Table (1): Frequency and perception distribution of the studied patients regarding to socio-demographic characteristics (n=50).

Socio demographic characteristics	(No.)	%
Age (in years)		
< 40 year	17	34.0
≥ 40 year	33	**66.0**
SD ± $\bar{\chi}$, range	45.74 ± 7.613(33-60)	
Sex		
Female	16	32.0
Male	34	**68.0**
Marital status		
Married	36	**72.0**
Divorced	2	4.0
Widowed	12	24.0
Educational Level		
Illiterate	26	**52.0**
Read and write	9	18.0
Intermediate qualification	12	24.0
High qualification	3	6.0
Working status		
Working	34	**68.0**
Not working	16	32.0
If yes, the occupation is (n= 34)		
Employee	8	23.5
Farmer	20	**58.8**
Free works	6	17.7
Residence		
Urban	22	44.0
Rural	28	**56.0**
Number of family members		
SD± $\bar{\chi}$, range	3.84 ± 1.057 (2-5)	
Monthly income		
Sufficient	18	36.0
Insufficient	32	**64.0**
Treatment costs		
Health insurance	16	32.0
At the state's expense	34	**68.0**

Table (2): Frequency and perception distribution of the studied patients according to their past medical and surgical history (n=50).

	(No.)	%
Previous hospitalization due to liver complaint		
Yes	**50**	**100.0**
If yes the cause of disease is		
Liver cirrhosis	**16**	**32.0**
Hepatitis B and C	**34**	**68.0**
Frequency of hospitalization		
Twice	**16**	**32.0**
Three times	**22**	**44.0**
More than 3 times	**12**	**24.0**
The last time of admission		
< one month	**2**	**4.0**
One month - < 3 months	**27**	**54.0**
3 months – 6 months	**21**	**42.0**
Previous surgery		
Yes	**28**	**56.0**
No	**22**	**44.0**
If yes, the type of surgery is (n=27)		
Appendicitis	**8**	**29.6**
Inguinal hernia	**10**	**37.1**
Caesarian section	**9**	**33.3**
Presence of comorbid disease		
Hypertension	**10**	**20.0**
Diabetes mellitus	**28**	**56.0**
Coronary heart disease	**4**	**8.0**
Arthritis	**8**	**16.0**
Family history of hepatocellular carcinoma (HCC)		
Yes	**16**	**32.0**
No	**34**	**68.0**
If yes, what is the degree of kind ship (n=16)		
First degree	**10**	**62.5**
Second degree	**6**	**37.5**

Table (3): Frequency and perception distribution of the studied patients according to their current medical history (n=50).

Patients' current medical history	(No.)	%
The current Medical condition		
Stable	18	36.0
Unstable	32	64.0
Time since diagnosis		
6 months – one year	34	68.0
>one year	16	32.0
The performed diagnostic tests #		
Blood and liver function tests	50	100.0
Magnetic resonance imaging	24	48.0
CT scan	40	80.0
Had undergone any procedure to treat HCC		
Yes	37	74.0
No	13	26.0
If yes, the type of procedure is (n=37) #		
Chemotherapy	29	78.3
Radiotherapy	5	13.5
Surgical intervention	7	18.9
Had performed RFA sessions before?		
Yes	8	16.0
No	42	84.0

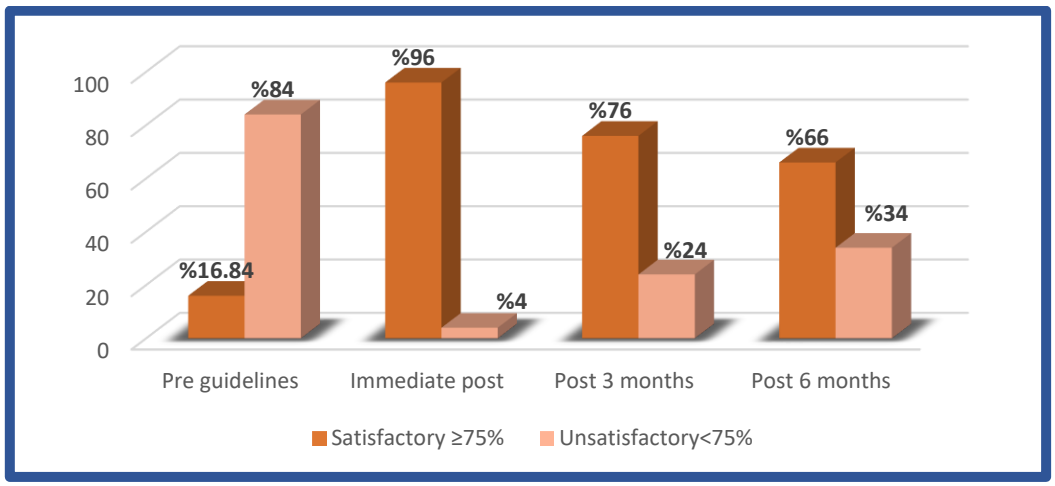

Figure (1): Distribution of the studied patients according to their total knowledge about HCC and RFA throughout study phases of guidelines implementation (n=50)

Table (4): Difference between the studied patients regarding their illness perception throughout study periods (n=50).

Illness Perception		Pre-educational guidelines (n=50)	3months Post educational guidelines (n=50)	6 months Post educational guidelines (n=50)	Z test P value (1)	Z test P value (2)
		Mean ± SD	Mean ± SD	Mean ± SD		
How much illness does affect life?	Cognitive perception	4.46 ± 0.67	1.36± 0.48	1.22 ± 0.54	- 6.251(<0.001**)	- 6.242 (<0.001**)
How long do you think illness will continue?		4.32 ± 0.79	1.44 ± 0.50	0.94 ± 0.71	- 6.172 (<0.001**)	- 6.160 (<0.001**)
How much control do you feel you have over illness?		1.42 ± 1.01	4.66 ± 0.47	4.96 ± 0.19	- 6.227 (<0.001**)	- 6.270 (<0.001**)
How much do you think treatment can help illness?		1.14 ± 1.14	4.64 ± 0.48	4.88 ± 0.38	- 6.259 (<0.001**)	- 6.247 (<0.001**)
How much do you experience symptoms from illness?		1.44± 0.99	1.32 ± 0.51	1.12 ± 0.59	- 3.333 (0.001**)	- 3.943 (<0.001**)
How concerned are you about illness?	Emotional perception	4.62 ± 0.53	2.04 ± 1.24	1.42 ± 0.49	- 5.908 (<0.001**)	- 6.258 (<0.001**)
How much does illness affect emotionally?		4.72± 0.45	1.56 ± 0.70	1.46 ± 0.67	- 6.241 (<0.001**)	- 6.276 (<0.001**)
How well do you feel understanding illness?	Degree of understanding	0.46 ± 0.50	3.44 ± 0.50	4.42 ± 0.70	- 6.272 (<0.001**)	- 6.278 (<0.001**)
Total		23.42 ± 2.17	20.46 ± 1.95	20.24 ± 1.72	- 4.377 (<0.001**)	- 4.410 (<0.001**)

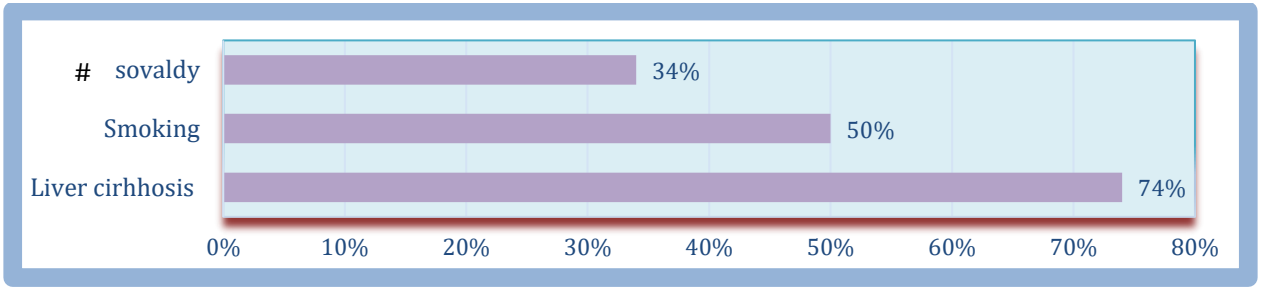

Figure (2) Ranking of the three most important factors that are believed to cause illness as experienced by the studied patients (n=50)

Table (5): Difference between the studied patients regarding their total illness perception throughout study periods (n=50).

Perception	Max score	Pre-educational guidelines (n=50)	% of mean	3months Post educational guidelines (n=50)	% of mean	6 months Post educational guidelines (n=50)	% of mean	Z test P value (1)	Z test P value (2)
		Mean ± SD		Mean ± SD		Mean ± SD			
Cognitive perception	25	13.62 ± 2.15	54.4%	13.30± 1.31	53.2%	13.12 ± 1.18	**52.4%**	**- 4.556 (<0.001**)**	**- 4.452 (<0.001**)**
Emotional perception	10	9.34 ± 0.65	93.4%	3.60 ± 1.29	36.0%	2.88 ± 0.77	**28.8%**	**- 5.501 (<0.001**)**	**- 2.454 (0.014*)**
Degree of understanding	5	0.46 ± 0.50	9.2%	3.44 ± 0.50	68.8%	4.42 ± 0.70	**88.4%**	**- 6.272 (<0.001**)**	**- 6.278 (<0.001**)**

Table (6): Correlation between patients' total knowledge and illness perception throughout study phases of educational nursing guidelines implementation (n=50).

Variables	Study phases	Total Knowledge score	
		r	P value
Perception	Pre educational guidelines	-0.293	0.039*
	Post 3 months of educational guidelines	-0.458	<0.001**
	Post 6 months of educational guidelines	-0.653	<0.001**

Discussion:

The results of the present study revealed that two thirds of studied patients their ages were above 40 years old with mean age 45.74 ± 7.613. From researchers point of view this might be related to liver disease is common in middle and old age than young age, this finding is in agreement with **Roshdy, et al., (2019),** who studied "Impact of early pulmonary rehabilitation on post liver transplantation " and reported that the mean age of the participants was 49.2 ±7.12years.

As regard to the patients' **gender**, the present study revealed that more than two thirds of studied patients were male. This might be explained by increasing exposure of male to smoking and alcohol. These results agreed with a study conducted by **Aljumah et al., (2016)** about "Clinical Presentation, Risk Factors, and Treatment Modalities of Hepatocellular Carcinoma: A Single Tertiary Care Center Experience" who found that HCC was more prevalent in males.

As regard to **marital status** of studied patients, the findings of the present study revealed that nearly three quarter of them were married. This finding was supported by **Abd El Rahman, et al., (2018),** who conducted study entitled" Knowledge, practice and satisfaction of clients with hepatitis c virus regarding Sovaldi therapy" and reported that most of the sample were married.

The present study indicated that more than half of the studied patients were illiterate. This might be due to their rural culture that not interested in education and they put their interest and effort to learn technical professions**.** these finding were in the same line with a study done by **Mohammed, (2019)** about" Impact of implementing self-care protocol on improving quality of life of patients with liver cirrhosis who reported that more than half of the studied patients were illiterate. On the other hand, the results disagreed with a study conducted by **Kundu, et al., (2015)** in the study entitled "Prevalence of Hepatitis B virus and Hepatitis C virus among chronic liver disease patient" who stated that the majority of studied patients were educated,

Concerning **patients' occupation;** the findings of the present study revealed that the majority of studied patients were worked as farmers. This might be due to the majority of them were illiterate and residing in rural areas, this result supported by **Abdel Rehaim & Mohamed, (2017)**, who performed study about "Knowledge of patient with liver cirrhosis regarding ascites self-management: instructions nursing guideline" and reported that the majority of patients worked as farmers which put them at high risk for developing liver cirrhosis. this finding is in contrast with a study conducted by **Shamsaeefar et al., (2020),** who studied "Quality of life among liver transplantation recipients before and after surgery, a single center longitudinal study, Shiraz, Iran," and stated that more than two thirds of studied patients sample weren't working.

In relation to **patient's residence**, the results of the present study indicate that more than half of studied patients lived in rural areas. The results from data collected in this study agreed with **Khalil et al., (2015)** in a study entitled "Effect of Suggested Nutritional Regimen on Liver cirrhosis Patient outcomes" and with **Abdullah. (2020)** in a study entitled "Psychological problems among patients suffering from liver cirrhosis" who stated that highest percentage of patients lived in rural areas.

One the other hand, these results disagreed with **Majeed& Atiyah (2020)** who studied "Impact of liver cirrhosis upon adult patients' daily living activities at Baghdad Teaching

Hospitals" and clarified that more than half of studied sample were from urban areas.

In relation **monthly income**, the findings of the present study revealed that nearly two thirds of the studied patients had insufficient monthly income and more than two thirds were treated at the state's expense.

Regarding **previous surgery**, the present study indicated that more than half of the studied patients had previous surgery. This result was in accordance with **Taha, et al., (2022)** who found that more than half of the studied patients had previous surgery, while disagreed with **Shepl, et al., (2017)** who found that more than two fifth of studied patients hadn't previous surgery. Regarding **presences of comorbid diseases**, the present study revealed that all of the studied patients have comorbid disease and the majority of them were diabetic. This may be due to that diabetes mellitus is a risk factor for HCC. This result agreed with **Koh, et al. (2013**), who performed a study on "Diabetes mellitus and risk of hepatocellular carcinoma in China"; and reported that the majority of patients had diabetes mellitus. Concerning **family history of HCC**, the present study showed that less than one third of studied patients had positive family history of HCC and the majority of them were first degree. These findings were in the same line with **Salah, et al., (2022)** who found that less than one third of studied patients have positive family history. These results clarify that the HCC cause is an infection, not genetic.

As regarding **the current medical condition** of the studied patients, the findings of the present study demonstrated that nearly two thirds of the studied patients have unstable medical condition and were diagnosed from six months to one year. This might be due to the selected sample were newly diagnosed HCC patients. These findings were in harmony with **Salah et al. (2012)** in a study entitled "Effect of Educational Nursing Guidelines on Knowledge and Post Ablation Syndrome for Patients with Hepatocellular Carcinoma" who found that nearly two thirds of the patients in the study had been diagnosed within a year.

The present study showed that all of studied patients had performed blood and liver function tests, more than three quarter performed CT scan and nearly half of them performed magnetic resonance imagining.

In addition, the majority of the patients didn't perform RFA sessions before, this finding was consistent with **Awad (2013)** in a study about "Effect of nursing instructions on patients with liver tumor undergoing radiofrequency ablation therapy" who demonstrated that over two thirds of the patients in the study and control groups never received radiofrequency session previously.

The current study demonstrated that there was a highly statistically significant difference regarding total patients' basic knowledge about HCC and RFA between pre & immediate post, 3 months and 6 months post educational nursing guidelines implementation. This might be attributed to the theoretical sessions that were provided to patients comprehensively, cover most of aspects of HCC &RFA. This finding is consistent with **Aziz (2011)** who conducted a study entitled "Patient education: it's effect on quality of life of patients with cancer on chemotherapy" and found that there were highly statistically significant differences in patients' level of knowledge pre/ post one month and post six months from the educational intervention about cancer.

As regarding illness perception, the results of the present study showed that there were improvements in patients' awareness about their illness. This result was in the same line with the findings of a study entitled "Impact of disclosure of diagnosis and patient autonomy on quality of life and illness perceptions in Chinese patients with liver

cancer" conducted by **(Jie et al.2016)** who found that the patients in the disclosed group perceived had a better understanding of their illness, having less emotional reaction and higher personal control over their disease.

From the researchers' point of view, whereas illness perceptions about personal control, patients' concern and emotion showed an improvement, which have been positively associated with psychological well-being and consequently reflected on patients' life. This result ensures the effectiveness of the educational nursing guidelines.

The findings of the present study revealed that there was statistically significant relation between patients' total level of knowledge and their sex and marital status 3months and 6 months post educational nursing guidelines implementation. These results agreed with **Goda, et al. (2020),** who studied "Learning Needs Assessment for Hepatocellular Carcinoma Patients Undergoing Thermal Ablation" and revealed that there was statistically significant relation between patients' total knowledge regarding self-care management and their sex and marital status in average post self-care program implementation.

As regarding the relation between patients' total illness perception and their socio-demographic characteristics, the present study revealed that post 3 months of guidelines implementation there was a statistically significant difference with marital status and educational level. This results agreed with **Gül, Erci, (2022)** in a study entitled "Investigating the correlation of health literacy with eating behavior and health perception in adult individuals" who mentioned that a significant relation was found between their educational levels and their illness perception levels. It was concluded that education level had an impact on health perception, and that as education level increased, health perception level increased as well.

As regarding the correlation between total knowledge score and total illness perception score, the present study revealed that there was a highly statistically significant negative correlation between patients' total knowledge score and total illness perception score and, this means that improving patients' knowledge about their disease had positively reflected on their illness perception.

Conclusion:

The implementation of the educational nursing guidelines had a positive impact on improvement of the studied patients' knowledge regarding HCC and RFA, as well their illness perception positively changed than pre-implementation. While there was a highly statistically significant negative correlation between patients' total illness perception score and total knowledge score post implementation of educational nursing guidelines that supports the study hypotheses. There was an enhancement in their illness perception.

Recommendations

For patients:

-Educational programs about RFA and HCC disease and its treatment modalities should be provided for HCC patients using new methods of teaching such as computer assisted instructions and home videos.

For further researchers:

Well-designed, prospective studies on large HCC patients sample with different levels of intervention are needed to define the optimal approaches to lifestyle modification for patients at risk of developing HCC.

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تأثير الارشادات التمريضية التعليمية على معرفة وإدراك المرض لدى مرضى سرطان الخلايا الكبدية الذين يخضعون للاستئصال بالتردد الحراري

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سرطان الخلايا الكبدية هو الشكل الأكثر شيوعا لسرطان الكبد والذي يبدأ في النوع الرئيسي من خلايا الكبد ويمثل تقريبًا جميع حالات سرطان الكبد. تلعب الأشعة التداخلية الآن دورًا مهمًا في علاج سرطان الخلايا الكبدية، خاصةً في عمليات الاستئصال بالتردد الحراري؛ لذا هدفت الدراسة الي تقييم تأثير الإرشادات التمريضية التعليمية على معرفة وإدراك مرضى سرطان الخلايا الكبدية الذين يخضعون للاستئصال بالتردد الحراري. تم استخدام دراسة شبه تجريبية لتحقيق هدف الدراسة، حيث أجريت هذه الدراسة في قسم الأشعة التداخلية الداخلية والعيادات الخارجية في المعهد القومي للكبد - جامعة المنوفية على عينة غير مقصودة من ٥٠ مريضا بالغا من كلا الجنسين تم تشخيصهم بسرطان الخلايا الكبدية ويخضعون للاستئصال بالتردد الحراري لمدة اثني عشر شهرا. تم جمع البيانات باستخدام أداتين: استبيان المقابلة المنظمة ويشمل الخصائص الاجتماعية والديموغرافية، تقييم التاريخ الصحي الطبي للمرضى وتقييم معرفة المرضى بشأن سرطان الخلايا الكبدية و استبيان تقييم إدراك المرضى للمرض. كان هناك فارق ذو دلالة إحصائية عالية بين نتيجة مراحل ما بعد التنفيذ والمتابعة مقارنة بالمرحلة السابقة للتدخل فيما يتعلق بمعرفة المرضى وإدراكهم للمرض. تم الوصول إلى أن تنفيذ الإرشادات التمريضية التعليمية كان له تأثير إيجابي على تحسين معرفة المرضى المدروسين بشأن سرطان الخلايا الكبدية والتردد الحراري؛ كما أن إدراكهم للمرض قد تغير بشكل إيجابي مقارنة بمرحلة ما قبل التنفيذ وقد أوصت الدراسة بأنه يجب توفير برامج تعليمية حول مرض سرطان الخلايا الكبدية وطرق علاجه للمرضى المصابين.