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Effect of Instructional Program on Health Promoting Lifestyle among Patients' Post Liver Transplantation

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ABSTRACT

Background: liver transplantation is a widely accepted therapeutic modality for individuals experiencing complications due to end-stage chronic liver disease. **Aim**: The study aimed to evaluate the effect of an instructional program on promoting a healthy lifestyle among patients post liver transplantation. **Study design:** A quasi experimental design was used. **Setting:** Out-patient clinic for post-transplantation follow-up at Ain Shams Specialized Hospital. **Sample:** A purposive sample included 90 post- liver transplantation patients. **Tools**: **The first tool:** A structured interview questionnaire consisting of four parts was used. **Part I:** To assess demographic data of patients after post liver transplantation, **Part II:** To assess Patients` history, **Part III:** to assess patients' knowledge regarding post liver transplantation. **Second tool:** To assess the health-promoting behaviour level of patients. **Results:** The study concluded 90 patients post liver transplantation participated in this study. Significant improvements were observed in patients' health-promoting lifestyle behaviors from pre-program phase to post-program and follow-up stages. Scores increased from 8.07±5.13 to 31.60±4.74 and further to 40.20±3.84, emphasizing the effectiveness of the instructional program. **Conclusion:** The study concluded that the program positively impacted patients' knowledge and their health-promoting lifestyle behavior regarding post liver transplantation. **Recommendation**: Establishing a comprehensive nursing discharge plan that incorporates education on self-care knowledge, lifestyle modifications and various treatments at home.

Key words: Health- promoting lifestyle, Liver Transplantation, instructional Program

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INTRODUCTION

Liver transplantation (LT) serves as a crucial live-saving intervention for individuals in the end-stage of chronic liver disease. Historically, LT was considered the last therapeutic option for patients in grave clinical conditions, resulting in high rates of premature mortality **[1]**.

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The liver, being an integral organ in the human body, so patients who receive a liver graft face a substantial set of physiological changes. One major challenge facing the transplant community is the increasing metabolic complications that impact quality of life and long- term survival **[2]**.

Initial hurdles in liver transplantation included immediate post-surgical survival and preventing acute rejection. As patient survival rates have improved, new challenges have surfaced, particularly affecting recipients over the long-term. Despite advancements in technology and medical practices, liver transplantation continues to be a complex procedure associated with notable morbidity and mortality **[3]**.

The transplant team collaborates with patients to make informed decisions regarding a healthy lifestyle. Patients are encouraged to adhere to the following recommendations : (1) attend follow-up visits with the transplant team, (2) take immunosuppressive medications as prescribed, (3) adhere to the schedule for laboratory tests and doctor visits, (4) engage in regular physical activity through exercise, (5) consult with a physician before beginning an exercise regimen, and (6) seek advice from a dietitian and the transplant team to select healthful foods for a healthy lifestyle, weight management and overall well-being **[4]**.

Following transplantation, patients may encounter challenges such as organ dysfunction, rejection, infections, bile duct complications, arterial hypertension, immunosuppressive drug resistance, and psychological concerns. Nurses play a pivotal role in enhancing quality of life, preventing complications, and facilitating necessary adjustments to treatment plans. Postoperative care standards encompass assessing patients post liver transplant, as well as managing rejection and implementing infection control protocols **[5]**.

According to the World Health Organization **[6]**, health outcomes are significantly influenced by lifestyle choices, which encompass behavior patterns shaped by individual characteristics, environmental factors, social connections, and socioeconomic status. The promotion of healthy behaviors and attitudes can enhance public health literacy and yield protective effects in conjunction with medical interventions.

The concept of Health-Promoting Lifestyles (HPL) underscores the importance of enhancing life quality through six key components: physical activity, balanced nutrition, wellness accountability, spiritual development, social connections, and stress management. By embracing this holistic approach, individuals can achieve satisfaction, self-improvement, and overall health and well-

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being. Effective maintenance of health can be achieved through a combination of liver transplant medications and lifestyle modifications **[7]**.

Community health nurses play an integral role in the long-term management of patients following liver transplantation. This management should focus on early recognition and effective treatment of complications, as well as promoting a healthy lifestyle. This can be done by encouraging a balanced and healthy diet, increasing physical activity, following therapeutic regimens, including immunosuppressive drugs, maintaining medical checkups, taking active precautions to treat chronic diseases and promoting bone health. Compliance with a healthy post- transplant lifestyle is crucial to the patient's outcomes. Community health nurses focus on the physical and psychological needs of recipients after liver transplantation and support them in leading a healthy and active life **[1]**.

Significance of the Study

According to the world health organization, the death rate of liver disease in Egypt was 68.866 or 12.40% of total mortality. The age adjusted death rate is 116.08 per 100.000 inhabitants; Egypt is number one in the world **[6]**.

Globally, liver disease is a leading cause of mortality, accounting for an estimated two million deaths annually. This represents 4% of all global deaths (one in every 25 deaths worldwide); approximately two-thirds of all liver-related deaths occur in men. The leading causes of death from liver disease are complications of cirrhosis and hepatocellular carcinoma **[8]**.

In 2021, an estimated 34.694 liver transplants were performed worldwide, representing a 6.5% increase from 2020 and a 20% increase from 2015. Of these transplants, approximately 19.20% were from living donors. In the United States, an estimated 8,047 liver transplant surgeries were performed in 2021, with over 120.000 candidates on the waiting list **[9].**

AIM OF THE STUDY

This study aimed to evaluate the effect of an instructional program on health-promoting lifestyle among patients post liver transplantation. The specific aims were to:

1. Assess knowledge among patients post liver transplantation.
2. Assess patients' health profile post liver transplant.
3. Develop and implement a lifestyle health promotion program for patients post liver transplantation.

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4. Evaluating the effect of instructional program on health -promoting lifestyle behavior among patients post liver transplantation.

Research hypothesis

The Instructional Program would have a positive effect on health-promoting lifestyle behavior among patients post liver transplantation.

SUBJECTS AND METHODS

Study design

A quasi-experimental design was used in this study.

Study setting

The study was conducted at an outpatient clinic for follow-up liver transplantation in Ain Shams Specialized Hospital. The clinic was open from 8:30 a.m. to 1 p.m. from Saturdays to Wednesdays. The clinic offers a broad range of healthcare services for people living in cities or rural areas.

Subjects

A purposive non-probability sample comprising post liver transplant patients was selected. The criteria included adult patients of both genders diagnosed with post liver transplant patients, whose ages ranged from 20 to 60 years old.

Sample size

The total sample size was 90 patients, which was determined according to the power analysis formula as follows:

$$n = \frac{2(Z\alpha/2 + Z\beta)^2 \times p\,(1-p)}{(d)^2}$$

Tools of data collection

A Structured interview questionnaire was developed by the researchers after a thorough review of the literature. The questionnaire was designed in Arabic and consisted of two tools used for data collection.

The first tool: A personal data questionnaire, which was divided into three parts:

- **Part I:** Demographic characteristics of patients, such as gender, age, education level, marital status, occupation, residence and monthly income.

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- **Part 2:** Medical history of patients, including the causes of developing liver cirrhosis, onset of liver disease, the main complaint, previous admissions to the hospital, duration after the operation, complaints from chronic diseases, smoking history, and family history of liver disease.
- **Part III:** This part of the study assessed patients' knowledge regarding liver transplantation. The tool used was a 17- item questionnaire that was adapted from **[10]** and modified by the researchers was used (pre, post/ follow-up program). The questionnaire assessed patients' knowledge of the definition, causes, risk factors, and complications of liver transplantation, as well as the care of patients after transplantation.

Scoring system:

The answers of patients were cross-coded with the model's main answers prepared by the researchers. Every correct answer had one score and an incorrect answer had a zero score. The total knowledge score was 85 grades because some of the questions had more than one answer. The scores on the questionnaire were categorized into two levels: less than 60%, which was considered unsatisfactory, and 60% or more, which was considered satisfactory.

The **Second tool:** used to assess patients' health-promoting lifestyles was the health-promoting lifestyles profile-II (HPLP-II). This tool was adapted from **[11]** and edited by the researchers. The HPLP-II consists of 52 items that assess patients' health behaviors after liver transplantation through six dimensions: health response, physical activity, nutritional habits, spiritual status, personal relations and stress management.

Scoring system:

Scores from the HPLP ranged from 52 to 208 based on a 4- point Likert scale. These scores were converted into a percentage, means and standard deviations were computed, with higher scores indicating better health behaviors. Participants were classified into three categories: inappropriate (52 to 104), intermediate (104 to 156), and proper healthy lifestyle (156 to 208).

Content validity: the validity of the study tools was examined by a panel of five experts in Community health nursing to ascertain clarity, face, completeness, and relevance. Minor refinements were suggested by the experts to enhance comprehension.

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Reliability:

Reliability testing using Cranach's' alpha coefficients, revealed good internal consistency of the tools, with values of 0.874 for the knowledge questionnaire and 0.911for the HPLP-II.

Pilot study:

To gauge the usability and clarity of the tools and estimate the time required for data collection, a pilot study involving 10% of the patient sample was conducted. The tools remained unchanged following the pilot study.

Ethical considerations

Approval was secured from the ethical research committee of the Faculty of Nursing, Ain Shams University. The ethical code was 24.02.235. The aim and the nature of the study were explained, informed consent was obtained from all participants, emphasizing confidentiality and the voluntary nature of participation.

Administrative design:

Official permission to conduct the study was obtained from the dean of the Faculty of Nursing at Ain Shams University. Approval from the directors of Ain Shams Specialized Hospital was also obtained.

Field work:

This study was conducted after obtaining permission from the relevant authorities. The researchers acquainted themselves with the participants and elucidated the study's objectives. Formal consent was then procured from the patients. The data collection phases spanned duration of four months, commencing in December 2022 and concluding in March 2023. Researchers collected data three times, pretest, and posttest after program implementation and follow up, requiring approximately 30–45 minutes to complete the tools. The researchers conducted visits to the study setting twice a week, from 9.00 a.m. to 2.00 p.m. prior to the commencement of data collection, ethical considerations were meticulously adhered to. The data collection process comprised five stages: interviewing and recruitment, assessment, planning, implementation, follow-up and evaluation phase.

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Interviewing and recruitment:

During the interviewing and recruitment phase, eligible patients from the outpatient clinic were recruited after a comprehensive explanation of the study objectives and subsequent formal consent acquisition.

Assessment phase:

The assessment phase involved the scrutiny of preliminary data pertaining to patients' medical history, comprehension of post-liver transplantation car, and adherence to health-promoting lifestyle behaviors.

Planning phase:

In the planning phase, the primary objective of the instructional program aimed to enhance patients' knowledge and promotion of healthy lifestyle behaviors post-liver transplantation, facilitating their adjustment to the challenges posed by their medical condition. Customizing the program in accordance with the patients' specific requirements, as determined via the pre-assessment, the researchers developed an educational booklet after thorough review of pertinent literature. The content of the booklet encompassed fundamental information on liver functions, the concept of liver transplantation, associated risk factors, impact of liver transplantation on various bodily systems, post- transplant medications, potential complications, Signs & symptoms of rejection, infection control measures, and guidelines for improving lifestyle behaviors and preventing rejection subsequent to liver transplantation.

Implementation of the program:

Subsequent to the planning phase, the program was implemented over a span of two months, involving 90 patients segregated into small groups of 7:8 participants. Each group underwent four theoretical sessions for each group, with each session lasting 30-45 minutes. The educational sessions commenced with a review of prior material and an outline of the new objectives, employing accessible and clear language. Pedagogical techniques focused on reinforcement and motivation to enhance the sessions. The booklet was distributed to the patients at the inception of the program, with posttest evaluations being conducted during follow-up visits. The researchers met the patients in a waiting area in Out-patient clinic for post-

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transplantation follow-up. Teaching methodologies incorporated lectures, small group discussions, and the utilization of visual aids such as booklets and images.

Follow up:

Researchers maintained regular contact with patients for two months to monitor their progress.

Evaluation phase:

Evaluation occurred immediately after the instructional program through the posttest after the last session by using the same tools and follow-up was done after two months.

Statistical Design:

Data analysis involved tabulating and statistically analyzing the collected data using the Statistical Package for Social Science (SPSS), version 2. Numerical data were expressed as mean and standard deviation, while qualitative data were presented as frequency and percentage. The Chi-square test and student t-test were used for statistical analysis of qualitative and quantitative data, respectively. Correlations between numerical variables were assessed using Pearson's method. A significance level of $p < 0.05$ and $p < 0.001$ was considered significant and highly significant, respectively.

RESULTS

Table (1): presents the demographic characteristics of patients post liver transplantation. It reveals that 23.3% of the study samples were aged above 40 years, while 50.0% had a high level of education. Additionally, 73.4% were employed, and 85.5% had insufficient monthly income to meet their needs.

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Table (1): Distribution of Patients According to Demographic Characteristics (n=90).

Items	No	%
Age group (years):		
<30	4	4.5
30- ≤ 40	7	7.8
40 - ≤50	31	34.4
50- ≤ 60	48	53.3
Mean ±SD	**37.9 ± 8.71**	
Gender:		
Female	38	42.3
Male	52	57.7
Educational level:		
Read & Write	17	18.9
Primary	10	11.1
Preparatory	5	5.6
Secondary school	47	52.2
Bachelor	11	12.2
Occupation :		
Employed	66	73.4
Unemployed	24	26.6
Marital status:		
Married	47	52.2
Divorced	16	17.8
Widow	27	30.0
Family income :		
Sufficient	77	85.5
Insufficient	13	14.5
Residence:		
Rural	75	83.3
Urban	15	16.7

Table (2): shows that 47.8% of patients had been living with liver disease for over ten years, with hepatitis C being the primary cause of liver failure in 62.2% of cases. The most common complaints were peripheral edema (93.3%) and abdominal ascites (86.7%). Moreover, 92.2% had been hospitalized for liver-related issues more than three times, and 35.6 % had a family history of liver diseases.

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Table (2): Distribution of Patients According to Their Medical History (n =90).

Medical history	No.	%
Causes of developing liver f cirrhosis and failure:		
• Hepatitis B virus	3	3.3
• Hepatitis C virus	56	62.2
• Bilharzias	14	15.5
• Auto immune diseases	9	10.0
• Liver cancer	15	16.7
Onset of the liver disease:		
• ≤ 5 years	12	13.3
• 6 - ≥ 10 years	35	38.9
• Over 10 years	43	47.8
The main complaint:		
• Hematemesis and bleeding	55	61.1
• Abdominal ascites	78	86.7
• Peripheral edema	84	93.3
• Recurrent hepatic coma	53	58.9
Previous admission of hospital:		
• Once	2	2.2
• Twice	5	5.6
• Three and more	83	92.2
Duration after the operation:		
• One month	44	48.9
• Two months	29	32.2
• Over three months	17	18.9
Care givers:		
• Wife/ Husband	58	64.4
• Children	38	42.2
• Home health nurse	7	7.8
Complain from chronic disease:		
• Hypertension	23	25.6
• Diabetes mellitus	17	18.8
• Heart diseases	9	10.0
• Diseases of the digestive system	27	30.0
• Bone diseases	6	6.7
• None	8	8.9
Smoking:		
• Smoker	12	13.3
• Non smoker	36	40.0
• Quit smoking	42	46.7
Family history of liver diseases:	32	35.6

Answers are not mutually exclusive

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Table (3): demonstrates a marked improvement in patients' knowledge regarding liver and liver function, concepts of liver transplantation, risk factors, effect of liver transplantation on all body system, medications, complications, signs and symptoms of rejection, knowledge about care after liver transplantation at home, measures for prevention of rejection, infection control measures, and importance of follow up. This improvement was statistically significant difference (p = <0.05) compared to pre-program scores.

Table (3): Distribution of Patients According to Their score level of Knowledge Pre-, Post-, and Follow- up of Health-Promoting Lifestyle behavior Program (n=90)

Items	Pre Mean+SD	Post Mean+SD	Follow-up Mean+SD	P-values (P1&P2)
Knowledge about liver and liver function	1.80+0.81	3.83+1.23	4.67+1.12	<0.05*
Concept of liver transplantation	0.90+1.06	5.33+1.37	7.30+1.18	<0.05*
Risk factors for liver transplantation	2.17+1.82	11.13+ 2.96	14.80+ 2.91	<0.05*
Impact of liver transplantation on various bodily systems	4.27+ 2.30	10.03+ 2.46	12.53+ 1.96	<0.05*
Post- transplant medications	0.37+ 0.85	3.77+ 1.41	5.67+ 1.03	<0.05*
Complication post liver transplantation	1.33+1.63	8.90+2.20	11.83+1.58	<0.05*
Signs &Symptoms of rejection	1.00+0.87	2.73+0.91	3.63+0.81	<0.05*
Self-care knowledge after liver transplantation in a home setting	1.00+0.87	3.17+ 0.87	4.50+0.68	<0.05*
Measures for prevention of rejection	1.13+0.43	3.57+1.10	4.50+0.68	<0.05*
Infection control measures	1.13+0.43	3.57+1.10	4.50+0.68	<0.05*
Importance of Follow up	1.00+0.87	3.17+ 0.87	4.50+0.68	<0.05*
Total knowledge score	13.97+6.98	52.47+10.86	69.20+7.82	<0.05*

Figure (1): illustrates a significant improvement in patients' overall knowledge levels, with 25.6% exhibiting satisfactory knowledge pre-program, rising to 85.6% post- program, and 91.1% after follow-up. This improvement was highly statistically significant difference (p=<0.001).

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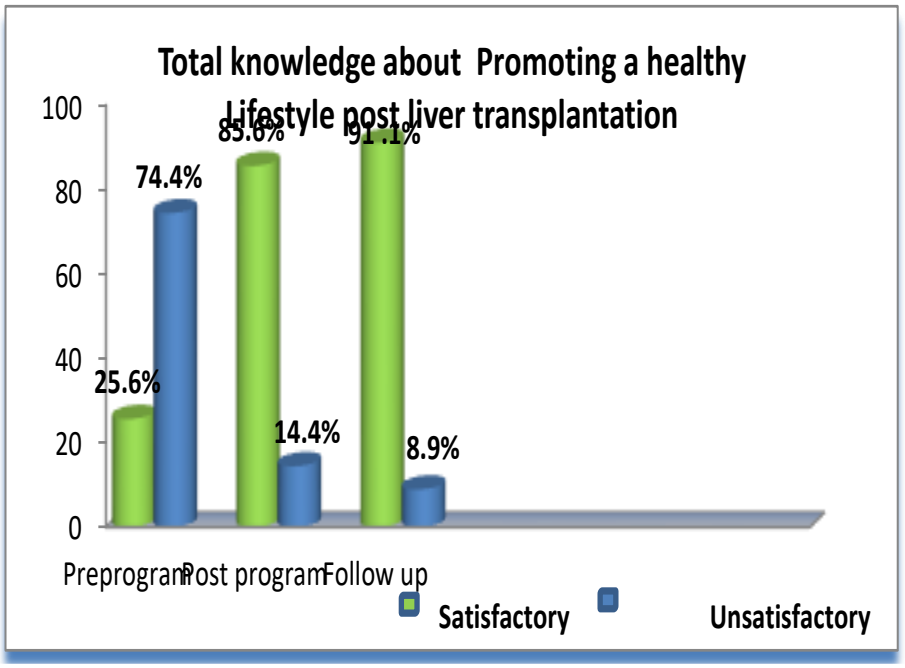

$\chi^2 = 108.263$ *p- value* < 0.001 *(HS)*

Figure (1) The Distribution of Patients Included in The study was Analyzed Based on Their Level of Knowledge Regarding Post-Liver Transplantation Pre-, Post- and Follow up Stages(n= 90).

Table (4): highlights the notable enhancements in patients' Health Promoting Lifestyle Behavior scores, with mean scores increasing from 8.07+5.13 pre-program to 31.60+4.74 post-program and 40.20+3.84 after follow-up. A significant difference was observed over time, with post hoc analysis revealing significant differences between each pair of assessments ($p < 0.05$).

Table (4): Distribution of participants According to Adequate Score Practices toward Health-Promoting Lifestyle Behaviors Pre-, Post- and Follow-up of the Intervention Program (n=90).

Health promoting lifestyle behavior	Pre Mean+SD	Post Mean+SD	Follow-up Mean+SD	P- values (P1&P2)
Health response	1.27+1.44	3.67+0.99	5.10+0.84	<0.05
Physical activity	0.13+0.57	2.80+0.81	4.33+0.71	<0.05*
Nutritional habits	1.27+1.44	3.67+0.99	5.10+0.84	<0.05
Spiritual status	2.17+1.09	4.23+0.82	5.40+0.77	<0.05*
Personal relations	2.13+1.85	8.67+1.32	10.20+0.96	<0.05
Stress management	2.37+2.55	12.23+2.67	15.17+2.25	<0.05*
Total	8.07+5.13	31.60+4.74	40.20+3.84	p1 > 0.05 p2 < 0.05*

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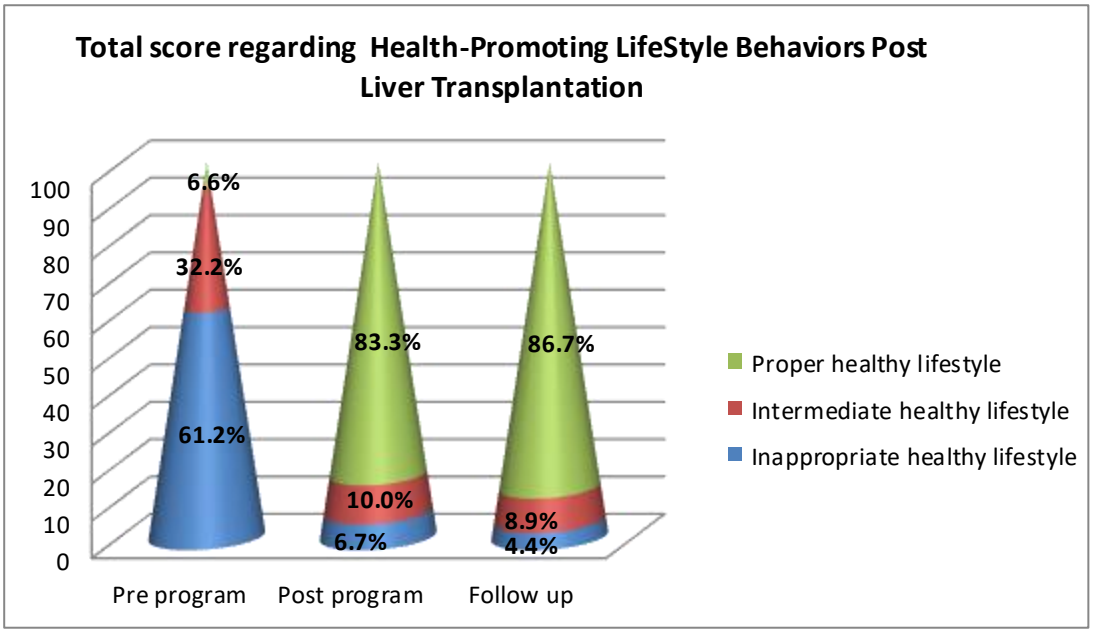
Figure (2): illustrates a highly statistically significant improvement in health - promoting lifestyle behaviors among patients, increasing from 83.3 % at 3 months post program to 86.7% at 6 months follow-up.



χ^2 = 157.923 p- value < 0.001 (HS)

Figure (2): Percentage Distribution of the Study sample According to their Health-Promoting Lifestyle Behaviors Following Liver Transplantation Pre-, Post- and Follow- up Program (n= 90).

Table (5): displays positive statistically significant correlations between patients' total knowledge scores and demographic characteristics post and follow-up, with highly significant differences (p=<0.001).

Table (5): Correlation between Demographic Characteristics of Patients and their Total Knowledge scores Pre, Post and Follow up Instructional Program (n=90).

Items	Total knowledge					
	Pre		post		Follow-up	
	r	P value	r	P value	r	P value
Age	0.833	< 0.001**	0.807	< 0.001	0.871	< 0.001**
Gender	0.527	< 0.001**	0.529	< 0.001	0.618	< 0.001**
Educational level	0.912	< 0.001**	0.846	< 0.001	0.851	< 0.001**
Occupation	0.827	< 0.001**	0.773	< 0.001	0.816	< 0.001**
Residence	0.463	< 0.001**	0.474	< 0.001	0.883	< 0.001**

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Table (6): show cases positive statistically significant correlations between patients' total knowledge scores and their health-promoting lifestyle behavior scores across pre-, post-, and follow-up instructional program, indicating a highly significant difference (p=<0.001).

Table (6): Correlation between Patients' Total Knowledge and their Total Health-Promoting Lifestyle Behaviors Pre-, Post- and Follow-up Program (n=90).

Total knowledge	Total Healthy Promoting Lifestyle Behavior					
	Pre		Post		Follow-up	
	r	72-	r	0.76	r	0.85
	P value	0.652	P value	0.001**	P value	0.001**

DISCUSSION

Patients experience a new life with various challenges after liver transplantation. Identifying these challenges can facilitate their quality of life. Liver transplant recipients need to make substantial changes to their lifestyle in order to have a good quality of life and protect their transplant. Basic requirements for such changes are adequate self- care knowledge and lifestyle modification **[12]**. Therefore, the purpose of this study was to evaluate the effect of instructional programs on health promoting lifestyle among patients' post liver transplantation.

According to demographic characteristics of the subjects under study revealed that the mean age of the participants was 37.9 ± 8.71years.This finding is consistent with **[13],** who reported a mean age of the participants was 41.8±13.8 years. Similarly, **[14],** who found a mean age of 49.8 ± 7.95 years among liver transplant recipients. The relatively advanced age of our study population may be attributable to the end-stage nature of liver disease, which is more common in older adults as a result of the cumulative effects of chronic cirrhosis and liver failure over time.

Concerning marital status of the participants, the present study revealed that more than half of the study participants were married. This finding is agreed with **[15],** they reported that 65.7% of liver transplant recipients are married. Also, this study was in the same line with **[16],** who found that 71.9% of the participants are married.

As regards educational level, the present study also found that more than half of the study participants had secondary education. This finding is congruent with **[17],** who found that 46.5% of liver transplant recipients had secondary education. However, this finding is

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inconsistent with a study by **[18],** who found that 55.9% of participants had primary education.

The findings of the current study indicate that more than half of the patients examined were unemployed. This finding is in agreement with **[19],** they reported that 59.3% of patients were unemployed. Also, this finding was consistent with **[20],** they reported that, 54.6% of studied patient unemployed. However, this contradicts the findings of **[21],** who reported that 67.7 % of patients were employed, possibly indicating the impact of chronic liver disease on their employment status.

Furthermore, this study found that less than three quarters of the patients resided in urban areas. This finding is congruent with the observations made by **[13],** they found that 55.6% of liver recipients lived in urban settings. Conversely, **[18],** who found that 38.9% of their studied patients lived in villages.

Regarding monthly income, the current study indicated that more than two thirds of the patients had sufficient family income per month. This finding aligns with the results of **[22]**, who found that 59.7% of their participants had adequate family income. However, this contrasts with the findings of **[19],** who stated that 65.3% of liver transplant recipients had insufficient monthly income.

In the context of patients' medical history, the current study findings indicate that less than half of the patients examined had been living with liver disease for more than ten years. This is consistent with prior research by **[22]**, they stated that, 56.4% of individuals suffered from liver disease within a duration of 10 to 12 years. However, the results of this study diverged from those of **[23],** who noted that 54.2% of post- liver transplant patients had been dealing with liver disease for less than 5 years.

Regarding the primary causes of liver cirrhosis and failure, the current study identified that HCV as the main culprit leading to liver failure and subsequent transplantation in more than two third of the patients studied. This aligns with the findings of **[15],** which highlighted that hepatitis C virus as the predominant cause of liver cirrhosis and the primary reason for liver transplantation in 66.2% of cases. Similarly, the study findings correspond with those of **[23],** indicating that 64.1% of participants had viral hepatitis.

Contrary to these results, **[14]**, found that hepatocellular carcinoma was the leading indication for liver transplantation in 39.7% of patients, while **[18]**, and found that 35.3% of patients undergoing liver transplantation did so due to hepatitis B infection.

The study also observed that more than three quarters of patients spent less than 20 days in the hospital post-transplant, suggesting a lack of complications following surgery. This finding contrasts with that of **[16]**, who noted that 74.1% of patients had longer hospital stays.

Moreover, the study indicated a significant improvement in patients' knowledge levels regarding post-liver transplantation following an instructional program, with scores

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steadily increasing from pre-to post- and follow-up phases. The mean score increased from 13.97+6.98 the pre-program phase to 52.47+10.86 following the program, and then to 69.20+7.82 the follow-up phase. These outcomes are consistent with **[23],** illustrated that 92.6% of participants improved in almost all areas of their patients' knowledge. Also, this finding was consistent with **[16]**, concluded that, 79.4% of participants enhanced knowledge post instruction. From the researchers' point of view, the program succeeded in achieving its objectives of improving patients' knowledge regarding post liver transplantation.

Concerning the total level of patients' knowledge concerning post liver transplantation, the study conducted here in revealed that approximately a quarter of the participants exhibited satisfactory knowledge prior to program initiation. Subsequently, a significant enhancement in knowledge levels was observed post implementation, with the majority of patients displaying improved understanding, as indicated by a highly significant statistical difference (P-value <0.001). This finding aligns with the research of **[19],** which reported that 88.9% of patients displaying good knowledge post instruction. Moreover, **[15],** also noted a meaningful improvement in knowledge levels following a discharge education program for liver transplant patients. The findings suggest that the instructional program contributes to patients' knowledge acquisition post implementation.

The present study findings indicate a significant improvement in patients' health promoting lifestyle behavior after three and six months post program implementation. Notable enhancements were observed in health promoting lifestyle scores over various time points, with the mean score increasing from 8.07+5.13 pre-program to 31.60+4.74 post- program, and further to 40.20+3.84 during the follow-up period. These results are consistent with the study by **[20],** which identified highly statistically significant differences (P- value <0.001) in health promoting lifestyle post liver transplantation between pre- and post- program phases. This improvement could be attributed to the positive impact of the instructional program on patients' lifestyle behaviors.

Regarding patients' health- promoting lifestyle behavior scores post liver transplantation, the study revealed that less than one tenth of patients exhibited proper lifestyle habits before program implementation. However, after three and six months, the majority of patients displayed improved health promoting lifestyles following program instruction, with a highly statically significant difference (P- value <0.001). Similar findings, **[17],** emphasize the positive outcomes of self-care education programs on patients' performance and safety, suggesting that practical knowledge in the program is more effective than theoretical knowledge.

Furthermore, the study found a highly positive statistically significant correlation between patients' demographic characteristics and their total knowledge after six months of program implementation. This observation is corroborated by **[24],** who reported a positive correlation between patients' knowledge and their educational level, emphasizing the

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importance of education in empowering patients to manage their risk factors and complications post liver transplantation.

Lastly, the study found a highly positive statistically significant correlation between patients' knowledge and their health-promoting lifestyle behavior after three and six months of program implementation. These results are consistent with those of **[24]**, who noted a positive association between patients' knowledge and their compliance with immunosuppressive therapy and lifestyle changes after liver transplantation. The researchers suggest that enhancing patients' knowledge through educational programs can have a positive impact on their adherence to recommended practices.

CONCLUSION

The study found a statistically significant positive impact of an instructional program on the knowledge and health promoting lifestyle behaviors of liver transplant patients, thus confirming the research hypothesis.

RECOMMENDATIONS

This research led to the following recommendations

1. Establishing a comprehensive nursing discharge plan that incorporates education on self-care knowledge, lifestyle modifications and various treatments at home.
2. Provision of Counseling sessions by community health nurses for liver transplant patients and their families to enhance self-care practices, at home, lifestyle adjustments, and health management at home.
3. Conducting further research on challenges faced by liver transplant patients that influence their quality of life.
4. Further studies should involve a larger and more diverse sample of patients from various regions of Egypt to enhance the generalizability of findings.

REFERENCES

[1] Yun, G., Lin, c., Jeong, J., Ha, N., Hong, J., Lee, S., and Kim, Y. (2021): Development of pre-Discharge Group Education Program for Liver Transplant Patients, The Journal of the Korean Society for Transplantation,33(5), ***Pp.***23-34.

[2] Cherney, K. (2019): The facts about liver transplant, available at https:// www.healthline.com/health/liver-transplant-survival. Accessed on 6-1-2023.

Print ISSN 2636-3224
Online ISSN 2636-3232

[3] Potter, P. and Perry, A. (2019): Fundamental of Nursing, 8th ed., Mosby, Inc., Elsevier, St Louis, Missouri, pp.63-146.

[4] Hrenczuk, C., Bieniak, B.,Pazik, J., and Nalkowski, P.(2019): Analysis of Health Behaviors in Patients after Liver Transplant, In Transplantation Proceedings, Elsevier, 55(12), ***Pp. 364-478.***

[5] Shu Wang, G., Yang, Y., Li., H., Jiang R., Sheng Fu, C., Jin, H., Xu Yang, K. and Hua Chen, G. (2022): Health-related quality of life after liver transplantation: the experience from a single Chinese center. Hepatobiliary and Pancreatic Diseases International 12, (43) 263-269.

[6]World Health Ranking (2020): International report on organ donation and transplantation activities, available at: https://www.healthdata.org/gbd/gbd2020-resources, accessed on 15/2/2023.

[7] Bryan, S., Ratcliffe, J., Neuberger, A., Burroughs, C., Gunson, B. and Buxton, R. (2019): Health-related quality of life following liver transplantation, Quality of life research, 5 (3), Pp.123-139.

[8] Harshad, J., Feeley, T.H. and Kim, H. (2023): A peer-based intervention educates liver transplant candidates about living donor liver transplantation. Liver Transplantation; 16: 42-8. Med: 20035520, available at: https://doi.org/10.1002/lt.21937/ ***reports/ accessed on 9/2/2023.***

[9] World Health Organization (2021): Global Observatory on Donation and Transplantation, available at: http://www.transplant observatory.org/reports/accessed on 8/3/2023.

[10] Suleiman, A. (2020): Knowledge, Attitude, and Willingness towards Organ Donation among Medical and Health Sciences Students in Central Region, Saudi Arabia. Transplant Research and Risk Management, available at: https://doi.org/10.2147/TRRM.S264872/reports/accessed on 5/3/2023.

[11] Meihan, C. and Chung-Ngok, J. (2019): Validation of the psychometric properties of the health-promoting lifestyle profile in a sample of Taiwanese women. Quality of life Res; 22:634-7.

[12] Bollipo, S., Kapuria, D., Rabiee, A., Benyakov, G., Lui, R., Lee, H., Dhanasekaran, R. (2020): One world, one pandemic, many guidelines: management of liver diseases during COVID-19, BMJ Journal, 67(7), p.1468.

[13] Dunn, M**., Rogal, S., Duarte-Rojo, A. and Lai,J.C. (2020):** Physical Function, Physical Activity and Quality of life after liver transplantation, Liver Transplantation, 27(5), Pp.704-705.

[14] Aberg, G. (2020): Quality of life after liver transplantation, Best Practice & Research Clinical Gastroenterology, 10 (31), Pp.554-565.

Print ISSN 2636-3224
Online ISSN 2636-3232

[15] Totti,V., Campione,T., M**osconi, S., Ta**m**e,** M**., Tonioli,** M**., Gregorini,** R**., and Bellis, O. (2020):**Observational Retrospective Study on Patient Lifestyle in the pre-transplantation and Post-transplantation Period in the Emilia-Romagna Region, in Transplantation Proceedings, Elsevier,52, Pp.1443-1445.

[16] Lee, T., Kaiser, T., Alloway, R., Woodle, E., Edwards, M.J. and Shah, S. (2019): Telemedicine Based Remote Home Monitoring after liver transplantation: Results of a Randomized prospective trial, Annals of Surgery, 270(3), Pp.785-796.

[17] Kinhs, N., Lorenconi, B., Pessoa, J.,Paim, S., Ramos, S., Martins, M. and Sens, S. (2020): Health needs of patients undergoing liver transplant from the context of hospital discharge**,** in Transplantation proceedings, Elsevier, 50, Pp.1433-1437.

[18] Sepanlou, S., Safiri, S., Bisignano, C., Ikuta, K., M. and Adedoyin, R. (2020): the global, regional and national burden of cirrhosis by cause in 196 countries and territories, 1990-2017: a systemic analysis for the GLOBL Burden of Disease Study 2017, The Lancet Gastroenterology and Hepatology, 5(4),347-367.

[19] Shamsaeefar, A., Nikeghbalian, S., Kazemi, K., Gholami, S., Sayadi, M.,Azadian, F. and Malekhosseini, S. (2020): Quality of Life among Liver Transplantation Recipients Before and After Surgery: A single-center longitudinal study, India Journal of Transplantation, 16 (3), Pp.428-439.

[20] Gezginci, E., Kosucu, S.,Goktas, S. and Sahin, E. (2019): Relationship between Depression and Healthy lifestyle Behaviors of Patients with History of Transplant, In Transplantation Proceedings, 53(8), Pp. 2467-2471.

[21] Neuberger, J. (2019): Long Term Management after Liver Transplantation, Reference Module in Biomedical Sciences, 87, Pp. 118-126.

[22] Jain, M., Venkataraman, J., Reddy, S.and Rela, M. (2019): Determinants of Medication Adherence in Liver Transplant Recipients. Journal of Clinical and Experimental Hepatology**,** 8(6), Pp. 767-877.

[23] Lu, H., Hu,Y., Xu, J.,Qin,W.,Cao, Y.,Li,J. and Qiao, Y.(2020): Self- Management Behavior, Symptom Occurrence, and Psychological Distress in Liver Transplant Recipients in China: A Descriptive Correlational Study, In Transplantation proceedings, Elsevier, 8 (3), Pp. 234-244.

[24] Girgenti, R., Tropea, A., Buttafarro, M.,Ragusa, R. and Ammirata, M. (2020): Quality of Life in Liver Transplant Recipients: A Retrospective Study, International Journal of Environmental Research and Public Health, 18 (12), Pp. 103-115.

Print ISSN 2636-3224
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