

# Assessment of Nurses knowledge Regarding Management of Patients Post Liver Transplantation

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**Abstract:** The nurse plays a vital role in caring patients post liver transplantation and decreases patients' stay at critical care unit. The aim of this study: This study was conducted to assess nurses' knowledge regarding management of patients post liver transplantation. Design: A quasi- experimental design was used in this study. Setting: The study was conducted at critical care unit in Ain Shams Specialized Hospital, Cairo, Egypt. Study Subjects: A purposive sample of nurses (40) at critical care unit in Ain Shams Specialized Hospital. Tools of data collection: Nurses' knowledge assessment structured Self-Administered Questionnaire. Results: The results of this study showed that, 12.5% of the studied nurses had satisfactory level of knowledge regarding management of patients post liver transplantation. Conclusion: The study revealed that most of studied nurses had unsatisfactory total level of knowledge regarding managing of patients post liver transplantation at critical care unit. While, There were a highly significant relation between nurses' knowledge and their demographic characteristics (age). Also, there were a significant relation between nurses' knowledge and their demographic characteristics (level of education and years of experience). Recommendations: Implementing an educational training program to improve nurses' knowledge regarding management of patients post liver transplantation.

**Keywords:** liver transplantation.

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## 1. INTRODUCTION

Liver transplantation is undoubtedly one of the most successful innovations in the medical field over the last 50 years. Transplantation, as a specialty requires full time professionals working with multi-disciplinary team with great emphasis on the importance of team work. Preparation of the patient is essential in the perioperative period, and the role of the nursing team is determinant for treatment success. Nurses are responsible for the planning and implementation of care delivered to patients and families during the liver transplantation process. Apart from giving direct care (Masih & Sharma, 2019).

A liver transplant is a surgical procedure that removes a liver that no longer functions properly (liver failure) and replaces it with a healthy liver from a deceased donor or a portion of a healthy liver from a living donor (Mayo Clinic, 2021). For many end-stage organ diseases, transplantation remains the most effective and often the only option for curative treatment. This is especially true for liver disease. Liver transplantation (LT) has become a common surgical procedure worldwide (Croome et al., 2020).

Liver Transplantation is a spectacular medical success story, it is the only effective therapy for large numbers of patients with end- stage liver disease, metabolic liver disease and primary liver cancer. There have been enormous strides in the success of the procedure: 1 year patient survival rates better than 90 % are routinely achieved, with 5 year survival rates in excess of 70% in the best centers. Rates of liver disease around the world are rapidly increasing (Massad& Chaib, 2020).

The early post-operative period for patients with LT is a crucial time when strict monitoring and sustainment of cardiorespiratory function, frequent assessment of allograft performance, timely recognition of unexpected complications and prompt treatment of extrahepatic organ system dysfunction are mandatory. Intensive care management of liver transplanted patients mainly centers on rapid hemodynamic stabilization, correction of coagulopathy, early weaning from mechanical ventilation, proper fluid administration, kidney function preservation, graft rejection prevention and infection prophylaxis (Woodruff, 2016).

In this context, the nurse as a member of the multidisciplinary team, plays a vital role in the success of the transplant program, and needs to continually update their knowledge, skills and attitudes in this very specific and complex area. Competent nursing is understood as a set of knowledge, skills and attitudes that enable nurses to act in an appropriate manner at all times. All of these skills can be expressed in terms of responsibility to the patients, the nurses themselves, health team, the profession, the community and society in general. Nursing care requires the development of skills in order to provide quality to customer needs, families and communities in physiological, pathological and psychosocial aspects (Negreiros et al., 2017).

#### **Significance of the study:**

Liver disease accounts for approximately 2 million deaths per year worldwide, 1 million due to complications of cirrhosis and 1 million due to viral hepatitis (HCV and HBV) and hepatocellular carcinoma (HCC). Cirrhosis is currently the 11<sup>th</sup> most common cause of death globally and liver cancer is the 16<sup>th</sup> leading cause of death; combined, they account for 3.5% of all deaths worldwide according to European Association for the Study of the Liver at 2019. In Egypt liver disease is the 2<sup>nd</sup> cause of death after cardiac disease (D' Antiga, 2019).

According to the latest WHO data published in 2018 Liver Disease Deaths in Egypt reached 68,866 or 12.40% of total deaths. The age adjusted Deaths Rate is 116.08 per 100,000 of population ranks Egypt 1 in the world.

The primary goal of LT is to relieve limitations resulting from liver disease or failure. However, active participation in the care of patients post LT must be taken in action, as it is an independent function of nursing practice and primary nursing responsibility. All nursing care is directed toward promoting, maintaining, restoring health, preventing complications and helping patients adapt to the residual effect of illness. So that, it is necessary to assess nursing performance for critical ill patients post LT. Patient and graft outcomes are closely monitored on a national level and 1- year survival is between 80-92 % (Suberman & Sakai, 2017).

#### **Aim of the Study:**

The study aimed to assess nurse's knowledge regarding management of patients post liver transplantation in critical care unit.

#### **The aim was fulfilled through:**

Assess nurses' level of knowledge regarding management of patients post liver transplantation.

## **2. METHODS**

The study was portrayed under the four main designs as follows:

1. Technical design.
2. Operational design.
3. Administrative design.
4. Statistical design.

#### **1) The technical design:**

-It includes research design, setting, subject and tools for data collection.

#### **A) Research design:**

A Quasi-experimental research design was used in this study.

Quasi- experimental research designs are the most widely used research approach employed to evaluate the outcomes of programs. It is going back to 1930s and continuing to the present, no control group and nonrandomized selection (Reichardt, 2019). Another alternative explanation for a change in the dependent variable in a pretest- posttest design in regression to mean (Chiang, 2015).

**B) Setting:**

This study was conducted at critical care unit in Ain Shams Specialized Hospital, Cairo, Egypt.

**Subjects:**

A purposive sample of 40 nurses caring for patients post liver transplantation in Ain Shams Specialized Hospital.

**Under the following inclusion criteria:**

- Nurses already dealing with patients post liver transplantation surgery.
- Years of experience not less than 6 months for working in critical care unit.
- Nurses who are willing to participate in the study.

**Tools of data collection:**

Data were collected using the following tools:

**I – Nurses' knowledge assessment structured self administrated questionnaire (appendix I).****Section I:**

It was used to assess nurses' demographic characteristics as (age, sex, level of education, marital status, years of experience, and training courses in liver transplantation).

**Section II:**

It was used to assess nurses' level of knowledge regarding management of patients post liver transplantation.

**Scoring system:**

**The total score of knowledge.** Each correct answer was given one mark and the incorrect answer was given zero. Based on critical care approach. It was considered that:

- $\geq 85\%$  was satisfactory level of knowledge.
- $< 85\%$  was unsatisfactory level of knowledge.

**2) Operational design:**

The operational design included preparatory phase, ethical considerations, validity and reliability, pilot study, field work and limitation of the study.

**A- Preparatory phase:**

It included reviewing of relevant literature, and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and journals to develop data collection tools.

**B- Ethical Considerations**

The ethical research considerations in this study included the following:

- 1- The research approval of protocol was obtained from Scientific Research Ethical Committee in Faculty of Nursing at Helwan University before starting the study.
- 2- The researcher clarified the objective and aim of the study to the nurses included in the study.
- 3- The researcher assured maintaining anonymity and confidentiality of the subject data.

4- Nurses were informed that they allowed choosing to participate or not in the study and they had the right to withdraw from the study at any time without giving any reasons.

5- Ethics, values, culture, and beliefs were respected.

**C- Validity and Reliability:**

**Validity** of the proposed tools by using face and content validity. Face validity aimed at inspecting the items to determine whether the tools measure what supposed to measure. Content validity was conducted to determine whether the content of the tools cover the aim of the study. This stage developed by a jury of five experts, two professors of medical surgical nursing from faculty of nursing Ain Shams University, two assistant professors one of them from faculty of nursing Ain Shams University and the other from faculty of nursing Helwan University, one lecturer of medical surgical nursing at Faculty of Nursing, Ain Shams University. The experts reviewed the tools for clarity, relevance, comprehensiveness, simplicity and applicability; minor modification was done.

**Testing reliability** of proposed tools was done statistically by alpha Cronbach test (**Appendix II**).

Alpha Cronbach for nurses’ knowledge was 0.791 and for nurses’ practice was 0.895 that indicate high reliability of the used tool.

**D- Pilot study:**

A pilot study was conducted to test feasibility and applicability of the study tools used in this study. It was carried out on 5 nurses. There was no modifications on tools were done, so that, the nurses who included in the pilot study were included in the main study sample.

**E- Field work:**

- An official permission for conducting the study was obtained from the director hospital directors and nursing directors of critical care unit at Ain Shams Specialized Hospital.

- Development of tool I& II after reviewing recent relevant literatures.

**3) Administrative design:**

The present study was approved by the scientific research committee of the faculty of Nursing Helwan University. Before starting any step in the study, an official permission will be obtained from the Faculty of Nursing, Helwan University to director of Ain Shams Specialized hospital, the director referral to director of critical car unit to give permission.

**4) Statistical design:**

The collected data were organized, analyzed using appropriate statistical significant tests. All Data were tabulated and subjected to statistical analysis. Statistical presentation and analysis of the present study was conducted, using the mean, standard Deviation, Linear Correlation Coefficient and chi-square tests by (*IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.*). A significant level value was considered when p- value <0.05\*, and highly significant level value was considered when p- value <0.001\*\*, while p- value >0.05 indicate non-significant result. Alpha Cronbach for nurses’ knowledge was 0.791 and for nurses’ practice was 0.895 that indicate high reliability of the used tool.

**3. RESULTS**

**Table (1): Demographic characteristics of the studied nurses (n= 40).**

Item	N	%
<b>Age</b>		
20-25	3	7.5
26-30	8	20
31-35	6	15
>35	23	57.5
Mean±SD	28.45±5.6	
<b>Gender</b>		
Male	5	12.5

Female	35	87.5
<b>level of education</b>		
Nursing secondary school diploma	33	82.5
Technical health institute	7	17.5
<b>Marital status</b>		
Married	32	80
Single	7	17.5
Divorced	1	2.5
<b>Years of experience</b>		
Less than 1 year	1	2.5
From 1-5 years	2	5
From 5-10 years	4	10
More than 10 years	33	82.5
Mean±SD	6.8±4.9	
<b>Training course</b>		
Yes	2	5
No	38	95
<b>Performance enhancement</b>		
Yes	2	5
No	38	95

**Table 2: Percentage distribution of the studied nurse’s level of knowledge regarding concept of liver transplantation for patients post liver transplantation (n= 40).**

Item of knowledge	Correct		Incorrect		Chi- square	
	N	%	N	%	X <sup>2</sup>	P-value
Anatomy and Physiology	9	22.5	31	77.5	40.102	<0.001**
Indication & Contraindication	7	17.5	33	82.5	48.813	<0.001**
Waiting list& MELD score	0	0	40	100	65.455	<0.001**
Donors & Criteria for selection.	1	2.5	39	97.5	64.962	<0.001**
Immunosuppressive medication	0	0	40	100	72.381	<0.001**
Infection control precautions	21	52.5	19	47.5	11.667	<0.001**
Complications	1	2.5	39	97.5	61.596	<0.001**
<b>Total nurses knowledge regarding liver transplantation</b>	3	7.5	37	92.5	57.800	<0.001**

P< 0.001

**Table 3: Percentage distribution of studied nurse’s level of knowledge regarding concept of post-operative nursing care for patients post liver transplantation (n= 40).**

Item of knowledge	Correct		Incorrect		Chi- square	
	N	%	N	%	X <sup>2</sup>	P-value
Vital signs	8	20	32	80	42.717	<0.001**
Mechanical ventilator.	0	0	40	100	65.455	<0.001**
Blood gases.	27	67.5	13	32.5	15.522	<0.001**
Central venous catheter	1	2.5	39	97.5	72.200	<0.001**
Arterial cannula	12	30	28	70	32.916	<0.001**
Nasogastric tube	19	47.5	21	52.5	22.029	<0.001**
Urinary catheter	12	30	28	70	32.916	<0.001**
<b>Total nurses knowledge regarding post-operative nursing care</b>	2	5	38	95	64.800	<0.001**

P< 0.001

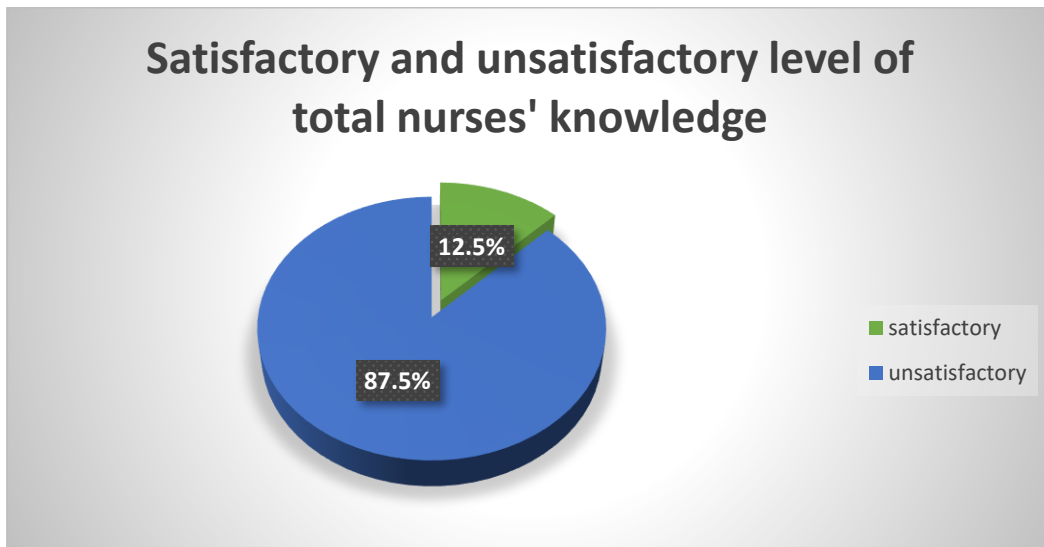


Figure 1: Satisfactory and unsatisfactory total nurses’ knowledge regarding liver transplantation & its nursing management.

Table 4: Relation between total nurses' knowledge and their demographic characteristics (n= 40).

	Total nurses' knowledge			
	Mean	SD	f/ t	P-value
<b>Age</b>				
20-25	44.67	13.58	7.289	<0.001**
26-30	42.63	3.96		
31-35	39.33	4.46		
>35	51.78	7.16		
<b>Gender</b>				
Male	46.00	13.15	0.437	0.664
Female	47.77	7.74		
<b>Level of education</b>				
Nursing secondary school diploma	48.91	7.67	5.530	0.024*
Technical health institute	41.14	9.25		
<b>Marital status</b>				
Married	48.03	8.82	1.338	0.275
Single	44.00	4.90		
Divorced	57.00	0.00		
<b>Years of experience</b>				
Less than 1 year	29.00	0.00	2.892	0.049*
From 1-5 years	52.50	0.71		
From 5-10 years	42.25	3.30		
More than 10 years	48.45	8.25		
<b>Training course</b>				
Yes	56.00	1.41	1.485	0.146
No	47.11	8.37		
<b>Performance enhancement</b>				
Yes	57.00	0.00	1.146	0.259
No	47.31	8.35		

P< 0.001

#### 4. DISCUSSION

The current study is a Quasi-experimental study aimed to assess nurse's knowledge regarding management of patients post liver transplantation at critical care unit.

Regarding to nurses' demographic characteristics, the present study result revealed that more than half of the studied nurses were more than 35 years old. This explains that they are adult, old graduated, tolerate the nature of the work. Also, most of the nurses were females, married, secondary school diploma nurse and had experience more than 10 years. This is may be due to the greater fraction of the nurse in Egypt was female and my also related to the study of nursing in Egypt were exclusive for female only till few years ago. Furthermore, they had a certification and license to practice their field as a nurse since graduated.

As showed, the majority of the study sample their knowledge not enhanced because, they didn't have any training course about liver transplantation. This may be due to load of work on them and not presence of time for them to attend training courses. Also, this may be due to lack of in-service training program. This may reflect job regulation related factors that affection nurses' knowledge. The training course for nurses about management of patients post liver transplantation is very important to improve their knowledge that affect positively on care.

This finding is consistent with **Karaly and AboElfetoh (2019)** who conducted a study about "effect of an educational guideline on nurses' performance caring for patients post liver transplantation" at Ain Shams Hospital and found that the majority of the studied nurses not have any training course about liver transplantation.

But contraindicated with **Chaney et al., (2016)**, who found that, The American Association for the study of liver diseases provides ongoing training in the field of hepatology for nurses to provide effective and high quality care. The optimal care of the patient post liver transplantation requires an enormous amount of effort which begins with planning and preparation of system development in which persons are educated and trained.

The present study revealed that, more than three quarters of the studied nurses didn't know anatomy and physiology of the liver. This finding was in the same line with **Abo El-Ata et al. (2021)**, who conduct a study on "Nurses' Knowledge and Practice Regarding Nursing Care of Patients with Liver Cirrhosis" at Ismailia University Hospital, Ismailia General Hospital and Port-Said General Hospital and found that, more than one third of the studied nurse's didn't know the anatomical situation of the liver.

Most of the studied nurses didn't know indication and contraindication for liver transplantation. This finding is consistent with **Youssef et al. (2017)**, who conduct a study on "Nurses' Performance Regarding Management of Patients Post Liver Transplantation" at Ain Shams Specialized Hospital and found that most of the studied nurses had unsatisfactory level of knowledge regarding indications and contraindications of liver transplant.

The current study results clarify that, all of the study sample didn't know MELD score and immunosuppressive medications. This might be to their beliefs that these aspects should be acquainted by the physician and lack of their awareness about the importance of these aspects and retention of knowledge with the time factor.

This on the same line with **Elpasiony (2013)**, who reported that more than two third of the studied nurses had unsatisfactory knowledge regarding MELD score in the study about "Assess nurses' performance for caring of patients undergoing liver transplantation and suggest nursing guidelines for care". But this finding disagrees with **Thomas et al. (2017)**, who found that majority of the nurses had satisfactory knowledge regarding immunosuppressant drugs.

The majority of nurses included in the study didn't know donor, criteria for selection and complications post-LT. This result in harmony with **Karaly and AboElfetoh (2019)** who conducted a study about "Effect of an educational guideline on nurses' performance caring for patients post liver transplantation" at Ain Shams and found that the majority of the studied nurses had an unsatisfactory level of knowledge regarding donor and criteria for selection and complications post-LT.

The present study revealed that more than half of the studied nurses had knowledge regarding infection control precautions, this finding was in agreement with **Younis et al. (2018)**, who conduct a study on "Effect of nursing teaching protocol on nurses' knowledge and practice regarding kidney transplantation patients" at nephrology university hospital and found that minority of the studied nurses' had knowledge regarding infection control.



The majority of nurses included in the study didn't know about postoperative nursing care because most of the studied nurses were diploma graduates and did not attend any in-service training program. These findings were in the same line with **Vlaisavjevic et al. (2014)**, who emphasized the importance of presence of knowledgeable nurses to provide continuous nursing care post-LT as patients at this period are intubated, need close monitoring, receive immunosuppressive therapy, with significant postoperative complications, and require several care procedures.

Most of the nurses included in this study didn't know about vital signs. This study results compatible with, **Odell et al. (2009)** who found that the experience and education of nurses influence their process of recognition, recording, reviewing, reporting and responding during vital signs monitoring, then concludes that a need exists to understand the context within which deterioration is detected and reported on – this will facilitate the development of improved education systems.

All of the studied nurses didn't have knowledge about mechanical ventilator. Similarly, **Sharma & Mudgal, (2018)**, who conduct a research on "Knowledge and Skills Regarding Care of a Patient on Mechanical Ventilator among the Staff Nurses Working in Selected Hospital" and showed that the mean post-intervention knowledge scores in all areas of knowledge was significantly higher than the mean pre-intervention knowledge scores.

More than two third of the studied nurses had knowledge regarding blood gases, this findings doesn't go in the same line with **Youssef (2013)**, who mentioned that all of nurses in critical care unit at Cairo University who conducted in the study had unsatisfactory knowledge regarding arterial blood gases sampling.

The majority of the nurses included in the study didn't have knowledge regarding central venous catheter. This result at the same line with **Boyouni & Mahmoud. (2017)**, who showed that there was a highly statistically significant improvement in total knowledge level of nurses immediately after implementation of education program guidelines entitled "Effect of education program on nurses' knowledge and practice regarding care of central venous line in pediatric hemodialysis: evidence-based practice guidelines" at Benha University Hospital and Benha Fever Hospital.

As regard of nurses' knowledge related to arterial cannula and urinary catheter the current study revealed that less than three quarters of the studied nurses didn't have knowledge related to arterial cannula and urinary catheter.

This result are in agreement with **Youssef et al. (2017)**, who stated that less than three quarters of the studied nurse had unsatisfactory level of knowledge regarding arterial cannula and urinary catheter.

More than half of the studied nurses didn't have knowledge regarding nasogastric tube. This finding is consistent with what was reported by **Mohammed et al. (2021)**, who mentioned that the majority of nurses had unsatisfactory knowledge score regarding nasogastric tube. The study was conducted at Benha University Hospital about "Effect of Implementing Nursing Guidelines on Nurses' Performance Regarding Complications of Nasogastric Tube among Critically Ill Patients".

Most of the study nurses had an unsatisfactory level of total knowledge regarding liver transplantation, which may be due to unavailability of posters and booklets and training courses. This result on the same line with **Karaly and AboElfetoh (2019)**, who revealed that all of the studied nurses had unsatisfactory score regarding their total knowledge about liver transplantation.

Furthermore, **Lameira, (2014)** stated that, the nurse caring the patients in early post-transplant period needs specialized knowledge to reduce the problems, prevent and intervene immediately to maximize the result of long term graft and provide quality care throughout the hospitalization period. Because the first 24 hours after transplantation represent a critical period, marked by hemodynamic and respiratory instability, and there is a great risk of developing complications, mainly of graft rejection.

The finding of the present study revealed that there was high statistically significant relation between total nurses' knowledge and their demographic characteristics (age and years of experience). Also, there were statistically significant relation between total nurses' knowledge and (their educational level and marital status). This may be due to marital stability and satisfaction, the workload, and facilities available. While, there were no statistically significant relation between total nurses' knowledge and (previous training course and their performance enhancement).

This finding was congruent with **Abdulla & Abdulla (2014)** reported that, there was a positive significant statistical correlation between age and knowledge of nurses' staff (increase knowledge with increase age of nurses). Also, **Eskander (2013)**, reported that there was a statistically significant relations between total nurses' knowledge and their age, years of experience.



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In contrast, **Younis, et al (2018)**, who conduct a study on "Effect of nursing teaching protocol on nurses' knowledge and practice regarding kidney transplantation patients" at nephrology university hospital and showed that demographic characteristics not affect nurse's knowledge.

**Youssef, et al (2017)**, who conduct a study on "Nurses Performance Regarding Management of Patients Post Liver Transplantation In Critical Care Unit" and reported that there was no statistically significant relation between nurses' knowledge, and their demographic characteristics (age, gender, educational level, marital status, years of experience, and attendance of training courses).

In summary, the results of this study revealed that there is a need to focus on the development of nursing staff knowledge regarding caring for patients post-LT, so effort should be directed toward enhancing creativity among nurses. Nurses must have access to updated information, learning resources, and continuous educational opportunities.

## 5. CONCLUSION

**Based on this study finding, it can be concluded that:**

The study revealed that most of studied nurses had unsatisfactory total level of knowledge regarding managing of patients post liver transplantation at critical care unit. There were a highly significant relation between nurses' knowledge and their demographic characteristics (age). Also, there were a significant relation between nurses' knowledge and their demographic characteristics (level of education and years of experience).

## 6. RECOMMENDATIONS

-Implementing an educational training program to improve nurses' knowledge regarding management of patients post liver transplantation.

-Critical care units should be supplied by a protocol of nursing care for managing of patients post liver transplantation.

-A simplified and comprehensive booklet should be designed including guidelines about caring for patients post liver transplantation in critical care unit.

-Further study is recommended to evaluate the effect of educational training program regarding managing of patients post liver transplantation and consequently their effect on the patients' outcome.

-Replication of the current study on large sample and different hospitals settings to be able to generalize the results.

### List of abbreviations:

Bachelor of Science in Nursing (BSN).

Hepatitis B Virus (HBV).

Hepatitis C Virus (HCV).

Hepato Cellular Carcinoma (HCC).

Liver Transplantation (LT)

Model of End-stage Liver Disease (MELD)

World Health Organization (WHO).

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