

## Factors Affecting Nurses' Attitude Regarding Care of Patients with Liver Transplantation

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### Abstract

**Background:** Liver transplantation is a complex and life-saving procedure for patients with end-stage liver diseases. Nurses play a critical role in the care and management of these patients throughout the transplantation process and postoperative recovery. **Aim of the study:** This study aimed to evaluate factors affecting nurses' attitude regarding care of patients with liver transplantation. **Subjects and Methods; Research design:** Descriptive design. **Setting:** The study was conducted in liver transplant unit in new surgical at Zagazig University Hospital. **Subject:** Convenience sample of all available nurses that are 50 bedside nurses. **Tool of data collection:** Interviewing questionnaire for assessing attitude of the studied nurses and factors related to nurses was used for data collection. **Results:** More than half of studied nurses (56%) are affected by total factors affecting their nursing care of liver transplant patients. Also, 62% of the studied nurses' social factors affect their care of patients with liver transplantation, presence of experienced people in the field affect performance at a higher rate 58%, family and people point of view of nurses during night shift affect their performance at a lower rate 34%. **Conclusion:** Total factors including physiological, psychological, social, professional, patient, work environment and relationships inside the workplace affecting nurses' performance regarding care of liver transplant patients was more than half (56%). **Recommendations:** Conducting continuous in-service training advanced through programs for nurses working with patient in critical care units for improving their performance provided to the patients post liver transplantation.

**Key words:** Factors, Liver Transplantation, Nurses' Attitude

### Introduction:

The liver is an accessory organ of the digestive system aiding in the digestion process. It is a peritoneal organ positioned in the right upper quadrant of the abdominal cavity, it is the largest visceral structure, it is exocrine organ by making bile and endocrine organ by making plasma proteins, clotting factors, binding proteins, hormone production and metabolism, there are four anatomical lobes which are divided into even smaller segments in accordance with the blood supply of the liver<sup>(1)</sup>.

Liver cirrhosis is condition in which the whole liver is replaced by multiple nodules that are separated from each other by anastomosing sheets of fibrous tissue, it is the final stage of various chronic liver diseases, cirrhosis is a diffuse alteration of hepatic architecture due to pathological processes of persistent inflammatory reaction and regeneration of the liver lobules in an irregular manner, presence of necrosis and fibrosis, changes in tissues and vessels of liver lead to reduction of hepatic mass and function with development of portal hypertension and liver failure<sup>(2)</sup>.

The global burden of disease Study estimated number of people with compensated cirrhosis at about 112 million worldwide with its prevalence of compensated cirrhosis of 1,395 cases per 100,000 population, 42% had HBV infection and 21% had HCV infection, the proportion of patients with cirrhosis and heavy alcohol use was high in Europe (16-78%) and the Americas (17-52), the prevalence of non-alcoholic fatty liver disease among patients with cirrhosis in this study were more limited, but estimates ranged from 2% in South Korea and Brazil to 18% in Canada<sup>(3)</sup>.

Nurses' performance is affected by group cohesion, supportive work environment, ability of nurses to work well in a team, the professional practice environment as pays and benefit, working conditions and resources, support to nurses, promotion opportunity, safe equipment, work encouragement, fair distribution of health professionals, assessing training needs and nurses' education and training<sup>(4)</sup>.

Attitude and behaviors of nurses are affected by Organizational justice in work environment, relations between health care providers, conflicts or collaboration, nurses' wellbeing and health, image of nurses, administrative managers support and workload, positive attitude prevent medical errors and promote safe environment <sup>(5)</sup>.

Job satisfaction is a major factor in nurse retention and the delivery of quality of nursing care, motivation and appreciation from leaders, promotion and rewards are the best way for encouragement nurses, satisfied workforce enhances the atmosphere at work, also improving salary increases nurses' retention and achieves higher productivity <sup>(6)</sup>.

Nurses' leaders are responsible for integration and development of patient's care by formulation treatment plan, evaluating nurses' performance and treatment results, accomplishment of goals by performing tasks for achieving effectiveness and efficiency of work, Leaders in nursing inspire and influence others to achieve their maximum potential, they use applied leadership in nursing by drawing upon critical thinking skills to manage a team <sup>(7)</sup>.

Lack of trained team affect thinking critically, and putting any judgement or assumptions, analyzing the information before starting the work impact awareness and understanding, protection against injury or disease that related to workplace, professional respect, satisfaction with salary that increase sense of loyalty, positive behavior outside the expectation and readiness to cooperate <sup>(8)</sup>.

Insufficiency and shortage of medical facilities, absence of materials and equipment used for work affect nurses work performance, increasing rewards, salaries will make nurses perform the job efficacy, achievement of equity in distribution of work, ensure safety and security in workplace, supportive leadership by creativity and innovation <sup>(9)</sup>.

### Significance of the study:

Liver transplantation is usually the best treatment for liver failure in patients who are fit enough for the operation and offers life-saving therapy for patients with complications of cirrhosis, this procedure has become a routine treatment with excellent outcomes for the great majority of recipients, and the outcomes of LT have improved significantly in recent years, due to improvements in surgical techniques, anesthesia, and immunosuppressive therapies <sup>(10)</sup>.

The preparation of the patient is fundamental in the perioperative period and the role of nurses is important for success of treatment, moreover the nurse is responsible for the planning and implementation of care delivered during the LT process so this study is carried for evaluating factors affecting nurses' performance regarding care of patients with liver transplantation <sup>(10)</sup>.

### Aim of the study:

The aim of this study was to evaluate factors affecting nurses' attitude regarding care of patients with liver transplantation through evaluating nurses' attitude regarding patients with liver transplantation .

### Research questions:

1. What is the level of nurses' attitude regarding patients with liver transplantation?
2. What are the physiological, psychological social, professional, patient, work environment and relationships inside the work place factors affecting nurses' attitude regarding care of patients with liver transplantation?

### Subjects and methods:

#### Research design:

The descriptive design was utilized to accomplish the aim of the study, answer the research question and to describe the existing phenomena through collecting data through questionnaire, interview or even observation.

#### Study Setting:

The study was conducted in liver transplant unit in new surgical at zagazig university hospital that includes liver transplant intensive care unit, intermediate care unit, operating and recovery rooms.

**Study subjects:**

Convenience sample of 50 bedside nurses who are giving direct care for patients in liver transplant unit and have more than one year of experience, (30) working in previous settings and (10) nurses working in ICU that participate in care of patients, (10) nurses working in liver transplant operating room.

**Tool for data collection:**

The required data were collected by using an interviewing questionnaire and it consists of three parts:

**Part I:** Demographic characteristics data of the studied nurses, it includes seven close ended questions related to nurses as age, gender, marital status, level of education, years of experience in work, experience in transplanted intensive care unit and previous training programs that are answered in short, fixed response and multiple-choice (**Metin & Demirer<sup>(11)</sup>**).

**Part II: Factors affecting nurses' attitude:**

**1. Factors related to nurse** that covered four items included 66 sub items:

**A. Physiological factors** include six subitems: Exhaustion, acute and chronic diseases, overweight, hearing and vision impairment and effect of exhaustion on work.

**B. Psychological factors** include six subitems: Working for the first time, concern about risk of infection, fear feeling, painful feeling toward patients, work stress and need to cry and moral appreciation when doing a good job.

**C. Social factors** include fourteen subitems: Far distance, difficult transportation, lack of income, family and people point of view, work relationships, presence of experienced people, opportunities of training, continuous supervisor guide, estimation of abilities, nursing distribution table is fair, balance between nursing staff and supervising staff, sufficiency of nurses for tasks at work, feeling at ease at work and instructions at work.

**D. Professional factors** include five subitems: Nursing work performance includes: job satisfaction, clarity of job

description, job appreciation from people, feeling of inefficiency and forcing overtime working period.

**2. Factors related to patient:**

Includes 11 sub items: Covered age, sex, body mass index, educational level, physical condition, mental health, ability to communicate, keeping privacy, adherence to advice and instructions, appreciation for nursing performance and patient view about nursing field.

**3. Factors related to work:**

Includes two points: Relationships inside the workplace includes eleven subitems (cooperation between employees and ability to work as a team, feelings of inequality during distribution of work, doctor use difficult and comprehensible language, doctor appreciation of the role of nursing, documentation in patient records, clarity of information, giving instructions via phone or social media, access to doctors, ability of work team to deal with problems, feeling satisfied inside the work team and take responsibility and factors related to the work environment includes thirteen subitems (availability of the necessary tools, presence of infection control instructions, work place temperature, safe work environment, adequate lighting, appropriate size of workplace, cleanliness of place, Proportionality the number of nurses and patients, the availability of the necessary personal protective equipment, workloads, equipment's work well and rewards for working efficiently).

This part consisted of four items were factors related to nurse included 31 subitems, factors related to patient included 11 subitems and factors related to work environment included 13 subitems, factors related to relationships inside the workplace 11 subitems. The responds to these statements were on two scales as follows: affected=2 and middle affected=1, low affected=0.

**Scoring system for factor items:** Total score for whole factors assessment tool was calculated for every nurse and the mean of total score was calculated. These scores were converted into percent scores.

**Part III: Questionnaire assessing nurses' attitude regarding care of patients with liver transplantation:** Aimed to assess nurses' attitudes regarding care of patients in intensive care unit. This part consists of 13 items as a question about the importance of presence of professional nurses working in ICU, two questions about an Importance of education and training.

Additionally, two questions about special health care needs and one question about compliance with infection control precautions; it was adapted and modified by the researcher from Parahoo<sup>(12)</sup>.

#### **The scoring system:**

The total score of the attitude was 13 grades (100%). Likert scale in form of three scores as the following: agree scored two, sometime scored one and zero for disagree for each area of attitude, 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 percent scores. Attitude was considered positive if the percent score was equal or above 60% and negative if less than 60% based on statistical analysis.

#### **Content Validity and Reliability:**

The tools were revised by a panel of five experts at nursing faculty at Zagazig University which included one professor and four assistant professors in medical surgical nursing reviewed the tool's content for clarity, relevance comprehensiveness, applicability, understanding and ease for implementation, all recommended modifications were done.

The reliability of tools was tested by measuring their internal consistency. It demonstrated a good level of reliability with Cronbach's alpha as follow: Attitude was 0.859 "Good".

#### **Fieldwork:**

Data were collected within a period of one year and five months from the beginning of Aug 2021 to Dec 2022. Data were collected three days per week Sunday, Monday and Wednesday from liver transplant intensive care and operating room at Zagazig University Hospital in the morning and afternoon shifts starting from 9:00 am to 1:00 pm in the morning shift and 2:00 pm to 8 pm in the afternoon shift ,the time used for finishing the interviewing questionnaire 35-45 minutes for each nurse according to nurses' physical and mental readiness and,It was necessary for the researcher to introduce herself and explain the aim of the study for subjects included in the study and obtaining their oral consent.

Data were collected by the researcher a simplified Arabic language to be suitable for the nurses, they were assured that the information collected would be treated confidentially and that it would be used only for the purpose of the study.

**The first phase** of the work is the preparatory phase that done by meeting with head nurses in liver transplant unit after obtaining the official permissions to clarify the objective of the study and applied methodology.

**The second phase that done** by meeting the study subjects, each nurse was met individually, got a full explanation about the aim of the study, and was invited to participate. The nurse who gave his/her verbal informed consent to participate was handed the interview questionnaire and was instructed during the filling.

#### **Pilot study:**

A pilot study was carried on 5 nurses and within the selected criteria to test the applicability of tools, arrangement of items and to estimate the time needed for each tool, the goal was to check the clarity, applicability, relevance and feasibility of the tools and to identify the difficulties may be faced during the application as misunderstanding of some questions. It also helped to estimate the time needed to fill in the sheets. Then the researcher excludes nurses with less than one year in experience. After that the items were then corrected and modification of the tools was done.

#### **Administrative and Ethical considerations:**

All ethical issues were taken into consideration during all phases of the study. The ethical research consideration in this study included the following: The researcher maintained an anonymity and confidentiality of the subject. The inclusion of the subjects in the study was totally voluntary and they were notified that they can withdraw at any stage of research. The aim of the study was explained to every subject before participation and an oral consent was taken from subjects for permission to participate in research process.

#### **Statistical Analysis:**

All data were collected, tabulated, and statistically analyzed using the IBM SPSS (Statistical Package for the social sciences) statistics for windows, version 23.0 IBM Corp., Armonk, NY: USA. Quantitative data were expressed as the mean  $\pm$  SD and (range), and

qualitative data were expressed as absolute frequencies (number) and relative frequencies (percentage).

Percent of categorical variables were compared using Chi-square test, Pearson correlation coefficient was calculated to assess relationship between various study variables, (+) sign indicate direct correlation and (-) sign indicate inverse correlation, also values near to 1 indicate strong correlation & values near 0 indicate weak correlation. All tests were two sided. P-Value < 0.05 was considered statistically significant, p and p-value  $\geq$  0.05 was considered statistically insignificant (NS).  $\beta$  (regression coefficients) and R square test for Multiple linear regression, Cronbach's alpha is a reliability coefficient and a measure of the internal consistency of tests and measures.

#### Significance of the results:

- Highly significant at p-value < 0.01.
- Statistically significant was considered at p-value < 0.05.
- Non-significant at p-value  $\geq$  0.05.

#### Results:

**Table (1):** Showed that 34% of studied nurses aged less than 27 years old with Mean  $\pm$ SD were 29.2 $\pm$ 5.7 with range 21-46 years. Gender was distributed as 66% females and 34% males. The most (72 %) of studied nurses were married. Regarding qualification of studied nurses having technical institute, bachelor's degree, nursing diploma only one nurse had postgraduate qualification were 62%, 22%, 14%, 2% respectively. About general years of experience, three fifths (60.0%) of them having more than five years' experience. About studied nurses had equal or more than three years of experience in liver transplant department were 54%. Only five nurses attained training course in liver transplantation.

**Table (2):** Clarified that half (50.0%) of the studied nurses physiological factors affect their care of patients with liver transplantation and 50% of studied nurses physiological factors didn't affect their care of patients with liver transplantation with mean $\pm$ SD (6.92 $\pm$ 2.69) and range from 1 to 11, 62% of nurses have exhaustion that affect performance followed by 44% of nurses were affected exhaustion during working in liver transplant unit and 44% of nurses answered

that chronic diseases will affect their performance, 44% of nurses said that wight gain affect performance with the lowest effect

**Table (3):** Illustrated that 36% of the studied nurses Psychological factors affect their care of patients with liver transplantation and 64% of studied nurses psychological factors didn't affect their care of patients with liver transplantation with mean $\pm$  SD (6.8 $\pm$ 2.65) and range from 2 to 12, moral appreciation when doing a good job affect performance at a higher level 58% followed by 56% working for the first time and feeling of failure when doing work at a lower level 54%.

**Table (4):** Illustrated that 62% of the studied nurses' social factors affect their care of patients with liver transplantation with mean $\pm$  SD 18.42 $\pm$ 6.07 and range from 7 to 27, presence of experienced people in the field affect performance at a higher rate (64%), family and people point of view of nurses during night shift affect their performance at the lowest rate (38%).

**Table (5):** Showed that 50%of the studied nurses professional factors affect their care of patients with liver transplantation with mean $\pm$  SD (6.1 $\pm$ 2.28) and range from 2 to 10, job satisfaction impact performance at a higher rate (58%) and feeling of inefficiency affect performance at a lower rate (34%).

**Table (6):** Illustrated that 60%of the studied nurses said that patient factors affect their care of patients with liver transplantation with mean $\pm$  SD (14.88  $\pm$ 4.35) and range from 7 to 22, respecting the patient privacy affect performance at a higher rate (74%) followed by difficulty in communicating with patient 62% and patient mental health 58% and gender of patient affect performance at a lower rate (36%).

**Table (7):** Illustrated that 96%of the studied nurses said that work environment factors affect their care of patients with liver transplantation with mean $\pm$  SD (21.7 $\pm$ 3.8) and range from 12 to 26, availability of hand antiseptic affect performance at a higher rate (92%) followed by the availability of necessary personal protective equipment and sterilization of place (88%), promotions and rewards for working affect performance at a lower rate (28%).

**Table (8):** Illustrated that 68% of the studied nurses' relationships factors affect their care of patients with liver transplantation with mean $\pm$  SD (15.74 $\pm$ 4.66) and range from 0.00 to 22, take responsibility within the work team affect performance of nurses at a higher rate (82%)

followed by cooperation among the employees and ability to work as a team 64%, feeling satisfied inside the work team affect performance at a lower rate (22%).

**Figure (1):** Percent of total factors affecting nursing care of liver transplant patients. This figure displays that (56%) of nurses' performance regarding care of liver transplant patients were affected by these factors.

**Table (9):** Pointed that 42% of the studied nurses have positive attitude and 58% of studied nurses have negative attitude with mean± SD 14.88±2.54 and range from 6 to 19, 52% of nurses have positive attitude toward special care after liver transplant and 62% of nurses have negative attitude toward importance of quality of care after liver transplant.

**Figure (2):** Percent of nurses' attitude regarding care of liver transplant patients. This figure illustrates that (42%) of nurses' attitude regarding care of liver transplant patients was positive.

**Table (10):** Showed that, there was no significant relation between studied nurses' attitude about liver transplantation and demographic characteristics  $p>0.05$ .

**Table (11):** Showed that, there was no significant relation nursing attitude about liver transplantation and their factors affecting nurse's practices  $p>0.05$ .

**Table (12):** Showed that, there was no significant relation between factors affecting nurse's performance regarding care of patients with liver transplantation and their demographic characteristics  $p>0.05$ .

**Table (13):** Clarified that there was positive correlation between total nurse's knowledge and total practice score and attitude with p-value were 0.024 and 0.003 respectively while negative correlation with total factor with p-value was 0.027 Also, there was a negative correlation between total factors score and total practice, attitude, age and years of experience with p-value were 0.01, 0.012, 0.013, 0.049 and equal -0.360, -0.354, -0.350 & -0.27 respectively.

## Discussion:

In regard to factors affecting nurses' attitude regarding Care of patients with LT, the present study investigated nurses' opinions about physiological factors and demonstrated that half of the nurses believed that those factors affect their care of LT patients. Our findings agreed with **Youssef and Ali** <sup>(13)</sup>, who clarified that working in liver transplant unit affect physical health of nurses and mentioned that it is necessary to assess nursing performance served for critical ill patients post LT due to impact of physical exhaustion on concentration and work-related physical impairment resulting in mistakes at work.

In addition, **Damiani and Carvalho** <sup>(14)</sup> noticed that nursing is stressful occupation, risk of illness is high due to stressful activities, nurses reportedly experience physical fatigue in liver transplant unit also effect of diseases as pain and chronic diseases on job performance as well as impairments in memory and thinking processes. Besides, **Dall'Ora et al.** <sup>(15)</sup> clarified that characteristics of job that contribute to high workload, decreasing of nursing staffing levels, the long shifts and time pressure are related to burnout in nursing and affect negatively on performance Furthermore, the results discovered by **Lui and Thomas** <sup>(16)</sup> reported that hypertension, diabetes and obesity are associated with negative effect on performance.

Regarding nurses' opinions about psychological factors affecting care of LT patients, more than three-fifth of the studied nurses thought that psychological factors didn't affect their care of patients with LT. These outcomes were in disagreement with numerous studies that emphasized that nurses undergo problems with their psychological and social well-being and mentioned that psychological factors are triggers of stress and opportunities for development, violence against health professionals, feeling of injustice, lack of social support and the critical role of leadership development that promote psychological safety can all impact on psychological health (**Sarumaha et al.** <sup>(17)</sup>; **Pousa & Lucca** <sup>(18)</sup>; **Schneider et al.** <sup>(19)</sup>).

Also, although LT nurses feel satisfied that they work un liver transplant team but this finding disagreed with **Bean** <sup>(20)</sup>, who showed that studied nurses were a afraid of failing when doing the work, depressed and anxious when dealing with patients and **Ordin et al.** <sup>(21)</sup> that reported that nurses that deal with liver transplant patients face greater negative effects regarding working under stress.

Concerning nurses' opinions about nurses' social factors affecting their care of patients with LT, more than three-fifth of the surveyed nurses asserted that social factors had an impact on their care of LT patients.

Continuous supervisor guide affect performance at a higher rate and people point of view of nurses affect their performance at the lower rate. Our results were in the same line with **Bean** <sup>(20)</sup>; **Watanabe and Inoue** <sup>(22)</sup>, who mentioned that social inequities lead to social resistance, conflicts and the lack of educational and organizational support is an obstacle to the development of nurses' performance. Add to this, **Hosseinzadegan et al.** <sup>(23)</sup> added that many nurses face problems in work and social isolation due to poor performance of nursing managers and lack of resources and facilities.

Furthermore, **Sargent and Wainwright** <sup>(24)</sup> pointed out that interaction with other patients and participation in support groups can positively affect patients' adaptation after transplantation and this finding disagreed with **Perez et al.** <sup>(25)</sup> showed the greater effect of people point of view on nurses performance due to the negative view about nurses resulting from that nurses had not put enough effort into creating and maintaining their image, how negatively nurses see themselves, lacking skills for team management with few opportunities for growth or promotion and with little responsibility, autonomy or decision-making capacity.

The current investigation studied the nurses' opinions about professional factors affecting their care of LT patients, and showed that half of the participants agreed that professional factors affect their care of patients with LT.

This outcome was congruence with **Liddle** <sup>(26)</sup> who showed that all health professionals influenced by professional factors and must continually update their theoretical knowledge and clinical skills by developing their ability to combine the use of the assessment tools with good observational skills and closely observing their patients. Also, **Atta et al.** <sup>(27)</sup> showed that job satisfaction, clarity of job description, work-related stress, support from co-workers and training are factors affecting nurse's performance level.

Concerning factors regarding patients, the present study showed that three fifth of studied nurses reported that these factors affect their performance, respecting patient privacy and difficult in communicating with patients affect performance at a higher rate and gender affect performance at a lower rate, this finding is in agreement with **Gouda et al.** <sup>(28)</sup> who showed that more than four fifth of the studied nurses reported that these factors had an effective effect on their performance.

In regard to the nurses' opinions about work environment and relationships inside the workplace factors affecting care of LT patients, we observed that most studied nurses believed that these factors had an impact on their care of LT cases. These outcomes were consistent with **Wachholz et al.** <sup>(29)</sup> who stated that work place health promotions is a combined effort of employees and society to improve health and well-being of people at work by promoting active participation and encouraging personal development.

As regard to the nurses' opinion about relationships inside the work place affecting their performance of LT patients, the study revealed that nearly two third of studied nurses influenced by these factors. This finding in same line with **Tran et al.** <sup>(30)</sup> who stated that mutual trust, emotional support, respect and reciprocal influence creating many positive outcomes including higher standard of patient care and high levels of workplace environment were generated by effective communication and collaboration.

Concerning the attitude of nurses towards the care of LT patients, more than half of the studied nurses had a negative attitude total score with 52% of nurses having positive attitude toward special care after liver transplant and 62% had negative attitude toward importance of quality of care after liver transplant. These outcomes were contradicted with **Erian** <sup>(31)</sup> found that 93.3% of them had satisfactory attitude toward patient post LT.

Moreover, **Vlaisavljević et al.** <sup>(32)</sup> and **López-Montesinos et al.** <sup>(33)</sup> affirmed that studied nurses had positive behavior and attitudes toward transplantation and health care professionals' attitude could be enhanced and modified through training and health education for promoting quality of nursing care.

The present study results clarified that there was no significant relation between studied nurses' attitude and their demographic characteristics. This finding disagreed with **Wahba** <sup>(34)</sup> that showed that there was significant relation between educational levels of nurses and their attitude regarding infection control in operating room.

Regarding relation between studied nurses' attitude and Factors affecting nurses' practice. The present study clarified that there was no significant relation between nursing attitude and factors affecting nurses practices .this finding disagreed with **Salih et al.** <sup>(35)</sup> that stated that there was relation between factors affecting nurses performance and attitude of nurses and emotional support influence on a positive attitude while presence of workloads affect negatively on attitude.

As regard to relation between factors affecting nurses' performance and their demographic characteristics. The results showed that there was no significant relation between factors affecting nurse's performance and their demographic characteristics. This result was controversy with **Gouda et al.** <sup>(28)</sup> who stated that there was highly statistical significant relation between factors affecting nursing performance in the surgical unit and their age, marital status or their experience.

As regard to matrix correlation of studied nurses' total knowledge, total practice, attitude and factors affecting patient care, this result showed that there was significant inverse correlation among factor, knowledge, practice, attitude, age and experience .this finding was in disagreement with **Atta et al.** <sup>(27)</sup> who stated that there were highly statistically significant positive correlations found among factors affecting performance, age and years of experience.

#### **Conclusion:**

Based on the results of the present study it could be concluded that more than half of studied nurses are affected by total factors (physiological, psychological, social, professional, patient, work environment and relationships inside the workplace) and in relation to nurses' attitude regarding care of liver transplant patients was approximately three fifth of nurses have negative attitude toward liver transplant patients.

#### **Recommendation:**

1. Conducting continuous in-service training advanced through programs for nurses working with patient in critical care units for improving their performance provided to the patients' post-LT.
2. A simple comprehensive booklet should be designed including guidelines about nursing care for patients post LT.
3. Public health agency should organize infection control programs by developing, implementing and evaluating policies and interventions because of the importance of compliance with infection control precautions for liver transplant patients.

Table 1: Frequency and percentage distribution of the studied nurses according to demographic characteristics (n=50)

Demographic Characteristics	No	%
<b>Age</b>		
<27	17	34.0
≥27	33	66.0
	<b>Mean±SD</b>	<b>29.2±5.7</b>
	<b>Median(range)</b>	<b>27(21-46)</b>
<b>Gender</b>		
Males	17	34.0
Females	33	66.0
<b>Education</b>		
Nursing diploma	7	14.0
Technical institute	31	62.0
Bachelors'	11	22.0
Postgraduate	1	2.0
<b>Social status</b>		
Single	13	26.0
Married	36	72.0
Widow	1	2.0
<b>General Experience per years</b>		
≤5	20	40.0
>5	30	60.0
<b>Experience in liver transplantation</b>		
<3	23	46.0
≥3	27	54.0
	<b>Mean±SD</b>	<b>2.8±1.3</b>
	<b>Median(range)</b>	<b>3(1-6)</b>
<b>Training course in LT</b>		
Yes	5	10.0
No	45	90.0

Table 2: Frequency and percentage distribution of studied nursing opinion about physiological factors affecting care of patients with liver transplantation (n=50)

Items of physiological factors	Impact on Performance					
	High		Middle		Low	
	No	%	No	%	No	%
▪ Exhaustion.	31	62.0	13	26.0	6	12.0
▪ Acute diseases as colds, pain and diarrhea.	21	42.0	19	38.0	10	20.0
▪ Chronic diseases.	22	44.0	10	20.0	18	36.0
▪ Hearing and vision impairment.	19	38.0	16	32.0	15	30.0
▪ Weight gain.	12	24.0	16	32.0	22	44.0
▪ Working in a liver transplant unit causes physical exhaustion.	22	44.0	18	36.0	10	20.0
▪ Physiological factors score						
	Mean±SD		6.92±2.69			
	Median(range)		7.5 (1-11)			
	Affect>60%		50.0%			
	Not affect<60%		50.0%			

**Table 3: Frequency and percentage distribution of studied nurses opinion about psychological factors affecting care of patients with liver transplantation (n=50)**

Items of Psychological factors	Impact on performance					
	High		Middle		Low	
	No	%	No	%	No	%
▪ Working for the first time.	28	56.0	20	40.0	2	4.0
▪ Concern about risk of infection from the cases or hospital infection.	15	30.0	25	50.0	10	20.0
▪ Feeling of pain for patient.	19	38.0	18	36.0	13	26.0
▪ Feeling of failure when doing the work.	18	36.0	5	10.0	27	54.0
▪ Work stress and desire to cry.	13	26.0	20	40.0	17	34.0
▪ Moral appreciation when doing a good job.	29	58.0	8	16.0	13	26.0
▪ Psychological factors score						
Mean±SD						6.8±2.65
Median(range)						6 (2-12)
Affect						36.0 %
Not affect						64.0 %

**Table 4: Frequency and percentage distribution of studied nurses opinion about nursing social factors affecting care of patients with liver transplantation (n=50)**

Items of Social factor	Impact on performance					
	High		Middle		Low	
	No	%	No	%	No	%
▪ The residence is far from the hospital.	20	40.0	22	44.0	8	16.0
▪ Difficulty in transportation.	24	48.0	22	44.0	4	8.0
▪ Lack of income.	28	56.0	11	22.0	11	22.0
▪ Work relationships.	24	48.0	13	26.0	13	26.0
▪ Family and people point of view of working during night shift.	17	34.0	14	28.0	19	38.0
▪ Presence of experienced people in the field.	29	58.0	19	38.0	2	4.0
▪ Opportunities for training and development the performance continuously.	30	60.0	13	26.0	7	14.0
▪ Continuous supervisor guide is available.	32	64.0	13	26.0	5	10.0
▪ Estimating your abilities and skills at work.	28	56.0	15	30.0	7	14.0
▪ Nursing distribution table is fair and equitable.	25	50.0	15	30.0	10	20.0
▪ The balance between the number of nursing and supervising staff.	22	44.0	19	38.0	9	18.0
▪ The number of nurses is sufficient or overburdening of your physical and mental capabilities.	23	46.0	15	30.0	12	24.0
▪ Feeling at ease at work.	27	54.0	14	28.0	9	18.0
▪ Availability of Instructions and guidelines for working in unit.	20	40.0	18	36.0	12	24.0
▪ Social factor						
Mean± SD						18.42±6.07
Median(range)						19 (7-27)
Affect						31 (62.0 %)
Not affect						19 (38.0 %)

**Table 5: Frequency and percentage distribution of studied nurses opinion about professional factors affecting care of patients with liver transplantation (n=50)**

Items of Professional Factors	Impact on performance					
	High		Middle		Low	
	No	%	No	%	No	%
▪ Job satisfaction.	29	58.0	12	24.0	9	18.0
▪ Clarity of job description.	16	32.0	26	52.0	8	16.0
▪ Job appreciation from people.	24	48.0	22	44.0	4	8.0
▪ Feeling of inefficiency.	12	24.0	21	42.0	17	34.0
▪ Forcing overtime.	23	46.0	16	32.0	11	22.0
▪ Professional factors score						
Mean± SD	6.1±2.28					
Median(range)	5.5(2-10)					
Affect	25(50.0 %)					
Not affect	25(50.0 %)					

**Table 6: Frequency and percentage distribution of studied nurses about patient related factors affecting nurses performance regarding care of patients with liver transplantation (n=50)**

Items of Patient Factors	Impact on performance					
	High		Middle		Low	
	No	%	No	%	No	%
▪ Patient Education Level.	17	34.0	23	46.0	10	20.0
▪ Gender.	15	30.0	17	34.0	18	36.0
▪ Age.	15	30.0	30	60.0	5	10.0
▪ Body Mass Index.	23	46.0	24	48.0	3	6.0
▪ Patient Physical condition.	28	56.0	21	42.0	1	2.0
▪ Patient mental health.	29	58.0	16	32.0	5	10.0
▪ Difficulty in communicating with the patient.	31	62.0	13	26.0	6	12.0
▪ Respecting the Patient Privacy.	37	74.0	7	14.0	6	12.0
▪ Follow instructions by Patients.	26	52.0	15	30.0	9	18.0
▪ Patient appreciation for nursing performance.	24	48.0	23	46.0	3	6.0
▪ Patient view about nursing staff.	20	40.0	25	50.0	5	10.0
▪ Factors related to patients score						
Mean± SD	14.88±4.35					
Median(range)	14 (7-22)					
Affect	30 (60.0 %)					
Not affect	20 (40.0 %)					

**Table 7: Frequency and percentage distribution of studied nurses opinion about work environment factors affecting care of patients with liver transplantation (n=50)**

Items of work environment	Factors Impact on performance					
	High		Middle		Low	
	No	%	No	%	No	%
▪ The availability of the necessary tools and equipment for the work.	34	68.0	16	32.0	0	0.0
▪ Availability of Infection control instructions.	40	80.0	10	20.0	0	0.0
▪ Availability of hand antiseptic.	46	92.0	4	8.0	0	0.0
▪ Work place temperature.	39	78.0	11	22.0	0	0.0
▪ Safe work environment.	40	80.0	10	20.0	0	0.0
▪ Adequate lighting.	40	80.0	10	20.0	0	0.0
▪ Appropriate size and breadth of workplace.	26	52.0	19	38.0	5	10.0
▪ Cleanliness and sterilization of place.	44	88.0	5	10.0	1	2.0
▪ Proportionality the number of nurses and patients.	29	58.0	15	30.0	6	12.0
▪ Availability of the necessary personal protective equipment.	44	88.0	5	10.0	1	2.0
▪ Workloads.	20	40.0	30	60.0	0	0.0
▪ Tools and equipment work well.	35	70.0	15	30.0	0	0.0
▪ Promotions and rewards for working efficiently.	25	50.0	11	22.0	14	28.0
▪ Factors of work environment score						
Mean±SD			21.7±3.8			
Median (range)			22 (12-26)			
Affect			48 (96.0%)			
Not affect			2 (4.0%)			

**Table 8: Frequency and percentage distribution about relationships inside the workplace factors affecting care of patients with liver transplantation (n=50)**

Items of Relationships Inside the Workplace	Impact on performance					
	High		Middle		Low	
	No	%	No	%	No	%
▪ Cooperation between the employees and the ability to work as a team.	32	64.0	15	30.0	3	6.0
▪ Feelings of inequality during distribution of work.	24	48.0	19	38.0	7	14.0
▪ Using difficult and incomprehensible language.	21	42.0	19	38.0	10	20.0
▪ Doctor appreciation of the role of nursing at work.	23	46.0	20	40.0	7	14.0
▪ Documentation in patients' records.	30	60.0	15	30.0	5	10.0
▪ Clarity of information when communicating with nursing staff.	31	62.0	18	36.0	1	2.0
▪ Giving instructions via phone or social media.	25	50.0	18	36.0	7	14.0
▪ Access to doctors.	25	50.0	21	42.0	4	8.0
▪ Ability of work team to deal with problems.	25	50.0	17	34.0	8	16.0
▪ Feeling satisfied inside the work team.	29	58.0	10	20.0	11	22.0
▪ Take responsibility within the work team.	41	82.0	3	6.0	6	12.0
▪ Factors related the relationships inside the workplace						
Mean±SD			15.74±4.66			
Median (range)			16 (0.00-22)			
Affect			34 (68.0 %)			
Not affect			16 (32.0 %)			

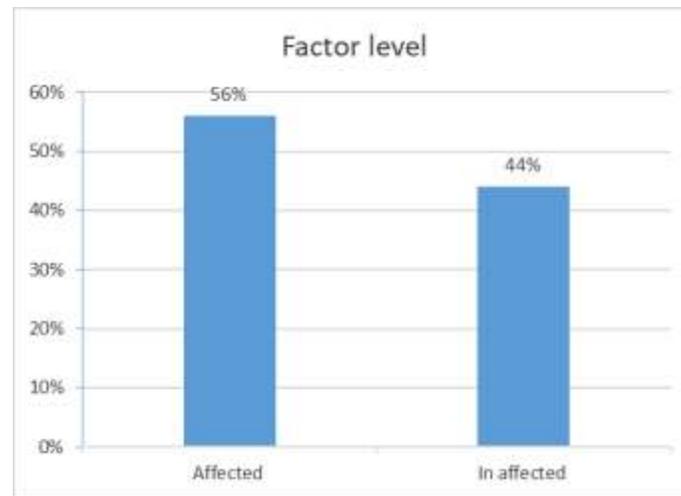


Figure (1): Total factors that affect nurses' performance regarding care of liver transplant patients

Table 9: Frequency and percentage distribution of studied nurses' attitude regarding liver transplantation (n=50)

Items	Agree		Sometime		Disagree	
	No	%	No	%	No	%
▪ Working in critical care unit requires professional nurses.	20	40.0	8	16.0	22	44.0
▪ Working in intensive care unit requires knowledge and skills.	14	28.0	16	32.0	20	40.0
▪ Training for nurses is essential before working in intensive care unit.	24	48.0	8	16.0	18	36.0
▪ Needs of patients for special nursing care after liver transplant.	26	52.0	4	8.0	20	40.0
▪ Answering patient's questions reduces his fear.	19	38.0	13	26.0	18	36.0
▪ Quality of nursing care to patient after liver transplant has positive effect on his health condition.	15	30.0	4	8.0	31	62.0
▪ Deal with patient that is aware of his illness is difficult.	24	48.0	6	12.0	20	40.0
▪ The use of sterile clothes during providing care to patient is not important.	22	44.0	4	8.0	24	48.0
▪ Hand tremble while providing nursing care to patients.	18	36.0	12	24.0	20	40.0
▪ Getting upset and angry when dealing with patient for a long time.	19	38.0	13	26.0	18	36.0
▪ Feeling bored when listening to patient complaint.	13	26.0	17	34.0	20	40.0
▪ Feeling worried when dealing with liver transplant patient.	12	24.0	24	48.0	14	28.0
▪ Providing with up to date information regarding care.	10	20.0	30	60.0	10	20.0
▪ Attitude score			14.88±2.54			
	Mean±SD					
	Median (range)		15 (6-19)			
	Positive		21 (42%)			
	Negative		29 (58%)			

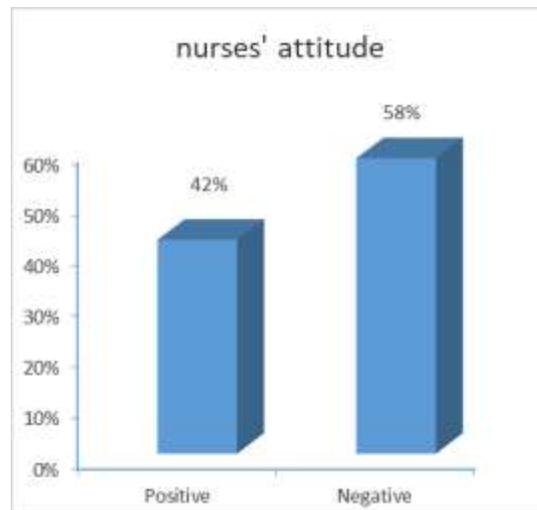


Figure (2): Nurses' attitude regarding care of liver transplant patients

Table 10: Relation between nurses' attitude about liver transplantation and their demographic characteristics (n=50)

Demographic Characteristics	Nurses 'Attitude about liver Transplantation				$\chi^2$	p-value
	Positive n.21		Negative n.29			
	No.	%	No.	%		
<b>Age</b>					1.27	0.26
<27	9	52.9	8	47.1		
>27	12	36.4	21	63.6		
<b>Gender</b>					0.27	0.603
Males	8	47.1	9	52.9		
Females	13	39.4	20	60.6		
<b>Education</b>					2.63	0.45
Nursing diploma	4	57.1	3	42.9		
Technical institute	11	35.5	20	64.5		
Bachelors	6	54.5	5	45.5		
Post graduate	0	0.0	1	100.0		
<b>Social status</b>					0.82	0.66
Single	6	46.2	7	53.8		
Married	15	41.7	21	58.3		
Widow	0	0.0	1	100.0		
<b>Experience per years</b>					0.06	0.82
≤5	8	40.0	12	60.0		
>5	13	43.3	17	56.7		
<b>Training course in liver transplantation</b>					0.74	0.39
Yes	3	60.0	2	40.0		
No	18	40.0	27	60.0		
<b>Experience in field</b>					0.04	0.85
<3	10	43.5	13	56.5		
≥3	11	40.7	16	59.3		

Table 11: Relation between studied nurses attitude about liver transplant and factors affecting nurses practice (n=50)

Factors	Nurses Attitude about Liver Transplant				$\chi^2$	p-value
	Positive n.21		Negative n.29			
	No.	%	No.	%		
<b>Physiological</b>						
Affected	10	47.6	15	51.7	0.08	0.77
Not affected	11	52.4	14	48.3		
<b>Psychological</b>						
Affected	6	28.6	12	41.4	0.87	0.35
Not affected	15	71.4	17	58.6		
<b>Social</b>						
Affected	12	57.1	19	65.5	.36	0.55
Not affected	9	42.9	10	34.5		
<b>Professional</b>						
Affected	9	42.9	16	55.2	0.74	0.39
Not affected	12	57.1	13	44.8		
<b>Patient factor</b>						
Affected	13	61.9	17	58.6	.06	0.82
Not affected	8	38.1	12	41.4		
<b>Work environment</b>						
Affected	20	95.2	28	96.6	.06	0.82
Not affected	1	4.8	1	3.4		
<b>Relation level</b>						
Affected	13	61.9	21	72.4	0.62	0.43
Not affected	8	38.1	8	27.6		
<b>Total factor level</b>						
Affected	9	42.9	19	65.5	2.54	0.11
Not affected	12	57.1	10	34.5		

Table 12: Relation between factors affecting nurses performance regarding care of patients with liver transplantation and their demographic characteristics (n=50)

Demographic Characteristics	Factors Affecting Nurses Performance				X <sup>2</sup>	p-value
	Affected n.28		Not Affected n.22			
	No.	%	No.	%		
<b>Age per years</b>						
<27	9	52.9	8	47.1	0.098	0.75
>27	19	57.6	14	42.4		
<b>Gender</b>					2.23	0.14
Males	12	70.6	5	29.4		
Females	16	48.5	17	51.5		
<b>Education</b>					5.39	0.15
Nursing diploma	4	57.1	3	42.9		
Technical institute	20	64.5	11	35.5		
Bachelors	3	27.3	8	72.7		
Post graduate	1	100.0	0	.0		
<b>Social status</b>					4.22	0.12
Single	10	76.9	3	23.1		
Married	17	47.2	19	52.8		
Widow	1	100.0	0	.0		
<b>Experience per years</b>					0.49	0.49
≤5	10	50.0	10	50.0		
>5	18	60.0	12	40.0		
<b>Training course in liver transplantation</b>					f	0.25
Yes	4	80.0	1	20.0		
No	24	53.3	21	46.7		
<b>Experience in field</b>					1.16	0.28
<3	11	47.8	12	52.2		
≥3	17	63.0	10	37.0		

Table 13: Matrix correlation of studied nurses total knowledge, total practice, attitude and factors affecting patient care (n= 50)

Parameters	Knowledge score		Practice Score		Attitude Score		Factor Score	
	(r)	p	(r)	P	(r)	P	(r)	P
Knowledge score	1							
Practice score	.320*	0.024	1					
Attitude score	.407**	0.003	0.198	0.168	1			
Factor score	-.313*	0.027	-.360*	0.01	-.354*	0.012	1	
Age per years	0.056	0.7	-0.12	0.399	0.182	0.205	-.350*	0.013
Experience per years	-0.065	0.654	-0.18	0.215	0.19	0.187	-.279*	0.049

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