Impact of Educational Nursing Guidelines on Hepatocellular Carcinoma Patients' Lifestyle Undergoing Radio Frequency Ablation

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Abstract

Background: Hepatocellular carcinoma (HCC) is the six most common primary malignancies worldwide. In Egypt, it represents the fourth common cancer; radiofrequency ablation has become a standard treatment option for HCC less than 5 cm in size **Aim of the research:** Evaluate impact of educational nursing guidelines on hepatocellular carcinoma patients' lifestyle undergoing radio frequency ablation. **Research design:** A quasi-experimental study design was used to fulfill the aim of study. **Setting:** Internal interventional radiology department and outpatient clinic at National Liver Institute, Menoufia University, Egypt **Sample:** A purposive sample of 50 adult patients from both genders diagnosed with hepatocellular carcinoma undergoing radiofrequency ablation. **Tools of data collection: Tool (I):** A structured interview questionnaire. (**II**) Lifestyle assessment questionnaire (pre- post-test and follow up). **Results:** There was a highly statistically significant difference between the results of the post implementation and follow-up phases compared with pre implementation about lifestyle. **Conclusion:** Implementation of the educational nursing guidelines had a positive impact on improvement of the studied patients' lifestyle than pre-implementation. **Recommendations:** Patients with hepatocellular carcinoma in health care settings should have access to a concise and comprehensive Arabic booklet about radiofrequency ablation precautions and guidelines needed. Well-designed prospective studies on large samples with different levels of intervention to define the optimal approaches to lifestyle modification.

Keywords: Educational nursing guidelines, hepatocellular carcinoma, lifestyle, & radiofrequency ablation.

Introduction

Hepatic malignancies are greatly common and frequently exhibit a therapeutic dilemma. The incidence of liver cancer is one of the highest cancers in the world and the most common form of primary liver malignancy is Hepatocellular carcinoma (HCC) which accounts for up to 90% of all liver tumors (**Asafo-Agyei & Samant, 2023)** HCC is now the six most common primary malignancy worldwide. In Egypt, it represents the fourth common cancer **(Petrick, 2020).**

Chronic liver disease and cirrhosis remain the most important risk factors for the development of HCC of which viral hepatitis include HBV and HCV viral infections, non-alcoholic steatohepatitis (NASH) and excessive alcohol intake are the leading risk factors worldwide that can lead to liver fibrosis and cirrhosis. An unhealthy diet, obesity, dietary aflatoxin exposure and

smoking are also considered as risk factors for liver cancer **(Llovet, et al., 2021).**

Interventional radiology is now playing an important role in the treatment of HCC. These techniques have significantly helped prevent progression of disease in liver transplant candidates and prolong survival in no transplant candidates **(Schwarz & Smith., 2021).** Radiofrequency ablation (RFA) is currently considered the gold standard among percutaneous ablative therapies. This minimally invasive therapy has the potential to dramatically alter patient outcome **(Crocetti et al., 2020).**

Radiofrequency ablation has become a standard treatment option for HCC less than 5 cm in size, particularly in individuals who are not candidates for hepatectomy. Except for its equivalent prognosis and efficiency, RFA has various advantages over surgical excision, including lower risk of problems, lower rate of complications, lower cost, applicability, and a shorter hospital stay to minimally invasive techniques **(Wang et al., 2023).**

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).**

The increasing burden of HCC emphasizes the prominent need to define important modifiable risk factors and emphasizes the unmet need for primary prevention. Cancers result from the interactions of host features with environment factors. Lifestyles, which comprise the habits by which a person chooses to live, define these interactions. Therefore, lifestyle measures appear to be important modifiable risk factors for HCC regardless of its etiology. Lifestyle patterns, as a whole and each component separately, are related to HCC risk **(Llovet et al., 2021).**

Established and emerging lifestyle risk factors for HCC; Accumulating preclinical, clinical and epidemiological evidence demonstrate that modifiable environmental and lifestyle factors play a key role in the pathogenesis of HCC, accordingly, lifestyle modification has emerged as an important strategy for the primary prevention of HCC **(Saran, et al., 2019).**

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).**

Egypt used to be the country with the heaviest hepatitis C virus (HCV) burden. The relationship between HCV and HCC is an important research area. In Egypt, HCC is a significant public health problem. A possible cause for the increasing rates of detection of HCC in Egypt is the mass screening program that was carried by the government for detecting and treating HCV. A multidisciplinary approach is now widely

applied to HCC management in health centers all over **(McGlynn et al., 2021).**

Aim of the Study:

The study was conducted to evaluate impact of educational nursing guidelines on HCC patients' lifestyle undergoing RFA.

Study Hypotheses: H1: lifestyle of HCC patients undergoing RFA would be positively changed post implementation of educational nursing guidelines than pre- implementation.

Subjects & Methods

Research design: A quasi-experimental study design (one group: time series quasi experimental design) was used to fulfill the aim of study.

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

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 and attained to the previously mentioned setting for twelve months during time of data collection, able to communicate and participate in the study and didn't attend previous educational intervention about the disease. Sample size was calculated as follow:

Epi-Info-7 program was employed to estimate the sample size by applying the following parameters:

Population size =50 per 3 months; (2) Expected frequency = 50%; (3) Accepted error = 5%; and (4) Confidence coefficient = 95%. The minimum sample size required was 45 patients

Tools of data collection: Two tools were used in this study:

Tool (I): A structured interviewing questionnaire, it included: **(A): Socio demographic characteristics** consisted of open and closed questions related to (age, sex, residence, educational level, marital state, working status, type of occupation, family members, monthly income and treatment costs), **(B): Assessment of patients' medical health history:** It included patients' past medical and surgical health history which contained (9 items) related to previous hospitalization due to liver complain, the cause of the disease, frequency of hospitalization, the last time of hospital admission, previous surgery, the type of surgery ,presence of comorbid disease, family history of HCC and the degree of kinship . Patients' current medical history which contained (6items) related to current medical condition, time since diagnosis, the performed diagnostic tests, patients undergone any procedure to treat HCC, type of procedure performed and if patients had performed any RFA sessions before.

Tool II: Life style assessment questionnaire: It was used to measure life style for patients with HCC undergoing RFA (pre, post and at follow up of educational nursing guidelines implementation), adopted from **(Godwin et al., 2003; Momayyezi et al., 2015)** and modified by the researchers, it consisted of (46 items) grouped into (7) categories related to physical health (8 items), physical activity and exercise (5 items), weight control and nutrition (8 items), smoking and alcohol avoidance (4 items), medication adherence (6 items), mental health and stress (9 items) & sleep quality (6 items).

Scoring system: Each item was evaluated and rated by 3- point Likert scale (2=always, 1=sometimes and 0=never). Ten of the questions were reversed its scores because it involved negative aspects. High scores indicated a good lifestyle.

Total lifestyle scores were classified as the following:

- Good (healthy) lifestyle ≥ 60% (≥ 55 grads of the total score)
- Poor (Unhealthy) lifestyle < 60% (<55 grads of the total score)

Content validity: Validity of data collection tools were 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 considerations and modifications were done, so the tools were considered valid from the experts' point of view.

Reliability of the tools: Reliability of proposed tools was applied by the researchers for testing the internal consistency of the tools by administrating of the same tool to the same subjects under similar condition. Internal consistency reliability of all items of the tools was done using Cronbach's alpha coefficient test, which was 0.871 for Life style scale. 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-P55). An official permission from the selected study settings was obtained before initiating the study. The aim of the study was explained to all participants before applying the tools to gain confidence and trust. Oral and written consent was obtained. The researchers-maintained anonymity and confidentially of the subjects and informed 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 for 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) in order to test clarity, applicability, feasibility of tools, and the time needed to fill the questions, required modifications were done. Some questions and items were omitted, added, or rephrased and then the final forms were developed. These patients were excluded from the study sample.

Field work:

Preparatory phase: The researchers reviewed the local and international related literatures and theoretical knowledge of its various aspects using textbooks, evidence-based articles, internet and journal to develop tools. This helped the researchers to prepare the required tools of data collection.

Assessment phase: At the beginning of this phase the researchers interviewed all available patients and introduced themselves to initiate communication and gain confidence, provided them with all information needed about the study. Each patient was interviewed before applying educational nursing guidelines in order to collect the baseline patients' data using **(tool I),** assess patients' lifestyle using **tool II** (pre-educational nursing guideline implementation). Average time for the completion of each patient interview was around (25-35 minutes). The number of

interviewing patients ranged from 4-5 patients per week.

Planning phase: Based on baseline data obtained from assessment phase and relevant review of literature, the educational guidelines were designed by the researchers to accommodate the patients' deficit and promoting lifestyle, and then a simple booklet was developed for patients and written in Arabic-language which covered all information related to HCC, RFA and life style. The contents of educational nursing guidelines were prepared according to patients' level of understanding in simple, organized and scientific Arabic language. It contained general and specific objectives. Three sessions were designed.

Implementation phase: The researchers attended the previously mentioned study setting and provided appropriate separate place for patient during the interview to maintain privacy and confidentiality of the study. At the beginning of the first session; the patients were oriented with the session contents. The 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 and the researchers discussed the objectives of the new session that will be demonstrated taking into consideration the use of simple Arabic language to suit patients' level of understanding and educational level. 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. The researchers used teaching methods such as lectures, group discussion, and suitable teaching media included booklet, figures and videos through laptop.

Evaluation phase: The evaluation phase emphasized on determining the impact of educational nursing guidelines on the patients' lifestyle. It was based on the finding of differences between pre, post, and at follow-up after implementation of the educational nursing guidelines. The evaluation was done through six months by using the same study tools of the pretest.

Statistical analysis: The collected data were organized, coded, categorized, computerized, tabulated and analyzed by using the Statistical Package for Social Sciences (SPSS) statistical software (version 25). Kolmogorov-Smirnov test was used for determining the normal distribution of quantitative variables. Qualitative data was presented as a number and percent. Furthermore, quantitative data was described as mean or standard deviation, as appropriate. 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 level 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 is 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. 52% were illiterate. As well 58.8%

were farmers. More than half 56% 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. Additionally, 54% of the studied patients had previous surgery, 37.1% were inguinal hernia and more than half of them (56%) were diabetic. 32% of studied patients had family history of HCC and 62.5% of them were first degree kindship.

Table (3) shows that 64% of the studied patients had unstable medical condition, 68% of them were diagnosed from 6 months to one year, in relation to the performed diagnostic tests, 100% of studied patients performed blood and liver function tests, 80% performed CT scan.74% had undergone procedure to treat HCC, from them 78.3% treated by chemotherapy and 13.5% treated by radiotherapy while 84%of the studied patients hadn't performed RFA sessions before.

Table (4) illustrates that there was improvement in the total mean score of all dimensions of patients' lifestyle 3 months and 6months post (follow up) educational nursing guidelines implementation with mean and standard deviation (66.14 ± 3.63, 52.18 ± 4.37) as compared to pre implementation (35.42 ± 8.73) respectively. Also, there were highly statistically significant difference between all dimensions of lifestyle pre and post 3 months and pre and 6 months post (follow up) educational nursing guidelines implementation observed at $p \leq 0.001$ in relation to physical health, physical activity and exercise, weight control and nutrition, smoking and alcohol avoidance, drug adherence, mental health and stress and sleep quality.

Table (5) illustrates the relation between patients' total lifestyle and their socio- demographic characteristics throughout study phases of educational nursing guidelines implementation, it shows that there was no statistical significant relation between patients' total lifestyle and their socio demographic data related to sex and marital status throughout study phases of educational guidelines implementation with ($p>0.05$).It also shows that there was highly statistically significant relation between patients' total lifestyle and their educational level pre educational nursing guidelines implementation as $p\leq0.001$.

Table (6) illustrates the relation between patients' total lifestyle and their medical health history throughout study phases of educational nursing guidelines implementation, it reveals that there was highly statistically significant relation between patients' total lifestyle and their medical health history related to the current medical condition and family history of HCC at pre educational nursing guidelines implementation with $p\leq0.001$compared to post 3months and 6months of guidelines implementation ,the results shows statistically significant relation with $p\leq0.05$. There was statistically significant relation between patients' lifestyle and their medical health history related to time since diagnosis with $p\leq0.05$ post 3 months and 6 months of guidelines implementation compared to pre guidelines implementation; it was not significant as $p>0.05$.

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

Socio demographic characteristics	(No.)	%
Age (in years)		
< 40 years	17	34.0
≥ 40 years	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 percentage 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 diagnosis 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
Prescence 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**

Table (4): Mean score of total HCC patients' lifestyle undergoing radio frequency ablation through studied phases (n=50)

Lifestyle dimensions	Max score	Pre-educational nursing guidelines (n=50) Mean ± SD	% Of mean	3months Post educational nursing guidelines (n=50) Mean ± SD	% Of mean	6 months Post educational nursing guidelines (n=50) Mean ± SD	% Of mean	Z test P value (1)	Z test P value (2)
Physical health	**16**	**4.28 ± 3.28**	**26.7%**	**12.90± 1.59**	**80.6%**	**10.20 ± 1.34**	**63.7%**	**- 6.161 (<0.001**)**	**- 6.211 (<0.001**)**
Physical activity and exercise	**10**	**1.94 ± 1.33**	**19.4%**	**6.56 ± 1.32**	**65.6%**	**2.48 ± 1.18**	**24.8%**	**- 6.171 (<0.001**)**	**- 5.828 (0.001**)**
Weight control and nutrition	**16**	**4.06 ± 2.47**	**25.4%**	**12.06 ± 1.03**	**75.3%**	**7.20 ± 2.34**	**45.0%**	**-6.272 (<0.001**)**	**-6.278 (<0.001**)**
Smoking and alcohol avoidance	**10**	**6.00 ± 1.76**	**60.0%**	**7.62 ± 1.36**	**76.2%**	**8.22 ± 0.73**	**82.2%**	**-3.651 (<0.001**)**	**-5.594 (<0.001**)**
Medication adherence	**18**	**5.50 ± 0.86**	**30.5%**	**6.48 ± 1.28**	**36.0%**	**7.16 ± 1.14**	**39.7%**	**-4.239 (<0.001**)**	**- 5.810 (<0.001**)**
Mental health and stress	**12**	**6.12 ± 2.29**	**51.0%**	**12.12 ± 2.17**	**100.0%**	**8.58 ± 2.72**	**71.5%**	**-6.192 (<0.001**)**	**- 5.897 (<0.001**)**
Sleep quality	**12**	**7.52 ± 0.93**	**62.6%**	**8.40 ± 0.94**	**70.0%**	**8.34 ± 0.96**	**69.5%**	**- 4.036 (<0.001**)**	**- 4.128 (<0.001**)**
Total	**94**	**35.42 ± 8.73**	**-**	**66.14 ± 3.63**	**-**	**52.18 ± 4.37**	**-**	**- 6.156 (<0.001**)**	**- 6.159 (<0.001**)**

Table (5): Relation between patients' total lifestyle and their socio- demographic characteristics throughout study phases of educational nursing guidelines implementation

Socio demographic characteristics	variables	Total lifestyle					
		Pre educational nursing guidelines	Test P value	Post 3 months of educational nursing guidelines	Test P value	Post 6 months of educational nursing guidelines	Test P value
		SD± $\bar{\chi}$		SD± $\bar{\chi}$		SD± $\bar{\chi}$	
Age	< 40 years	7.72± 39.94	U= 138.500 0.004*	3.77± 67.11	U=204.500 0.153 n.s	4.84± 53.52	U=211.000 0.153 ns
	≥ 40 years	8.40±33.09		3.51±65.63		4.00±51.48	
Sex	Female	7.86± 32.93	U=180.500 **0.056 n.s**	2.65± 65.68	U=239.500 **0.498 n.s**	3.30± 51.62	U=226.000 **0.336 n.s**
	Male	8.99±36.58		4.03±66.35		4.81±52.44	
Marital status	Married	9.67± 34.86	H= 0.829 **0.661 n.s**	3.42± 65.66	H=4.771 **0.092 n.s**	4.41± 51.38	H=4.211 **0.122 n.s**
	Divorced	2.12±40.50		2.12±69.50		0.70±56.50	
	Widowed	5.97± 36.25		4.19± 67.00		3.83± 53.83	
Educational level	Can't read and write	7.73± 31.65	H=28.187 **<0.001****	3.72± 65.50	H=7.415 **0.060 n.s**	4.40± 51.65	H=2.559 **0.465 n.s**
	Read and write	8.89±33.11		3.63±65.22		5.00±51.55	
	Intermediate qualification	1.69±44.35		2.93± 68.14		4.01± 53.64	
	High qualification	0.00±29.00		0.00±63.00		0.00±51.00	
Working status	Working	10.15 ±33.73	U=254.000 0.707 n.s	3.83± 65.29	U=162.000 0.020*	4.46± 50.85	U=125.000 0.002*
	Not working	1.59±39.00		2.40±67.93		2.47±55.00	
Residence	Rural	8.56±38.13	U=181.500 0.013*	2.84±66.54	U=291.000 0.738 n.s	4.50±52.72	U=263.000 0.378n.s
	Urban	8.41± 33.28		4.18± 65.82		4.30± 51.75	

Table (6) Relation between patients' total lifestyle and their medical health history throughout study phases of educational nursing guidelines implementation

Medical health history	variables	Total lifestyle					
		Pre educational guidelines	Test P value	Post 3 months of educational guidelines	Test P value	Post 6 months of educational guidelines	Test P value
		SD± $\bar{\chi}$		SD± $\bar{\chi}$		SD± $\bar{\chi}$	
The current medical condition	Stable	4.80± 42.94	U= 23.000 **<0.001****	3.15± 67.77	U=160.000 **0.009***	4.10± 53.94	U=177.000 **0.0.024***
	Unstable	7.52±31.18		3.60±65.21		4.26±51.18	
Time since diagnosis	6 months – one year	10.15 ±33.73	U=254.000 **0.707 n.s**	3.83±65.29	U=161.000 **0.02***	4.46± 50.85	U=125.000 **0.002***
	>one year	1.59±39.00		2.40±67.93		2.47±55.00	
Family history of HCC	Yes	1.68± 44.18	U=2.000 **<0.001****	2.79± 68.06	U=141.500 **0.006***	4.15± 54.31	U=155.000 **0.015***
	No	7.56±31.29		3.66±65.23		4.15±51.17	
Had performed RFA sessions	Yes	7.44± 35.50	U=147.500 **0.594 n.s**	3.81± 67.50	U=124.000 **0.255 n.s**	4.77± 54.25	U=118.500 **0.194n.s**
	No	9.04±35.40		3.58±65.88		4.23±51.78	

Discussion:

Regarding **age,** 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, these findings are consistent with a study carried out by **Taha, et al., (2022)** about "Quality of life for patients with hepatocellular carcinoma undergoing radio frequency ablation" who found that the mean age of the studied patients was 44.9±4.86.

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. This result agreed with statistical analysis observed by the **World Health Organization (WHO), (2022)** estimated that 900,000 individuals develop each year HCC, and the most common form of primary liver cancer occurs in male than females. On the other hand, disagreed with **Taha et al., (2022)** who found that more than half of studied patients were female

As regard to **marital status**, the findings of the present study revealed that nearly three quarters of them were married. This finding was supported by **Abdullah et al., (2021),** who studied "Quality of life among patients with chronic liver diseases at Al-Rajhi liver Hospital, Assiut University" and reported that the majority of the studied sample were married.

Concerning educational level, the present study indicated that more than half of the studied patients were illiterate. This might be due to their rural culture that they are more interested to learn technical professions**.** These findings agreed with a study conducted by **Shepl et al., (2017)** about" Lifestyle Patterns of Patients with Hepatocellular Carcinoma in National Liver Institute" and founded that the majority of studied patients don't read and write. On the other hand, the results were inconsistent with **Sheta & Abo El-Fadl. (2023)** in a study entitled "Effect of Self-Care Strategies on Health Outcomes of Patients with Hepatocellular Carcinoma" who mentioned that minority of studied subjects had high education. This discrepancy may be due to different settings where both studies were conducted.

Concerning patients' occupation; the findings of the present study revealed that more than two thirds of the studied patients are working and the majority of them were farmers. This might be due to their low levels of education and this would be explained by the fact that the majority of the study patients was 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. These findings disagreed with the study conducted by **Salah et al., (2022) al., in** a study entitled "Quality of life for patients with Hepatocellular carcinoma undergoing Radio frequency Ablation" who stated that less than two third of the studied patients were not working.

In relation to patients' residence, the present study indicated that more than half of studied patients lived in rural areas. From the researchers' point of view, this data reflected the real image that the primary risk factor for HCC is hepatitis C viral infection which is a disease more common among Egyptian men particularly those in rural areas who acquire it occupationally as farmer workers. This result is supported by **Rao et al., (2013)** who conducted a study about "Further evidence for association of hepatitis C infection with parenteral

schistosomiasis treatment in Egypt" who documented that the majority of liver cirrhosis patients lived in rural areas.

One the other hand, these results disagreed with **Hassan et al., (2014)** in the study entitled "The role of hepatitis C in hepatocellular carcinoma: a case control study among Egyptian patients" who stated that the majority of cases were from urban area.

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. The results agreed with **Sheta and Abo El-Fadl., (2023)** in a study entitled "Effect of Self-Care Strategies on Health Outcomes of Patients with Hepatocellular Carcinoma" which demonstrated that more than fifty percent of the patients received treatment at the government's expense. On the other hand, these results disagreed with **Sabola et al., (2022)** who conducted a study about" Effect of a Designed Nursing Intervention on Knowledge and Fatigue among Patients with Liver Cirrhosis" and demonstrated that the majority of studied patients had enough income**.**

In relation to **previous hospitalization due to liver complaint**, the present study showed that more than two thirds of the studied patients were hospitalized before due to liver cirrhosis and the remaining related to hepatitis B and C and the last time of admission of nearly half of them were from one month to 3months. This finding could be attributed to the chronic nature of liver disease, which often necessitates frequent hospitalization. This result aligns with a study conducted by **AlFauomy et al., (2020)** entitled "Effect of Nursing Interventions on Self-management Behaviors of female patients with Liver Cirrhosis" and showed that about half of the studied group were hospitalized three times or more in the last year. 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 **Mohamed (2013)**, who studied "The impact of self- care instructional program on quality of life of patients with liver cirrhosis at El Kasr El- Ainy Cairo University Hospital in Egypt"; and reported that 70% of patients didn't have any previous surgery,

Regarding **presence 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 and diabetes mellitus is chronic diseases companion to old age. 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. These results disagreed with a study conducted by **Shepl et al., (2017)** and found that about one third of studied 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. These findings were disagreed with **Abdelaziz, et al., (2014)** in research article entitled "Survival and Prognostic Factors for Hepatocellular Carcinoma: An Egyptian Multidisciplinary Clinic Experience" which

mentioned that the minority of the patients had not positive family history of HCC.

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 had 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. This finding was supported by **American Cancer Society, (2017)** which stated that detecting HCC disease early often allows for more treatment alternatives and enhances patients' outcome.

As regarding the performed diagnostic tests and procedure to treat HCC, 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. This was supported by **American Cancer Society (2017)** which showed that all the patients in the study and control groups performed relevant investigations,

The results also showed that the majority of the studied patients who had undergone procedures to treat HCC performed chemotherapy, while the majority of them didn't perform RFA sessions before, these findings were consistent with **Salah et al., (2022)** who found that two thirds of the studied patients had not previous session of RFA and 100% of them performed investigation before session of RFA. **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 two thirds of the individuals only received one RFA treatment.

As regard to impact of educational nursing guidelines on HCC patients' lifestyle; the results of the present study illustrated that there was improvement in the total mean scores in all dimensions of patients' lifestyle post educational nursing guidelines implementation than pre-implementation. This might be due to the effect of following healthy behaviors and monitoring of disease progression. Also, the majority of studied patients tried to adjust their lifestyle behaviors regarding HCC to live healthy life with minor problems. This result agreed with **Shepl et al., (2017)** who found that majority of studied patients had healthy lifestyle score, but some of studied patients insist never change life style patterns although HCC progression. Additionally, these results were in align with **Sheta, & Abo El-Fadl., (2023)** who reported an improvement in patients' practices regarding dietary habits, daily life style, taking medication following the application of self-care strategies compared to before implementation.

Concerning the relation between patients' total level of knowledge and their socio- demographic characteristics, 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 post 3months and 6 months of educational nursing guidelines implementation. This result agreed with **Magdy et al., (2023)**who conducted a study about "Effect of Self-Management Program on Health Outcomes of the Patients with Liver Cirrhosis" and revealed that there was statistically significant relation between patients' total knowledge and their sex and marital status in average post self-care program implementation.

Conclusion:

The implementation of the educational nursing guidelines had a positive

impact on improvement of the studied patients' lifestyle than pre-implementation.

Recommendations:

For patients:

- Patients with HCC in health care settings should have access to a concise and comprehensive Arabic brochure/booklet about RFA precautions and guidelines needed.

For nurses:

-Activating the educator role of the nurse through educational programs to raise awareness among patients about the importance of early diagnosis, proper treatment, adherence to medications, life style modifications, and follow-up.

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 نمط حياة مرضي سرطان الخلايا الكبدية الذين يخضعون للاستئصال بالتردد الحراري

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يعد سرطان الخلايا الكبدية سادس أكثر الأورام الأولية شيوعا في جميع أنحاء العالم وفي مصر يمثل رابع أكثر أنواع السرطان؛ وقد أصبح العلاج بالتردد الحراري خيارا علاجيا قياسيا لسرطان الخلايا الكبدية الذي يقل حجمه عن ٥ سم. لذا هدفت الدراسة الي تقييم تأثير الإرشادات التمريضية التعليمية على نمط حياة مرضى سرطان الخلايا الكبدية الذين يخضعون للاستئصال بالتردد الحراري، وتم استخدام التصميم شبه التجريبي (مجموعة واحدة اختبار قبل وبعد) 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. تم جمع البيانات باستخدام استبيان المقابلة المنظمة واستبيان تقييم نمط الحياة (قبل - بعد الاختبار والمتابعة). كان هناك فرق ذو دلالة إحصائية عالية بين نتائج مراحل ما بعد التنفيذ والمتابعة مقارنةً بمرحلة ما قبل التنفيذ فيما يتعلق بنمط الحياة. كان لتنفيذ الإرشادات التمريضية التعليمية تأثير إيجابي على تحسين نمط حياة المرضى الذين تمت دراستهم مقارنةً بمرحلة ما قبل التنفيذ وقد أوصت الدراسة بأن يحصل المرضى المصابون بسرطان الخلايا الكبدية في مراكز الرعاية الصحية على كتيب عربي مختصر وشامل حول الاحتياطات والإرشادات اللازمة للاستئصال بالتردد الحراري كما أوصت بدراسات مستقبلية مصممة بشكل جيد على عينة كبيرة مع مستويات مختلفة من التدخل لتعريف الأساليب المثلى لتعديل نمط الحياة.