Home Health Care Model to Improve Quality of Life among Post Liver Transplant Recipients

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Abstract

Liver transplantation represents the only curative treatment option for end-stage liver disease. **The aim of this study:** Was to evaluate home health care model to improve quality of life among post liver transplant recipients. **Research design:** A quasi experimental design was utilized in this study. **Setting:** This study was conducted at Liver Transplantation Unit of National Liver Institute, Menoufeya University followed by home visits to conduct the study. **The sample:** Purposive sample was used in this study; the total sample included 70 patients. **Tools: Three tools** were used **I):** A structured interviewing questionnaire which consists of four parts to assess **a):** Socio-demographic characteristics **b):** Medical history **c):** Patients' knowledge regarding liver transplantation and home health care model, and **d)**: Reported practices of patients post liver transplantation, **II):** Observational checklist which consists of two parts to observe **a):** Home health care practices post liver transplantation **b):** Home environment of patients post liver transplantation, and **III):** Scale to measure quality of life of patients post liver transplantation. **Results:** 61.4% of the studied patients had good knowledge post implementation of home health care model, 88.6% of the studied patients had satisfactory practices post implementation of home health care model, and 70.0% of the studied patients had good quality of life post implementation of home health care model. There were positive statistically significant correlations between the studied patients' total quality of life score and total practices score and total knowledge score pre and post implementation of home health care model. **Conclusion:** The home health care model succeeded to improve knowledge, practices and quality of life of the studied patients post LT. **Recommendations:** Continuous home health care model for patients post liver transplantation to enhance patients` knowledge, practices and quality of life.

Key words: Home health care model, Liver transplantation, Quality of life

Introduction:

Liver Transplantation (LT) is considered one of the most complex procedures in modern surgery and is performed when conventional therapeutic resources are not sufficient to treat liver diseases. For the patient, LT typically means a rapid transition from living with end-stage liver failure to a state of health and improved vitality as an inflection point in a recipient's life *(Aberg, 2020; Dunn et al., 2020; Knihs et al., 2020).*

Globally, 1.5 billion people have chronic liver diseases. Liver diseases account for more than two million deaths per year. Liver cirrhosis caused more than 1.32 million deaths (440000; 33.3%) in females and (838000; 66.7%) in males globally and 1 million due to viral hepatitis and hepatocellular carcinoma. This high prevalence of liver diseases has led to

increasing number of patients suffering from end stage liver disease, necessitating liver transplantation *(Bollipo et al., 2020; Sepanlou et al., 2020).*

Liver transplantation not only prolongs a recipient's life, but also improves the recipient's Quality Of Life (QOL) by aiming to allow the recipient to achieve the best possible improvement relative to the pre-transplant period. Achieving an adequate QOL is an indicator of therapeutic success that is becoming more and more important to measure after the transplant. However, even after liver transplantation, quality of life often remains below levels found in the general population because acute and chronic graft rejection, recurrence of liver disease, or secondary effects of immunosuppressant are very stressful complications for patients and families *(Girgenti et al., 2020).*

Home health care is a primary health care model that is an integrated system of care designed to meet the health needs of individuals, families and communities in local settings. The goal of the complex rehabilitation after transplant is to maximize the lifetime, improve the quality of life and restore social relationships. Home Health Care (HCC) model after liver transplantation emphases the provision of a variety of clinical and medical services that are provided directly or indirectly to patients in places of residence and in communities. These services can include medical, physiological, or social assessments, wound care, education on the use of drugs, pain management, patient education, disease management, physiotherapy, speech therapy and the empowerment of patients and families to prevent complications and promote patients` health *(Nasrabadi et al., 2019).*

Community health nurse as a care provider participate in long-term management of patients post liver transplantation. Long-term management should focus on early recognition and effective treatment of complications, promoting a healthy life-style by encouraging adequate nutrition, an increase in physical activity, compliance with the drugs and minimizing the inherent side-effects of the immunosuppressive agents, prevention of infection, maintenance of regular health checks, and active treatment of chronic disease and promoting bone health. Compliance with a healthy lifestyle after transplantation is important for patient outcomes. Community health nurses meet recipients` physical and psychological needs after LT. With active management, recipients will lead a healthy and active life *(Neuberger, 2019).*

Significance of the study:

In Egypt, According to the latest world health organization` data published; liver disease deaths in Egypt reached 68,866 or 12.40% of total deaths. The age adjusted death rate is 116.08 per 100,000 of population; ranks Egypt number one in the world *(World Health Rankings, 2020).*

More than 34,074 liver transplants are performed throughout the world each year and around 19.20% are from living donors *(WHO, 2020).* According to the American Liver Foundation, around 8,000 liver transplant surgeries are performed in the United States every year with 120,000 candidates on the waiting list *(Cherney, 2019).*

Egypt nowadays witnesses a significant evolution in the liver transplantation surgeries. More than 15 medical centers and hospitals which operate in Egypt today would provide liver transplantation operations with the highest standards of quality and success rates. This is

why many patients from the Arab World and Africa resort to Egypt to carry out such medical procedures. Many Egyptian doctors also have the experiences and skills required to carry out such a complicated surgery. Egypt is one of the most leading countries in the Middle East in liver transplantation operations *(Saudi German Hospital, 2020).*

Aim of the study:

This study aimed to evaluate home health care model to improve quality of life among post liver transplant recipients.

Research hypothesis

Home health care model will improve quality of life among post liver transplant recipients.

Subject and method:

Research design:

A quasi – experimental design was used in carrying out this study.

Setting:-

This study was conducted at Liver Transplantation Unit of National Liver Institute, Menoufeya University where considered the first center in the Middle East where liver transplantation takes place and it differentiates from other transplantation center by high attendance and following of patients from all over Egypt and Middle East; followed by home visits to conduct the study.

Sampling:

Purposive sample of patients attended to previously mentioned setting throughout 12 months from the beginning of the study with the following criteria: Age between 18 – 60 years, in the first three months post operation, agreeing to participate in the study. The total sample included 70 patients.

Tools for Data Collection: Three tools were used to collect the data:

Tool (I): A structured interviewing questionnaire: It was developed by the researcher based on literature review of the current and past available national and international references related literature about chronic obstructive pulmonary disease by using a journal, textbooks and internet search, approved by supervisors and it was written in simple clear Arabic language: It comprised of four parts to assess:

The first part: It was designed to assess socio demographic characteristics of patients involved in the study.

The second part: It was designed to assess medical history of patients post liver transplantation.

The third part: It was concerned with patients' knowledge related two main areas: Knowledge of patients regarding liver transplantation which included 15 items and knowledge of patients about home health care model which included 2 items.

Scoring system:

The scoring system for patients` knowledge was calculated as follows (2) score for complete correct answer, while (1) score for incomplete correct answer, and (0) for don't know answer. For each section of knowledge, the score of the items was summed up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a percent score. The total knowledge score was considered good if the score of the total knowledge $\geq 75\%$ equal and more (25) point, while considered average if it equals 50-<75% (17-25) point, and considered poor if it is < 50% less (17) point.

Fourth part: Reported practices of patients post LT which included items that divided into that divided into four parts: Exercise, prevention of infection, nutrition and medications regimen.

Tool (II): Observational checklist which covered the following two parts:

The first part: Designed to observe home health care practices among post LT recipients adapted from **Perry et al., 2018**

which included (10) items; perform deep breathing exercise, practice cough exercise, perform range of motion of upper extremities: Neck exercise, shoulder and elbow exercise, arm and wrist exercise, hand and finger exercise, practice range of motion of lower extremities: Hip and knee exercise, ankle and foot exercise, perform hand washing and mouth care.

Scoring system:

The scoring system for patients` practices was calculated as follows (1) score for done and (0) for not done practicing. The score of the items was summed- up and the total divided by the number of the items, giving a mean score. These scores were converted into a percent score. The total practices score was considered satisfactory if the score of the total practices ≥60% (≥26point), while considered unsatisfactory if it is < 60% (< 26point).

Second part: The second part: Designed to observe home environment of patients post LT adapted from *(Mohamed& Mostafa, 2018).*

Scoring system:

The scoring system for patients` home environment was calculated as follows (2) score for good and, while (1) score for average, and (0) for poor.

Tool (III): Scale to measure quality of life of patients post LT which included (19) items adapted from **Bryan et al., 1998.** The scale was measured on a Likert type of (always, sometimes and never) which was modified by researcher to assess the impact physical, psychological and social status on quality of life of patients. It was translated into Arabic by the researcher and divided into three domains: Physical status which included (7) items, psychological status which included (8) items and social status which included (4) items.

Scoring system:

Quality of Life scale score was calculated as (2) scores for always, (1) scores for sometimes and (0) for never. The score of the items was summed- up and the total divided by the number of the items, giving a mean score. These scores were converted into a percent score. The total quality of life score (19) was considered good if the score >75% (>28) points, while considered average if its 50- 75% (19-28) points, and considered poor if it <50 (<19) points.

Content validity of the tools:

Content validity of the tools was done by five of Faculty's Staff Nursing experts from the Community Health Nursing Specialties who reviewed the tools for clarity, relevance, comprehensiveness, and applicability and give their opinion.

Reliability of the tools:

Reliability of the tool was applied by the researcher for testing the internal consistency of the tool, by administration of the same tools to the same subjects under similar condition on one or more occasion. Answers from repeated testing were compared (test-re-test reliability). The reliability was done by Cronbachs Alpha coefficient test which revealed that each of the three tools consisted of relatively homogenous items as indicated by the moderate to high reliability of each tool. The internal consistency of the knowledge was 0.88, while practices were 0.91, and quality of life was 0.86.

Ethical considerations:

All ethical issues were assured; oral consent has been obtained from each patient before conducting the interview and given them a brief orientation to the purpose of the study. Patients were also reassured that all information gathered would be confidentially and used only for the purpose of the study. The patients had right to withdraw from the study at any time without giving any reasons.

Pilot study:

The pilot study was conducted on (6)

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patients who taken in one month and half. The pilot study was aimed to test the content, clarity, applicability and simplicity of the tool using the interviewing questionnaire and the observational checklist as a pre-test sheet. The estimation of the time needed to fill the questionnaire time needed to fill each sheet consumed about 30 minutes. No modifications were done, so the pilot study sample was included in the total sample.

Field work:

Data were collected over 12 months from the start of March 2019 to end of the February 2020. The study was conducted by the researcher for the studied sample in the selected setting of Liver Transplantation Unit of National Liver Institute and their home through home visits. The researcher visited the Liver Transplantation Unit two days per week (Wednesday and Thursday) from 9:00 am to 12:00 mid- day, and other two days of the week (Saturday and Tuesday) to accomplish home visits to previously selected cases. The researcher chose these days because increase the frequency of patients in these days and these days appropriate for researcher. The average time needed for the sheet was around 30/minutes, the average number interviewed at the outpatient clinics were 3-5 patients/day depending on the responses of the patients.

Home health care model included four phases:

Based on the results obtained from the interviewing questionnaire and observational checklists, as well literature review, the home health care model developed by researcher. It was implemented immediately after pre-test. The researcher implemented the home health care model through 4 phases as the following:

(I) Assessment phase: In this phase of the home health care model, assessed knowledge, practices and quality of life of the studied patients through collection and analysis of baseline data from the filled tools. In this

phase the researcher did the pre- test.

(II) Planning phase: The researcher identified the important needs for target group, set priorities of needs, goals and objectives were developed.

(III) Implementation phase: The researcher implemented the home health care model through six sessions of 3 hours and 30 minutes (3 theoretical sessions and 3 practical sessions; 2 hours theoretical and 1 hour practical), each session lasted 30 – 45 minutes including periods of discussion, and the average number implementation of the home health care model were 3-5 patients/day**,** and immediately did the post-test.

Teaching methods:

All patients received the same intervention content using the same teaching methods, there were:

- Illustration discussion.
- Demonstration and re-demonstration.
- Presentation.

Teaching aids: Suitable teaching aids were specially prepared for intervention, as: colored pictures, handout, real objects (equipment) and videos

Phase (IV): Evaluation of the home health care intervention:

After implementation the home health care model, the researcher applied the post-test immediately to evaluate the knowledge acquired. Evaluation of the intervention was done by using the post-test questionnaire which was the same formats of pre - test in order to compare the change in the patients` knowledge, practices, and quality of life immediately after implementation of the home health care model.

Statistical analysis:

All data collected were organized, tabulated and analyzed using appropriate statistical test. The data were analyzed by using the Statistical Package for Social Science (SPSS)

version 21 which was applied to calculate frequencies and percentage, mean and standard deviation, as well as test statistical significance and associations by using Chi- square test (x2)and linear correlation coefficient (r), and matrix correlation to detect the relation between the variables (P value).

Significance levels were considered as follows:

Highly statistically significant $P < 0.001**$
Statistically significant $P < 0.05*$
Not significant $P > 0.05$

Result:

Table (1): Shows that; 48.6% of the studied patients aged 50 to less than 60 years with mean age 49.66± 6.84 years, 62.9% of them were males, and 68.6% of them were married. Regarding to their educational level; 31.4% of the studied patients had secondary education, 40.0% of them didn't work, while 60.0% of the studied patients were lived in urban areas and 65.7% of them had enough family income per month.

Table (2): Shows that; 51.4% of the studied patients suffered from liver disease since more than ten years, 77.1% of them had HCV as the main cause of liver failure. 87.1%, 84.3% of studied patients suffered from abdominal ascites and peripheral edema respectively, 77.2% of them had previous hospital admission due to liver diseases more than three times, 57.1% of them had family history of liver disease.

Table (3): Shows that; 54.3% of the studied patients undergo liver transplant surgery since one month or more, while 71.4 % of them stayed at hospital for less than 20 days with mean day 16 ±6.10 days. 60.0% of the studied patients were cared by husband or wife. 37.1% of them didn't suffer from other health problems, 55.7% of the studied patients didn`t smoke.

Table (4): Reveals that; 85.7% of the studied patients lived away from birds and animals, while 74.3% of them lived in a clean and tidy room and had a good level of ventilation in the house.

Figure (1): This figure illustrates that; 10.0% of studied patients had good knowledge pre implementation of HHC model which increased to 61.4% post implementation of HHC model, while 55.7% of them had poor knowledge at pre implementation of HHC model, and then this percentage decreased to 11.4% post implementation of HHC model.

Figure (2): This figure illustrates that; 32.9% of the studied patients had satisfactory practices pre implementation of HHC model, and then this percentage increased to 88.6% post implementation of HHC model.

Figure (3): This figure illustrates that; 20.0% of the studied patients had good total scores of quality of life pre implementation of HHC model which increased to 70.0% post implementation of HHC model.

Table (5): Shows that; there was a positive statistically significant correlation between the studied patients` total practices score and total knowledge score pre and post implementation of HHC model.

Table (6): Shows that; there were positive statistically significant correlations between the studied patients` total quality of life score and total knowledge score and total practices score pre and post implementation of HHC model (P= > 0.05).

Table (1): Distribution of the studied patients regarding their socio demographic characteristics (n=70).

Demographic characteristics	No.	%
Age / years		
30-	6	8.6
40-	26	37.1
50-	34	48.6
60+	4	5.7
Mean ± SD	49.66± 6.84	
Sex		
Male	44	62.9
Female	26	37.1
Marital status		
Single	4	5.7
Married	48	68.6
Widowed	10	14.3
Divorced	8	11.4
Educational level		
Can't read and write	15	21.4
Basic education	16	22.9
Secondary education	22	31.4
University education	17	24.3
Occupation		
Employee	18	25.7
Free work	24	34.3
Not working / Housewife	28	40.0
Residence		
Urban	42	60.0
Rural	28	40.0
Family income		
Enough and save	8	11.4
Just enough	46	65.7
Not enough	16	22.9

Table (2): Distribution of the studied patients regarding their past medical history (n=70).

Past medical history	No.	%
Onset of the liver disease		
< 5year	6	8.6
5 - years	28	40.0
10 - years	36	51.4
* Causes of liver cirrhosis and failure		
Hepatitis B virus	0	0.0
Hepatitis C virus	54	77.1
Bilharzias	27	38.6
Primary liver tumors	20	28.6
* The main compliant		
Abdominal ascites	61	87.1
Hematemesis and recurrent bleeding	46	65.7
Peripheral edema	59	84.3
Recurrent hepatic coma	34	48.6
Previous hospital admission		
Once	4	5.7
Twice	12	17.1
Three and more	54	77.2
Family history of liver disease	40	57.1

*Answers are not mutually exclusive

Table (3): Distribution of the studied patients regarding their current medical history (n=70).

Current medical history	No.	%
Time post-surgery:		
Month -	38	54.3
Two months -	20	28.6
Three months+	12	17.1
Duration of hospital stay / days:		
< 20	50	71.4
≥ 20	20	28.6
Mean ± SD 16 ±6.10		
*Care givers		
Husband/wife	42	60.0
Children	34	48.6
Home health care nurse	11	15.7
* Other health problems:		
None	26	37.1
Diseases of the digestive system	17	24.3
Heart disease /blood vessels such as hypertension	8	11.4
Endocrine diseases such as diabetes mellitus	14	20.0
Rheumatism	5	7.1
Smoking:		
Smoker	0	0.0
Non smoker	39	55.7
Quit smoking	31	44.3

*Answers are not mutually exclusive

Table (4): Distribution of the studied patients regarding their home environmental condition (n=70).

| Home environment	Good		Average		Poor	
	No.	%	No.	%	No.	%
Ventilation level inside the house.	52	74.3	15	21.4	3	4.3
Changing and washing the bed linen daily.	36	51.4	32	45.7	2	2.9
Staying away from birds and animals.	60	85.7	8	11.4	2	2.9
Cleaning with disinfectants.	25	35.7	39	55.7	6	8.6
Clean and tidy personal room.	52	74.3	13	18.6	5	7.1
Safe disposal of waste.	24	34.3	31	44.3	15	21.4
Using a vacuum cleaner when cleaning.	25	35.7	32	45.7	13	18.6
Elimination of insects and rodents.	41	58.6	18	25.7	11	15.7
Cleansing the bathroom by using cleansing materials.	25	35.7	30	42.9	15	21.4
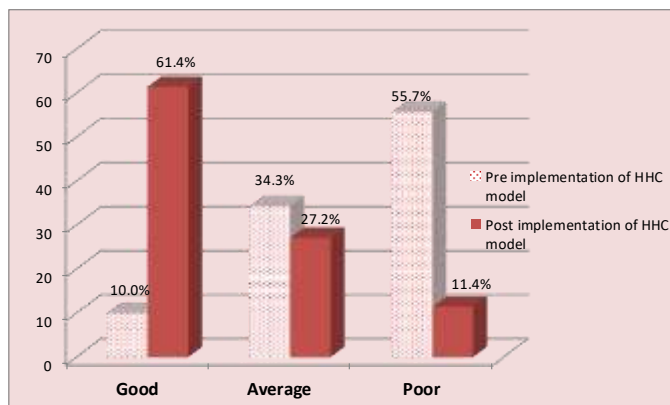
Figure (1): Percentage distribution of the studied patients regarding their total knowledge score about liver transplantation, home health care model pre and post implementation of HHC model (n= 70).
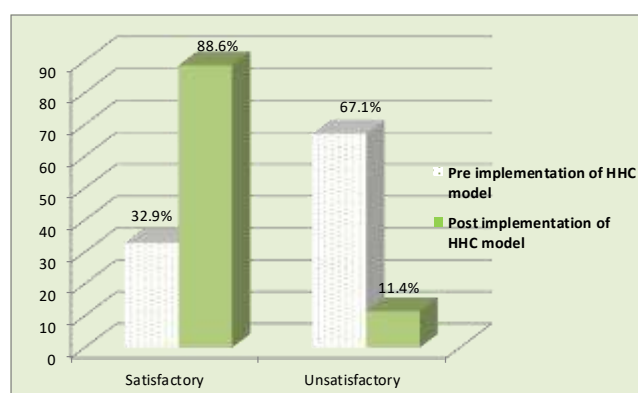

Figure (2): Percentage distribution of the studied patients` total practices score pre and post implementation of HHC model (n=70)
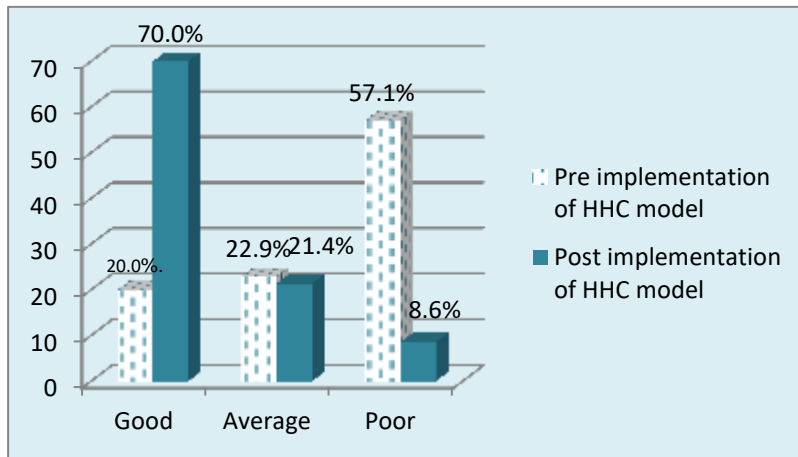
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Figure (3): Percentage distribution of the studied patients regarding their total quality of life score pre and post implementation of HHC model (n=70).

Table (5): Correlation between studied patients total practices score and total knowledge score pre and post implementation of HHC model (n=70).

Items	Total practices			
	Pre		Post	
	r	p-value	r	p-value
Total knowledge	0.74	0.025*	0.83	0. 001**

* Statistically significant difference (P < 0 .05)

Table (6): Correlation between the studied patients total knowledge score, total practices score and total quality of life score pre and post intervention (n=70).

Items	Total quality of life			
	Pre		Post	
	r	p-value	r	p-value
Total knowledge	0.21	0.05*	0.40	0.04*
Total practices	0.33	0.04*	0.56	0.02*

* Statistically significant difference (P < 0 .05)

Discussion:

Patients undergoing transplantation experience several adaptations from the point of being placed on the waiting list for a lifesaving organ until the postoperative period. While waiting for the organ, a number of limitations imposed by the chronic disease occur. As a result of the underlying disease, the patient's clinical condition can worsen and liver cirrhosis can arise, leading to ascites, encephalopathy, digestive hemorrhages, and other complications. After liver transplant, the limitations are mainly

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related to the use of immunosuppressant drugs, recurrent diseases, and rejection, in addition to several changes when the patient returns home **(Knihs et al., 2020).**

This study aimed to evaluate home health care model to improve quality of life among post liver transplant recipients. Home health care model was expected to be effective methods for improve quality of life among patients post liver transplantation evidenced by significant improvement in the patients` knowledge, practices, and significant improvement in quality of life of patients (physical, psychological, and social domains).

According to demographic characteristics of the studied patients, the current study revealed that; less than half of the studied patients aged from 50 to less than 60 years old with mean age of present study were 49.6±6.84. This might be due to end stage liver disease which common in old age as a result of effect of chronic cirrhosis and liver failure for long time that necessitating liver transplantation when conventional therapeutic resources are not sufficient to treat liver disease. This finding was in agreement with **Roshdy et al. (2019),** who conducted study on impact of early pulmonary rehabilitation on post liver transplantation, Cairo, Egypt, (N=30), and who reported that the mean age of the participants was 49.2 ±7.12years. Also this finding was in the same line with **Totti et al. (2020),** who made study on observational retrospective study on patient lifestyle in the pre transplantation and post-transplantation period in the Emilia-Romagna region, Italy, (N = 223), and who reported that the mean age of liver transplantation recipients was 50 ± 6 years . However this finding was in disagreement with **Knihs et al. (2020),** who conducted study on health needs of patients undergoing

liver transplant from the context of hospital discharge, Santa Catarina, Brazil, (N. = 20) and who reported that the mean age of participants study was 55.4 years.

The current study revealed that; more than three fifths of the studied patients were males. This might be due to liver diseases are common in male than female. This study was consistent with **Gezginc et al. (2019),** who studied the relationship between depression and healthy lifestyle behaviors of patients with history of transplant, Istanbul, Turkey, (N. = 110) and who reported that 60.9% of the studied patients were male. Also, this study was in agreement with **Kothari et al. (2016),** who studied inpatient rehabilitation after liver transplantation decreases risk and severity of 30-day readmissions, California, United States, (N.= 779) and who found that 64.3% of the studied patients were male.

Concerning the marital status of the studied patients, the present study revealed that; more than two thirds of the studied patients were married. This study agreed with **Hrenczuk et al. (2018),** they conducted study on analysis of health behaviors in patients after liver transplant, Warsaw, Poland, (N= 115), they reported that 63.5% of liver recipients were married. Also, this study was in the same line with **Mansouri et al.(2017),** they studied the effect of self-management training on self-efficacy of cirrhotic patients referring to transplantation center of Nemazee hospital: A randomized controlled clinical trial, Shiraz, Iran, (N= 40), and they found that 70.0% of the participants were married. However, this study results disagreed with **Wesolowska-Gorniak et al. (2019),** they made study on determinants of professional activity after kidney and liver transplantation: questionnaire development and validation, Warsaw, Poland, (N= 64), and they reported that only 46.9% of patients were married.

As regards educational level, the present study revealed that less than one third of the studied patients had secondary education. This study was congruent with **Hrenczuk et al. (2018),** they reported that 41.7% of liver recipients had secondary education. Also, this study was supported by **Bender et al. (2018),** they studied patient quality of life after liver transplantation in terms of emotional problems and the impact of socio demographic factors, Warsaw, Poland, (N=121), and they found that 41.3% of patients had secondary education. On the other hand, this study disagreed with **Ordin& Karayurt (2016),** they conducted a study on effects of a support group intervention on physical, psychological, and social adaptation of liver transplant recipients, Izmir, Turkey, (N=25), and they reported that 48.6% of liver transplant recipients had primary education.

The result of the present study revealed that; two fifths of the studied patients did not work. This might be due to effect of chronic liver disease on their health that disabled the patients from working. This study was in agreement with **Lu et al. (2020),** they studied self-management behavior, symptom occurrence, and psychological distress in liver transplant recipients in china: A descriptive correlational study, Shanghai, China, (N=255), and they reported that 54.9% of studied patient did not work. Also, this finding was consistent with **Shamsaeefar et al. (2020),** they studied quality of life among liver transplantation recipients before and after surgery: A single-center longitudinal study, Shiraz, Iran, (N=40), and they reported that 52.5% of patients were unemployed. However, this study finding was contradicted with **El-Meteini et al. (2019),** they studied psychosocial profile and psychiatric morbidity among Egyptian patients after living donor liver transplantation, Egypt,

(N=33), and they reported that 66.7% of the studied patients were working.

This study showed that; three fifths of the studied patients lived in urban areas. This study finding was in the same line with **Bender et al. (2018),** they reported that more than half of liver recipients lived in urban area. However, this study finding was contradicted with **Wesolowska-Gorniak et al. (2019),** they reported that 35.9% of the studied patients lived in village.

Concerning to monthly income, the present study results showed that; almost two thirds of the studied patients had enough family income per month. This might be due to the governmental financial support authorities to the patients for surgery and medications costs. This study finding was consistent with **Gezginc et al. (2019),** and they reported that 57.3% of the studied patients had enough family income. However, this study disagreed with **Jain et al. (2019),** they studied determinants of medication adherence in liver transplant recipients, India, (N=56), and they reported that 41.0% of liver transplant recipients had high monthly income.

As regards past medical history, the current study revealed that; three fifths of the studied patients suffered from liver disease since more than ten years. This might be due to the studied patients suffered from liver disease from long period of time and become chronic disease that affect functions of liver and less than half of the studied patients aged from 50 to less than 60 years old. This study finding agreed with **Mohamed& Mostafa, (2018),** they conducted a study on the effects of educational intervention on self-care behavior and expected clinical outcome in patient undergoing liver transplantation, Egypt,(N=60), and they found that 53.3% of

the studied patients suffered from liver disease within 10 to 12 years. However, this study was contradicted with **Abdel-Ghany et al. (2016),** they studied knowledge and daily living activities of post liver transplant clients, Egypt, (N=105), and they found that 56.2% of post liver transplant clients suffered from liver disease since less than 5 years.

Concerning the main causes of liver cirrhosis and failure, this study results showed that; HCV was the main cause of liver failure that necessitating liver transplantation in three quarters of the studied patients. This study finding was congruent with **Totti et al. (2019),** they made a study on physical condition, glycemia, liver function, and quality of life in liver transplant recipients after a 12-month supervised exercise program, Italy,(N=40), and they reported that hepatitis C–related cirrhosis was the main indication for LT in 58.6% of studied patients. As well as, this study finding was agreed with **Ordin& Karayurt (2016),** they found that 64.1% of study participants suffered from viral hepatitis.

On the other side, this study finding was inconsistent with **Casanova et al. (2016),** they conducted a study on identifying improved and non-improved aspects of health-related quality of life after liver transplantation based on the assessment of the specific questionnaire liver disease quality of life, Barcelona, Spain, (N=156), and they found that hepatocellular carcinoma was the main indication of liver transplantation in 35.3% of patients. As well as, this study finding was contradicted with **Moussa (2018),** who made a study on promoting physical activity and quality of life post liver transplant in Saudi Arabia, (N=15), who found that 33.3 % of studied

patients, hepatitis B virus was the main reason for liver transplantation.

The result of the present study revealed that; more than two thirds of the studied patients stayed less than 20 days at hospital with mean day was 16 ±6.10. This might be due to absence of any problem and complications after surgery; stability of their health status and doctors` order to live in a near house to hospital for regular follow up for one month after hospital discharge for any sudden risks. This finding was contradicted with **Yun et al. (2017)**, they made a study on development of pre-discharge group education program for liver transplant patients, Korea, (N =10) and they found that 71.1% of patients stayed more than 20 days. Also this finding disagreed with **Lee et al. (2019),** they studied telemedicine based remote home monitoring after liver transplantation, Cincinnati, United State, (N=50), and they reported that the mean day of hospital stay of patients was 6.9±2.10.

Considering the studied patients` environment, the present study revealed that; majority of the studied patients lived away from birds and animals, while three quarters of them lived in a clean and tidy room and had a good level of ventilation in the house. This might be due to three fifths of the studied patients lived in urban areas and patients` awareness that good environment affected well on patients recovery and minimizing infection. This finding was in agreement with **Mohamed& Mostafa, (2018),** they found that most of patients had satisfactory environment.

Regarding to total knowledge score of the studied patients, the present study revealed that; more than half of the studied patients had poor knowledge pre

implementation of HHC model and more than three fifths of the studied patients had good knowledge post implementation of HHC model. It might be due to the home health care model help the studied patient to acquire knowledge about liver transplantation. This finding was consistent with **Elshamy et al. (2018),** they reported that 69.4% of the study participants had good knowledge post instruction. Also, this finding was in the same line with **Yun et al. (2017)**, they found that there was significance improvement in the overall knowledge level before and after the pre-discharge education program for liver transplantation patients.

Regarding to total practices of the studied patients, the present study revealed that; more than two thirds of the studied patients had unsatisfactory practices pre implementation of HHC model, and then this percentage increased to majority of the studied patients had satisfactory practice post implementation of HHC model. This might be due to the effect of home health care model that help in improving patients` practices post liver transplantation. This study finding was consistent with **Ali et al. (2017),** they reported that 96.7% of the study subjects had unsatisfactory level of practices score before implementation of the instructional scheme, while 70.0% had satisfactory level of practice immediately after implementation of the scheme. Also, this study finding agreed with **Mohamed& Mostafa, (2018),** they reported that there was marked deficiency in patients` total self-care during pre-program and there were statistically significant improvements in all aspects of patients` total self-care ability at the post test (p < .0001).

Regarding to total score of quality of life, the present study revealed that; more than two thirds of the studied patients had good total scores of quality of life post

implementation of HHC model. This might be due to the aim of home health care model in improving patients` quality of life post liver transplantation. This finding was in the same line with **Girgenti et al. (2020),** they studied quality of life in liver transplant recipients: A retrospective stuady, Italy, (N=82), and they reported that mean values of total quality of life was high.

Concerning correlation between the studied patients` total knowledge score and total practices score; the present study revealed that there was a positive statistically significant correlation between the studied patients` total knowledge score and total practices score pre and post implementation of HHC model. This might be due to attributed to the fact that the knowledge was the baseline of practices and affect positively on their practices. This study finding agreed with **Elshamy et al. (2018),** they reported that there was a positive association between total patients' knowledge and patient compliance to immunosuppressive therapy post liver transplantation patient after exposure to instructions was highly statistical significant p value equal (<0.001).

Concerning correlation between the studied patients` total quality of life score, total practices score and total knowledge score, the present study revealed that there were positive statistically significant correlations between the studied patients` total quality of life score and total practices score and total knowledge score pre and post implementation of HHC model. This finding might be due to the studied patients had poor knowledge and unsatisfactory practices which could affect on their quality of life and this improved as the effect of implementation of HHC model.

Conclusion

The home health care model succeeded to improve knowledge, practices and quality of life of the studied patients post LT. Three fifths of the studied patients had good knowledge post implementation of home health care model, majority of the studied patients had satisfactory practices, and more than two thirds of the studied patients had good quality of life post implementation of home health care model. There were positive statistically significant correlations between the studied patients' total quality of life and total practices and total knowledge pre and post implementation of home health care model.

Recommendations:

1- Continuous home health care model for patients post liver transplantation to enhance patients` knowledge, practices and quality of life.

2- Disseminated simplified booklets should be available in all transplantation centers to all patients waiting liver transplantation as a care guide and reference to the patient and his family.

3- Psychosocial rehabilitation program should be held to meet the liver transplantation patient's needs.

4- Establishment of a web site, including all information pertained to transplantation process and all aspect of health education such as different educational materials, media and audio-visual aids.

5- Further researches are proposed to explore the effect of home health care model on the prevention of complications post liver transplantation.

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