

ORIGINAL RESEARCH

The effects of educational intervention on self-care behavior and expected clinical outcome in patient undergoing liver transplantation

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Received: January 14, 2018

Accepted: April 3, 2018

Online Published: April 26, 2018

DOI: 10.5430/jnep.v8n9p102

URL: <https://doi.org/10.5430/jnep.v8n9p102>

ABSTRACT

Background: Organ transplantation has the potential to rapidly restore the health and wellbeing of individuals experiencing end stage liver disease (ESLD). The aim of the research was to evaluate effects of educational intervention on self-care behaviors and expected clinical outcome in patient undergoing liver transplantation.

Methods: A convenience sample of 60 liver patients was assigned for transplantation. The study was conducted in the transplanted Unit in Ain Shams University Hospitals. A quasi-experimental design with pre-post and follow up assessment has been used for this study. Tools were utilized to collect data such a) Self-care practice assessment tool, b) Patient physiological assessment sheet, and c) Demographic and medical health history tool.

Results: Improvement in knowledge and self-care behaviors at the post and follow-up tests ($p < .0001$) after implementation of program compared by pretest evaluation. There are significant improvements in blood pressure (BP) and laboratory results through study stage ($p < .001$). The pain level improved after intervention and follow up ($p < .0001$). There are statistically significant between age, job and self-care behaviors at follow up phase.

Conclusions: Liver transplantation patients showed a positive improvement in their knowledge, self-care and physiological outcomes after implementing of program. Replication of the study on larger probability sample from different geographical areas to achieve more generalizable results.

Key Words: Liver transplantation, Self-care behavior, Educational intervention, Clinical outcomes

1. INTRODUCTION

Liver transplant is a method used for the treatment of end-stage liver disease patients. Liver Transplant Recipients (LTRs) may experience physical, psychological, and social problems during this period.^[1] Therefore, people with chronic liver failure need nursing educational interventions to support the required lifestyle changes, prevent and control disease progress.^[2]

Liver transplantation was reflected as one of the most dif-

ficult processes in current surgery because depends on a comprehensive hospice infra-structure and skillful multi-professional team in the provision of care to severely weakened and immune depressed patients.^[3] It is used as a treatment technique to assure the survival of patients with irreversible hepatic failure, when there is no other method of management accessible. Transplant nurse is an integral part in team of healthcare and the key to developing an effective communication essential in the care of the liver transplant

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patient.^[4] For achievement of life-style independence after transplantation, as well as delivery of high quality of care through provides instruction of health information such areas as diet, medications, measuring of vital signs, and self-care. Therefore, Patient education plays a critical role in this successful of post-transplant management.^[5]

Knowledge and use of evidence-based guidelines were designated as the theoretical structure for this research. It combines of describing a problem, searching and critically evaluating the obtained results, in order to provide support for the enhancement of health care quality and to decline costs.^[6]

Patient teaching is a systematized process and short-term that is restricted to a given health-disease condition and aims at self-care in view of a certain health problem.^[7] Although patient education is an extensive and planned learning experience that is achieved by means of long-term learning methods, counseling and behavior changing techniques that intend to influence the patient's knowledge, increase self-care and improve health behavior.^[8] Therefore nurses perform learning activities for patients and their relatives concerning long-term measures to promote health.^[9] By doing so, patients are able to understand self-care ability and physiological outcomes leading to importance of following the therapeutic scheme proposed by the transplantation team, as well as to identify signs and symptoms that may unveil a health-related problem.^[10]

A number of studies demonstrated that the nursing responsibility in the education of liver transplantation patients aims to make the recovery easier,^[11] minimize postoperative complications,^[12] improve self-care ability and physiological outcomes for functional status,^[13] and is an essential step for a successful transplant.^[14] The complexity and comprehensive nature of the transplantation procedure require consistent provision of information.^[15]

Educational intervention must be used with body part transplant patients for an extensive time, and are still being used in current in various transplant centers global.^[16] Research documents that educational intervention for organ transplant patients can reduce anxiety levels and improve psychosocial variation, permit patients to return earlier to work, as well as improvement self-care performance, and health care condition.^[17] Another focus has been on the efficacy of educational intervention to rise the physical, psychosocial adaptation of liver transplant recipients.^[18]

Self-care was defined by Orem as one of the modules of self-care nursing philosophy.^[19] The significance of self-care conception is linked to human's need for preserving, supporting health and recovery, absence of healthcare education,

insufficient access to health facilities for the whole community, and improved expenditure of healthcare services.^[20] Self-care educational actions improve symptoms and complications of diseases, shorten recovery, and decrease hospital stay and re-hospitalization rate.^[21] It has been reported that lack of self-care knowledge in patients with chronic disease, such as hepatitis, is the central reason for frequent referring to healthcare centers and rehospitalization.^[22,23]

1.1 Significance

HCV-associated disease is one of the leading causes of hepatocellular carcinoma and the main indications for liver transplantation.^[24] Approximately 6,000 liver transplants are performed in the United States annually.^[25] In Egypt, hepatitis C virus (HCV) prevalence among the 15-59 years age group is estimated to be 14.7%. Liver transplant (LT) is the unique curative therapy for clients with hepatic cancer care (HCC) or end-stage liver disease and provides the only possibility for reversing the terminal situation.^[26] According to Ain hospital records in 2017, the total numbers of cases of transplantation during the whole year were round 50-60 cases. People with transplant have the potential for post-operation complications. Therefore, this category of patients' needs nursing intervention to preserve required lifestyle changes and improving their self-care abilities.

1.2 Operational definition

1.2.1 Educational intervention

It is nominate program to patient undergoing liver transplantation to improve self-care behavior and clinical outcomes. It consists, nature of transplantation, postoperative care, immunosuppressive drugs, complication, discharge planning, follow up and self-care domains such as personal hygiene, activity and exercise, incision care, stress management, and diet.

1.2.2 Expected clinical outcomes

It is physical parameters such as vital signs, body weight, blood sugar, bilirubin, SGOT, SGPT as well as complaint abdominal ascites, peripheral edema, difficult breathing and abdominal ascites.

1.3 Aim of the study

The aim of the research was to evaluate effects of educational intervention on self-care behaviors and expected clinical outcome in patient undergoing liver transplantation.

1.4 Research hypotheses

H1: Improve liver transplant recipients' self-care practice after implementation of program.

H2: Transplant patients' clinical outcome will be statistical significantly with normal value post implementation of

program.

2. METHODS

2.1 Research design

A Quasi experimental study design with pretest, posttest, and follow up assessments was utilized in this study.

2.2 Research setting

The study was conducted in the liver transplant unit at Ain Shams University Hospitals (ASUH).

2.3 Subjects

The study involved a convenience sample of 60 adult patients undergoing liver transplantation, with the inclusion criterion ranged from 18 to 60 years old, agreeing to participated, and willing to complete the program. The exclusion criterion was having chronic diseases such as end stage renal disease, heart disease and psychological disorder.

2.4 Tools

It consists of three tools for data collection such as:

Tool 1: Demographic and medical health history tool

Part one was attentive with patients' socio-demographic characteristics such as sex, age, education, marital status, occupation, residence, caregiver, monthly income, family size and crowding index.

Part two was related to patient health history as duration of illness, causes of liver failure, complications, previous hospitalization and previous surgery and transplant to the liver.

Tool 2: Assessment of self-care behavior sheet

Self-care ability was measured by the questionnaire that was developed by the researcher by using instruments of previous review literature.^[27-30] These questionnaires were used after content validity and reliable. This sheet was developed to assess patients' self-care ability about liver transplantation; it consists of 30 questions covering the following areas: personal hygiene, diet, environment, incision care, activity and exercise, and psychological condition. Patients respond through yes or no to each dimension of self-care behaviors. Total of self-care behavior was taken from summing the "yes" responses and each right answer got one score with total scores of 30. Scores less than (< 60%) are considered as unsatisfactory. Scores more than (> 60%) are considered as satisfactory. In addition to Self-care tool translated into Arabic language by the investigator and was used for assessing patient's personal hygiene, diet, environment, incision care, activity and exercise, and psychological condition. This tool was used pre-post and follow up program implementation.

Tool 3: Patient physiological assessment sheet

This sheet was designed to assess patients' clinical outcome. It constitutes of vital signs using standard methods of measurement, pain assessment, and the laboratory tests results such as blood glucose level, prothrombin time (PT), Partial Thromblastin Time (PTT), and liver blood test (SGOT and SGPT as known ALT and AST).

Content validity and reliability of the tools

It was used for modifying tools such as patient knowledge and practice were translated and modified by the researchers, tools content of validity ascertained by 7 experts from nursing and medical staff members. The reliability of the tools 2, 3 was tested using the internal consistency method with Cronbach's alpha of 0.87 and 0.89.

2.5 Ethical considerations

Verbal approval was obtained from each participant before inclusion in the study. Nature and purpose of study explanation was given according to subjects' level of understanding. They were assured that all the gathered data will be treated confidentially.

2.6 Procedures

The current study was carried out on four phases: preparation, planning, implementation and evaluation.

1) Preparation phase: The preparation phase was concerned with designing the educational program about liver transplantation care and prepares the tools of data collection and educational material (brochures, colored booklet and power point) after reviewing literatures. The contents of the liver transplantation booklet and the study tools were reviewed by a panel of 7 medical and nursing experts to ensure content validity. If needed modification were done.

After taking the permission from the hospital director, the researcher clear clarification of the goal, nature of the study and its expected outcomes. Ethical approval has been taken from all study subjects and they were noted that withdrawal can be done any time.

2) Planning phase: Transplant educational intervention was developed based on patient needs, and related literature. The nursing educations were design to improve patient knowledge, self-care behavior and clinical outcomes about liver transplantation. The intervention was based on patient needs identified in pretest. It's included the subordinate section as display in the patient handout such as nature of transplant, reason, clinical manifestations, and complication and nursing management. Finally, self-care practice which emphasized on personal hygiene, diet, environment, incision care, activity and exercise, and psychological condition and the method

of measuring blood pressure. Also, the prepared handout should give to patients

3) Implementation phase: The study subjects were exposed to the educational program activities which are 7 consecutive sessions over two weeks (4 sessions practical & 3 session theory). Each session lasted from 30 to 45 minutes. The first two sessions were designed to equip subjects with the necessary basic information related to the liver transplantation. One session about diet, two sessions about wound care and physical therapy and session about method of measuring blood pressure. The total time for program was around six hours.

During this phase, each patient in the study sample received the designated educational intervention. The overall sessions were round two sitting per week for every patient and continuous till patients become satisfied with information related to liver transplantation. Each session take around 35 to 45 minutes, and allow to each patient to asking, discussion to reach high level of understanding. During these sessions using examples for clarified, handouts and brochure regarding liver transplant to facilitated the understanding to participants. As regards, skill sessions were around 3 to 4 sessions according the level of patients learning skills and re-demonstrated with the researcher.

4) Evaluation phase: During these phases, three evaluations were conducted for each patient in the study: first one was at the beginning of the study as a baseline data for developing the transplant educational intervention according to patient's need. Second evaluation occurs post-test immediately after implementation of the program to evaluate the change in the patient knowledge and self-care practice regarding liver transplantation by using self-care measure questionnaire and expected clinical outcomes. Third evaluation was done three months to follow up patient the same assessment tools were used previous.

2.7 Data analysis

Data were tabulated and analyzed using (SPSS) version 18.0. Computerized data entry. Descriptive statistics (frequency, percentage, mean and standard deviation [SD]) were performed for variables and chi-square test was utilized for comparison of the same group for qualitative variables before and after intervention, and interrelationship between total self-care measures of patients and their socio-demographic characteristics. Also, graphics were done using excel program. Paired *t*-test was used was used for comparison of the same group for quantitative variables before and after intervention.

Person correlation was used for assessment of interrelation-

ship among quantitative variables of pre, post, and flow up. Also, to estimate the interrelationship between pre, post, and flow up of total self-care measures of patients as dependent variable and their socio-demographic characteristics as independent variable. *P* value was considered significant if less than .05.

3. RESULTS

Table 1 shows that more than half (51.6%) of sample their age range 44 to 57 years old with a mean age of 47.66 ± 6.56 . Two thirds of the patients (60%) were primary school, while 18.3% of them were university graduate, the majority of the studied (86.7%) were not working. Regarding residence, the majority of patients (83.3%) were lived in rural areas. Referring to marital status, the most of patients (90%) were married. Considering monthly income of sample, slightly more than third of subjects (41.6%) were not enough income. Also, the most of the studied subjects (65%) were male. While (35%) were female the significant mentioned above are illustrated graphically in Figure 1.

Table 1. Personal demographic characteristic of the study subject (n = 60)

Items	Patients (N = 60)	
	Frequency	Percent (%)
Age (in Years)		
30-39 years	10	16.7
40-49 years	19	31.7
> 50 years	31	51.6
Mean \pm SD	47.66 \pm 6.56	
Educational level		
Illiteracy	0	0.0
Read and write	13	21.7
Primary school	36	60.0
Bachelor	11	18.3
Work condition		
Working	52	13.3
Not working	8	386.7
Marital status		
Single	0	0.0
Married	54	90
Divorced	3	5.0
Widow	3	5.0
Family number		
< 3	0	0.0
3-4	32	53.3
5-6	27	45.0
> 6	1	1.7
Income		
Enough	60	100
Not enough	0	0.0
Residence		
Rural	10	16.6
Urban	50	83.3
Caring person		
Husband/wife	53	88.3
Children	7	11.7

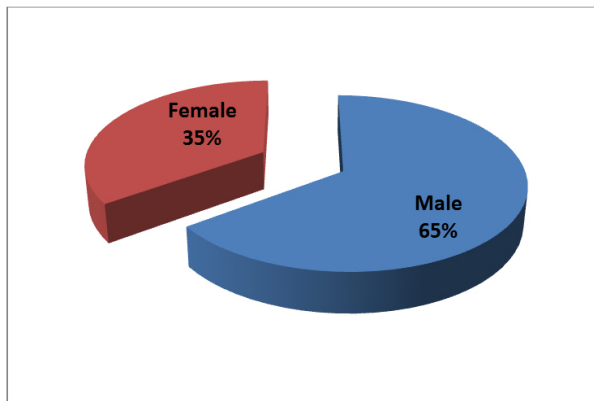


Figure 1. Percentage distribution of patients' sex

Table 2 represents the distribution of patients' medical and family history. It displays the most of study (81.6%) were hepatitis C with liver cirrhosis. More than half of sub-

jects (53.3%) suffering liver diseases within 10 to 12 years. In relation to complain with disease, more than one third (36.7%) had abdominal ascites and peripheral edema. Regards chronic disease (comorbid), nearly one fourth (18.3%) were diabetes, while nearly more than two thirds of the sample (63.4%) were diabetes and hypertension diseased.

Table 3 shows statistically significant improvements in body weight, vital signs, and lab results (blood sugar, SGOT, SGPT, PT, and PTT) from pre to post test ($p < .0001$), while body temperature and respiration still improved ($p < .0001$) post program implementation. As regards, blood sugar witnessed significant improvements at follow up phase respectively ($p < .002$).

Figure 2 shows that a significant statistical decrease pain levels from pre to post implementing program and at follow up phase ($p < .0001$).

Table 2. Percentage distribution of patients' medical and family history (n = 60)

Items	Patients (N = 60)	
	Frequency	Percentage (%)
Liver disease suffering (years)		
7-9	20	33.4
10-12	32	53.3
> 13	8	13.3
Causes of the disease		
Bilharzias	1	1.7
Liver tumor	8	13.3
Hepatitis B	2	3.33
Hepatitis C with liver cirrhosis	49	81.66
The main complaint		
Abdominal ascites	22	36.7
Hematemesis	0	0.0
Peripheral edema	22	36.7
Difficult breathing	0	0.0
Current bleeding	16	26.67
Current admission to the hospital		
Yes	60	100
No	0	0.0
Current surgical operation related to liver disease		
Yes	2	3.3
No	58	96.7
Liver transplantation operation		
Yes	2	3.3
No	58	96.7
Chronic disease		
No	11	18.3
Diabetes	5	8.3
Hypertension	6	10.0
Diabetes/Hypertension	38	63.4
Family history of liver disease		
Yes	32	53.3
No	28	46.7
Family history of liver transplantation operation		
Yes	0	0.0
No	60	100

Table 3. Comparison between pre, post and follow-up scores of patients’ physiological outcome record (n = 60)

Physiological Signs	Mean score			Paired Samples Test	
	Pre	Post	Follow up	Pre & Post (t1	Pre & follow up (t2
	Mean ± SD	Mean ± SD	Mean ± SD	p-value)	p-value)
Weight	84.73 ± 8.31	82.65 ± 7.93	82.93 ± 8.19	10.77 < .000*	-0.564 > .05
Bl.P	104.3 ± 6.71	93.8 ± 5.54	93.58 ± 5.81	9.478 < .000*	0.331 > .05
Temperature	37.00 ± 0.40	36.53 ± 0.33	36.80 ± 0.27	6.86 < .000*	-6.75 < .000*
Pulse	84.53 ± 5.55	77.77 ± 7.83	78.63 ± 7.21	8.80 < .000*	-1.49 > .05
Respiration	20.78 ± 2.29	19.38 ± 1.57	20.02 ± 1.37	6.79 < .000*	-4.27 < .000*
Blood sugar	134.85 ± 27.06	115.45 ± 22.20	110 ± 16.83	8.81 < .000*	3.28 < .002*
SGOT	75.45 ± 14.51	43.97 ± 10.78	43.62 ± 10.05	23.52 < .000*	0.665 > .05
SPGT	76.62 ± 14.0	43.32 ± 9.11	43.86 ± 8.73	20.57 < .000*	-1.56 > .05
PT	17.60 ± 2.8	13.61 ± 1.84	13.62 ± 1.83	9.15 < .000*	-1.09 > .05
PTT	50.96 ± 8.48	37.19 ± 9.54	36.86 ± 9.60	7.80 < .000*	1.31 > .05

* $p < .05$; ** $p < .01$

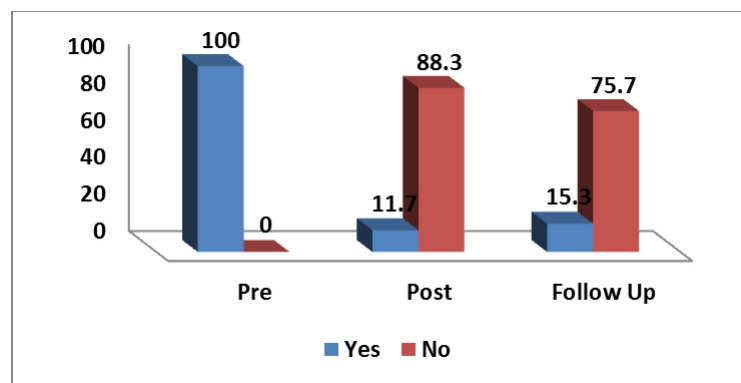


Figure 2. Comparison between pre, post and follow-up patients’ pain

Table 4 reveals marked deficiency in patients’ self-care of transplanted during the pre-program, there are statistically significant improvements in all aspects of patients’ self-care ability at the posttest ($p < .0001$, respectively). Also, the follow-up phase showed continued improvements in many areas such as personal hygiene and incision care at the pre and follow up phase ($p < .05$). While there some decline in satisfactory between posttest and follow up phase in self-care aspects such as diet, environment, activity and exercise, drug side effect and emotional disorder (see Figure 3).

Table 5 shows that a negative significant correlation between age (years) and mean total self-care behavior ($r = .199$; $r = .107$ at $p < .05$) at post phase. Also there a negative significant correlation between age and total self-care ($r = .107$ at $p < .05$) in the same table indicates positive statistically correlation between work and total self-care scores at follow up phase ($r = .316$, $p < .010$) is tabulated in Table 6. However, there was no significant correlation between sex, education level, marital status, residence and family number at posttest and 3 months after therapy.

Table 4. Comparison between pre, post and follow-up patients’ total self-care measures items (n = 60)

	Pre N = 60		Post N = 60		Follow Up N = 60		Pre & Post (χ^2 p-value)	Pre & follow up (χ^2 p-value)
	n	%	n	%	n	%		
Personal hygiene								
Satisfactory > 60%	8	13.3	58	96.6	57	95.0	83.23	0.209
Unsatisfactory < 60%	52	86.7	2	3.4	3	5.0	< .000**	> .05
Diet								
Satisfactory > 60%	19	31.7	59	98.3	55	91.7	58.61	2.81
Unsatisfactory < 60%	41	68.3	1	1.7	5	8.3	< .000**	> .05
Environment								
Satisfactory > 60%	33	55.0	59	98.3	58	96.7	31.49	0.342
Unsatisfactory < 60%	27	45.0	1	1.7	2	3.4	< .000**	> .05
Incision care								
Satisfactory > 60%	31	51.7	57	95.0	53	88.3	28.81	1.75
Unsatisfactory < 60%	29	48.3	3	5.0	7	11.7	< .000*	> .05
Activity and exercise								
Satisfactory > 60%	4	6.7	58	96.7	57	95.0	97.31	0.209
Unsatisfactory < 60%	56	93.3	2	3.3	3	5.0	< .000**	> .05
Drug administration and side effects								
Satisfactory > 60%	22	36.7	51	85.0	50	83.3	29.41	0.063
Unsatisfactory < 60%	38	63.3	9	15.0	10	16.7	< .000**	> .05
Emotional condition(patients and family)								
Satisfactory > 60%	16	26.7	56	93.3	54	90.0	55.56	0.436
Unsatisfactory < 60%	44	73.3	4	6.7	6	10.0	< .000**	> .05
Total self-care measures of patients								
Satisfactory > 60%	22	36.7	57	95.0	53	88.3	45.38	1.75
Unsatisfactory < 60%	38	63.3	3	5.0	7	11.7	< .000**	> .05

* p < .05; ** p < .01

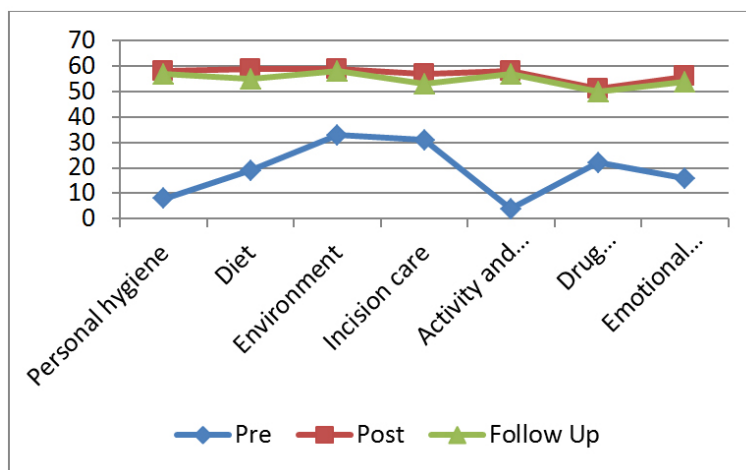


Figure 3. Comparison between pre, post and follow-up patients’ satisfactory level of self-care measures items (n = 60)

Table 5. Relation between total self-care measures of patients and their socio-demographic characteristics (Posttest)

Variable	Patients (60)	
	Post	
	R	p value
Age	.199	< .05*
Sex	.008	> .05
Educational level	.109	> .05
Work	.090	> .05
Marital status	.072	> .05
Family number	.079	> .05
Residence	.103	> .05
Caring person	.155	> .05

* $p < .05$ **Table 6.** Relation between total self-care measures of patients and their socio-demographic characteristics (follow up test)

Variable	Patients (60)	
	Flow up	
	R	p value
Age	.107	< .05*
Sex	.060	> .05
Educational level	.063	> .05
Work	.316	< .01**
Marital status	.114	> .05
Family number	.037	> .05
Residence	.163	> .05

* $p < .05$; ** $p < .01$

4. DISCUSSION

Liver transplantation for acute liver failure (ALF) still has a high early mortality. Education share to patient knowledge, performing behavior as well as help in decision making about treatment and well-being.^[31,32] Moreover, evidence suggests that a greater emphasis on supporting self-care behaviors is essential to effective disease management. Therefore, this study was done with the aim to evaluate the educational intervention on self-care behaviors and expected clinical outcome in patient undergoing liver transplantation.

This study results revealed that the majority of the intended sample were male and most of the subjects age between 40 to 60 years old. In line with this finding, Heneish and colleagues (2017) found that the most of patients were male with age ranged from 40 to 63.2 years.^[33] This may be attributed to incidence of Schistosomiasis more among male than female. A study by Yun et al. (2017) supported this interpretation. They showed that 73.7% were men, with a

mean age 53.39 ± 9.42 years.^[34] According, study done by Scaglione and colleagues (2015) found the median age of patients was 53 years, 61.8% were men.^[35]

In the present study, over eighteen of the patients were hepatitis C and liver cirrhosis are causes of developing liver failure. This was consisted with the results of Amer and Marwan (2015) portrayed that hepatitis C virus prevalence among the 15-59 years' age. The high dispersal of chronic liver diseases lead to rising numbers of Egyptian patients suffering from ESLD, requiring liver transplantation (LT).^[36] Zimmermann, Otto & Schuchmann (2009) stated that the main HCV-cirrhosis is one of the leading indications for liver transplantation among Egyptian patients.^[37] In addition, Yosry et al. (2008) showed that hepatitis C related end stage liver disease (ESLD) is the leading indication for liver transplantation and appear at 89.8% of cases in Egypt.^[38]

As regards to chronic diseases post liver transplant, the results of the present study showed that, more than half of the studied subjects had chronic diseases such as diabetes mellitus and hypertension. This finding was in agreement with Algarem, Sholkamy, Alshazly and Daoud (2014) stated that incidence of 25% were new-onset diabetes and 20% were hypertension after transplantation.^[39] Similar study by Van Laecke et al. (2009) showed that diabetes mellitus increasingly recognized as a complication post liver transplantation. This result could be attributed to the effect of immunosuppressive medications.^[40]

The current study detect that statistically significant differences among pre to post implementation interventional educational program as regards measuring respiration, temperature, blood pressure, body weight and laboratory investigation (SGOT, SGPT and bilirubin). In agreement with the previous study findings, Pezzatiet al. (2015) revealed that the implementation of transplant intervention educational program, lead to significant improvements in their performance related to measuring vital signs.^[41] In addition, Neuberger and colleagues (2009) mentioned that there was significant improvement observed liver function and body weight of liver transplant recipients after liver transplantation due to reduced ascites.^[42] Similar for these results study done by Feng et al.^[43]

Majority of the studied sample reported pain pre transplantation are improved after implementation of program. One interpretation is related to progress of treatment and compliance with pain management. This findings are consistent with Hansen et al., (2014) establish that 30%-40% of patients with end stage liver disease, experienced moderate pain and 50 percent relief with both pharmacological and non-pharmacological pain management strategies.^[44]

The current study revealed that the preprogram implementation of the liver transplant recipients under study had unsatisfactory knowledge regarding liver transplant and self-care aspects. In the main time, there are a stochastically significant improvement in the total self-care scores among patients between pre and post implementation of intervention of program. This improvement was demonstrated by personal hygiene, and diet, environment, incision care, activity and exercise as well as emotion condition. This may be attributed to condition control and response for nursing intervention. These results are also in line with those of most studies focusing on education program to promotion of self-care. In the same line with, Masala (2012) stated study on fifty-four patients who underwent liver transplantation. Found that quality of life was associated regular psychosocial support, and follow-up in all phases of treatment after transplantation.^[45]

Also Delair and colleagues (2010) illustrates that nursing intervention program led to improve of these patients' self-efficacy and knowledge among liver transplant.^[46] Similar, study done by 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.^[47] On other hands, Volk and colleagues (2013) showed that 53% to 67% improvement in patient knowledge after simple educational intervention.^[48]

In the present study, there are no statistically significant relations were detected between self-care behavior with age and sex, educational level, marital status, income, family number

($p > .05$), at pre and post implementation of program. This study consistent with Huyen and colleagues (2011) showed no significant relationship between education level and self-care behaviors.^[49] In the same line Abootalebi et al. (2012) found that no statistically significant relationship between gender and self-care behaviors. While there is statistically significant relation between ages with self-care scores at three months after program ($p < .05$).^[50] These findings were similar to those obtained by Heidar Zadeh (2006) stated that lower age could improve self-care ability of patients undergoing treatment.^[51]

Also, in this study, there are positive correlation between employment status (work) and self-care illness behaviors at follow up phase. This study agreement with study by Hunt et al. (1996) suggested that specific interventions for liver transplant recipients lead to change health perceptions and encourage return to work.^[52]

5. CONCLUSION AND RECOMMENDATIONS

Our study findings concluded that improving their knowledge and self-care practices in liver transplant post implementation of educational intervention. Also there are improvements in physiological outcomes after educational intervention. The results of this study it's recommended to enforce educational intervention as a usual care in transplantation unit for support patient and improve health outcomes as well as afflicted care continuity at house.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

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