Needs and Perception of Patients Undergoing Liver Transplantation

Basma Magdy Mabrok, Eman Talaat Mohamed, Susan Mohamed Dessouky
Medical Surgical Nursing, Faculty of Nursing, Ain Shams University.
Corresponding Author:
Basma Magdy Mabrok,
Tel. No.: 01021014163
E-mail: Basmanorin2018@gmail.com

Abstract

Background: Liver transplantation is considered one of the most complex procedures in modern surgery. Its success depends on a complete hospital infrastructure, in addition to a multidisciplinary team skilled to care for severely debilitated and immunosuppressed patients.

Aim of work: Assessment of needs and perception of patients undergoing liver transplantation. **Design:** A descriptive study used in this study on 30 patients. **Setting**: Liver transplantation out patients' clinic and liver transplantation department at Nasser Institute for Research and Treatment Hospital. **The sample:** A purposive sample of (30) patients with end stage chronic liver disease undergoing liver transplant were included in this study. **Tools:** two tools were used, Tool I: Structured interview questionnaire composed of 2 parts: part 1 includes: **a) demographic data**: It includes (age, gender, marital status, residence, level of education and occupation). **b) Medical history of the patients:** to assess the present medical history of the patients. Part 2: Needs assessment questionnaire: it was developed by the researcher to assess the needs of patients undergoing liver transplant. It is divided into 4 parts: Physiological needs, Psychological needs, Social needs, and learning needs. Tool II: Treatment Effects Questionnaire (TEQ). To assess patients' perception regarding their treatment after transplantation. **Results:** The present study revealed that the highest patients' needs were the psychological needs (87.3%) followed by social needs (71.5%) and physiological needs (48.2%) while learning needs were at lowest (36%). and (63%) of them were disagree regarding to treatment Effects Questionnaire (TEQ). **Conclusion:** The highest patients' needs were the psychological needs followed by social needs and physiological needs while learning needs were at lowest. As regard to total mean of perception, less than two third of the studied patients had a positive perception regarding towards treatment after liver transplantation. **Recommendations:** Learning guidelines should be provided for patients undergoing liver transplantation starting from admission until discharge from the hospital. A simple booklet should be provided for patients undergoing liver transplantation including all aspects such as medications, nutrition, early warning signs of infection and its prevention, daily activity, and follow-up.

Key Words: Liver transplantation, Needs, perception, patients

Introduction

Liver transplant (LT) is the unique curative therapy for patients with end-stage liver disease and provides the only possibility for reversing the terminal situation, which impacts the biological, psychological and social levels ***(Gitto and Villa, 2016).***

Liver transplantation can be a lifesaving option for people with acute/chronic liver failure. Although liver transplantation has positive outcomes, the recipients experience many physical, psychological and social problems. It is of great importance to satisfy their needs for overcome these problems ***(Pierce, 2018).***

With the developments in surgical techniques, improvements in perioperative care, and the use of strong immunosuppressive drug therapies, considerable developments have recently been achieved in post-transplant survival ***(Dutkowski et al., 2010).***

Although there have been increased developments in liver transplant and post-transplant care processes, one of the conditions that affect transplant and post-transplant process is the individual's illness perception. Illness perception refers to thoughts, ideas, and beliefs about illness during the illness period and the following recovery period, and it constitutes individuals' behaviors and coping mechanisms.

One should recognize their coping skills with the illness and improve these skills when necessary in order to better cope with the illness and prevent the development of anxiety ***(Kapikiran et al., 2021).***

Significance of the study:

Assessing the needs and perception for patients undergoing liver Transplantation improve patient outcomes and enhance the quality of nursing care provided for such group of patients.

Aim of the study:

Assess needs and perception for patients undergoing to liver transplant.

SUBJECTS AND METHODS:

Research Design:

A descriptive study was used in this study on 30 patients during 3 months.

Setting:

This study was conducted in liver transplantation out patients' clinic in Nasser Institute for Research and Treatment Hospital.

Sample:

A purposive sample of (30) patients with end stage chronic liver disease undergoing liver transplant were included in this study.

Tools: Two tools were used:

Tool (I):

1- Structured interview questionnaire comprises one part related to

a) **Demographic data**: It includes (age, gender, marital status, residence, level of education and occupation).

b) Medical history of the patients: It is used to assess the present medical history of the patients and family history of the same disease.

It has been developed in simple Arabic language based in extensive review of relevant and recent literatures.

2- Needs assessment questionnaire: This part was developed by the researcher based on national and international literature review to assess the needs of patients undergoing to liver transplant. It is divided into.

A. Physiological needs.
B. Psychological needs.
C. Social needs.
D. Learning needs.

Tool (II)

Treatment Effects Questionnaire (TEQ): to assess patients' perceptions of the consequences associated with their current treatment adapted from Griva, Jayasena, Davenport, Harrison, and Newman, (2009). Consists of 20 items.

Items were scored on an 8-point scale ranging from 0 to 7.

- ***Operational design:***

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

- **Preparatory phase:**

It will include reviewing of related literature, and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop tools for data collection.

- ***Pilot study:***

A pilot study will be conducted on 10% of the total sample in order to ensure the clarity of the questions, the applicability of the tools and the time needed to complete them.

- **Validity and reliability**

a- Validity:

It was established for face and content validity by a panel of five experts that reviewed the tools for clarity, relevance, comprehensiveness, understanding, applicability and according to their opinion some modifications were applied.

Face validity verifies that the instrument looked like, it was valid or gave the appearance of measuring the content desired for a study. **Content-related validity** examines the extent to which the method of measurement includes all the major elements relevant to what is being measured ***(Burns & Grove, 2009)***.

b- Reliability

Reliability testing was done using Cronbach's alpha test that measures the degree of reliability for the entire form.

- ***Field work:***

Data were collected within 3 years from January 2020 to December 2022. It was necessary for the researcher to spend 10 minutes at the beginning, before administering the interview questionnaire sheet, to introduce herself, briefly explains the study objectives, orients the patients under study to the kind of questions and gives guidance if needed to answer the question. This technique was repeated for all patients under study.

We asked the patients the questions in Arabic and recoded their answers in questionnaire tool, the patients' answers were recorded as yes (patient had need) or no (patient had no need).

Each patient was interviewed in the outpatient clinic one week before admission for operation to collect data related to demographic data and preoperative patients' needs utilizing structured interview questionnaire. the postoperative data of physiological and learning domains were collected one week after operation and the data of social and psychological domains were collected one month after operation, then using the third part to assess patient' perception regarding liver transplantation.

Ethical considerations:

Prior study conduction, approval was obtained from scientific research and ethics committee of the Faculty of Nursing in Ain Shams University. The researcher clarified the aim of the study to patients be included in the study. They were assured that anonymity and confidentiality would be guaranteed and will be informed about their right to refuse or withdraw from the study at any time. The study procedures did not entail any harmful effects on participants.

An approval was obtained from hospital director and nursing director the purpose of the study will be simply explained to the patients who agreed to participate in the study before any data collection.

- **Statistical design:**

The collected data were organized, categorized, tabulated and analyzed using the Statistical Package for Social Sciences (SPSS). Data were presented in tables and charts using numbers, percentages, means, standard deviations, ANOVA (F)-test, r-test and alpha cronbach test. Level of significance was threshold at 0.05 (P> 0.05= insignificant, P< 0.05 = significant and P< 0.01=highly significant).

Results

Table (1) shows that 70% of the studied patients were with age group more than 40 years and 93% of them were married. In relation to educational level, 80% of patients had secondary school education, 73.3% of patients had professions requiring physical strength, and 83.3% of them had insufficient income of their own.

Table (2) illustrates that all studied patients were suffering from disease for more than six months. All of them discovered their disease by suffering symptoms (ascites, hematemesis, dyspnea, or neurological manifestations) and the most common complaint on admission was ascites (60%). All patients had previous hospitalization for many times, and 50% of them has previous ICU admission.

Table (3) illustrates that 23.3% of the studied patients were smokers, 33.3% of them had diabetics, 33.3% of them had chronic renal disease, 3.3% of them had hypertension, 16.7% of patients had previous hospital admission for surgical causes other than liver disease, and 76.7% had no history of allergy.

Table (4) shows that 53.3% of the studied patients had family history of liver disease, 87.5% of their liver diseased family members had liver cirrhosis, however no one of them experienced liver transplantation.

Table (6) Table (6) illustrates that 100% of studied patients were afraid of disease progression, 90% were worry about the surgical intervention, 86.7% became easily annoyed, sometimes crying, feel low self-esteem and were not coping with the new situation of the disease, however, through the postoperative period 93.3% of patients reported that operation improved their general health, and only 6.7% felt worry and low self-esteem.

Table (7) Table (7) illustrates that 100% of studied patients the disease interfered with their jobs, social activities, finance, and they all had emotional support from their families, 5% of them did not look for enjoying their lives. Though the postoperative period, 100% of the studied patients reported that operation improved their social activities and they all get emotional support from their families.

Table (8) Table (8) illustrates that 93.3% of studied patients needed to know about postoperative pain management, 86.7% needed to know how to do postoperative exercise, and 46.7% of needed to know the hospital-stay period.

Figure (1) shows that the highest patients' needs were the psychological needs (87.3%) followed by social needs (71.5%) and

physiological needs (48.2%) while learning needs were at lowest (36%).

Table (9) presents a highly statistically significant difference between patients' age regarding their psychological and physiological needs domains (F= 11.017 &3.942 respectively) with P<0.01 as psychological needs are high in (>40) years age group and physiological needs are high in (30-40) years age group than other age groups. There was no significant difference between patients' age groups regarding their as social and learning needs.

Table (10) shows that 90% of patients are agree that treatment has many bad side effects, and are difficult to control. 83.3% of the studied patients think that treatment is effective, 90% of the studied are disagree that treatment prevents them enjoying their lives, 86.7% are disagree that treatment burdens their families, or affecting their daily activities or their sexual lives, or their illness is being worse.

Figure (2) As regard to total mean of perception, 63% of the studied patients were disagree

Table (1): Percentage distribution of the of studied patients according to their socio-demographic characteristics (n=30):

Items		No	%
Age			
From 18 to 30		1	3.3
From >30 to 40		8	26.7
> 40		21	70
Marital status	Married	28	93.3
	Un married	2	6.7
gender	Male	26	86.7
	Female	4	13.3
Education	Illiterate	4	13.3
	Secondary education	24	80.0
	Higher education	2	6.7
Residence	Rural	6	20.0
	Urban	24	80.0
Work status	Working	28	93.3
	Not working	2	6.7
Occupation type	Physical	22	73.3
	Administrative	8	26.7
Income	sufficient	5	16.7
	insufficient	25	83.3

*As stated by patients.

Table (2): Percentage distribution of the studied patients according to present history (n=30):

Items		No	%
Duration of illness	More than six months	30	100.0
Method of disease discovery	symptoms	30	100.0
Previous hospitalization	yes	30	100.0
Frequency of hospitalization	For many times	30	100.0
Previous intensive care hospitalization	yes	15	50.0
	No	15	50.0
If yes, frequency intensive care hospitalization	once	3	10.0
	For many times	27	90.0
On admission complaint	hematemesis	6	20
	ascites	18	60
	Respiratory symptoms	1	3.3
	Neurological symptoms	5	16.7

Table (3): Percentage distribution of the studied patients according to past history (n=30):

Items		No	%
Allergy	drugs	3	10.0
	foods	4	13.3
	nothing	23	76.7
Chronic diseases	no	9	30.0
	diabetes	10	33.3
	hypertension	1	3.3
	renal disease	10	33.3
Previous hospitalization for rather than liver disease	yes	5	16.7
	no	25	83.3
Surgery	yes	5	16.7
	no	25	83.3
Smoking	yes	7	23.3
	no	23	76.7

Table (4): Percentage distribution of the studied patients according to family history (n=30):

Items		No	%
Family history for liver diseases	Yes	16	53.3
	No	14	46.7
Family Liver diseases type	liver cirrhosis	14	87.5
	liver failure	2	12.5
family liver transplant	Yes	0	0.0
	No	30	100.0

Table (5): Percentage distribution of physiological domain of the patients' needs (n=30).

	item	Preoperative.		Postoperative.	
		No	%	No	%
I. Respiratory system	1. suffer from difficult breathing	25	83	4	13.3
	2. suffer from sleep dyspnea	6	20.0	6	20.0
II. cardiovascular system	1-suffers from low blood pressure	21	70.0	26	86.6
	2. suffers from high blood pressure	6	20.0	3	20.0
	3.suffer from leg pain	4	13.3	4	13.3
	4.suffer from muscles cramps	26	86.7	2	6.7
III. neurological system	1- suffer from memory disturbance	5	16.7	5	16.7
	2- suffer from low concentration	23	76.7	8	26.7
	3- suffer from distractibility	30	100.0	12	40.0
	4- suffer from imbalance	30	100.0	8	26.7
IV. gastrointestinal system	1- Suffer from heart burn	30	100.0	16	53.3
	2- suffer from abdominal bloating	30	100.0	10	33.3
	3- Suffer from nausea and vomiting	30	100.0	30	100.0
	4- suffer from ascites	18	60	1	3.3%
	5- suffer from hematemesis	16	53.3	1	3.3%
V. locomotors system	1-disease affected on ability to move alone	30	100.0	16	53.3
	2-disease affected on bath alone	3	10.0	16	53.3
	3-disease affected on ability to wear alone	3	10.0	8	26.7
VI. Elimination system	1- constipation	22	73.3	20	66.7
	2- polyuria	20	66.7	20	66.7
	3- change in urine color	17	56.7	3	10.0
	4- hematuria	3	10.0	3	10.0
VII. integumentary system	1- urticaria	24	80.0	1	3.3
	2- skin pigmentation	26	86.7	26	86.7
	3.suffer from muscles cramps	26	86.7	2	6.7

Table (6): Percentage distribution of psychological domain of the patients' needs (n=30).

	item	Preoperative.		Postoperative.	
		No	%	No	%
Psychological domain	1-Feel worries	26	86.7	2	6.7
	2-Feel low self-esteem	26	86.7	2	6.7
	3-No coping with new situation related to disease	26	86.7	1	3.3
	4-Feel worries with surgical intervention	27	90.0	1	3.3
	5-Become easily annoyed	26	86.7	1	3.3
	6-Disease effect on appearance	25	83.3	28	93.3
	7-afraid of disease progression	30	100.0	3	10
	8-Desire for sometimes crying	26	86.7	2	6.6
	9-Disease affect general health	26	86.7	1	3.3

Table (7): Percentage distribution of social domain of the patients' needs (n=30):

	item	Preoperative.		Postoperative.	
		No	%	No	%
X. Social domain	1-disease effect on social activities	30	100	30	100
	2-disease illness interfering with your job	30	100	30	100
	3- disease affected your social role	30	100	30	100
	4-change in job after disease	30	100	2	16.7
	5-get emotional support from family	30	100	30	100
	6- didn't care relationship with family	4	13.3	4	13.3
	7-didn't look for enjoy in life	5	16.7	5	16.7

Table (8): Percentage distribution of learning domain of the patients' needs(n=30):

Item		No	%
.preoperative	1- needs to know stay period in hospital	14	46.7
	2- needs to receive health education related to postoperative care	17	56.7
	3- needs to learn way of communicative methods postoperative	14	46.7
	4- needs to learn postoperative exercise	16	53.3
	5- needs to learn methods for pain management	28	93.3
	6- needs to receive health education related to postoperative complications	2	6.7
postoperative	1- needs to know how to do exercise	26	86.7
	2- needs to know follow up regimen	6	20.0
	3- needs to know medication regimen	5	16.7
	4- needs to know effect of medication	4	13.3
	5- needs to know medication side effects	2	6.7
	6- needs to know precaution for medication	4	13.3
	7- needs to know diet regimen post-operative	4	13.3
. *postoperative*	8- needs to be informed of the symptoms that you need to see a doctor	5	16.7

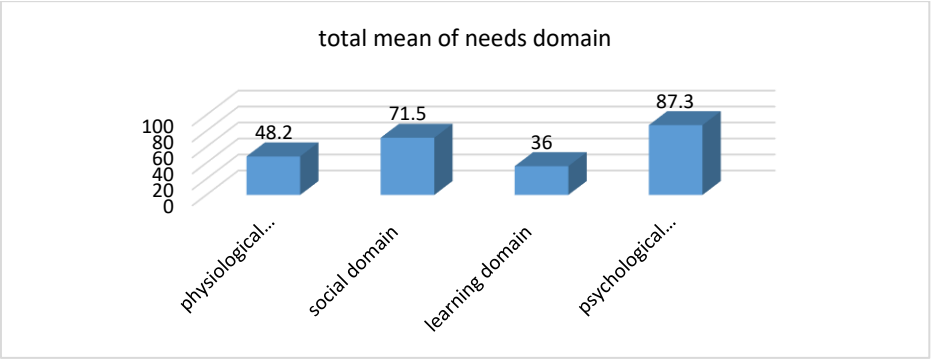

Figure (1): Total mean of needs domain.

Table (9): Relation between patients' needs domains and their age**.**

Needs domains	AGE (n=30)						F	P-value
	18-30 (N=1)		30-40 (N=8)		>40 (N=21)			
	Mean	SD	Mean	SD	Mean	SD		
Physiological	82.000	2.875	80.375	-	78.52	1.4006	3.942	.031*
Psychological	19.000	-	11.250	.46291	12.523	1.8060	11.017	.000*
Social	14.000	.	14.500	1.4142	14.238	1.5461	.107	.899
learning	24.000	.	20.875	2.58775	21.714	2.6859	.721	.496

***P< 0.05 significant ** P<0.01 highly significant**

Table (10): Percentage distribution of patients' perception (n=30).

Items	Agree		Disagree	
	No	%	No	%
1-treatment side effects make sleeping difficult	6	20.0	24	80.0
2-this treatment is worse than my illness	7	23.3	23	76.7
3-teatment side effect disrupt my sexual life	4	13.3	26	86.7
4-there is pain/discomfort from treatment	24	80.0	6	20.0
5-I am worry about treatment side effects	26	86.7	4	13.3
6-my life revolves about this treatment	26	86.7	4	13.3
7-there are many bad side effects	27	90.0	3	10.0
8-treatment side effects ruin my appetite	27	90.0	3	10.0
9-as a result of treatment, my appearance worsened	5	16.7	25	83.3
10- as a result of treatment, I do not work at my job.	8	26.7	22	73.3
11-treatment is ineffective	5	16.7	25	83.3
12-I frequently visit the clinic for treatment	2	6.7	28	93.3
13-treatment side effects disrupt my mind or memories.	7	23.3	23	76.7
14-teatment prevents me enjoying myself	3	10	27	90
15- as a result of treatment, I depend on others for help with everyday activities.	5	16.7	25	83.3
16- as a result of treatment, I am less active.	3	10	27	90
17-treatment side effects are difficult to control.	27	90	3	10
18-going for treatment burdens family.	4	13.3	26	86.7
19-my illness is getting worse.	4	13.3	26	86.7
20-all things considered treatment disrupt my life.	4	13.3	26	86.7

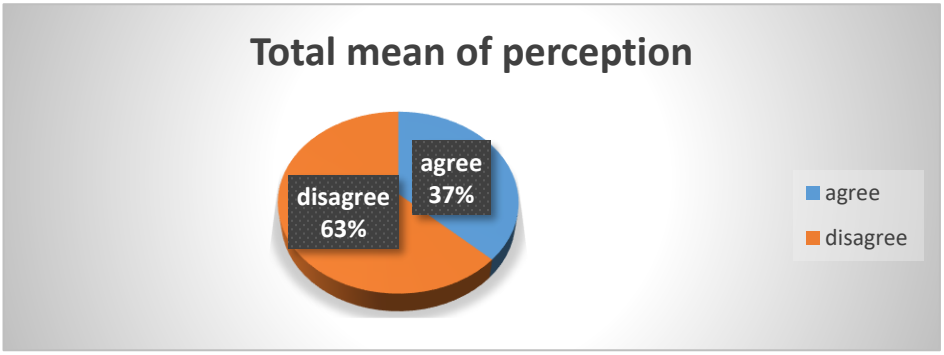

Figure (2): Total mean of perception.

Discussion

Liver transplantation is a highly complex surgical procedure of which success depends on numerous factors arising from the training and infrastructure of the institution that performs it. It is a resource used with a view to the survival of the patient with irreversible liver disease, where treatment options are ineffective. Given the complications of liver disease, the patient is at high risk of death and becomes a candidate for transplantation, however, it is important to emphasize that the possibility of surgery depends on the availability of organ donors, a factor that, because of the shortage of available organs, becomes an obstacle, reflected in the prolonged wait. Thus, the mortality rate is high in this phase, since the onset of serious complications becomes prone ***(Prochnon et al., 2022).*** So the current study aimed to assess needs and perception for patients undergoing liver transplant.

The result was presented in the following sequence: **Part 1:** was concerned with socio-demographic characteristics, patients' medical history, past history and family history related to disease. **Part 2:** was concerned with needs assessment domains (physical, psychological, social and learning) of patients under the study. **Part 3:** was concerned with the relation between needs assessment domains and patients' socio-demographic characteristics. **Part 4:** was concerned with assessment of patients' perceptions and relation between patients' socio-demographic characteristics. **Part 5:** was concerned with the relation between total patients' needs and total perceptions.

Part 1: Socio-demographic characteristics, patients' medical history, past history and family history related to disease.

Regarding to age of the studied patients, the present study result showed that 70% of the studied patients were with age group more than 40 years. This could be due to that that liver transplant recipients in Egypt take time until they found the matching donor and the fund. Also, it could be due to that middle age patients had healthy hepatic synthetic function than the older ones.

The present study results go in the same line with ***Garcia et al., (2018)*** who applied study entitled "Social support for patients undergoing liver transplantation in a Public University Hospital" and found that, highly percentage of the studied patients their age was > 50 years old.

As regard to marital status, the current study result mentioned that the most of the studied patients were married. This result is supported by ***Peixian et al (2012)*** who studied "the health related quality of life of recipients after liver transplant (LT)" and ***Santo (2010)*** who studied "the anxiety levels observed in candidates for (LT)" they found that the majority of the liver transplant recipients were married and minority of them were divorced.

The present study results showed that majority of patients had secondary school education, 73.3% of patients had professions requiring physical strength, and 83.3% of them had insufficient income of their own.

This result was a negative point that not help patients to identify the health needs and management. The present study result disagreement with ***Garcia et al., (2018)*** who applied study entitled "Social support for patients undergoing liver transplantation in a Public University Hospital" and found that more than half of them had elementary school.

This result was in disagreement with ***Ebraheim & Barakat, (2018)*** who applied study entitled "Health Needs Management Program and Compliance with Therapeutic Regimen among Postoperative Liver Transplant Recipients" and found that half of the studied patients were highly educated.

Regarding to present history of the studied patients the present study results illustrated that, all studied patients were suffering from disease for more than six months. They discovered their disease by signs and symptoms, and more than three quarters of them the main complaint on admission was ascites. All patients had previous hospitalization for many times, and half of them has previous ICU admission.

This finding is in accordance with ***Priya et al., (2020***) who applied study entitled "Study on Prescribing Patterns of Antimicrobial Agents in Liver Disease Patients" and reported that the chief complaints were of ascites in most of the liver disease patients.

Regarding to past history of the studied patients the current study results illustrated that, less than one quarter of patients were smokers, one third of the study group had diabetics, minority of them had hypertension, one third of them had chronic renal impairment, minority of them had previous hospital admission for surgical causes other than liver disease, and more than three quarters of them had no history of allergy. These results are supported by ***Rachwan et al., (2021)*** who applied study entitled " cirrhosis and significant coronary artery disease-peri-liver transplantation (CAD-LT) score effectively predicts risk of significant coronary artery disease in liver transplant candidates" and found that, one third of the study group had diabetics, low percentage of the studied patients had hypertension while highly percentage of the studied patients were smokers.

As regard to family history of the studied patients the current study results showed that, more than half of patients had family history of liver disease with no family history of liver transplantation. This result reflects the importance of family history in heredity of diseases. This finding is in accordance with ***Rachwan et al., (2021)*** who showed that the studied patients hadn't family history of liver transplantation.

Part 2: Needs assessment domains (physiological, psychological, social and learning) of patients under the study.

Regarding to physiological domain of the patients' needs the present study result illustrated that majority of patients suffered from difficult breathing, leg odema, and muscle cramp and all of patients suffered from distractibility and imbalance preoperatively.

The present study result is in accordance with ***Al-Saaid, (2019)*** who applied study entitled "Effect of Counseling on Liver Transplantation Recipients Compliance with Therapeutic Regimen" and reported that, highly percentage of the studied patients suffer from difficulty in breathing. While disagree in relation to odema; less than half of them suffer from odema.

Concerning to physiological domain of the patients' needs the present study results illustrated that, all patients had abdominal pain, nausea, vomiting, heart burn, more than one half of them suffered from hematemesis preoperatively, and 100% of them had nausea and vomiting, 53.3% had heart burn postoperatively. This may be due to duration of disease and side effect of medication.

This finding was contrasted with ***Xie et al., (2021)*** who conducted study entitled " Preliminary single center experience of Helicobacter pylori eradication among the liver transplant recipients" and revealed that, minority of the studied patient s had nausea, vomiting and heart burn.

As regard to physiological domain of the patients' needs the present study results illustrated that all married patients (93.3% of patients) suffered from sexual disorders, majority of them suffered skin pigmentation, two thirds of them suffered from constipation and polyuria, majority of them suffered from urticaria.

The present study results are supported by ***Burra and Germani (2013)*** who conducted study entitled "Long term quality of life for liver transplant recipients, Padua University Hospital, Padua, Italy " and found that, the studied patients undergoing liver transplant suffer from sexual disorder and a significant improvement of sexual function after transplantation among such group of patients. Also this finding was in agreement with ***Kavousanaki et al., (2019)*** who applied study entitled " Liver transplantation for familial amyloid polyneuropathy (Val30Met): Long-Term Follow-up prospective study in a non-transplant center" and mentioned that, more than two thirds of the studied patients suffer from constipation.

Regarding to psychological domain of the patients' needs the current study results illustrated that, most of studied patients were afraid of disease progression, worry about the surgical intervention. The majority of them became easily annoyed, sometimes crying, feel low self-esteem and were not coping with the new situation of the disease. This may be attribute to the importance of education on coping abilities which in turn allay stress, tension and anxiety and also reflects positive effect of health needs management program in improving of psychological needs of patients under study. Also the health need management program helps the patients to express their worries and fears regarding organ rejection and the surgical complications.

The present study results were supported by ***Al-Saaid, (2019)*** who found that, highly percentage of the studied patients were afraid from progress of my condition. While more than one third of them were can't cope up with changes.

As regard to social domain of the patients' needs the current study result illustrated that all of studied patients the disease interfered with their jobs, social activities, finance. They all had emotional support from their families, and minority of them did not look for enjoying their lives.

The social dysfunction may be attributed to that the studied patients suffered from dependency which is enough to interfere with normal social activities and interpersonal relations.

This finding was in accordance with ***Miyazaki et al., (2010)*** who conducted study entitled " Patients on the waiting list for liver transplantation: caregiver burden and stress" and found that, highly percentage of the studied patients had negative effects on their social activities.

All patients we studied had social support from their families, this result was contrasted with ***Garcia et al., (2018)*** who applied study entitled " Social support for patients undergoing liver transplantation in a Public University Hospital" and mentioned that, the studied patient undergoing liver transplant had a negative effect on social support. This may be because of 53% patients they studied had liver transplantation for alcoholic hepatitis who had low social support, other than our patients that most of them had viral hepatitis.

As regard to learning domain of the patients' needs, the current study results illustrated that most of studied patients needed to know about postoperative pain management, the majority of them needed to know how to do postoperative exercise, and less than half of them needed to know the hospital-stay period. This might be due to patients worried about disease and process of operation.

As regard **to *Ebraheim & Barakat, (2018)*** mentioned that, the studied subjects are willing to enhance their knowledge and skills as well as they have many questions and much to learn to meet with their health needs for maintaining a healthy life and protecting themselves from complications. Also ***Ko et al., (2016)*** who conducted study entitled "Informational Needs of Liver Transplant Recipients during a Two-Year Post Transplant Period" clarified that liver transplant recipients with higher education had greater informational needs. Patients with low socioeconomic status are unwilling to attend health educational program because of low education and health awareness to be engaged in positive health behaviors.

Additionally, ***El Shafee, (2016)*** who applied study entitled "Impact of an instructional scheme for patients undergoing liver transplantation surgery on their performance and health outcomes" stated that implementation of instructional education of liver transplant patients and their families can improve their knowledge and awareness of post-transplant regimens and self-care techniques can lead to improves outcomes.

As regard to total mean of needs domains of the studied patients, the current study result showed that the highest patients' needs were the psychological needs followed by social needs and physiological needs while learning needs were at lowest.

The present study result was disagreeing with ***Al-Saaid et al., (2019)*** who found that, more than two fifths of the liver transplant recipients had psychological alteration. While this finding was contrasted with ***Bawnik and Saab (2009)*** who studied "health related quality of life after liver transplantation for adult recipients" stated that the majority of studied patients' needs were physical and mental components of health related quality of life scores were improved.

Part III: The relation between needs assessment domains and patients' socio-demographic characteristics.

As regard to relation between patients' needs domains and their age, the present study result presented a highly statistically significant difference between patients' age regarding their psychological and physiological needs domains (F= 11.017 &3.942 respectively) with P<0.01 as psychological needs are high in (>40) years age group and physiological needs are high in (30-40) years age group than other age groups. There was no significant difference between patients' age groups regarding their social and

learning needs. The present study result was in disagreement with ***Gomez et al., (2019)*** mentioned that Social support was higher when the age of the patients was (18–30 years), probably due to the fact that younger patients had parents - an important source of social support.

As regard to relation between patients' need domains and their gender, the current study results presented a statistically significant difference between patients' gender regarding their learning needs domains (F=4.397) with P<0.05. This result was contrasted with ***Dąbrowska-Bender et al., (2016)*** who conducted study entitled "Assessment of the quality of life in patients after liver transplantation as an important part of treatment results" and found that there was no significant correlation found between the patients' needs and socio-demographic such as age, gender.

As regard to relation between patients' need domains and their marital status, the present study result presented that there was a statistically significant difference between patients' marital status regarding their learning needs domains (F=1.883) with P<0.05. This result was contrasted with ***Viswanath & Nathan, (2017)*** who applied study entitled "Assessment of health related quality of life among liver transplant recipients" and found that health needs domain a significant association was found with level of education (p<0.05).

As regard to relation between patients' need domains and their educational level, the present study result showed that there was no statistically significant difference between patients' educational levels and their psychological, social, and physiological, and learning needs. The present study result was in disagreement with ***Saab et al., (2011)*** who applied study entitled "Differences in health-related quality of life scores after orthotopic liver transplantation with respect to selected socioeconomic factors" mentioned that there was highly statistical significant relation between physical function and educational level.

As regard to relation between patients' need domains and their work statues, the current study result showed that there was no statistically significant difference between patients' work status and their psychological, social, and physiological, and learning needs. This result was contrasted with ***Mokbel et al., (2020)*** who applied study entitled "Biopsychosocial needs of patient after Liver transplantation during follow up period" and showed that there was statistically significant relation between patient's biopsychosocial needs and their age.

As regard to relation between patients' need domains and their occupation type, the current study result showed that there was no statistically significant difference between patients' occupation type and their psychological, social, and physiological, and learning needs. This result was contrasted with ***Viswanath & Nathan, (2017)*** who found that health needs domain a significant association was found with education and occupation (p<0.05).

As regard to relation between patients' need domains and their income, the present study result showed that there was no statistically significant difference between patients' income and their psychological, social, and physiological, and learning needs. This result was in disagreement with ***Mokbel et al., (2020)*** who showed that there was statistically significant relation between patient's biopsychosocial needs and income.

Part IV: Assessment of patients' perceptions and relation between patients' socio-demographic characteristics.

As regard patients' perception, the current study results showed that the majority of the studied patients disagree in relation to treatment side effect. As regard to total mean of perception, the current study result less than two third of the studied patients were disagree.

This result was contrasted with ***Moayed et al., (2019)*** who applied a study entitled "Barriers to Adherence to Medical Care Programs in Liver Transplant Recipients" and showed that the studied Recipients reported that barriers to adherence to medical treatment; I think that these are the side effects of medications, I had a transplant, but I got worse instead of getting better.

However, this result was supported by ***Kartal et al., (2023)*** who applied a study entitled "The effect of illness perception levels of liver transplant patients receiving immunosuppressive therapy on their rational drug use levels" they reported that patients had

a moderate level of illness perception they also determined that Increasing illness perception level in parallel to increasing education level and rational drug use indicates the importance of education in this regard.

The relation between total patients' needs and total perceptions

As regard to relation between patients' perceptions and their Socio-demographic characteristics, the current study result showed that there is no statistically significant difference between patients' sociodemographic data and their perception. This result was contrasted with ***Bülbüloğlu & Demir, (2021)*** who applied study entitled "The effect of perceived social support on psychological resilience in liver transplant patients receiving immunosuppression therapy" and reported that the psychological resilience of the patients and their perceived social support was found to be low.

Conclusion

Based on the findings of the present study, it can be concluded that, the highest patients' needs were the psychological needs (87.3%) followed by social needs (71.5%) and physiological needs (48.2%) while learning needs were at lowest (36%). and 63% of them had perception regarding liver transplantation.

Recommendation

Based on the findings of the current study, the following recommendations are suggested

- Learning guidelines should be provided for patients undergoing liver transplantation start from admission until discharge from the hospital.

- A simple booklet should be provided for patients undergoing liver transplantation needs including all aspects such as medications, nutrition, daily activity, follow-up and early warning signs of infection and its prevention which may be a guide and reference to them.

- Replication of the study on a larger population selected from different geographical areas in Egypt to be generalized.

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Conflict of interests

The authors declare no conflict of interest.

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