

## LIVER TRANSPLANTATION: EVIDENCE FOR NURSING CARE<sup>1</sup>

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*Evidence-based practice is the adopted theoretical and methodological framework and the integrative literature review was the research method used for this study. This study aimed to search and evaluate evidence available in literature about scientific knowledge on nursing care to adult patients submitted to liver transplantation during the perioperative period. Lilacs, Medline and Cinahl were used for the search, which resulted in a sample of 20 scientific papers. The results evidenced publications on nursing care to prepare the patient, prevent injuries, on the importance of a documentation system, prevention and early detection of complications, as well as education on immunosuppressive therapeutics, patient education and nursing activities in the pre, intra and postoperative periods, and the nurses' role in providing nutritional and emotional support to patients and family members.*

**DESCRIPTORS:** perioperative nursing; nursing care; liver transplantation

## TRANSPLANTE DE HÍGADO: EVIDENCIAS PARA EL CUIDADO DE ENFERMERÍA

*La práctica basada en evidencias consiste en el marco teóricometodológico adoptado y la revisión integradora de la literatura fue el método de investigación seleccionado. El estudio tuvo como objetivo buscar y evaluar las evidencias disponibles en la literatura sobre el conocimiento científico producido, relacionado al cuidado de enfermería prestado al paciente adulto sometido al transplante de hígado, en el periodo perioperatorio. Las bases de datos Lilacs, Medline y Cinahl fueron utilizadas para buscar los estudios, cuya muestra fue de 20 artículos. Los resultados colocaron en evidencia publicaciones sobre los cuidados de enfermería para la preparación del paciente, prevención de lesiones, importancia de un sistema de documentación, prevención y detección precoz de complicaciones, enseñanza de la terapéutica inmunosupresora, enseñanza del paciente y la actuación del enfermero en el pre, trans y postoperatorio, así como sobre el papel de este profesional en el soporte nutricional y emocional de pacientes y familiares.*

**DESCRIPTORES:** enfermería perioperatoria; atención de enfermería; trasplante de hígado

## TRANSPLANTE DE FÍGADO: EVIDÊNCIAS PARA O CUIDADO DE ENFERMAGEM

*A prática baseada em evidências consiste no referencial teórico-metodológico adotado e a revisão integrativa da literatura foi o método de pesquisa selecionado. O estudo teve como objetivo buscar e avaliar as evidências disponíveis na literatura sobre o conhecimento científico produzido, relacionado ao cuidado de enfermagem prestado ao paciente adulto submetido ao transplante de fígado, no período perioperatório. As bases de dados Lilacs, Medline e Cinahl foram utilizadas para a busca dos estudos, cuja amostra foi de 20 artigos. Os resultados evidenciaram publicações sobre os cuidados de enfermagem para o preparo do paciente, prevenção de lesões, importância de um sistema de documentação, prevenção e detecção precoce de complicações, ensino da terapéutica imunossupressora, ensino ao paciente e a atuação do enfermeiro no pré, intra e pós-operatório, bem como sobre o papel desse profissional no suporte nutricional e emocional de pacientes e familiares.*

**DESCRIPTORES:** enfermagem perioperatória; cuidados de enfermagem; transplante de fígado

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## INTRODUCTION

Liver transplantation is considered one of the most complex procedures in modern surgery. Its process depends on a complete hospital infrastructure, in addition to a competent multi-professional team in the delivery of care to severely debilitated and immunodepressed patients<sup>(1)</sup>. It is used as a resource to guarantee the survival of patients with irreversible hepatic failure, when there is no other form of treatment available<sup>(2)</sup>.

The preparation of the patient is essential in the perioperative period, and the role of the nursing team is determinant for treatment success. Therefore, the nurse is responsible for the planning and implementation of care delivered to patients and families during the liver transplantation process.

Evidence-based practice (EBP) was selected as the theoretical framework for this study. It consists in defining a problem, searching and critically evaluating the obtained results, in order to provide support for the improvement of health care quality and to decrease costs<sup>(3)</sup>.

The integrative literature review is a research method used to gather and analyze available evidence. It aids in the decision making process by providing interventions that can permit a more effective care and better cost/benefit<sup>(4)</sup>. An advantage of this method is the ability to gather data from different types of research designs, including theoretical and empirical literature<sup>(4)</sup>.

Aiming at providing support for nursing care, the goal of this study was to search and evaluate evidence available in the literature on scientific knowledge related to the nursing care delivered to adult patients submitted to liver transplantation in the perioperative period.

## METHOD

The following stages were followed in the elaboration of the integrative review: identification of the topic, sampling or search in the literature, extraction of data from the included studies, evaluation of studies, interpretation of results and synthesis of knowledge or presentation of integrative review<sup>(4-5)</sup>.

The question guiding the review was: what scientific knowledge, related to the nursing care

delivered to adult patients submitted to liver transplantation in the perioperative period, has already been produced?

The selection of articles included in the review was performed in the following databases: Medical Literature Analysis and Retrieval System on-line (MEDLINE), Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Latin American and Caribbean Health Sciences (LILACS), through the keywords: nursing care, perioperative nursing, perioperative care, nursing, preoperative care, preoperative period, intraoperative care, intraoperative period, postoperative care, postoperative period and liver transplantation. To reduce bias during the search, the keywords included in the Medical Subject Headings (MeSH), in the List of Topical Subheadings of CINAHL Information Systems, and those included in the Virtual Health Library – Health Sciences Descriptors were used.

The inclusion criteria were: articles that address the nursing care delivered to the adult patient submitted to liver transplantation in the perioperative period, published between 1994 and 2004 in English, Spanish or Portuguese. The researchers read the title and abstract of each identified article, with the guiding question and adopted inclusion criteria in mind, to select a final sample of 20 articles, which were fully analyzed.

The extraction of data from the articles was performed with the aid of an instrument proposed by a perioperative nurse<sup>(6)</sup>. For the analysis of the research design and level of evidence, concepts proposed by nursing scholars<sup>(7-8)</sup> were used.

To facilitate the understanding of evidenced results, the articles included in the review were distributed in categories as follows: nursing care in the preoperative (three articles), intraoperative (two articles), and postoperative (seven articles) periods, patient education (one article), the role of nurses (one article), nutritional support (four articles), and emotional support (two articles).

## RESULTS

From the 20 articles included in the review, 15 were written by nurses, two by physicians, one by

a nutritionist, one had the collaboration of nutritionists and nurses, and one of physicians and nurses.

Regarding the journals' country of origin, ten studies were published in the United States of America (USA), five were published in Spain, two in Ireland, two in Brazil, and one in England. Thus, 13 studies were written in English, five in Spanish and two in Portuguese.

Only three studies from those analyzed were of evidence level II (strong), that is, randomized controlled clinical trials; six studies were of evidence level IV, while four were

descriptive exploratory studies, and two were case studies; five studies presented evidence level VI (experience reports); and six studies were literature reviews, which have no evidence level available according to the adopted framework; the knowledge produced by these latter articles was considered important, however, for the planning of care delivered in liver transplantation.

A synthesis of the articles included in the integrative review, distributed in Tables 1, 2, 3, 4 and 5 according to the established thematic categories, is presented below.

Table 1 – Synthesis of studies related to nursing care in the preoperative period of liver transplantation

Study	Intervention/Objective	Results	Conclusions
Schmelzer et al. <sup>(9)</sup> Randomized controlled clinical trial (n = 25)	Compare the colonic cleaning and absorption of fluids in the administration of enema with tap water (control group) and soapsuds enema (experimental group) and describe discomfort reported by patients.	The use of soapsuds enema resulted in greater output excreted by patients when compared to results obtained in patients in the control group. There was, in both types of enema, a negative balance between the entrance and exit of solutions as well as absorption of fluid by the colon.	The soapsuds enema produced greater output of intestinal content than the one with tap water. Both presented similar rates of absorption and were equally tolerated by both groups of patients.
Radovich <sup>(10)</sup> Case study	Identify the use of transjugular intrahepatic portosystemic shunt (TIPS) implications for nursing care in patients with cirrhosis, who develop refractory ascites and recurrent gastrointestinal hemorrhage.	TIPS reduces ascites, diminishing the need for diuretics and chances of esophageal varices bleeding. The procedure can lead to hepatic encephalopathy, requiring the nursing team's constant surveillance.	The use of TIPS promotes patients' quality of life. The nursing team teaches patients and families, which allows for early detection of complications related to the procedure.
Krumberger <sup>(11)</sup> Literature review	Seek support in the literature to care for patients with fulminant hepatic failure (FHF) and necessary care to improve survival of patients awaiting a liver transplantation.	In case of potential FHF, the nurse should collect the patient's detailed history, ask about the ingestion of medications, especially hepatotoxic substances, use of alcohol or cocaine, occupational exposure to blood and body fluids, in addition to other hazards suggesting a viral toxin.	The multiprofessional team's intensive care, detailed monitoring and fast forwarding to liver transplantation can improve the chances of survival of the patient with FHF.

Table 2 – Synthesis of studies related to the nursing care in the intraoperative period of liver transplantation

Study	Intervention/Objective	Results	Conclusions
Looby, Flynn <sup>(12)</sup> Experience report	Report the stages in the construction of integrated documentation system of the nursing care delivered to patient submitted to liver transplantation.	Among the registered information we highlight: surgical procedure, blood lost, surgical wound closures, dressing, flood-bypass channel, skin conditions, vascular access, maintenance of airways, drugs infusion, total of fluids administered, availability of blood and more recent laboratory exams.	Authors appoint that the documentation of nursing care in the perioperative period is necessary to identify the care delivered to patients and provide data to evaluate the results.
Looby <sup>(13)</sup> Experience report	Make considerations related to the liver transplantation surgery and organs procurement, succinctly focusing on nursing care.	The nursing team performs procedures that assure the patient's safety, among them: prevention of pressure ulcers, nerve stretching and hypothermia, collection of exams, control of entrance and exit of liquids, and infusion of blood by-products.	The search for knowledge and the development of abilities necessary to implement effective interventions that meet the patients' and families' needs is a great challenge for the perioperative nurse.

Table 3 – Synthesis of studies related to nursing care in the postoperative period of liver transplantation

Study	Intervention/Objective	Results	Conclusions
Jiménez et al. <sup>(14)</sup> Literature review	Describe the most frequent complications experienced by the patient submitted to liver transplantation in the immediate postoperative and the nurse's role.	The nurse's work is focused on the prevention or early detection of complications. For that, the terminal hepatopathy and anesthetic-surgical interurrences must be known so that a fast evaluation on the risk of complications is possible.	Nurses need to have knowledge of complications and develop abilities to work with them when necessary.
Whiteman et al. <sup>(15)</sup> Randomized controlled clinical trial (n = 69)	Investigate the efficacy of continuous lateral rotation therapy (CLRT) in 60° angle with the use of Restcue Dynamic Air Therapy Bed® to reduce pulmonary complications, comparing with conventional therapy of changing decubent position every two hours in a standard bed.	The incidence of lower respiratory tract infection was significantly lower, and the time before the infection occurred was significantly longer in the group who used CLTR compared to the group using a standard bed. The duration of mechanic ventilation was similar in both groups, as well as resolution and incidence of atelectasis.	Authors conclude that the CLRT was efficient in diminishing incidence and time necessary for the appearance of infections in the lower respiratory tract.
Lacunza et al. <sup>(16)</sup> Retrospective descriptive-exploratory study (n = 83)	Measure existing differences in the development of nursing care in two consecutive groups of patients submitted to liver transplantation (GI and GII) according to plan established by the Intensive Care Unit (ICU).	Patients in the GII had a shorter permanence in the ICU (3.5 days) than the GI (4.4 days). The oral diet was well tolerated in all patients, though it was started earlier in the GII. The bacteriological controls were performed less frequently in the GII (5) than in the GI (19).	Authors conclude that the reduced permanence of patients in the ICU, as well as the reduced number of clinical and laboratorial exams over the years, represent improvement of care delivered, reduced costs and more beds available in the ICU.
Yague et al. <sup>(17)</sup> Longitudinal retrospective descriptive-exploratory study (n= 47)	Evaluate the efficiency of care and educational plan regarding the rate of mouth infections and surgical wound of the patient with a liver transplant during the patient's entry in the hospital and after discharge.	Of the 47 analyzed cases, 29.78% presented mouth infections of viral origin and 17.02% presented infection of the surgical wound. Ten mouth infections (21.27%) and eight infections (17.02%) of the surgical wound were observed in the first month after the grafting. In the second period, three mouth infections (6.38%) and one (2.12%) surgical wound infection were detected. Only one mouth infection (2.12%) was observed in the third period.	Authors emphasize the importance of the nurses' role in patients' education on the prevention of infections, especially regarding self-care at home.
Polomano et al. <sup>(18)</sup> Literature review	Make considerations on the nursing care to cancer patients and especially surgical treatment of hepatocellular carcinomas (hepatic liver resections and liver transplantation).	Authors describe the nursing care plan including goals, nursing diagnoses and interventions. They emphasize the nurse's responsibility in the care delivered as well as the development of knowledge and abilities in the prevention and treatment of common complications for these patients.	The importance of nursing in critical care to patients submitted to liver transplantation and the need to improve knowledge and abilities necessary to work with complex therapies are highlighted.
Zaldegui et al. <sup>(19)</sup> Experience report	Describe the nurse's work in domiciliary hospitalization in a liver transplantation program.	Among the advantages of a care plan, the authors stress: minimal alteration of the patient's and family's life style, individualized and integral care, minimized anxiety, situational diagnosis in the family scope and encouraged development of the nurse's autonomy.	The continuity of nursing care at the patients' home is an efficient tool to reduce hospitalization, promote integration in the family environment, which lead to the patient's improved quality of life.
Shultz, Meriney <sup>(20)</sup> Literature review	Present a general view of immunosuppressors used in liver transplantation and considerations on the nursing care in their administration.	Care is mainly directed towards the correct administration and evaluation of anaphylaxis, rejection, renal failure, hyperkalemia, nephrotoxic, among others.	Scientific knowledge on immunosuppressive drugs is essential for the nurse to implement efficient interventions in clinical practice.

Table 4 – Synthesis of studies on patients' education and nurses' role regarding liver transplantation

Study	Intervention/Objective	Results	Conclusions
Franco et al. <sup>(21)</sup> Experience report	Present the development of patients' education, who participate in programs of organs transplantation, and discuss their educational needs.	Education should be initiated as soon as possible in the pre-transplant period and continue after hospital discharge. Understanding the transplantation stages requires constant information that should be periodically reinforced. Education plays an important role in the patient's and family's preparation to overcome the challenges associated to the long treatment.	The implementation of cooperative care leads to many challenges and opportunities, implementation and evaluation of innovating educational strategies able to meet the real needs of patients and families who undergo this kind of treatment.
Sasso, Azevedo <sup>(22)</sup> Experience report	Report on the experience of implementing a liver transplantation program and the nurse's role in the perioperative period.	Authors describe how the transplant center's multidisciplinary team and the nurse's activities in the perioperative period were formed. Coordination and orientation in the Intensive Therapy Center and in the hospitalization unit are the nurse's responsibility, though in addition to these activities in the outpatient clinic and surgical center, this professional delivers direct care to patients and families.	The nurse should work on the prevention and identification of complications, implement actions that allow for the recovery and improvement of the patient's quality of life. The authors appoint the need to provide guidelines for systematization of nursing care in this area.

Table 5 – Synthesis of studies related to nutritional and emotional support regarding liver transplantation

Study	Intervention/Objective	Results	Conclusions
Wicks et al. <sup>(23)</sup> Randomized controlled clinical trial (n=24; control group =14/ enteral diet; experimental group=10/NPT)	Compare the efficiency and tolerability of early enteral feeding using a double lumen nasojejunal tube with total parenteral nutrition (TPN) in the immediate post-transplant period.	Diet was initiated in the first 18 hours after the liver transplantation and was well tolerated. The average number of days patients initiated the oral diet (4 days) and reached 70% of the estimated requirements (5 days) did not significantly differ between the two groups.	Authors conclude that the enteral feeding is as effective, in the maintenance of the patient's nutritional state, as the TPN and has potential benefits related to the reduction of complications and costs.
Pomposelli, Burns <sup>(24)</sup> Literature review	Review guidelines related to administration of nutritional support in the perioperative period of liver transplantation.	Diet should allow for adequate level of proteins and calories in malnourished patients, resulting in a positive nitrogen balance and appropriate body mass gain.	Adequate nutritional support can diminish the incidence of complications both in patients who await the surgery and in those in the immediate postoperative.
Parolin et al. <sup>(25)</sup> Literature review	Make considerations regard the liver role in the metabolism of diverse nutrients and describe methods of evaluation of the nutritional state.	Protein-calorie malnutrition affects 70 to 100% of cases of terminal hepatic disease and adversely affects the results of liver transplantation.	Nutritional support coupled with clinical treatment contributes to a favorable prognosis and improved quality of life.
Pluvin et al. <sup>(26)</sup> Prospective descriptive-exploratory study (n = 50)	Know the nutritional state of patients who will be submitted to liver transplantation.	Of the patients studied, 48% presented some level of malnutrition (10% mild, 30% moderate, and 8% severe malnutrition). Patients considered well nourished presented statistically significant differences in relation to anthropometrical parameters of patients with moderate and severe malnutrition.	Malnutrition is a very prevalent clinical problem among candidates for liver transplantation; the anthropometrical parameters are the best markers of the nutritional state of patients.
Chappell, Case <sup>(27)</sup> Descriptive-exploratory study	Describe the levels of adult patients' anxiety in preoperative of liver transplantation and in situations along the recovery process.	The highest scores of anxiety occurred before the first hepatic biopsy and during the first rejection. Authors suggest nursing interventions to diminish anxiety.	Emotional support to the patient promoted by the nurse is essential during different phases of the liver transplantation process.
Benning, Smith <sup>(28)</sup> Case study	Discuss the psychosocial needs of families of patients in liver transplantation programs, including aspects of chronic disease, transplant evaluations, waiting period, immediate postoperative, and long-term adjustments recovery.	15 year-old patient with fulminant hepatic failure secondary to Wilson's disease was submitted to transplantation and had complications that led to a new surgery; recovered after six months of hospitalization (case 1). Patient, 34 years old, submitted to transplantation due to cryptogenic cirrhosis. Immediate postoperative developed to acute liver rejection unresponsive and died (case 2).	Authors appoint that family members experience psychosocial stressors during long periods, and the nurse is able to meet their needs, contributing to improve the positive results related to the procedure.

## DISCUSSION

The preoperative period of liver transplantation ranges from the moment the patient enters the waiting list of the Health Secretary to receive a liver from a diseased donor to the moment the patient is called to receive the graft in the hospital.

In Brazil, this period is long and currently takes around three years. The patient with a severe hepatic disease can develop several complications, since such disease can compromise several organic systems. In this period, the patient is periodically supervised by a physician in the outpatient clinic and evaluated by a nurse and other professionals from the multidisciplinary team, such as social workers, nutritionists, psychologists and physiotherapists.

The intraoperative period of liver transplantation is considered one of the most complex moments in the process because, most of the times, the receiver already presents several complications due to the primary disease. Additionally, several factors influence success in this period, among them the conditions of the donated liver, time of ischemia until the new liver implantation, intense hemorrhages that accompany the procedure, and other anesthetic-surgical interurrences<sup>(12-13)</sup>. In this scenario, interventions implemented by the nurse to prevent lesions are relevant, such as the use of devices to assure adequate surgical positioning and to avoid the occurrence of pressure ulcers.

After the recovery of vital and hepatic functions, patients are kept in a special hospitalization unit for a few days until they are in conditions for discharge. Thus, nursing care in the postoperative period focuses on the implementation of interventions directed at the prevention or early detection of the more frequent complications, such as surgical (Hemoperitoneum, biliary and vascular complications), graft (primary graft failure, acute rejection) and general complications (respiratory, cardiovascular, renal, hematological, metabolic, digestive, and infectious)<sup>(14-17)</sup>. These complications partially depend on the patient's conditions before the liver transplantation.

The administration of medication is an essential activity for the nurse involved in a liver transplantation program. This activity permeates the perioperative period and involves not only the administration of drugs per se, but also a process of education in health, which provides patients, and their

families, information to correctly use the medicament therapy at home with the smallest risk possible, especially in relation to the immunosuppressive drugs.

The emergence of immunosuppressive drugs (such as cyclosporine and tacrolimus) is one of the factors permitting increased life expectancy after liver transplantation, by fighting rejection of the transplanted organ. The nursing team needs to know the indication, mechanisms of action, advantages and disadvantages, administration routes, side effects and necessary care regarding the use of this therapy<sup>(20)</sup>.

Teaching patients is a nurse's difficult task because it demands the implementation of interventions that cause changes in the patients' life style, affecting their personal values and beliefs. For the patient to achieve an independent life style after the transplantation, the nurse should provide knowledge related to nutrition, medication, monitoring of vital signs, and registration of information. The education promotes the development of cognitive, psychomotor and attitudinal abilities, with which patients and families can guarantee the continuity of care and an active participation in the treatment<sup>(21)</sup>.

Nurses work on the pre, intra and postoperative periods of liver transplantation, with specific activities, whether in the outpatient clinic, in the hospitalization unit, in the surgical unit or in the intensive therapy unit. The planning, implementation and evaluation of care in transplanted patients are part of the coordinating nurse's role. This professional acts as a link in the multidisciplinary team's communication, and effective communication is essential in care delivery to patients and families<sup>(22)</sup>. Although the nurse is only one of the members contributing to the care for patients with liver transplantation, his role is essential for treatment success.

Patients who present a terminal hepatic disease and have the liver transplantation as the only option to obtain cure or survival, usually present an aggravated nutritional state. The liver is the organ responsible for synthesizing and storing several vital nutrients for the metabolism. However, it does not exert its functions adequately when sick, which reflects on the nutrition of patients who await a transplantation. Patients can present malnutrition, lose weight because of poor ingestion of food, poor absorption of nutrients, and impaired hepatic function, which aggravates their health state.

Malnutrition has to be treated before transplantation, so that chances of a positive result are increased and chances of any postoperative complications are decreased<sup>(23)</sup>. This problem is treated by the multidisciplinary team: the nutritionist evaluates the minimum nutritional conditions for the patient to bear the surgical stress, while the social worker evaluates the patient's socio-economic conditions to assure the family has the means to acquire adequate food. The psychologist, on the other hand, evaluates the patient's emotional state and factors that can lead to non-adherence to an appropriate diet; it is the physician's role to prescribe medication, or even the use of an enteral or parenteral diet. Finally, the nurse frequently evaluates the development of the patient's nutritional state, observing and recording physiological functions, verifying weight and waist circumference, acceptance of the diet and preferences<sup>(24-26)</sup>.

The nurse, as a member of the multidisciplinary team, spends most time with patients and is the element capable of keeping an affective bond with patients and families, especially in a liver transplantation program in which the whole process involves a long period of time. Thus, patients establish with nurses a relationship of trust, respect, and freedom to share their anxiety and fears. Many of them experience moments of anguish, anxiety, fantasy and doubts, because they do not know how the whole

transplant process will develop. Myths and beliefs related to the organ that will be implanted, gender, age, the donor origin, a potential rejection that can end the dream of having a normal life, all these elements and others influence the emotional state of those awaiting a liver transplantation. Therefore, the multidisciplinary team plays an essential role in clarifying all patients' and families' doubts and questions. The psychologist's role in this process is essential, as well as that of the nurse, because the nurse can, through exchange of information, bring new elements for the psychological and, many times, psychiatric treatment, because some patients develop disorders that require specialized treatment<sup>(27-29)</sup>.

## CONCLUSION

After this integrative review was carried out, the relevance of the nurse's role in liver transplantation programs became clear. This professional is responsible for the management of care delivered to patients and families and performs care, administrative, educational and research activities, which are of fundamental importance for the success of liver transplantation. Thus, the researchers consider the fundamental importance of research development and/or the use of its results to support clinical practice and, in this scenario, evidence-based practice has a lot to offer.

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