

## Biopsychosocial needs of patient after Liver transplantation during follow up period

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### Abstract

**Background:** Liver transplantation (LT) has been widely accepted as the standard treatment for patients with end-stage liver disease and unrespectable hepatocellular carcinoma (HCC). **Aim of the study:** assessing patient's biopsychosocial needs as regard liver transplantation during follow up period. **Design:** A descriptive exploratory design was utilized. **Setting:** The present study was conducted at liver transplantation outpatient clinic in National Hepatology and Tropical Medicine Research Institute. **Study subjects:** a purposive sample of 30 adult patients were included in the study, their age 18-55ys, of both sexes, and follow up period start from one week after discharge. **Data collection tools:** Data were obtained through four tools; 1-An interviewing questionnaire for patients post liver transplantation which includes: demographic characteristics of the studied patients and their medical history, 2-Patient's biopsychosocial needs assessment questionnaire for patients post liver transplantation, 3-Patient's structured health assessment tool for patients post liver transplantation during follow up period, and 4- Factors affecting patient's follow up post LT. **Result:** It was found that, sixty three percent of the studied subjects their highest needs were social needs while fifty percent of the study subjects their highest needs were physical needs. Also the finding of the study revealed that thirty six of the studied subjects had psychological needs. **Conclusion:** The highest needs of patients after liver transplantation during follow up period were the social needs followed by physical needs and psychological needs. Also, psychological patient related factors were the highest factors affecting the patients during follow up period after liver transplantation followed by financial patient related factors. There was statistically significant relation between patient's biopsychosocial needs and their age and income. **Recommendation:** The study recommended, providing discharge plan for recipient of liver transplantation include: increasing patients 'and family awareness through more explanation about liver transplantation, recovery, return to their occupational activities and coping strategies in working sites, healthy life style behavior.

**Keywords:** Biopsychosocial needs, Factors, Follow up, Liver transplantation

### Introduction

Egypt has high prevalence of hepatitis C virus (HVC) infection. It is estimated that 90% of cases of HCV in Egypt are infected by genotype IV. The high prevalence of HCV infection has led to increasing numbers of Egyptian patients suffering from chronic liver disease, cirrhosis, and hepatocellular

carcinoma; all are associated with high morbidity and mortality (El-Gazzaz & El-Elemi 2010).

The high prevalence of chronic liver disease in Egypt has led to increasing numbers of Egyptian patients suffering from end stage liver disease. Despite significant improvement in the medical management of complications of cirrhosis, patients still

suffer from reduced quality of life and must confront the fact that their disease will inevitably progress to liver failure and death. Liver transplantation (LT) is the most effective intervention that can increase patient survival (El-Gamal, Morsy, Ismail & El-Shazly, 2013).

Liver transplantation (LT) represents the only chance of cure and long-term survival as a treatment of irreversible liver diseases and acute liver failure. The rates of success and survival have increased from 30% in the 1970s to almost 80% today (Masala et al., 2012). In less than 30 years, it has been rapidly developed from a highly experimental and controversial procedure to one of the most successful stories in medicine. It represents a complex surgical procedure, which require removal of a diseased or injured liver and replace it with a healthy whole liver or a segment of a liver from another person, called a donor (Lai, 2010, Lesurtel, & Clavien, 2011).

Bio-psychosocial perspective argues that, for any individual, all three sub-systems – biological, psychological and social – are interrelated and interdependent and that each system exerts an influence on the other. Thus, from a bio-psychosocial perspective, each individual experiences the interplay of biological, psychological and social factors. The biological subsystem refers to a person's physiological (biological) processes, the psychological subsystem to a person's knowledge, emotions, cognitions and beliefs, and the social subsystem refers to the influence of society and its values and norms on a person (Merwe, 2010).

The period following liver transplantation the clients suffer from a chronic condition, which by itself entails risks and health problems, so they need to understand the transplantation process so as to change their living experience for better

life post transplantation. Recognition, management, and prevention of medical as well as surgical complications after liver transplantation are the keys to improve long term outcomes and quality of life (Singh & Watt, 2012; El-Gamal et al., 2013).

The outcomes after LT have shown consistent improvement in the recent years. One-year patient and graft survival rates are 89.4% and 86.4%, respectively with cadaveric donor, and slightly higher at 91% and 86.8% with live donor (Schiff, Maddrey, & Sorrell, 2012). The major reasons for this dramatic increase include refined surgical and preservation techniques, better immunosuppressive protocols, more effective treatment of infections, and improved care during the critical perioperative period (Diensta & Cosimi, 2012).

There are many factors affecting the patient's pattern of adherence with their recommended life style behaviors. These are classified in categories including demographic and economic, past and present medical history, number and type of recommendations. Patient psychological states also determine acceptance or non-acceptance of illness. More over individual is more likely to engage in preventive health behavior and prescribed regimen according to health believe which include perceived severity of disease, perceived susceptibility to complication, perceived benefits, barriers and cost of treatment (El-mallkh & Findlay, 2015).

Patient and family education is a key element in the care of liver transplantation patients. Educational needs appear as soon as the patient becomes a potential candidate for a transplant and the questions that are raised include the actual procedure, its possible sequelae, the course of treatment and long-term quality of life concerns. Teaching

should begin before or at the start of the pre-transplant work-up and it should continue up to the time of discharge (Togashi, Sugawara & Akamatus, 2013).

The nurse, as a member of the multidisciplinary team, spends most time with patients and is the element capable of keeping an affective bond with patients and families, especially in a liver transplantation program in which the whole process involves a long period of time. Thus, patients establish with nurses a relationship of trust, respect, and freedom to share their anxiety and fears. Myths and beliefs related to the organ that will be implanted, gender, age, the donor origin, a potential rejection that can end the dream of having a normal life (Frank, Beltran & Dojlidko, 2011).

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

This study aimed to assess patient's biopsychosocial needs as regards liver transplantation during follow up period.

#### **Research questions:**

What are the patient's biopsychosocial needs during follow up period after liver transplantation?

### **Subjects and Methods**

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

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

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

A descriptive study was utilized to conduct this study aim.

#### **B) Setting**

The present study was conducted in liver transplantation outpatient clinic at National Hepatology and Tropical Medicine Research Institute affiliated to Ministry of Health and Population.

#### **C) Subjects**

The type of study sample was a purposive sample of 30 adult patients, their age (18-55ys) of both sexes, and follow up period after liver transplantation one week after discharge.

#### **D) Tools for data Collection**

Four tools for data collection include the following:

**1- Structured interview questionnaire for patients post liver transplantation:** This questionnaire was developed by the researcher using the most relevant literature, (Lee & Daugherty, 2016; Mitchell, 2013) it included two parts:

- **Part 1:** it was concerned with demographic data of the studied subjects as age, sex, marital status, education, income, occupation, and number of children.

- **Part 2:** it was concerned with medical history of the studied subjects which include past medical history such as diagnosis of recipient disease, other chronic illness, family history of same disease, any type of surgery, hospitalization, additional vaccination status, addiction to alcohols, smoking and present medical history such as medication, admission to hospital and ICU due to liver disease, after operation complications, allergy for medication or food.

### • 2- Patient's biopsychosocial needs assessment questionnaire for patients post liver transplantation:

• This questionnaire was adapted from (Morfeld, Bullinger, Hogrefe, Göttingen, 2011) and modified by the researcher to suit the study aim and was used to assess patients' physical, psychological and social needs This questionnaire consisted of three parts as following:

• Patient's physical needs including 10 items for physiological status, 4 items for role physical, 2 items for bodily pain, 6 items for general health, 5 items for vitality.

• Patient's social needs including 2 items.

• Patient's psychological needs including 5 items.

#### ➤ Scoring system:

The scoring system for the questionnaire; if the answer was yes it was given zero grade and this mean that patient had a need which must be met, but if the answer was no it was given one grade and mean that patient had no need on this part. Total score of each category of needs < 65% this considered patient had less important needs and the total score of each category of needs >65% mean that patient had needs.

### 3- Patient's structured health assessment tool for patients post liver transplantation during follow up period:

This tool was developed by the researcher using the relevant literatures to suit the study aim (Guillen, Black, Thomas & McNamara, 2014 & Kim et al., 2012 & Farid et al., 2012). It was used to assess the patients' needs during follow up period and include: vital signs (6 items), nutritional

status (8 items), medications (5items), daily activity (5items) and complications such as (rejection (4items), infection (4 items), and cancer (3 items).

#### ➤ Scoring system:

Negative items means there was a need for the patients to be covered. Positive items means there was no needs for such point. According to yes and no sometimes yes mean positive and no means negative and some items vice versa according to questions. So summations of each part whether it was positive or negative items identify the level of patients' needs related to such items. Patient who had needs given a score of one mark and the patient who had no needs given the score of zero. Total score of each category of needs was calculated. If it was > 65% this considered patient had less important needs and if the total score of each category of needs < 65% this means that patient had needs.

### 4- Factors affecting patient's follow up post liver transplantation:

This tool was developed by the researcher using the relevant literatures (Tejeda et al., 2013). It was used to assess factors affecting on patients during follow up period which include yes and no statements as follows:

• **Factors related to patient including** 4 items for physical factors, 4 items for financial factors, 4items for social factors, 4items for psychological factors, and 4items for unawareness.

• **Factors related to place** including 4items.

• **Factors related to care provider** including 8items.

➤ **Scoring system:**

The scoring system for the questionnaire; if the answer was yes it was given zero grade and this mean that patient had factors that affect him during follow up, but if the answer was no it was given one grade and mean that patient had no factor affect him during follow up on this part. Total score of each category of factors was calculated. If it was > 65% this considered patient had less factors affect him and if the total score of each category of factors < 65% this means that patient had factors affect him.

**2) Operational design:**

The operational design includes preparatory phase, tool reliability and validity, pilot study and field work.

**A) Preparatory phase**

It includes reviewing of the past and current related literatures and theoretical knowledge of the various related aspects using books, articles, internet, and periodical magazines in order to develop the data collection tools.

**B) Tool validity and reliability:**

- **Reliability** of proposed tools was done statistically by Cronbach Alpha test (0.85 for follow up tool & 0.84 for biopsychological tool). This means that the tool is reliable.

- **Validity** it was established by a panel of seven experts, four professors and three assistant professor of medical surgical nursing at the faculty of Nursing Ain Shams University.

**C) Pilot study**

A pilot study was carried out on 10 % of the study subjects (3 patients).

**D) Field work**

- Purpose of the study was explained to patients who agree to participate in the study prior to any data collection simply.

- Sampling was started and completed within 6 months from June 2017 until the end of November 2017.

- The researcher started to collect the data from the patients by the pre-constructed tools on the first visit for follow up.

- The researcher interviewed the patients one day per week at morning shift from 9 Am to 2 Pm as the patients coming for follow up only one day at Saturday; 1: 2 recipient /day were interviewed.

- The patients were asked to give oral agreement to participate in the study; the investigator explained the aim and objectives to the participants. The confidentiality of any obtained information was assured, and the subjects were informed about their right to participate or not in the study. The participants were also assured about anonymity, and that data will only be used for the purpose of the study.

- The questionnaire was filled by the researcher and time needed for completing the questionnaire sheet was about 30-40 minutes.

**3) Administrative design:**

An official approval to conduct the study was obtained. The purpose of the study was illustrated as well as the main data item to be covered, and the study was carried out

after gaining the necessary approval from the director of National Hepatology and Tropical Medicine Research Institute through formal letter from Dean of Faculty of Nursing at Ain Shams University.

#### **Ethical consideration:**

The ethical research considerations in this study included the following:

- Agreement to conduct this study was obtained from the ethical committee in faculty of nursing Ain Shams University.

#### **Results:**

#### **5) Statistical Design:**

The collected data were organized, scored tabulated and analyzed using the number and percentage, distribution. Statistics analyzed done by using the computer Statistical Package for Social Science (SPSS), version 21 and proper statistical tests were used to determine whether there significant difference or not. The following statistical analysis was used: number, percentage, mean, stander deviation, Chi-square (X<sup>2</sup>) and propotion probability of error (P value).

**Table (1):** Number and percentage distribution of the studied subjects according their demographic characteristics (n=30).

Demographic characteristics	No	%
<b>Age</b>		
18<30	5	16.7%
30<45	8	26.7%
45+	17	56.7%
	<b>Mean + SD= 42.2+10.9</b>	
<b>Sex</b>		
Female	7	23.3%
male	23	76.7%
<b>Marital status</b>		
Married	25	83.3%
Not married	5	16.7%
<b>Educational Level</b>		
Can't read and write	3	10.0%
Reads and writes	7	23.3%
Primary education	10	33.3%
University	10	33.3%
<b>Work</b>		
Sedentary	12	40.0%
Manual work	10	33.3%
Not working	8	26.7%
<b>Income</b>		
Enough	5	16.7%
Not enough	25	83.3%

**Table (1):** describes that, the mean age of the studied subjects included in the study were 42.2 + 10.9. Also 76.7% of the studied patients were male. Concerning the marital status 83.3% of the studied subjects were married, 76.6 % of them had more than one child, 33.3% had university

education, and another 33.3% had primary level of education. As regard to work 40.0% of the studied subjects were working sedentary work, and 83.3% of them hadn't enough income.

**Table (2):** Number and percentage distribution of the studied subjects regarding their past medical history (n=30).

	N	%
<b>Past history</b>		
<b>Cause of liver diseases</b>		
- Immune disease	6	20.0%
- Liver cirrhosis	5	16.7%
- Viral hepatitis C	19	63.3%
<b>Presence of Chronic disease</b>		
- No	22	73.3%
- Yes	8	20.0%
<b>Type of disease</b>		
- HTN	4	50.0%
- Diabetes	5	62.5%
<b>Previous surgical operation</b>		
- No	22	73.3%
- Yes	8	26.7%
<b>Alcoholism</b>		
- No	28	93.3%
- Yes	2	6.7%
<b>Smoking</b>		
- No	18	60.0%
- Yes	12	40.0%
<b>Family history</b>		
<b>Relatives suffer from liver disease</b>		
- No	18	60.0%
- Yes	12	40.0%
<b>Diagnosis of relatives</b>		
- Liver cirrhosis	2	6.7%
- Virus C	10	33.3%
<b>Relative degree</b>		
- First degree	10	33.3%
- Second degree	2	6.7%

**Table (2):** shows that, 63.3% of the studied patients had viral hepatitis C. Also, it was noticed that only 20.0% of the studied subjects had history of chronic diseases. As 62.5% of the studied subjects had diabetes disease while 50.0% had hypertension. Concerning previous surgical operation 73.3% of the studied patients had a previous surgical operation and 60.0% of them were smokers. As regard to family history of liver disease, it was found that 40.0% of the studied subjects had family history of liver disease with 33.3% first relative degree had virus C.

**Table (3):** Number and percentage distribution of the studied subjects regarding their present medical history (n=30).

Present History	N	%
<b>Ways of disease discovery</b>		
• Symptoms of the disease	23	76.7%
• Accidentally	7	23.3%
<b>Admission to hospital due to liver disease</b>		
• No	9	30.0%
• Yes	21	70.0%
<b>Number of admission to hospital due to liver disease</b>		
• One time	2	9.5%
• More than one time	19	90.4%
<b>Admission to ICU due to liver disease</b>		
• No	24	80.0%
• Yes	6	20.0%
<b>Number of ICU admission</b>		
• One time	3	50.0%
• More than one time	3	50.0%
<b>Allergy</b>		
• No	30	100.0%

**Table (3):** describes that 76.7% of the studied subjects were discovered disease through appearance of symptoms. Regarding admission to hospital due to liver disease, it was found that 70.0% of the studied subjects were admitted to hospital; with 90.4% of them were admitted to more than one time. Also, 20.0% of the studied patients were admitted to Intensive Care Unit. As well as, 100% of them didn't have allergy to any type of food or medication.

**Table (4):** Frequency distribution of the studied subject's total biopsychosocial needs after liver transplantation (n=30).

Items	Yes		No	
	N	%	N	%
<b>Physical needs</b>	16	53.3%	14	46.7%
Physiological	10	33.3%	20	66.7%
Physical role	22	73.3%	8	26.7%
Body pain	22	73.3%	8	26.7%
General health	17	56.7%	13	43.3%
vitality	15	50.0%	15	50.0%
<b>Social needs</b>	19	63.3%	11	36.7%
<b>Psychological needs</b>	11	36.7%	19	63.3%
<b>Total</b>	16	53.3%	14	46.7%

**Table (4):** illustrates that the patients' highest needs were social with percentage 63.3% followed by physical needs with percentage 53.3% then psychological needs with percentage 36.7%.

**Table (5):** Number and percentage distribution of the studied subject's assessment regarding complications during follow up period (n=30).

Items	Yes		No	
	N	%	N	%
<b>Risk for rejection</b>				
- Performing periodic rejection diagnostic investigation	17	56.7%	13	43.3%
- Oriented to signs and symptoms of rejection	9	30.0%	21	70.0%
- Presence of rejection symptoms	9	30.0%	21	70.0%
<b>Infection</b>				
- Perform practices to prevent infection	12	40%	18	60%
- Presence of signs and symptoms of infection	3	10%	27	90%
<b>Cancer</b>				
- Perform practices to prevent cancer	10	33.3%	20	66.7%
- Presence of signs and symptoms of cancer	2	6.7%	28	93.3%

**Table (5):** reveals that, concerning to complications during follow up period, it was noticed that 56.7% of patients were perform periodic rejection diagnostic investigation while 70.0% of the patients didn't orient about signs and symptoms of rejection and another 70.0% of them didn't have rejection symptoms. As well as, 60% of patients didn't perform practices to prevent infection while 90% of them didn't have signs and symptoms of infection. Also, while 66.7% of the studied subjects didn't perform practices to prevent cancer while 93.3% of them didn't have signs and symptoms of cancer.

**Table (6):** Number and percentage distribution of factors affecting the studied subjects after liver transplantation during follow up (n=30).

Items	Yes		No	
	N	%	N	%
<b>Patient related factors</b>				
- Physical	12	40.0%	18	60.0%
- Financial	26	86.7%	4	13.3%
- Social	12	40.0%	18	60.0%
- Psychological	28	93.3%	2	6.7%
- Unawareness	22	73.3%	8	26.7%
<b>Place related factors</b>				
- Accessibility	26	86.7%	4	13.3%
- Transportations costs	23	76.7%	7	23.3%
- Place cleanliness	14	46.7%	16	100.0%
- Increased waiting time	20	66.7%	10	33.3%
<b>Health care providers related factors</b>				
- Information about follow up importance	4	13.3%	26	86.7%
- Causes of attendance	5	16.7%	25	83.3%
- Nursing service	3	10.0%	27	90.0%
- Medical service	7	23.3%	23	76.7%
- Other team members service	1	3.3%	29	96.7%

**Table (6):** illustrates that 93.3% of the studied patients had psychological factors that affected them during follow up while 86.7 of them had financial patient related factors. As well as, 73.3% of the patients had unawareness patient related factors affected them during follow up. Regarding factors related to place, it was found that 86.7% of the studied patients were suffering from location accessibility to follow up place but 76.6 were suffering from transportations costs and 66.7% of them were waiting for long time during follow up. Concerning factors related to care providers, it was found that 23.3% of the studied patients were had problems related to medical services.

**Table (7):** Relation between factors affecting the studied subject's follow up post liver transplantation and biopsychosocial needs.

Item	Factors				X <sup>2</sup> test		
	N	Yes %	N	No %	X <sup>2</sup>	P	Sig
<b>Biopsychosocial needs</b>							
Yes	4	13.3%	10	33.3%	8.4	0,0037	HS**
No	13	43.3%	3	10.0%			

**Table (7):** shows that, there was highly statistical significance relation between patient's biopsychosocial needs and factors affecting them during follow up at (p value =0.0037).

## Discussion

The liver transplantation (LT) has rapidly advanced from an experimental therapy to a mainstream treatment option for a wide range of acute and chronic liver disease. LT is now considered as the gold standard for treatment of clients with end stage liver disease and have evolved to include previously contraindicated conditions such as hepatocellular carcinoma and alcohol related liver disease. Cirrhosis from chronic hepatitis C infection remains the most common indication today (Merion, 2010, Duffy et al., 2010).

Regarding the demographic characteristics and medical history, the present study revealed that, more than half of the studied subjects were above 45 years old with the mean age  $42.2 \pm 10.9$  years. These results might be due to the chronicity of the disease which is contributed to these age groups. This result agrees with the study conducted by El-Gamal, (2013) who found that the mean age of liver transplant clients was  $50 \pm 4.8$  and more than half of the study sample age was between 40 and 50 years old. Also, Aguiar et al., (2016) conducted a study about quality of life in liver transplant recipients and the influence of

sociodemographic factors, which mentioned that, the age of clients with liver transplantation, was ranged from 40-59 years.

Regarding the gender, more than three quarters of the studied subjects were males. This result agrees with a study done in china on 256 liver transplant recipients about health-related quality of life by Chen, Yan, and Wang (2012) who found that, most of participant clients were males. Also, El-Gamal, (2013) who reported that majority of participant clients were males.

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Regarding education, this study revealed that about one third of LT clients were university graduates. This finding could be explained by increasing the ratio of people awareness about importance of education in Egypt. This result disagrees with Abdel-

**Ghany, Soliman, and Abdel-Raouf (2016)** who found that nearly third of subjects were university graduates. Also, is inconsistency with the study about performance of creatinine-based GFR estimation equations in solid-organ transplant recipients conducted by **Shaffi et al., (2014)** who reported that, about two thirds of LT clients were highly educated. Also, evidence suggests that those who achieve a higher level of education attainment are more likely to engage in healthy behaviors and less likely to adopt unhealthy habits (**Van, Metselaar, Tilanus, Kazemier and Stam, 2010**).

In relation to monthly income of the studied subjects, the results of this study revealed that most of subjects had not enough monthly income to cover their needs in addition to costs of medications which add burden on the patients. This might be due to that the liver transplant operation needs more financial support from the first step during preparations of recipients and donors, the operation and its costs to lifelong medications and investigations, which consume a lot of money. This result comes in accordance with **Stilley et al., (2013)** who revealed that, in the developing and developed countries, financial determinants likely to be low in patients especially post LT.

Regarding the past history of the studied patients, the results of the study clarified that more than half of LT clients had hepatitis C virus as the cause of liver diseases. This finding comes in accordance with **Cuadros, Branscum, Miller and Abu-Raddad, (2014)** who stated that HCV is the most common reason for the adult liver transplantation. In addition to that, **Vinaixa, Rubin, Aguilera and Berenguer, (2013)** who mentioned that, among liver transplant clients the most common causes of liver cirrhosis were hepatitis B and C viruses.

Regarding the presence of chronic diseases before LT, the results of the study clarified that, one fifth of the studied subjects

had chronic diseases such as diabetes mellitus and hypertension. This result could be attributed to the age of majority of the studied subjects who were above 45 years old as this age group has higher liability to chronic illness. This finding is in agreement with **Laura, Rachel, Emmanuel and Tsochatzis, (2015)** who stated that, hypertension and diabetes mellitus increasingly recognized as a complication of aging among organ transplantation patients.

In relation to smoking, the results of the study found that, more than one third of the studied subjects were smokers. This could be due to that the majority of our studied patients were males. This result agrees with **Khosravi, Pourahmad, Bahreini, Nikeghbalian, and Mehrdad, (2015)** confirmed that, increasing the smokers numbers between LT patients due to the deadly effect of smoking on the liver which lead to liver cell failure.

Regarding total scores of biopsychosocial needs, the present study revealed that the highest needs among biopsychosocial needs were social needs followed by physical needs and psychological needs. These results are consistent with **Jin et al., (2012)** who found that the highest needs were social support. This could be due to Egyptians natural society concern about social aspects.

According to rejection, the present study revealed that, about three quarters of the studied subjects were not oriented to signs and symptoms of rejection. As well as, nearly half of the subjects were not performing periodic rejection diagnostic investigation. This might be due to low income and insufficient education related to LT for the patients. These findings were inconsistent with the study conducted by **Ko, Lee and Muehrer, (2015)** in China about informational needs of liver transplant recipients during two-years post-transplant period, which stated that, the high adherence

level between his subjects' information about medication and rejection prevention.

Concerning cancer, the present study revealed that, two thirds of the studied subjects didn't perform practices to prevent cancer which reflect inattention of liver transplantation team about patients' education aspects and also the majority of them didn't have signs and symptoms of cancer. This finding is consistent with **Euvrard et al., (2012)** who conducted a study in England about skin-cancer prevention post transplantation, which found that, LT recipients have a 3-fold greater risk of developing a de novo malignancy compared with the general population so this risk of post-transplant neoplastic disease can be successfully reduced with a careful management of immunosuppressive therapy. Also, **Stallone, Infante and Grandaliano, (2015)** in Chicago who conducted a study about management and prevention of post-transplant malignancies, which realized that, cancer might be considered as a major limitation in achieving optimal outcomes in organ transplantation. Thus, prevention of post-transplant malignancy-related morbidity and mortality must be considered a main endpoint in solid organ transplant programs.

Regarding factors affecting patients during follow up period, the results of current study found that most of the studied subjects experienced the financial factors that affect their adherence to follow up and most of them had place accessibility related factors. Also, the majority of subjects had psychological factors affecting their adherence to follow up. These findings agree with **Tejeda et al., (2013)** who reported that, the most common barriers to follow up care post LT were the intrapersonal barriers with over half experienced financial barriers followed by communication concerns with medical providers and employment issues. At the institutional level, issues related to system problems with scheduling care (e.g., the care provided was not efficient or

convenient to the patient's needs) were reported by fourteen percent of the patients.

In regard to relation between factors affecting subjects after LT and their biopsychosocial needs, the current study revealed that, there were highly significant relations between factors affecting subjects and their biopsychosocial needs.

### **Conclusion:**

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Based on the results of the current study it can be concluded that: The highest needs of patients after LT during follow up period were the social needs followed by physical needs and psychological needs. Also, psychological patient related factors were the highest factors affecting the patients during follow up period after LT followed by financial patient related factors. There was statistically significant relation between patient's biopsychosocial needs and their age and income. Also, there was a highly statistical significant relation between patients' biopsychosocial needs and factors affecting them after liver transplantation during follow up period.

### **Recommendations:**

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#### **In the light of these findings it can be recommended that:**

- Providing discharge plan for recipient of LT include: Increase patients and family awareness through more explanation about LT, recovery, return to their occupational activities and coping strategies in working sites, healthy life style behavior especially their immunosuppression medications and their nutrition for maintaining the ideal body weight, post-operative complication especially rejection and problems and follow up schedule.

- Providing printed educational materials must be used to improve knowledge, satisfaction, and adherence to treatment, as well as stimulate patients' self-

care which can help patients and their families recognize symptoms that should alert recipient to seek medical help.

- Psychosocial counseling should be provided by specialist for LT recipients and their family members to facilitate dealing with anxiety, improve their mental health, and decrease their social isolation.

- Increase the patients' awareness, encourage and motivate them to perform periodical follow up for physical examination and investigation for early detection of complications.

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