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Learning Needs Assessment for Hepatocellular Carcinoma Patients Undergoing Thermal Ablation

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Abstract
Thermal ablation hasapproved as a safe and predictable therapyto manage certain types cancer. Patients in need to be awareof all phases of the thermal ablation procedure. ***Aim:*** *Toassess learning needs for hepatocellular carcinoma (HCC) patients undergoing thermal ablation.*
Design: *Descriptive study design was used.*
Setting: *study werecarried out in HCC unit at Mahala Hepatology Educational Hospital affiliated to Ministry of Health.*
Sample: *A convenient sample of 100 patients who attended the HCC unit for duration of 6 months from the beginning of march 2018 to the end of august 2018and accepted to participate in the study with age from 20-60 year , different level of education, socioeconomic status and scheduled for radiofrequency ablation therapy.*
Tools: *1) Patients demographic and health related sheet, 2) Learning needs assessment sheet for HCC patients and 3) Post ablation syndrome questionnaire.*
Results: *A significant correlation noticed between level of patients' knowledge regarding liver cancer, pre ablation preparation, post- ablation care with patients age, sex and level of education.All studied HCC patients undergoing thermal ablation have learning needs in all investigated domains.*
Conclusion :*The study concluded that assessment of learning needs for HCC patients undergoing thermal ablation is very important and help in increasing patients awareness of their disease, thermal ablation procedure,the importance of adherence to treatment and life style modification to minimize complications.*
Recommendations: *the study recommended that patients learning needs should be assessed by nurses constantly in terms of their condition, simple booklet written in Arabic language should be available for all HCC patients included all needed information.Replication of the current study on larger probability sample and various setting in Egypt.*
Key Words*: Learning needs assessment, Thermal ablation, Hepatocellular carcinoma.*

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I. Introduction

Hepatocellular carcinoma (HCC) is the furthermostpublic form of primary liver cancer. Globally, liver cancer is the fifth and seventh common cancer in males and females, respectively,and the burden lies mostly in developing countries. The areas of high occurrence include Eastern and South-Eastern Asia, Middle and Western Africa. It is the third common cause of death and its high fatality is mirrored on high mortality to incidence ratio. In Egypt, liver cancer is the fourth most common cancer and is the second cause of cancer mortality in males and females**[1].**

Among primary liver cancersHCCis a troublingform with increased incidence, prevalence, and mortality rates,butcan be managed with several treatment choicesdepending on tumor and patient-related factors. Additionally, the currentemphasis on screening for early detection and the enhanced therapeutic modalities resulting in a real modification in the doubtful picture of HCC**[2]**. HCC is secondary to either a viral hepatitis B or C infection or cirrhosis in most patients andboth treatment choices and prognosis are reliant on numerous factors particularlytumor size, staging, and grade. Poor prognosis observed with high-grade tumors, while low-grade tumors continue for many years without symptoms. In areas where hepatitis is uncommon, most cancers of the liver are metastatic HCC**[3]**.

Early stage HCC possibly curable by different ablative methodsincluding surgical resection, liver transplantation (LTP), and percutaneous ablation**[4]**.Thermal ablation, including radiofrequency ablation (RFA) and microwave ablation (MWA), are principally selected for HCC patients who are inappropriate for liver

transplantation or hepatic resection. Though, the application of thermal ablation has extended and appeared as an additional first- choice management option for early-stage HCC**[5]**.

HCC patients may suffer a lot of complications after procedure including symptomatic pleural effusion, hepatic abscess and hemothorax because of damage to the intercostal artery that required drainage. In addition to intraperitoneal hemorrhage and hematoma of the abdominal wall that required blood transfusion. Ileal or colonic perforation, subcutaneous intercostal seeding and jaundice because of biliary stenosis. Liver decompensation, hepatic infarction, atrial fibrillation, abdominal pain and worsening of chronic renal insufficiency and many other complications**[6]**.

Before, during and after nursing management for HCC patients undergoing thermal ablation covers preparation of necessary equipment, preparation of patient physically and psychologically **[7]**. Moreover, all necessary knowledge about the surgery and the recovery period should be provided to patients by nurse. Patients should be given enough description about suggested treatment, including any threats and possible management. Therefore, nurses have a vital role to cover all patients' necessary knowledge and ensure that all discussion takes place**[8]**.

Therefore, assessing the level of knowledge of HCC patient undergoing thermal ablation will help in determining the patients' learning needs that guide the clinicians to preparing health educational program for patients undergoing thermal ablation, which can increase their awareness of their chronic disease, importance of adherence to treatment and life style modification to minimize complications especially post ablation syndrome for early detection and management.

Significant of the study

HCC Patients undergo thermal ablation have an increased risk for getting possible side effects and complicationswhich may occur during and after ablation. Therefore, preparing health educational program based on learning needs assessment for those patients will help in increasing their awareness of their chronic disease, the importance of adherence to treatment and life style modification to minimize complications**.**

II. Aim of the study

The aim of the study is to:

1- Assess learning needs for HCC patients undergoing thermal ablation.

2- Design health educational program for HCC patients undergoing thermal ablation based on the results of learning needs assessment.

Research Question:

What are the learning needs of HCC patients undergoing thermal ablation?

III. Materials and methods

Study design: Descriptive study design were utilized to accomplish this study.

Setting: This study was conducted in HCC unit at Mahala Hepatology Educational Hospital affiliated to the Ministry of Health, Egypt.

Subject: A convenient sample of 100 patients who attend the HCC unit for duration of 6 months and accept to participate in the study with age from 20-60 year , different level of education and socioeconomic status**.**

Tools: Three tools were used in this study.

Tool I: Patients demographic and health related sheet, this consist of 2 parts:

***Part I:*Socio-demographic data** which include (age , sex , level of education , occupation , marital status ,...etc) and patients habits (smoking or not) .

Part II:Patient's medical history (duration of disease, risk factors, etc.).

Tool II:Learning needs assessment sheet for HCC patients undergoing thermal ablation. This was developed by researcher based on review of recent related literature**[9]**and consist of three parts:

***Part I*:**Concerned with information about disease which includes (definition of disease, causes or risk factors, signs and symptoms, complications ...Etc.).

***Part II*:**Concerned with patients learning needs before procedure, which include (skin preparation, fasting time, types of anesthesia, position of body ...Etc.)**[10]**.

***Part III*:**Concerned with patients learning needs after procedure and at home which includes (types of diet and fluids taken , medication taken , care of wound , possible complications , types of exercise ....etc) .

Tool III:Post ablation syndrome questionnaire: It consists of:

A. Index of fever, chills , malaise and site of pain :adopted from ***(Dodd III et al., 2005)*[11]**.to assess patients' fever , chills , malaise and sites of pain at treatment site, shoulder and other sites.

B. Rhodes Index of nausea, vomiting and retching questionnaire:adopted from ***(Kim et al., 2007)*[12].**And include eight-point patient self – report questionsto assess nausea, vomiting (frequency, severity and amount) and retching.

Scoring system:grade of nausea, vomiting and retching were recorded by the patient as none takes 0, mild discomfort takes 1, moderate discomfort takes 2, great discomfort takes 3 and severe or marked discomfort takes 4. Amount of vomiting graded as follow: 3 cups or more = very large, 2-3 cups = large, 1/2-2 = cups moderate, up to 1/2 cup = small and I didn't throw up.

C. Analogue scale for pain: adopted from***(Flaherty, 1996)*****[13]**.to measure pain severity at ablation site and around as follow: 0 for no pain, 1-3 for mild pain,3-5 for moderate pain and 6-10 for sever pain.

D. Self-Rating anxiety scale:adopted from**[14]*****(Zung, 1971)***It is a 16 questions graded from 0-3used to judge patients' level of anxiety: 0 for never, 1 for sometimes, 2 for always, and 3 for all times.

Total 48 marks scored as follows:

- score less than 12=No anxiety.
- score 12 to 23=Mild anxiety.
- score 24 to 35=Moderate anxiety.
- score 36 to 48 = Sever anxiety.

Administrative design:

The researcher obtained an official permission before collecting the data from the director of Mahala Hepatology Educational Hospital.

Operational design: This part included: Validity, Reliability, Pilot study and Field work.

Validity:

The content-validation of the tools was ascertained by a panel of seven experts; two from field of hepatology liver cancer and five from the field of Medical-Surgical Nursing at faculty of nursing Mansoura University who reviewed the tools for clarity, comprehensiveness, relevance, applicability, understanding and simplicity for the implementation and some modifications were applied according to their opinions. Tools were translated into Arabic language and submitted to back translation by bilingual expert to ensure accuracy of meaning.

Reliability:

Reliability test was done by using Cronbach's Alpha equation and it was 0.77-0.94.

Pilot studyincluded (10%) of total sample to evaluate clarity, probability, applicability of tools and to approximat the proper time required for answering the questionnaire. Modification was done according to the results of pilot study.

Field work:

The study was implemented through the following four phases and was conducted over a period of six months which started from march 2018 to august 2018.

Phase 1: Preparatory phase (Assessment)

Studied patients interviewed in the inpatient ward by the researcher and introducing herself to the studied patients and explaining the purpose of the study and to obtain oral consent from each patient. Knowledge of each patient was assessed individually using a structured questionnaire sheet and the average time to fill it was estimated about 20 to 30 minutes.

Phase 2: Interviewing patients to assess post ablation syndrome.

After patients discharge from operating room, the researcher was interviewed them to assess post ablation syndrome which consists of (Index of fever, chills, malaise and site of pain), (Rhodes index of nausea, vomiting and retching), (Analogue scale for pain) and (Self- rating anxiety scale). The researcher was assessed the same syndrome the second day of operation and researcher was continued assessment for 3 weeks by telephone calls.

Phase 3 : Interviewing the studied patients after one month of operation.

The researcher was interviewed the studied patients after one month of operation to assess health condition and impact of thermal ablation on their health and life style using post ablation syndrome questionnaire.

Phase 4: Development of Educational booklet based on HCC patients learning needs assessment about disease and thermal ablation procedure (Using the patient health education guideline)

Based on the assessed data and through internet searching and literature review for the relevant information, the researcher developed patients educational booklet for caring of patients with HCC undergoing thermal ablation. It covered knowledge regarding HCC disease, thermal ablation session and covered required knowledge regarding before and after thermal ablation session, post ablation syndrome and care at home.

Ethical Consideration:

All ethical considerations were taken during this study including; clarified aim, risks, benefits and procedure of the study. Patients were informed that they are allowed to choose participating or not in the study. An informed consent was obtained from patients who accepts to participate in the study. Anonymity and confidentiality of

subjects data was maintained. Participants were informed that they have the right to withdraw from the study at any time.

4-**Statistical design:**

The collected data were coded, processed then analyzed using the Statistical Package of Social Science (SPSS version 20). The quantitative data were presented in mean and standard deviation (SD), while the qualitative data were presented as number (N) and percent (%). Chi square test was used for testing significance of data. Pearson correlation was done between variables and Cronbach's alpha was used to measure internal consistency.

IV. Results

Table (1) Showed distribution of studied sample according to their demographic characteristics. Two thirds of studied sample (62 %) aged 51 - 60 year and about one third (38 %) aged 41 – 50 with mean age was 51.25±5.79years. Mostly were male (75%), and illiteracy was prevailing among 65% among them. In relation to marital status about three fourth (77%) were married. Regarding occupation about one third of studied sample (37%) unemployed. Additionally 66% and 34% reported smoking and Excessive Analgesics and antibiotics consumption as unacceptable habits respectively

Table (2) Show distribution of the studied sample according to their medical history. This table showed that 33% of studied sample suffering from DM, and 31% have a history of surgical operations. Regarding duration of liver cancer one half (50%) of studied sample diagnosed with liver cancer from about 6 months – 1 year and about one third (32%) diagnosed more than 1 year. Regarding risk factors more than one half of studied sample reported HCV as a primary cause of liver cancer whereas Hepatic fibrosis, HBV, and Bilharzias' infection reported by the minority of them (18%, 13% and 12% respectively). One half (51%) of our sample discovered the tumor by chance, whereas 41% transferred from outpatient clinics. In relation to other cancers about two thirds (70%) diagnosed previously with other cancers, breast (28.7) and uterine cancer (25.7) are more prevailing among them

Figure 1: shows total knowledge score among HCC patients undergoing thermal ablation, it clear thatthe majority of studied sample (63%) have poor knowledge level compared to only 15% of them have good level of knowledge

Figure 2:represents frequency distribution of HCC patients undergoing thermal ablationaccording to their knowledge level regarding radiofrequency ablation therapy. It is clear that the majority of patients have unsatisfactory level of knowledge regarding preparations before thermal ablation (78%) and post care (73%) whereas only half of patients show unsatisfactory level of knowledge regarding liver cancer

Figure 3: represents frequency distribution of HCC patients undergoing thermal ablation according to presence of fever it can be noticed that about two third (66%) of studied sample suffering from fever post thermal ablation session

Figure 4:representsfrequency distribution of HCC patients undergoing thermal ablation according to pain severity using Analogue Scale for Pain. It is clear that more than one third of studied patients (43%) suffering severe pain whereas 40% of them suffering moderate and only 17% suffering mild pain

Figure 5: shows frequency distribution of HCC patients undergoing thermal ablation according to site of pain , of all patients more than half (54%) suffering painat the site of needle insertion, and about one third (38%) reporting shoulder pain, and only 8% experience pain in both shoulder and treatment site

Table 3: represents data regarding post ablation syndrome, it is clear that the mean scores ofnausea, vomiting and retching were higher, recording 4.5 for frequency, 4.8 for distress and 4.7 for the amount of vomiting. regarding nausea 3.8, 4.2 and 4.8 mean score were recorded for duration, frequency and distress respectively, whereas 4.9 and 4.5 were recorded as a mean score for distress and frequency respectively for retching

Table 4: represents frequency distribution of HCC patients undergoing thermal ablation according to level of anxiety. It is clear that more than one third of studied sample (42%) suffering moderate anxiety, and one third of them suffering sever anxiety (36%) compared to only 16% have mild anxiety and the rest of them (6%) haven't any anxiety

Table 5: represent**s** Correlation between demographic characteristics of study participants and their total knowledge score. It is noticed that a significant correlation between level of knowledge regarding liver cancer, knowledge regarding preparation, knowledge regarding post- ablation care and patients age, sex and level of education

Table 1: Frequency distribution of HCC patients undergoing thermal ablation according to their socio-demographic data (N = 100)

Socio-demographic data	Studied group (n = 100)	
	%	No
Sex		
Female	**25%**	**25**
Male	**75 %**	**75**
Age		
20<30	**0.0**	**0.0**
31<40	**0.0**	**0.0**
41<50	**38 %**	**38**
51<60	**62 %**	**62**
Mean ± SD	**51.25 ± 5.79**	
Min – Max	**45.46–57.04**	
Median	**51.25**	
Education level		
Illiterate	**65%**	**65**
Read and write	**25 %**	**25**
Middle Education	**5 %**	**5**
University education	**5 %**	**5**
Marital status		
Single	**9 %**	**9**
Married	**77 %**	**77**
Divorced	**5 %**	**5**
Widowed	**9 %**	**9**
Occupation		
Does not work	**37 %**	**37**
Worker	**16 %**	**16**
Employee	**15 %**	**15**
house wife	**2 %**	**2**
Unacceptable Habits		
Smoking	**66 %**	**66**
Alcohol	**2 %**	**2**
Excessive Analgesics and antibiotics	**34 %**	**34**

Table 2: Frequency distribution of HCC patients undergoing thermal ablation according to their medical history (N = 100)

Medical history	Studied group (n = 100)	
	%	No
Patients health history		
DM	**33 %**	**33**
Hypertension	**17 %**	**17**
Surgical procedure	**31 %**	**31**
Bilharzias infection	**12 %**	**12**
Blood transfusion	**7 %**	**7**
Duration of liver cancer		
1-6 months	**18 %**	**18**
6 months – 1 year	**32 %**	**32**
more than 1 year	**50 %**	**50**
Risk factors		
Hepatic fibrosis	**18 %**	**65**
HCV	**57 %**	**25**
HBV	**13 %**	**5**
Bilharzias' infection	**12 %**	**5**
reason for attending thermal ablation clinic		
Discovered the tumor by chance		
Transferred from outpatient clinics	**51 %**	**51**
Under investigation for early detection	**41 %**	**41**
	8 %	**8**
Presence of other cancers		
No	**30 %**	**30**
yes	**70%**	**70**
Type of cancer		
Brain	**22.9 %**	**16**
Bone	**1.4 %**	**1**
Lung	**21.3%**	**15**
Breast	**28.7 %**	**20**
Uterus	**25.7 %**	**18**

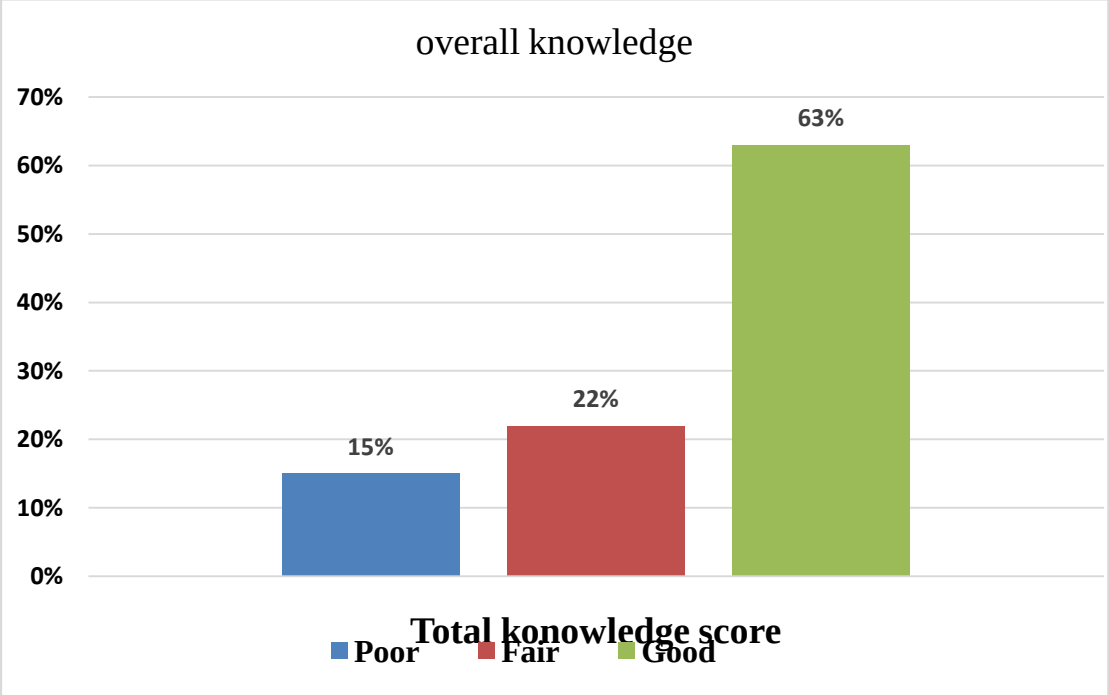

Figure 1: Total knowledge score among HCC patients undergoing thermal ablation
Poor: <50% Fair: 50 % - 75 % Good: ≥75 %

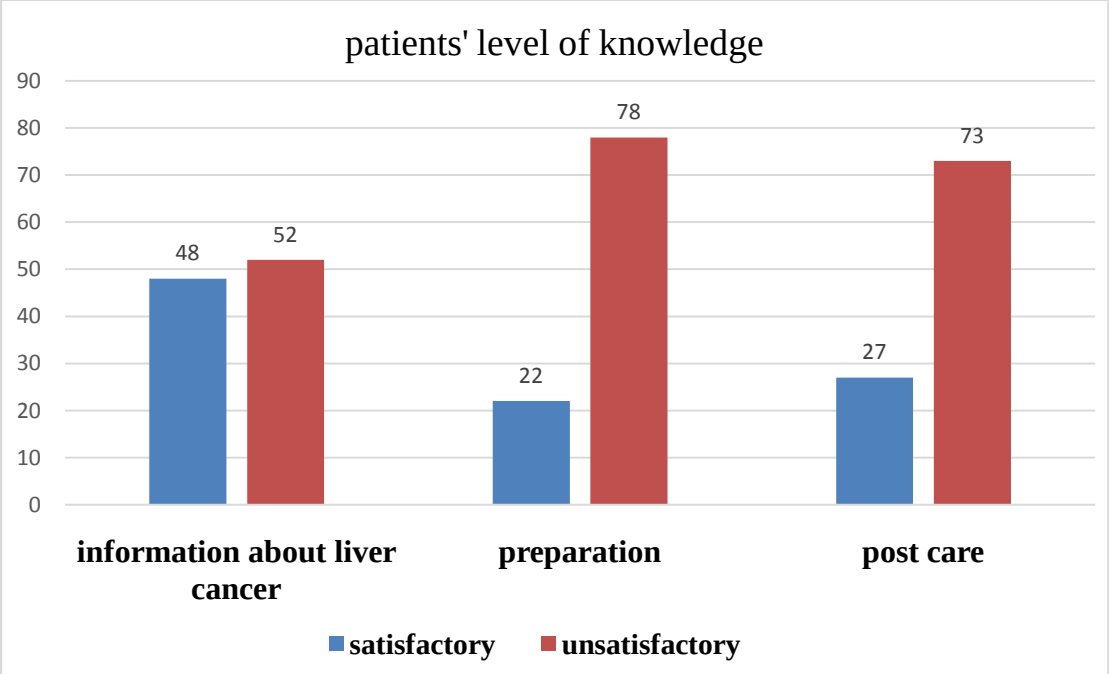

Figure 2: Frequency distribution of HCC patients undergoing thermal ablation according to their knowledge level regarding radiofrequency ablation therapy (No=100).

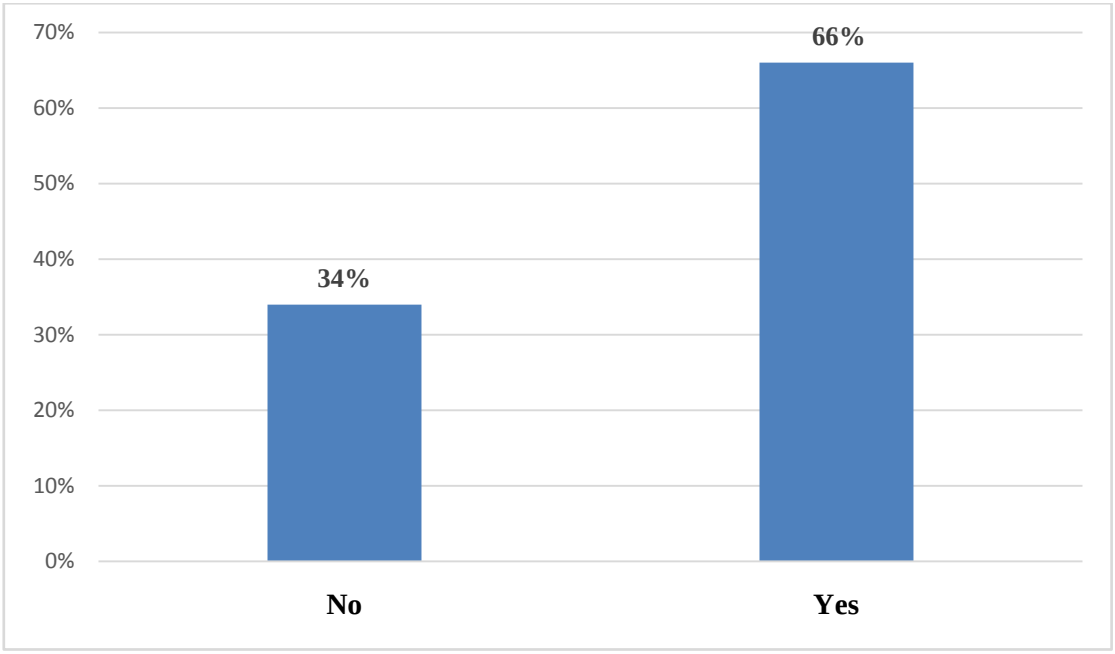

Figure 3: Frequency distribution of HCC patients undergoing thermal ablation according to presence of fever(No=100).

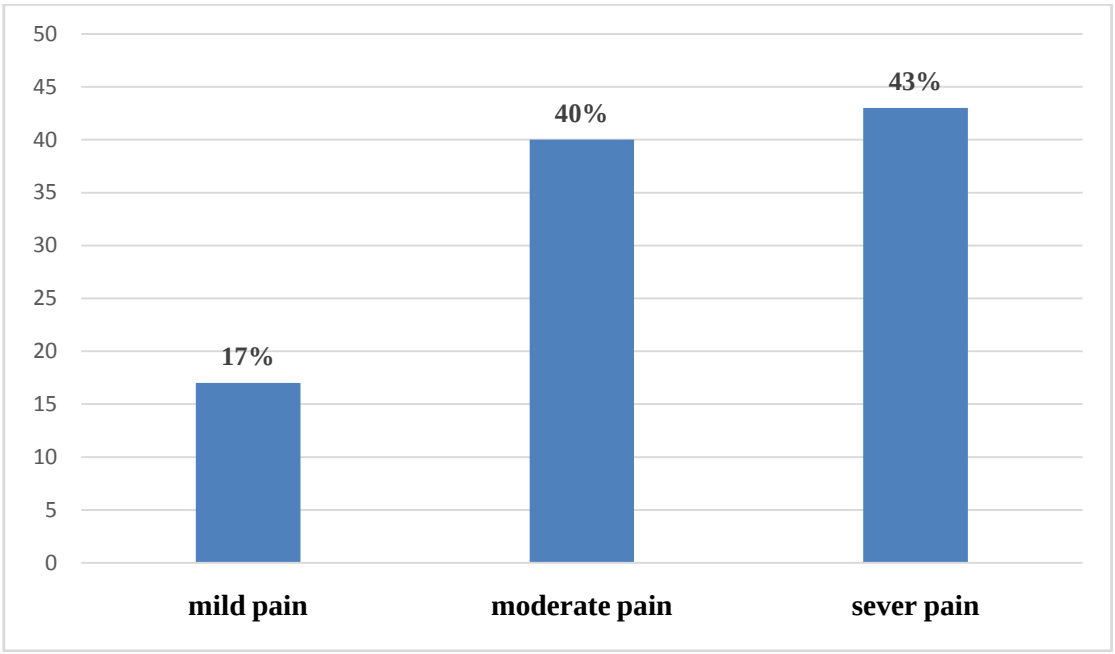

Figure 4: Frequency distribution of HCC patients undergoing thermal ablation according to pain severity using Analogue scale for pain (No=100).

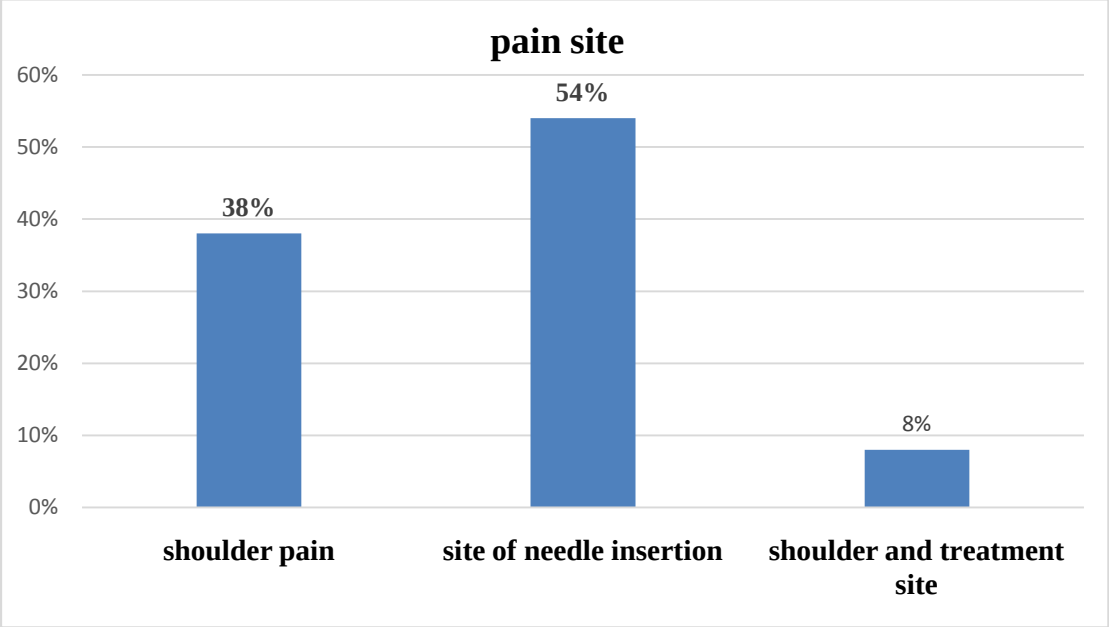

Figure 5: Frequency distribution of HCC patients undergoing thermal ablation according to site of pain (No=100).

Figure 3:Mean scores distribution of HCC patients undergoing thermal ablation according to post ablation syndrome regarding nausea, vomiting, and retching

Item	Mean	SD
Vomiting		
Frequency	4.5	0.9
Distress	4.8	0.6
Amount	4.7	0.7
Nausea		
Duration	3.8	1.0
Frequency	4.2	0.9
Distress	4.8	0.9
Retching		
Frequency	4.5	0.7
Distress	4.9	0.5

Table 4: Frequency distribution of HCC patients undergoing thermal ablation according to their level of anxiety post thermal ablation procedure(No=100).

ITEMS	LEVEL OF ANXIETY	
	NO (100)	**Percentage (%)**
NO	**6**	**6 %**
MILD	**16**	**16 %**
MODERATE	**42**	**42 %**
SEVER	**36**	**36 %**

Table 5: Correlation between demographic characteristics of studied participants and their total knowledge score regarding liver cancer and thermal ablation procedure

Variables	Level of knowledge	Age		Sex		Education	
		r	***p***	***r***	***p***	***R***	***p***
Total knowledge score	Poor	0.517	**0.00***	0.292	**0.02***	0.691	**0.00***
	Fair	0.383	**0.00***	0.322	**0.01***	0.543	**0.00***
	Good	0.424	**0.00***	0.162	0. **00***	0.354	**0.01***

V. Discussion

RFA is a fairly novel, slightly intrusive, safe, and harmless method used to manage cancerous hepatic cellsboth primary and metastatic with manageable post ablation syndrome. Most of HCC patients submitted toRFAsuffering from some simple complicationsincluding nausea, vomiting, fever, chills, malaise, and pain, a few days after procedure **[15]**

Patients' education is a broad and intended learning practice that is achieved by long-term learning ways, counselling and behavioral change skills that proposed to improve the patient's knowledge and health behavior**[16].** The nurse is responsible for patient teaching in the preoperative period. Learning and psychological support has a positive effect on patient's physical and psychological health, equally pre and post-operative. It was proven that those patients who received education before surgery showed less pain and anxiety, less problems, earlier discharge, highly satisfied with their care, and resumed normal activities sooner. Positive outcomes improved through the education they and their family receive**[2].**

This study aimed to assesses learning needs for hepatocellular carcinoma patients undergoing thermal ablation in HCC unit at MahalaHepatology Educational Hospital affiliated to the ministry of health.

Regarding sex, the present study showed that male's patients comprised higher proportion than female. This is supported by***Ferlay et al., (2015)*****[17].** who reported thatmales more affected than females, with ratios between 2:1 and 4:1.This was in agreement with a study by***Feldman et al., (2016)*****[18]** on the prevalence and the epidemiological features of HCC conducted in Egypt, which included 321 HCC patients, and of them, 82.55% were male, whereas only 17.45% were female the exact purpose is unknown, but may attributed to that many cancers have androgen receptors, and there is also a men predominance in risk factors

Regarding age, the present study showed that hepatocellular carcinoma more in age group between 51 to 60 years. This may be due to disease process that take a long time to appear. This is supported by ***Dimitroulis, et al (2017)*****[19]**who reported that HCC is usually asymptomatic in early stages and tends to be invasive.Therefore, diagnosis with HCC is most frequent among those 55 to 65 y. This is due to cirrhosis results from hepatitis B, hepatitis C, or alcohol, aflatoxin, non-alcoholic fatty liver disease and liver flukes. Another study done by ***Shaker et al., 2013*** **[20]**found that the most frequent age category affected by HCC in Egypt was between 51 and 60 years.

Regarding risk factors, our study showed that HCC present in high percentage among smoker, diabetic, HCV and HBV patients. This results agreed with ***Marrero et al. (2018) and Arzumanyan et al., (2013)*****[21, 22]**theywho said that risk factors for liver cancer have been identified, including hepatitis B virus (HBV), hepatitis C virus (HCV), aflatoxin, alcohol drinking, tobacco smoking, obesity and diabetes.

Concerning patients' knowledge about Hepatocellular Carcinoma, our study revealed that the majority of studied patients have lack of knowledge regarding their disease and RFA procedure. This may be due to lack of concern and knowledge in our culture about our diseases including early detection, screening and follow up and lack of an Arabic guidelines in thermal ablation unit to guide the patients and providing needed information.This conclusion is agreement with ***Hjorth (2011)*****[23]** they specified that, in the first 24 hr after thermal ablation, providing Patient with needed information and proper guidelines regarding RFA and recovery period is a significant part of patients' care personalized to his educational needs. Additionally, allow patients to express feelings and joinactively in planned care. our result mirror the significance of learning needs assessment in the pre thermal ablation period to determine patient's needs that guide patients' care plan.

Heimbach et al. (2017)**[24]** Discovered that providing patients with knowledge regarding what to expect through their RF management, resulting in great benefit for patients. Preferably, this knowledge should be discussed with the patient when the management choice is first discussed. Consequently, health care staffs who are engaged in patients education and support should have the suitable and up to dated information and understanding to facilitate this educational process.

Numerous misconceptions regardingliver cancer and radiofrequency therapy as a line of its treatment are reported several studies. Therefore,health care teamthey caring for those suffering HCC should have accurate updated information which provided for patients and other fellow specialists**[25]**. Also, ***WHO (2014)*****[26]** discovered that main goals of management and potential consequences would recognize by health care team, and patients they caring for and their care giversfrom the beginning. ***King et al., (2015)*****[27]** stated that before RFA, nurses should focus on patient education and assess their educational needs to increase their awareness regarding RFA technique.

Regards post ablation syndrome, results of the existing study discovered that most patients have experienced post ablation syndrome after RFA procedure. This conclusion was consistent with ***Heimbach et al., (2017)*****[24]** who shown that the post-ablation syndrome is a shared experienceamong the majority of HCC patients after RFA session, includingincreased body temperature, nausea, vomiting and malaise.

Nordlinger et al. (2013)**[28]** stressed that slight increase in body temperature, pain, and malaise are the main characteristics of post ablation syndrome and might be parallel to a mild tumor lyses syndrome. So, patients should recognized that, these mild symptoms are usual and with continuous proper hydration in the

following 5 – 7 days post ablation symptoms will disappear. In this respect ***Salah et al. (2012)*****[29]** which exposed that the nursing guidelines significantly limits adverse effect of post ablation syndromein radiofrequency ablation patientsby growing patients' knowledge about ablation therapy.

The findings revealed that most patients report moderate to severe pain at site of insertion with needle – like probe.our result come hand on hand with finding of***Synder et al. (2010)*****[30]** who revealed that the value of assessing patients learning needs is to incorporate nursing education in nursing care plan and to decrease patient's suffering and sensation of pain. In addition***, Bruix and Sherman (2011)*****[31]** declared that, pain assessment must be carried out by nursing staffincluding type, severity, duration, past experiences, impact on daily functionand reaction to analgesics. In these respect, ***Ruers et al. (2012)*****[32]** stated that, patients in hospitals may benefit from analgesics, which immediately obtainable post-RFA.

The majority of the studied patients had moderated and severe anxiety. This is may be due to fear from unknown resulting from lack of information and education about RFA procedure. Results by ***Hjorth (2011)*****[23]**were in agreement with our result who reported thatpatients' education regarding radiofrequency ablation decrease learning needs, improve overall outcomes and reduce anxiety. ***Subeh, Salami & Saleh, 2014*** **[33]** confirmed that patients' instruction and reassurancearesignificant in thermal ablation management which reduce anxiety regarding post RFA symptoms.

Present study showed that the total knowledge score for studied patients in all investigated knowledge domains was poor especially those related to nature of disease andpostRF carewhich agree with **Amirabadi, Nasiri, Kazemi&Kardan, 2014[34]** they found decreased level of total knowledge score for their participants undergoing RFA especially nature of the disease. Also study by***Salah et al. (2012)*****[35]** which discovered that, the majority of studied participantshad inadequate knowledge regarding (RFA) therapy

It is noticed that a significant correlation between level of knowledge and patients age, sex and level of education.

Patients with average or high education had much knowledge and less learning needs than those who are illiterate or just read and write. This indicates that the higher the educational level the higher searching for health knowledge. In the same line ***Amirabadi, Nasiri, Kazemi&Kardan, 2014 and Moghadam et al., 2013*** **[34, 36]** identified the same relationship between educational level and the need for knowledge. But this result is incongruent with that of **Kaur, Sharma, Jhajj&Bajwa, (2017)[37]**who found no relation between patients' education and their learning needs.

Regarding sex and age in our study small age patients specially female are more knowledgeable than male patients. This results come in agreement with the study findings of ***Sayed et al. (2013)*****[38]**whodocumented statistically significant relation between demographic data and recipients level of knowledge.

Finally, preparing health educational program for patients undergoing thermal ablation can increase their awareness of their chronic disease, importance of adherence to treatment and life style modification to minimize complications. In addition to increase awareness of their family members, who are in close contact with the patient about disease and post ablation complications for early detection and management.

VI. Conclusion

Based on findings of the present study the following can be concluded that:

1. Majority of HCC patients undergoing thermal ablation have poor knowledge in all investigated domains.
2. Assessment of learning needs of HCC patients is therefore important and can guide health care staff in planning the education programs and helps reduce complications and post ablation syndrome.

VII. Recommendations

In the light of the findings of the present study, the following recommendations are suggested:

1- Patients learning needs should be assessed by nurses constantly in terms of their conditions.

2- Simple booklet written in Arabic language should be developed, and be available for all HCC patients included all needed information.

3- Replication of the current study on larger probability sample and various setting in Egypt for HCC patients to understand their condition and to promote self-care level.

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Reference

[1]. **Salem, E. S.(2015):**Epidemology of hepatocellularcarcinoma. Medical oncology, Hematology. National Cancer Institute, Cairo University, Egypt, 11796.

[2]. **Jones, C., Badger, S. & Ellis, G.(2011):**The role of microwave ablation in the management of hepatic colorectal metastases. The Surgeon, 9: (1), 33-37.

[3]. **Esmat, G., Elbaz, T. & Kassas, M.(2013):** Hepatocellular carcinoma in Egypt: an updated status. Liver cancer: act today, save your life tomorrow. World Gastroenterology Organisation (WGO). WDHD 2013 Final Publication.

[4]. **Bertot, L. C., Sato, M., Tateishi, R., Yoshida, H. & Koike, K.(2011):**Mortality and complication rates of percutaneous ablative techniques for the treatment of liver tumors: a systematic review. European Radiology, 21: (12), 2584-2596.

[5]. **Zanus, G., Boetto, R., Gringeri, E., Vitale, A., D'Amico, F., Carraro, A., et al.** (**2011)**: Microwave thermal ablation for hepatocarcinoma: six liver transplantation cases. Transplantation Proceedings . Elsevier, 1091-1094.

[6]. **Livraghi, T., Meloni, F., Solbiati, L., Zanus, G. & system, C. I. G. u. A.(2012):**Complications of microwave ablation for liver tumors: results of a multicenter study. Cardiovascular and Interventional Radiology, 35: (4), 868-874.

[7]. **Elbaz, T., El Kassas, M. & Esmat, G.(2013):** Management of hepatocellular carcinoma: updated review. Journal of Cancer Therapy, 4: (2), 536-545.

[8]. **Ibrahim, A., Seif-Eldin, I., Ismail, K., Hablas, A., Hussein, H. & Elhamzawy, H. (2007):**Cancer in Egypt, Gharbiah: Triennial Report of 2000–2002, Gharbiah Population-based Cancer Registry. Cairo: Middle East Cancer Consortium.

[9]. **Ferlay, Colombet, Soerjomataram, Mathers, Parkin, Piñeros, et al. (2019).** Estimating the global cancer incidence and mortality in 2018: GLOBOCAN sources and methods. International Journal of Cancer, 144(8), 1941-1953.

[10]. **Singal, Nehra, Adams-Huet, Yopp, Tiro, Marrero, et al. (2013).** Detection of Hepatocellular Carcinoma at Advanced Stages Among Patients in the HALT-C Trial: Where Did Surveillance Fail? American Journal of Gastroenterology, 108(3), 425-432

[11]. **Dodd III, G. D., Napier, D., Schoolfield, J. D. & Hubbard, L.(2005):**Percutaneous radiofrequency ablation of hepatic tumors: postablation syndrome. American Journal of Roentgenology, 185: (1), 51-57.

[12]. **Kim, T. H., Choi, B. M., Chin, J. H., Lee, M. S., Kim, D. H. & Noh, G. J.(2007):**The reliability and validity of the Rhodes index of nausea, vomiting and retching in postoperative nausea and vomiting. Korean Journal of Anesthesiology, 52: (6), S59-S65.

[13]. **Flaherty, S. A.(1996):**Pain measurement tools for clinical practice and research. Aana J, 64: (2), 133-40.

[14]. **Zung, W. W.(1971):**A rating instrument for anxiety disorders. Psychosomatics, 12: (6), 371-379.

[15]. **van Amerongen, Jenniskens, van den Boezem, Fütterer, & de Wilt. (2017).** Radiofrequency ablation compared to surgical resection for curative treatment of patients with colorectal liver metastases – a meta-analysis. HPB, 19(9), 749- 756.

[16]. **Feltracco, Brezzi, Barbieri, Galligioni, Milevoj, Carollo, et al. (2013).** Blood loss, predictors of bleeding, transfusion practice and strategies of blood cell salvaging during liver transplantation. World Journal of Hepatology, 5(1), 1-13.

[17]. **Ferlay, Soerjomataram, Dikshit, Eser, Mathers, Rebelo, et al. (2015).** Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. International Journal of Cancer, 136(5), E359-E386.

[18]. **Feldman, Friedman, & Brandt. (2016).** Sleisenger and Fordtran's gastrointestinal and liver disease, ed 10. Elsevier: Phila-delphia

[19]. **Dimitroulis D, Damaskos C, Kouraklis G. (2017)**From diagnosis to treatment of hepatocellular carcinoma: An epidemic problem for both developed and developing world.World J Gastroenterol 23(29): 5282-5294

[20]. **Shaker M, Abdella H, Khalifa M, El Dorry A. (2013).** Epidemiological characteristics of hepatocellular carcinoma in Egypt: a retrospective analysis of 1313 cases. Epub 33(10):1601-6. doi: 10.1111/liv.12209

[21]. **Marrero, Kulik, Sirlin, Zhu, Finn, Abecassis, et al. (2018).** Diagnosis, staging, and management of hepatocellular carcinoma: 2018 practice guidance by the American Association for the Study of Liver Diseases. Hepatology, 68(2), 723-750.

[22]. **Arzumanyan, Reis, & Feitelson. (2013).** Pathogenic mechanisms in HBV- and HCV-associated hepatocellular carcinoma. Nature Reviews Cancer, 13(2), 123-135.

[23]. **Hjorth. (2011).** Improving patient outcomes through a radiotherapy education and information package for consumers and health care professionals. Ballarat Austin Radiation Oncology Centre BAROC, Victorian Integrated Supportive Care Conference

[24]. **Heimbach, Kulik, Finn, Sirlin, Abecassis, Roberts, et al. (2017).** AASLD guidelines for the treatment of hepatocellular carcinoma. Hepatology, 67(1), 358-380.

[25]. **WHO. (2010).** World Cancer Report 2010. International Agency for Research on Cancer. World Health Organization

[26]. **WHO. (2014).** World Cancer Report 2014. International Agency for Research on Cancer. World Health Organization

[27]. **King, Canasto-Chibuque, Johnson, Yip, Chen, Kojima, et al. (2015).** A genomic and clinical prognostic index for hepatitis C-related early-stage cirrhosis that predicts clinical deterioration. Gut, 64(8), 1296-1302.

[28]. **Nordlinger, Sorbye, Glimelius, Poston, Schlag, Rougier, et al. (2013).** Perioperative FOLFOX4 chemotherapy and surgery versus surgery alone for resectable liver metastases from colorectal cancer (EORTC 40983): long-term results of a randomised, controlled, phase 3 trial. The Lancet Oncology, 14(12), 1208-1215

[29]. **Salah, Tawfeek, & Ahmed. (2012).** Radiofrequency ablation therapy: Effect of educational nursing guidelines on knowledge and post ablation syndrome for patients with hepatocellular carcinoma. Journal of American Science, 8(2), 13- 19.

[30]. **Synder, Graham, Vick, & Gray. (2010).** Patients satisfaction chronic pain, and quality of life after elective incision hernia repair: effects of recurrence and repair technique National Institute of Health. USA: Brigham.

[31]. **Bruix, & Sherman. (2011).** Management of hepatocellular carcinoma: An update. Hepatology, 53(3), 1020-1022

[32]. **Ruers, Punt, Van Coevorden, Pierie, Borel-Rinkes, Ledermann, et al. (2012).** Radiofrequency ablation combined with systemic treatment versus systemic treatment alone in patients with non-resectable colorectal liver metastases: a randomized EORTC Intergroup phase II study (EORTC 40004). Annals of Oncology, 23(10), 2619-2626

[33]. **Subeh M , Salami I & Saleh M. (2014)**Most Frequent and Severe Symptoms and Learning Needs among CABG Patients. International Journal of Nursing 1(2) pp. 167-182

[34]. **Amirabadi T., Nasiri A., Kazemit & K ardan M. (2014).** Educational needs of patients with Heart valve replace surgery in BirJand, 2012. Journal of Surgery and Trauma; 1(4) : 90-96.

[35]. **Salah, Tawfeek, & Ahmed. (2012).** Radiofrequency ablation therapy: Effect of educational nursing guidelines on knowledge and post ablation syndrome for patients with hepatocellular carcinoma. Journal of American Science, 8(2), 13- 19.

[36]. **Moghadam FA., Haerian A., Salami MS., Karbasi MH., Fakhr-Tabatabayir & Vazirif.(2013).** Evaluation of Knowledge, Attitude and Practice between Periodontal Disease and Diabetes. Journal of Community Health Research; 2(2) : 124-130.

[37]. **Kaur K., Sharma SK., Jhajj H., Kaur G &Bajawa H.(2017)**. Knowledge and Learning needs of Hypertensive patients visiting O.P.D at D.M.C & H, Ludhiana. Nursing and Midwifery Research Journal ; 3(1) : 43-48.

[38]. **Sayed, Radwan, EL-Meteini, & Esmat. (2013).** Effect of Home Care on the Quality of Life of Patients Undergoing Liver Transplantation. (Doctoral Degree), Faculty of nursing, Ain Shams University, Egypt.