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Health Needs Management Program and Compliance with Therapeutic Regimen among Postoperative Liver Transplant Recipients

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Abstract

Liver transplant recipients 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. The **aim** of this study was to The aim of this study was to assess the effect of health needs management program on liver transplant recipients' needs and their compliance to therapeutic regimen .Research design: A quasi experimental design was utilized to meet the aim of the study. **Setting**: The study was conducted in liver transplantation outpatient clinic at El Manial Cairo University hospital. Subjects: A purposive subjects of 40 patients post liver transplantation surgery from the liver transplantation outpatient clinic. **Tools**: A) Patient structured interviewing questionnaire to assess demographic characteristics among study subjects. B) Patients 'needs assessment tool to assess the following: 1. physical needs, 2. psychological needs, 3. social needs, 4. spiritual needs.5.educational needs C) Patients' compliance questionnaire. **Results**: there were statistically significant differences among study subjects between pre and post program implementation regarding physical, psychological, social and educational needs. Furthermore, there were highly statistically significant differences between pre and post program implementation phases regarding all items of compliance among study group subjects. **Conclusion**: this study concluded that health needs management program had a positive effect in improvement of overall physical, psychological, social and educational needs of the recipient a well as their compliance to the therapeutic regime post program implementation. **Recommendation**: Health care providers specially nurses should develop time specific education programs based on liver transplant recipients' educational needs at different post transplant times to maintain patients' compliance .

Key words: Compliance, Liver Transplantation, Needs, Therapeutic Regimen.

Introduction

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 the1970s to almost 80% today. 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 **(Masala,**

et al., 2012 and Gad, Al Sebaey , Lotfy , Eltabbakh and Sherif , 2015).

According to the latest WHO data published in 2017 Liver Disease Deaths in Egypt reached 53,687 or 10.45% of total deaths. The age adjusted Death Rate is 84.71 per 100,000 of population ranks Egypt #1 in the world **(World Health Organization (WHO), 2017).**

Liver transplant 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. Therefore, it is important for liver transplant clients and their families to have relevant knowledge concerning the basic process involved with liver transplant, to manage some of the challenges and complications facing them, and to recognize symptoms that should alert recipients to seek medical help **(Singh ,2012 and El-Gamal, 2013).**

Compliance is the extent to which a person's behavior aligns with medical or health advice, most commonly it refers to medication compliance, but can also apply to other medical instructions, use of self-care or self-directed exercise, pain and stress management strategies. Compliance aims at promote healthy lifestyles to optimize health outcomes for patients undergoing liver transplantation. Raising awareness about the importance of patients' compliance with medical instruction has positive effects on patient recovery and satisfaction. The nurse has important role in providing access to patients' education to improve their knowledge, skills and compliance **(Hinkle and Cheever, 2014).**

Health needs are often differentiated as needs, demands, and supply. Need in health care is commonly defined as the capacity to benefit. If health needs are to be identified then an effective intervention should be available to meet these needs and improve health. There will be no benefit from an intervention that is not effective or if there are no resources available **(Ho, Lee, Cheng, Hu, Wu, and Hoa, 2016).**

The post discharge problems postoperative liver transplantation were difficulty with reading medication labels, not getting the help they needed, not being aware of available services, informational deficits, symptoms distress, social problems and emotional problems as anxiety and uncertainty. Home care reduces the costs and should focus on a chronic care model of patient education and on empowering both the patient and the family to take responsibility for the care **(Grattagliano, 2011 and Zarrinpar & Busuttil, 2013).**

Patients after liver transplant surgery suffer from a chronic condition, which by itself entails risks and health problems. Thus, patients who are capable of understanding the transplantation can also change their living experience. They need to learn how to deal with new drugs, take them for the rest of their lives, besides adhering to lifestyle changes, including hygiene practices, infection prevention, monitoring of the new organ's functioning, body image changes and adaptation to mood and energy level swings, professional issues, among others **(Mendes, Junior. Ziviani, Zago and Galvão, 2013).**

Nurses are the health team members who spend most time with the patient, giving them an essential role as educators in the different learning needs diseases demand. Therefore, these professionals' scientific background is relevant with a view to putting in practice effective strategies to promote changes in patients' behavior, attitudes and lifestyles. The nurse's role in patient

education is of utmost importance but also a challenge, particularly in liver transplantation. Nurses perform learning activities for patients and their relatives concerning long-term measures to promote health. By doing so, patients are able to understand the rationale and importance of following the therapeutic regimen proposed by the transplantation team, as well as to identify signs and symptoms that may unveil a health-related problem **(Kozier, Erb, Berman, Snyder, Lake and Harvey, 2010 and Bhat Al-Busafi , Deschênes & Ghali , 2014).**

Significance of the study:

The numbers of patients undergoing liver transplantation are increasing in Egypt; nursing has a significant role and responsibility for planning, administering, and evaluating the care of liver transplantation patient as a member of the team. Needs assessment is used to determine the programs requiring attention and the way to best meet these needs **(Amer & Marwan, 2016).**

Recent researchers always recommend patient education for organ transplant to reduce anxiety levels and improve biopsychosocial variation, permit patients to return earlier to work, as well as improvement of patient compliance to therapeutic regimen. This study conducted to ensure LT patient's compliance with therapeutic regimen through implementation of health needs management program.

Aim of the study:

The aim of this study was to assess the effect of health needs management program on liver transplant recipients' needs and compliance through the following:

1. Assessing recipient's needs as regard to physical, psychological, social, spiritual, and educational domains.
2. Assessing recipient's compliance pre program implementation.
3. Planning and implementing the health needs management program based on need assessment.
4. Evaluating the effect of health needs management program on liver transplant recipient's needs and compliance to therapeutic regimen.

Research hypothesis:

This study hypothesized that:

1. Health needs management program will statistically significantly improve physical, psychological, social, spiritual, and educational needs post program implementation
2. Health needs management program will statistically significantly enhance compliance of liver transplant recipients to therapeutic regimen.

Operational Definitions

- **Health needs management program:** means development of educational program based on physical, psychological, social, spiritual and educational needs and aiming to reducing these needs.
- **Compliance:** the degree to which a patient correctly follows treatment regimen including, medications, nutrition, wound care, daily living activities, follow up and precautions /preventive measures of complications.

Subjects and Methods:

Research Design*:*

A quasi-experimental design study was utilized to meet the aim of this study.

Setting of the study:

The study was conducted in liver transplantation outpatient clinic at El Manial Cairo University hospital.**Research Subjects:**

A purposive subject, of 40 patients post liver transplantation surgery from the liver transplantation outpatient clinic were included in the study. The subjects were assessed twice, pre and post program implementation and the effect of health needs management program was evaluated one month after program implementation in order to evaluate the effect of the health needs management program on the patients compliance and their needs.

Inclusion criteria:

Patients included in this study were those fulfilling the following criteria including; adult patients from both gender, accepted to participate in the study, post-operative patients after liver transplantation surgery and free from immediate post-operative complications and were at least two weeks post discharge in the follow-up period.

Tools of the study:

Data were collected by the following tool:

1- Patient structured interviewing questionnaire:

It is developed by the researcher in simple Arabic language, based on recent literature; it was filled in by the researcher. It concerned with demographic characteristics of the patients under study such as (age, gender, and level of education, residence, marital status & type of work).

2- Patients 'needs assessment tool

This tool was developed by the researcher in a simple Arabic language based on reviewing the related literatures. It consisted of five parts as following:

It includes the following parts:

First part: concerned with physical needs assessment

It consisted of two sections:

A-Physical needs assessment as regard to body system alterations including; cardio vascular, respiratory, neurological, gastrointestinal tract, elimination, skin, activity & movement, rest & sleep and sexual assessment. It includes (43) items. This part is developed by the researcher based on **Hall & Guyton (2016) and Lewis Heitkemper, Dirksen and Bucher (2016):** This tool was assessed twice; pre and post program implementation.

Scoring system

Each alteration as reported by patient got one grade and absence of alteration got 0 grades. The sum alterations of each system were summed and total mean scores were attained. Total alteration for each system /total systemic alterations is considered when statistically each study subject report 60% of alteration for each system/all systemic alterations.

B- Physical needs assessment as regard to daily living activities using Katz scale:

It is a standardized tool to assess functional status as a measurements of the patient`s ability to perform activities of daily living independently, it is adopted from **(Shelkey & Wallace, 2007).** It is translated into Arabic language and retranslated to ensure its validity .It was used to detect

problems in performing activities of daily living. The index ranks adequacy of performance in the six functions of bathing, toileting, transferring, continence and feeding. The instrument is most effectively used among older adults in a variety of care settings.

Scoring system

Each function is rated on a two point scale.

0:- dependant 1:- independent

The total score for ADLs, range from 0 to 6, the patient`s score were collected and ranged as following, a score of 6 indicates full function, 4 indicates moderate impairment, and 2 or less indicates severe functional impairment.

Second part: concerned with the psychological needs assessment using anxiety, depression and stress scale (DASS); it is standardized scale, adopted from **(Tran, Tran, Fisher, 2013)**.it is translated into Arabic and retranslated to assure validity. It includes 21 item self report questionnaires to assess the severity of depression, anxiety and stress. Each item is scored from 0 (no response) to 3 (worst response).

Scoring system

The scale to which each item belongs is indicated by the letter D (Depression), A (anxiety) and S (stress). For each scale (D& A and S) sum the scores for identified items.

The total score of each item was categorized as following:-

Level	Depression	Anxiety	Stress
Normal	0-4	0-3	0-7
Mild	5-6	4-5	8-9
Moderate	7-10	6-7	10-12
Severe	11-13	8-9	13-16
Extreme severe	14+	10+	17+

Third part: concerned with the social needs assessment using Social dysfunction rating scale. It is a standardized scale adopted from **Linn, Sculthorpe, Evje, Slater, and Goodman, (1969)**. It is a 21- item scale which measure the negative aspect of an individual`s social adjustment translated and retranslated was done. Three major categories have been made in this scale, the self- perception, interpersonal relations, and social performance.

Scoring system

Each item is ranged from 0-5, classified as following:-

0:- very severe 1:-severe

2:- moderate 3:- mild

4:- very mild 5:- no

The total score (100) is divided as following:-

0<20:- very high level of social dysfunction.

20<40:- high level of social dysfunction.

40<60:- moderate level of social dysfunction.

60<80:- mild level of social dysfunction.

80<100:- no social dysfunction.

Fourth part: concerned with the spiritual needs assessment. It includes (5) items. It is developed by the researchers based on related literatures **(Hodge, 2006 and Yong, 2008).**

The scoring system

The alternatives for the replies are graded from 0-1, (0) for YES response and (1) for No response the total score can vary from 0–5, and higher values reflect more spiritual needs.

Fifth part: it concerned with educational needs assessment regarding liver transplantation, this part was developed by the researcher based on relevant literatures **(Myers and Pellino, 2009 ; Mendes, Rossin, Ziviani, Castro-e-Silva & Galvão, 2012 and Mendes, Silveira, Curvo, & Galvo, 2016):** It include assessment of patients knowledge regarding liver transplantation surgery, the warning signs of complications post-surgery, signs & symptoms of rejection, measures of prevention of infection and/or bleeding as well as knowledge about medication & nutrition and, daily activity and instructions regarding precaution and prevention of complications. It includes (52) items.

The total score was divided into two categories as follows:

- Less than 70%, the patient level of knowledge was considered unsatisfactory level.
- ≥70%, the patient level of knowledge was considered as satisfactory level.

3-Patients'compliance questionnaire

It concerned with evaluation of liver transplant recipient's compliance to therapeutic regimen post liver transplant surgery. It was adopted from **Burra et al., (2011) and Eberlin, Otto & Krämer (2013)** and modified by the researchers .The assessment done twice throughout the study pre and post the program implementation. It was divided into sex sections as the following; assessment of patients' compliance regarding , medications regimen (8 items), The diet regimen (8 items), The wound care (2 items) ,The activity regimens (5 items) , The follow up schedule (2 items) ,Precautions for prevention and early detection of complications (7 items).

The scoring system

All of this items were checked as (yes) or (no) answer, (yes) answer got (1) grade, while (No) answer got (0) grade with total score (35).

The total score was divided into two categories as follows:

- Less than 60% the patient was graded as incompliance to his post-operative therapeutic regimen
- 60% and above the patient was graded as compliance with his post-operative therapeutic regimen.

Content validity and reliability:

Validity:

Content validity will be conducted to determine whether the tool cover its aim through a group of jury of 7 experts in the field of medical surgical nursing and psychiatric nursing at the faculty of Nursing, Ain Shams University, The study tool will be reviewed regarding the clarity, relevancy, comprehensiveness and simplicity.

The Reliability:

It tested by using Cranach alpha test the reliability score of tool is (0.74, 0.79 and 0.81) for patients interview questionnaire,

patient needs assessment sheet and Patients 'compliance questionnaire respectively.

Operational design

The operational design includes (preparatory phase, pilot study and field work)

Preparatory phase:

It included reviewing of the current related available literature and theoretical knowledge of the various aspects of these issues, using books articles, periodicals, magazine and internet in order to develop the tools for data collection.

Pilot study:

Before performing the actual study, a pilot study was done on 4 patients (equal 10% of the study group). The pilot study was conducted to assess tools applicability and feasibility and time needed to answer it. Minimal modification was done foe data collection tools. So the patients included in the pilot study did not excluded from the study subjects.

Field Work:

This study was conducted through four phases: assessment, Planning, implementation and evaluation.

Assessment phase

This phase aimed at collecting data from patients under the study to identify the patients' needs including; physical, psychological, social, spiritual, and educational needs in addition to patients' compliance before educational program implementation.

Planning (preparatory) phase

Based on the assessment phase, the program content and media (in the form of the program booklet, posters, and visual materials) were prepared by the researchers for patients under the study based on their needs.

Implementation phase

Data collection was started and completed within 14 months including post test in the period from beginning of August 2016 until end of September 2017 (in order to collect appropriate sample size for statistical analysis). Data were collected two days /week from 9 am to 3 pm according the out-patient clinic visiting hours and the presence of the patients. Every patient was interviewed individually by the researchers at the out-patient clinic. The educational program sessions were planned and implemented according to each patient' needs. Each session lasted from 30-45 minutes.

Purpose of study was explained by the researcher to patients who agreed to participate in the study prior to any data collection; the study tools were filled in and completed by the researcher on 2 stages (pre and post implementation of educational program).Educational program was given for each patient according to their needs using booklet with different teaching methods. Researchers' telephone numbers and email address were given to the studied patients and patients' telephone during follow up visits in outpatient clinics to complete data collection during follow up period.

The study subjects were exposed to the educational program activities which are 6 consecutive sessions over four weeks (2 practical session & 4 theoretical sessions). Each session lasted from 30 to 45 minutes. Theoretical sessions included the information regarding liver transplantation purposes, advantages, complications, and

immunosuppressive medications, warning signs of potential complications, instructions regarding preventive measures of complications, medications, nutrition and daily living activities. Practical sessions included practices regarding infection control measures, physical exercises and wound care.

Evaluation phase

The evaluation phase was emphasized on estimating the effect of the health needs management program on patient's needs and compliance to the therapeutic regimen pre and post- program implementation using study collection tools. The evaluation was done one month post program implementation to assess retained knowledge and compliance one month post program implementation.

I- Administration design.

An official permission was taken from the director of liver transplantation unit at El Manial Cairo University hospital which the study was conducted.

II- Statistical design.

Data were presented in tables and charts. Data were analyzed using Statistical Program for Social Science (SPSS) version 20.0. Quantitative data were expressed as mean± standard deviation (SD), T-test. Qualitative data were expressed as frequency and percentage.

The following tests were done:

- Chi-square (X2) test of significance was used in order to compare proportions between two qualitative parameters.
- The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant as the following:
- Probability (P-value)

– P-value <0.05 was considered significant.

– P-value <0.001 was considered as highly significant.

– P-value >0.05 was considered insignificant.

Ethical consideration

Purpose of the study was explained to the patients who agree to participate in the study prior to any data collection they were assured that any anonymity and confidentially would be guaranteed and the right to withdraw from the study at any time. Ethics, values, culture and beliefs was respected.

Limitation of the study

Time for data collection at pre-program implementation phase was long to collect appropriate study sample according to inclusion criteria.

Results:

The presentation and analysis of data obtained in this study will be displayed under four parts:

Table (1): Frequency distribution of the studied subjects regarding demographic characteristics (n=40).

Item	No.	%
Age (years) Mean±SD 48.58±7.97		
20<40	4	10
40<60	36	90
≥ 60	0	0
Gender		
Female	11	27.5
Male	29	72.5
Marital status		
Single	0	0
Married	38	95
Divorced	2	5
Educational level		
Illiterate	4	10
Read & write	10	25
Basic	7	17.5
High	19	47.5
Job/work		
Sedentary /professional	26	65
Manual work	14	35
Residence		
Urban	17	42.5
Rural	23	57.5

Table (1) shows that 90% of study subjects their age group was 40-<60 years with mean age 48.58±7.97. Regarding the gender 72.5% of the study subjects were males, and 47.5% of them were highly educated while (35%) of them have sedentary/professional jobs. Regarding marital status, it was found that 95% of the study subjects were married, also 57.5% of them are from rural residence.

Table (2): **Comparison of physical needs as regards to systemic alterations among study subjects pre and post program implementation (Total n=40).**

Physical Needs	Pre		Post		x2	P value
	No.	%	No.	%		
Systemic Alterations						
Respiratory system	18	45	5	12.5	9.585	0.002*
Cardiovascular system	16	40	5	12.5	7.055	0.008*
Nervous system	21	52.5	6	15	11.891	0.001**
GIT alteration	19	47.5	6	15	9.109	0.003*
Movement\ Activity	31	77.5	20	50.0	6.545	0.011*
Elimination	10	25	2	5	5.342	0.021*
Skin alteration	19	47.5	2	5	18.196	0.001**
Comfort and sleeping	21	52.5	7	17.5	10.057	0.001**
Sexual relations	32	80	20	50	7.197	0.007*
Total	**19**	**47.5**	**7**	**17.5**	**7.671**	**0.003***

** Highly Significant (HS) = p < 0.001 * Significant (S) = p < 0.05

Table (2): This table clarifies that there were statistically significant differences among study subjects between pre and post program implementation regarding systemic alterations of respiratory, cardiovascular, GIT, movement & activity and elimination systems at p= 0.002, 0.008, 0.003, 0.011, 0.021 and 0.007 respectively, While highly statistically significant differences were detected among them regarding systemic alterations of nervous system, skin and comfort & sleeping at p <0.001. The results also reveals that there were statistically significant differences among study subjects between pre and post program implementation regarding the total systemic alterations at p = 0.003.

Table (3): Comparison of physical needs as regards to performance of daily living activities among study subjects pre and post program implementation (Total n=40).

Item	Dependency Pre		Dependency post		x2	p
	No.	%	No.	%		
Activities of Daily Living						
Bathing	13	32.5	1	2.5	12.468	0.001**
Dressing	6	15.0	1	2.5	3.914	0.048*
Toileting	15	37.5	2	5.0	12.624	0.001**
Transferring	38	95.0	17	42.5	25.658	0.001**
Continence	5	12.5	0	0.0	5.333	0.021*
Feeding	23	57.5	7	17.5	13.635	0.001**
Total	**19**	**47.5**	**7**	**17.5**	**6.893**	**0.009***

** Highly Significant (HS) - p < 0.001 * Significant (S) - p < 0.05
Dependency: i.e. patient is dependent when performing daily living activities

Table (3): as shown from this table, there were a marked decrease of number of dependent patients between pre and post program implementation phases with highly statistically significant differences detected regarding dependency of performance of bathing, toileting, transferring and feeding at p <0.001. In addition, It is noticed that the percentage of dependent patients at pre-program implementation phase was decreased from 47.5% at pre- program implementation phase to 17.5% at post-program implementation phase with statistically significant difference at p= 0.009.

Table (4): Comparison of Psychological Needs using DASS Scale among study subjects pre and post program implementation (Total n=40).

Psychological Needs	Pre		post		x2	p
	No.	%	No.	%		
Depressive symptoms						
Mild	21	52.5	28	70.0	12.468	0.001**
Moderate	13	32.5	9	22.5		
Severe	7	17.5	3	7.5		
Anxiety symptoms						
Mild	19	47.5	28	70.0	3.914	0.048*
Moderate	15	37.5	11	27.5		
Severe	6	15.0	1	2.5		
Stress symptoms						
Mild	16	40.0	20	50.0	12.624	0.001**
Moderate	9	22.5	11	27.5		
Severe	15	37.5	2	5.0		
Total						
Mild	19	47.5	25	62.5	9.893	0.001**
Moderate	12	30.0	10	25.0		
Severe	10	25.0	5	12.5		
** Highly Significant (HS) = p < 0.001 * Significant (S) = p < 0.05						

Table (4): regarding psychological needs among the study subjects, pre and post program implementation, there were highly statistical significant differences regarding levels of depressive and stress symptoms (p= <0.001), while, there was a statistically significant difference among them regarding levels of anxiety symptoms (p =.0.048). Also, the results showed highly statistically significant difference regarding total level of psychological alterations at pre and post program implementation phases at p <0.001.

Table (5): Comparison of social needs using Social Dysfunction Rating Scale among study subjects pre and post program implementation (Total n=40).

Items	Pre		post		x2	p
	No.	%	No.	%		
Self- perception						
Mild	14	35.0	28	70.0	26.476	0.001**
Moderate	16	65.0	10	25.0		
Severe	10	25.0	2	5.0		
Interpersonal relations						
Mild	13	32.5	29	72.5	22.550	0.001**
Moderate	20	50.0	11	27.5		
Severe	7	17.5	0	0		
Social performance						
Mild	12	30.0	31	77.5	7.813	0.005*
Moderate	15	37.5	8	20.0		
Severe	13	32.5	1	2.5		
Total						
Mild	13	32.5	29	72.5	18.7	0.001**
Moderate	17	40.25	10	25.0		
Severe	10	27.25	1	2.5		
** Highly Significant (HS) = p < 0.001 * Significant (S) = p < 0.05						

Table (5): illustrates categories and levels of social dysfunction among the study subjects pre and post-program implementation using social dysfunction rating scale. It was noticed that 40.25% & 27.25% of study subjects had moderate and severe total social dysfunction at pre program implementation phase as compared to 25% and 2.5% of them at post program implementation phase with highly statistically significant differences regarding total levels of social dysfunction between pre and post program implementation phases at p <0.001.

Table (6): Comparison of Spiritual needs among study subjects pre and post program implementation (Total n=40).

Spiritual Items	Pre		post		X2	p
	No.	%	No.	%		
Able to do daily religious activity	24	60.0	22	55.0	2.484	0.146
Feeling comfort and psychological support from religious activity	21	52.5	18	45.0	2.461	0.182
Feeling closed connection with God	39	97.5	37	92.5	2.461	0.182
Having positive meaning and perception about life as acceptance	23	57.5	20	50.0	2.256	0.167
Surgery cause positive change in life	24	60.0	21	52.5	2.092	0.155
Feeling of inner peace	25	62.5	22	55.0	1.918	0.142
Total	**22**	**55.0**	**20**	**50.0**	**2.482**	**0.184**
Not significant (NS) = p > 0.05						

Table (6): shows that there were non-significant changes among study subjects regarding all items of spiritual needs pre and post program implementation phases at p >0.05.

Table (7): Comparison of satisfactory level of knowledge among study subjects pre and post program implementation (Total n=40).

knowledge	Satisfactory level Pre		Satisfactory level post		X2	p
	No.	%	No.	%		
Definition of liver transplant	19	47.5	38	95.0	22.061	0.001**
Purpose of liver transplant	23	57.5	29	72.5	4.692	0.196
Advantages of liver transplant	38	95.0	35	87.5	0.626	0.429
Importance of immunosuppressive	31	77.5	39	97.5	12.468	0.001**
Characteristics of the donor	37	92.5	40	100.0	3.117	0.077
Warning signs for potential complications	6	15.0	32	80.0	53.334	0.001**
Preventive measures for complications as:						
Rejection	16	40.0	40	100.0	34.286	0.001**
Infection	17	42.5	40	100.0	32.281	0.001**
Bleeding	8	20.0	39	97.5	49.568	0.001**
Instruction regarding						
Medications	12	30.0	39	97.5	38.498	0.001**
Nutrition	3	7.5	40	100.0	68.837	0.001**
Daily living activities	11	27.5	36	90.0	32.237	0.001**
Total Satisfactory level of knowledge	**16**	**40**	**32**	**80**	**22.491**	**0.001****

** Highly Significant (HS) = p < 0.001 * Significant (S) = p < 0.05
Satisfactory: ≥70%, Unsatisfactory: <70%

Table (7): shows that there were highly statistically significant differences between the result of the pre & post program satisfactory scores of knowledge among study subjects regarding all items except; Purpose of liver transplant , advantages of liver transplant and Characteristics of the donor at p=0.196, 0.429 and 0.077 respectively. Also there was highly statistical significant difference between pre and post-program implementation phases regarding total satisfactory level of knowledge at p. <0.001.

Table (8): Compliance with therapeutic regimen among study subjects pre and post program implementation (Total n=40).

Compliance items	Pre		Post		X2	p
	No.	%	No.	%		
Medications	27	67.5	39	97.5	7.790	0.001**
Nutrition	17	42.5	40	100.0	32.281	0.001**
Wound care	11	27.5	36	90.0	32.237	0.001**
Physical activity and daily living	8	20.0	37	92.5	42.217	0.001**
Follow up schedule	23	57.5	40	100.0	21.587	0.001**
Precautions for prevention and early detections of complications (rejection, bleeding & infection)	7	17.5	33	82.5	33.800	0.001**
Total compliance	**17**	**42.5**	**34**	**85**	**17.481**	**0.001****
** Highly Significant (HS)= p < 0.001						

Table (8): clarifies that there were highly statistically significant differences between pre and post program implementation phases regarding all items of compliance among study group subjects at p <0.001. The total compliance was statistically significantly improved among study subjects from 42.2% pre program implementation to 85% post program implementation at P-Value <0.001.

Table (9): Correlations between total compliance to therapeutic regimen among study subjects and their total physical, psychological, social, spiritual, and satisfactory level of knowledge post program implementation (Total n=40).

Variables	Compliance to therapeutic regimens	
	r	p-value
Total physical needs	-0.375	0.001 **
Total Psychological needs	-0.380	0.001 **
Total Social needs	-0.223	0.047 *
Total Spiritual	-0.006	0.957
Total satisfactory level of knowledge	0.507	0.000 **
** Highly Significant (HS) = p < 0.001 * Significant (S) = p < 0.05		

Table (9): Studying the relationship between the total scores of subjects' compliance to the therapeutic regimen with the physical, psychological, social, spiritual need and Total satisfactory level of knowledge among study subjects, the results revealed that there was highly positive statistical significant relationship between subjects' total compliance and total satisfactory level of knowledge post program implementation (r=.0.507). However, negative correlations can be observed between subjects' total compliance and their total physical, psychological and social needs post program implementation (r = -0.375, -0.380 & -0.223 respectively).

Discussion

Liver transplantation can be a lifesaving choice for patients with acute or chronic liver diseases. To safeguard liver function and avoid complications, recent researches and practices are aiming to develop self-management strategies based on health needs assessment **(Ko, Lee & Muehre, 2016).** So that identifying liver transplant recipients' informational needs is a crucial part of the nursing role as a key prerequisite to developing appropriate self-management education **(Mendes et al., 2013).**

As regards to the demographic characteristics among studied subjects, the current study shows that the majority of the studied subjects their age group was 40-<60 years with mean age 48.58±7.97. 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.

This result was congruent with **Paternoster et al. (2010)** and with **Guerra, Garenne, Mohamed and Fontanet (2012)** who confirmed that the age of the postoperative liver transplant recipients was above 40. As well, more than two-thirds of the studied subjects were male. This may be attributed to incidence of Schistosomiasis more among male than female. A study by **Yun et al. (2017)** supported this interpretation.

This result also was congruent by **Hussein (2012) and Mabrouk (2012)** who found that more than half of the studied subjects were males. Also, **Heneish Elbanna and Salah (2017)** found that the most of patients were male with age ranged from 40 to 63.2 years. Regarding the level of education, it was found that about half of the studied patients were highly educated. This result was a positive point that helps the researchers to implement the health need management program. This result agreed with **Masala et al. (2012)** who found that around half of liver transplant recipients got high school education.

Concerning the physical needs as regards systemic alterations among studied subjects in the current study, there was statistically significant improvement among study subjects post program implementation as compared to pre program phase regarding the total systemic alterations. The significant reduction of systemic alterations among study subjects post program implementation indicate the positive effect of health needs management program on systemic alterations

These results in the current study were supported by **Lemzyea, Dharancy, Neviere, Pruvot, Declerck, and Wallaert (2012)** in a study titled " Aerobic capacity in patients with chronic liver disease: Very modest effect of liver transplantation" that there were statistically significant improvements in the patient's physiological function after the implementation of the educational program. In the same context, **Danzinger and Kumar (2010) and Burra et al. (2013)** in their studies reported that cardiopulmonary pulmonary and sexual function alterations after transplantation were gradually recovered due to effect of patient education

Concerning the physical needs as regards to performance of daily living activities among study subjects, it was noticed that nearly half of the studied subjects reported dependency at performance of daily living activates as compared to nearly on fifth of them at pre program implementation phase with statistically significant difference between pre and post implementation scores. These results indicate improvement of performance of daily living activities post program implementation as compared to pre program implementation phase among study subjects. These results agreed with **Hazem, Bassem, Mohamed, Abdelfattah, Azzam, and Al-Hamoudiin (2010)** who found that statistical positive

correlations between the postoperative activity of daily living and patient's education. In addition, **Sharif, Mohebbi, Tabatabaee, Saberi and Gholamzadeh (2005)** found in their research findings, that there was a significant difference in three domains of Quality of life; fatigue, emotional function, worry and systemic symptoms for patients in the experimental group one day after the educational intervention.

The above results concluded that the subjects 'total physical needs either regarding total systemic alterations or performance of daily living activities in pre-progam implementation phase were obviously diminished after providing the health need management program with statistical significant difference between the result of the pre and post implementation scores that reflect positive effect of the program in improvement of physical needs post program implementation. These findings go in the same line with **Bawnik and Saab (2009),** who studied health related quality of life after liver transplantation for adult recipients and stated that after liver transplantation management the majority of physical and mental components of health related quality of life scores were improved.

As regards to the psychological needs among studied subjects in the current study, the results showed highly statistically significant differences regarding overall levels of psychological alterations at pre and post program implementation phases. This may be attribute to effect 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. Furthermore, the health need management program helps the subjects' to express their worries and fears regarding organ rejection and the surgical complications. This is congruent with **Lakdizaji, Hassankhni, Agdam, Khajegodary and Saleh (2013)** who stated that educational interventions had significant impact of promotion of quality of life in patients they added that ongoing education improved the physical and emotional dimensions of quality of life.

Regarding social needs, the results of current study illustrates categories and levels of social dysfunction among the study subjects pre and post-program implementation using social dysfunction rating scale. It was noticed that total levels of social dysfunction significantly decreased post program implementation as compared to pre program implementation levels. The social dysfunction at pre program phase may be attributed to that half of the study subjects suffered from total dependency which is enough to interfere with normal social activities and interpersonal relations.

The positive change in social domain may be attributed to that all of the studied subjects positively responded to and reacted in the discussion of physical and psychosocial aspects and their related health care need management which may have significant changes in the subjects' scores after the program. This finding was in agreement with **Barcelos, Berquist, Esquival and Wayman (2008)** who observed their study that there was an improvement in all variables in social domain of the patients after liver transplantation in periods of 1, 3, 6, 9 and 12 months due to effect of psycho-educational intervention.

Comparison of the spiritual health needs among the post-operative transplant recipient before and after health need management program, there was no statistically significant difference. This could be due to that most of the subjects reported that they practice religious activities which are the most comforting source in dealing with the disease experience and stress. They also reported that they have a close connection with God for support, feeling of inner peace and faith. This analysis agreed

with **Bonaguidi, Michelassi, Filipponi and Rovai (2010)** who illustrated that Patients who have serious diseases often turn to God; this religiosity enables patients to better cope with the disease and improves their quality of life. Another research supported the current study such as **Leeson, Nelson, Rathouz, Juckett, Caes and Costanzo (2015)** who illustrated in their study that spirituality and connection with God may be a resilience factor that could be targeted to improve the quality of life for recipients after transplantation.

Comparison of post-operative recipients' educational needs pre and post program implementation, the current study revealed that a higher statistically significant difference between total satisfactory scores of knowledge post program implementation among the study subjects as compared to their pre-implementation level score, which reflect the effectiveness of the health need management program in improving educational needs among study subjects. This result was supported by **Mendes et al. (2013)** who confirmed that significant cognitive gains were verified after the educational program among post-operative liver transplant recipients.

On the other hand, most of the studied subjects had an optimal educational level which in turn facilitates the researchers to implement the program sessions. Furthermore, 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. Harmonious to this illustration, **Ko et al. (2016)** 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.

In the same line, **El Shafee (2016)** 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. In addition, **Volk , Fisher and Fontana (2013)** showed that 53% to 67% improvement in patient knowledge after simple educational intervention.

"This study hypothesized that health needs management program will statistically significantly improve physical, psychological, social, spiritual, and educational needs post program implementation". The previous hypothesis was supported to greater percentage by the current study at post-program implementation phase as the study group subjects' recorded significant improvement in overall physical, psychological, social and educational needs. That reflects the effectiveness of health need management program on satisfying and decreasing needs of patients under study. In this respect, **Rongies et al. (2011)** found that the majority of aspects of health-related quality of life (physical function, body problems, general health, social function, and emotional reaction) were significantly improved in patients who indicated they regularly engaged in educational intervention program.

Comparison of the subjects' compliance to the therapeutic regimen in the current study pre and post program implementation, there were positive and significant differences in the all items. It meant that subjects are more compliant to therapeutic treatment regimen post program implementation as compared to the pre program assessment. This may be due to the significant and positive effect of the program that was tailored to the subjects' health needs and introduced important information, instructions and practices for prevention and early detections of complications (rejection, bleeding & infection) post liver transplantation such as medication regimen,

the healthy diet, wound care, physical activity and follow up. Such information and practices significantly improves the subjects' compliance to overall therapeutic regimen post liver transplantation.

This result was congruent with Mendes et al 2013 who studied the effect of educational intervention on liver transplant recipients and found that despite patients' difficulties to adhere to the treatment proposed in organ transplantation programs, as patients become aware of what needs to be done to contribute to the success of their treatment after the educative intervention. Other studies supported the present study such as **Burra et al. (2013)** who found that patient's compliance regarding diet was improved after counseling intervention. Moreover, **Lamy, Powell and Burkhart (2010)** reported that, patient education improved patients compliance with treatment regimen in the study group in contrast to patients in the control group.

"This study hypothesized that health needs management program will statistically significantly enhance compliance of liver transplant recipients to therapeutic regimen." This hypothesis also was supported with current study results as study subjects shows more compliance post program implementation as compared to pre program phase. This could reflect the positive response of the study subjects to educational reinforcement of all items of compliance post liver transplantation.

The result of the present study reveals that there were negative statically significant relationships between subjects' compliance to the therapeutic regimen and their total physical, psychological social and spiritual needs. It means the more compliance to therapeutic regimen, the less physical psychological, social and spiritual health needs. As well, managing the physical and psychosocial needs can improve the compliance to the therapeutic regimen among study subjects. So that, the four study' variables are interrelated and each other lead to both. This result is supported **Cameron (1996**) who illustrated that patient compliance affected by the physical, psychological and social needs such as illness and the treatment, family support, and social interactions. This result agreed with **Parker (2011)** who stated that the patient compliance had a clinically important influence on patient's physical, psychological and social domains.

The result of the present study found that there was a positive statistically significant relationship between the subject's compliance to the therapeutic regimen and the acquired satisfactory knowledge post program implementation that indicate the more knowledge among study subjects, the more compliance to therapeutic regimen. This result was supported by **Cameron (1996)** who mentioned that knowledge and understanding are considered important factors that influence patient's compliance to the treatment.

Also, **Comerota, Throm, Kelly and Jaff (2008)** stated that promoting a patient's knowledge will improve his/her level of compliance. It is highlighted that, the health need management program is an essential not only for improving patient's self-management related to patients' physical, psychosocial health needs as well as increasing patients' compliance to the therapeutic regime for maintaining liver function and avoid complications, but also, it improves quality of life of postoperative liver transplant recipient.

According to **ko et al. (2015),** the recent practice and research strategies have focused on improving self-management behaviors among liver transplant recipient through providing health needs information and intervention such as medication regimen as prescribed, follow up in outpatient clinics, avoiding infection and monitoring

complications. They added that health need management education can improve health behaviors, symptoms, emotional disturbances and control over the disease.

Conclusion

In view of the current study which aimed to evaluate the effectiveness of health need management on postoperative liver transplant recipients and their compliance with the therapeutic regimen. Health needs management program had a positive effect in improvement of overall physical, psychological, social and in addition to educational needs of the recipient post program implementation. As well the health needs management program statistically significantly improve compliance of recipients after liver transplantation under the study regarding all aspects of therapeutic regimen.

Recommendations

The results of this study projected the following recommendations:

1. Health care providers specially nurses should develop time specific education programs based on liver transplant recipients' educational needs at different post transplant times to maintain patients' compliance.

2. A comprehensive and simplified booklet including the therapeutic regimen which submitted to the liver transplant patients after admission to the hospital will serve as a care guide and reference to the patient and his family.

3. Replication of the study on a larger probability subjects selected from different geographical areas in Egypt is recommended to obtain more data which could be generalized.

4. Inclusion of family members in teaching should be appreciated and their learning needs should be assessed since the family is the basic unit of health care management and the primary care taker of the patient.

5. Studying factors affecting patients' compliance with therapeutic regimen for recipients of liver transplantation post-surgery is recommended.

6. Further studies have to be carried out in order to assess nurses' knowledge and practices regarding care of organ transplantation.

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