

# Advancements in the Examination of the Preparedness of Parents of Children Undergoing Liver Transplantation

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## ABSTRACT

Liver transplantation is a very efficient remedy for liver ailments in children, and with advancements in technology, the anticipated survival rate after the surgery has also increased. Nevertheless, as a result of insufficient medical resources and the implementation of the quick rehabilitation approach, children are often released from the hospital prior to achieving complete recovery, leaving parents to assume the role of primary carers. Release preparedness, including the patient's physical state, mental well-being, and community assistance, is a significant indicator of a patient's adjustment to life after release. An efficient evaluation of discharge readiness may promote a seamless transition to home, minimize problems, and limit the need for further treatment and readmission. The objective of this research was to offer a comprehensive overview of the present condition regarding the preparedness of parents of children who have had liver transplantation to establish a foundation for evaluating and implementing appropriate interventions.

**Keywords:** Liver transplanted children; Parents; Discharge readiness; Evaluation tool

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## INTRODUCTION

Liver transplantation is a crucial therapeutic intervention for severe liver illnesses, particularly in pediatric patients with cholestatic diseases, biliary atresia, hereditary metabolic diseases, acute liver failure, and hepatic malignant tumors (1-2). The majority of these children are afflicted with end-stage liver disease. However, because of the ongoing advancements in liver transplantation for children in China, the prospects for long-term postoperative survival have been steadily improving (3).

Nevertheless, as a result of the enhanced efficiency in the turnover of capital in surgical wards, the scarcity of medical resources, and the advancement and implementation of the rapid rehabilitation surgery concept, the duration of hospitalization for children undergoing liver transplantation has significantly decreased, leading to the discharge of many patients before achieving full recovery (4). Consequently, there is a growing need for discharge preparation programs specifically designed for children, with parents serving as the primary carers.

Research has shown that doing thorough evaluations to evaluate the preparedness of parents of children for discharge may enhance the process of transitioning from the hospital to home and decrease the occurrence of difficulties after release. Consequently, this leads to a decreased need for further treatment and a decrease in the number of readmissions. Hence, discharge preparation services for parents of children with illnesses should be enhanced (5).

### 1. Concept of Discharge Readiness

Evaluating a patient's readiness for release is crucial to determining their eligibility and capacity to reintegrate into the community and achieve complete recovery post-discharge successfully. The notion of discharge readiness was introduced by researcher Fenwick in 1979 (6), wherein various factors such as the patient's physical well-being, mental health status, and community support were assessed to determine if the patient and their family were adequately prepared for discharge, thus facilitating a smooth transition to post-hospital life. Additional researchers have enhanced the notion of readiness for discharge by asserting

that it should encompass the patient's physical stability, social assistance, ability to protect oneself, acquisition of professional knowledge, and psychological adaptability. They have categorized readiness for discharge into three successive phases: in the hospital, at the moment of discharge, and after discharge (7-8). Evaluating the preparedness for discharge is crucial in order to develop tailored post-care plans and rehabilitation schemes. By evaluating the care requirements of patients and their families upon discharge, carers may provide helpful advice and assistance to aid them in effectively dealing with the difficulties of illness management and recuperation. Nevertheless, the existing assessment techniques for evaluating the preparedness of families with sick children to be released still need some help, including arbitrary selection and incomplete assessment material. Hence, it is essential to conduct more studies and devise more practical evaluation instruments to enhance patients' and their families' rehabilitation and healthcare administration.

### 2. Tool to Assess Discharge Readiness of Parents of Children with Liver Transplantation

At present, the primary methods used to evaluate the readiness of parents of children undergoing liver transplantation for release are general measures. However, there is a need for the development of specialized discharge readiness scales specifically designed for parents of children undergoing liver transplantation. The Readiness for Hospital Discharge-Parent Form (RHDS-Parent Form) is a frequently used evaluation instrument. The RHDS Parent Form was created in 2006 by Weiss et al., drawing from Meleis' Transition Theory (9). It comprises five dimensions: the parent's status, the child's status, the parent's ability to handle discharge from the hospital, knowledge of the illness, and social and available support. In total, there are 29 entries in the form. The scale needs more content validity since it has yet to undergo testing.

The scale has been utilised internationally by caretakers of children with organ transplants, congenital heart disease, NICU, and chronic illnesses to evaluate their preparedness for hospital discharge (10-11). This study in China has solely focused on parents of preterm newborns. Further research is required to evaluate if the scale can be used to assess the

readiness of parents of children with various disorders in China (12).

The Carer Readiness Scale (CPS), developed by British academics Archbold et al. (13) in 1990, is another frequently used evaluation measure. The scale comprises eight components about the fundamental physiological requirements of patient care, emotional support, strategic planning for patient services, management of carer stress, provision of suitable care to the patient, proficiency in handling and addressing emergencies, accessibility to healthcare facilities, and informational resources, and overall assistance. The measure has been used internationally by carers of children with chronic illnesses, including cancer and other chronic conditions. In 2016, Chinese researcher Yanjin Liu and colleagues adapted the scale to be more suitable for Chinese culture and tested it on long-term carers of patients with ischemic stroke. The scale demonstrated a high level of internal consistency, with a Cronbach's alpha coefficient of 0.925 (14).

Furthermore, there is the Fragile Infant Parent Discharge Readiness Evaluation (FIPRE) scale (15). The FIPRE scale was created to evaluate the readiness of parents of vulnerable infants and young children to be discharged from the hospital. It consists of four dimensions: the performance of the ICU service, the child's health, the parent's mental health, and the parents' psychological anxiety. Scale iterations have been devised in the United Kingdom and Spain. However, they are not yet accessible without restrictions. There have been no research studies undertaken in China to evaluate children using this scale. However, researchers Lin Min et al. have given a concise summary of the scale (16).

The carers are more concerned about the patient's readiness for discharge, which is a crucial factor in determining their eligibility to leave the hospital and their capacity to fully recover and reintegrate into the community. Choosing a suitable scale to determine the readiness for release is advantageous in promoting the child's recovery.

### **3. Factors influencing discharge readiness in children with liver transplantation**

#### **3.1 Provider Factors**

The donor variables primarily include the surgical technique used for organ donation, the origin of the liver, the graft-to-recipient weight ratio (GRWR), and the physical well-being of the liver donor (17-18). The primary surgical methods used for liver transplantation in pediatric patients are partial hepatic artery transplantation and total liver transplantation. The primary sources of liver donors include contributions from family members and organ donations from dead individuals. Research has shown that parental liver transplantation is more feasible and has superior outcomes in terms of graft survival and short- and long-term survival, as compared to dead organ donation by citizens (19). Research has shown that maintaining a graft-to-recipient weight ratio (GRWR) between 2-4% significantly decreases the occurrence of perioperative problems in pediatric patients undergoing liver transplantation (17).

Furthermore, the quality of the liver obtained from the donor might also impact the child's long-term recovery. For instance, donors who have hepatitis viruses or moderate-to-severe fatty liver disease increase the chance of long-term survival following the operation (20). The quality of the liver supply also influences the long-term healing of the youngster. When parents serve as liver donors, they experience not only physical pain but also dread, worry, helplessness, and sadness over their children's unfavorable prognosis after surgery, as well as the expensive nature of therapy. A high-quality liver source can effectively decrease perioperative complications in children (4). This, in turn, enhances the family's confidence during the postoperative phase and facilitates a smoother transition to discharge. Additionally, it is crucial to provide psychological support to parents who undergo liver transplants to improve their readiness for discharge further.

#### **3.2 Child Factors**

Child variables primarily include preoperative and postoperative infection symptoms, the occurrence of postoperative problems, the administration of vaccines, and the evaluation of the child's nutritional condition (21-22). The following elements have been examined in this research. Multiple studies have shown a direct correlation between the child's postoperative state, the duration of their recovery, and the degree of preparedness of the parents for the child's departure from the hospital (23-25). The

parents' inclination to release is greater. Consequently, it is essential to actively manage viral infections in children before surgery, effectively handle any complications that arise after surgery, and establish vaccination methods based on scientific reasoning. Additionally, all children should be assessed for nutritional risk, and those at high risk should receive appropriate energy supplementation. These measures aim to decrease the duration of hospitalization for children and improve the preparedness of parents of children who have undergone liver transplantation for discharge.

### 3.3 Carer Factors

The primary carer variables include the carer's age, physical well-being, social support, illness knowledge, and educational credentials. The research revealed a correlation between the advanced age and lower socioeconomic status of parents who serve as liver donors for their children undergoing liver transplantation (26). This correlation was shown to impact the quality of care provided to the kid negatively, hence hindering their postoperative recovery. Multiple studies have demonstrated that carers with strong social support, advanced education, and a comprehensive understanding of the disease are more proficient in caring for their children and enhancing their preparedness for discharge. Furthermore, the "3+1+1" extended care model enhances carers' knowledge of the disease in children who have undergone liver transplantation and fosters their physical and mental well-being. (27-29).

Healthcare practitioners should prioritize their attention toward elderly carers who are in a state of physical decline and possess little understanding of the illness. They should promptly provide relevant expertise to address their needs. Simultaneously, carers' preparedness for release might be enhanced by adopting or investigating novel care models. Health education, being a cost-effective and straightforward instruction, has favorable outcomes regarding information acquisition. Research has also validated that the consistent provision of care via peer education has significantly benefited child outcomes and patient adherence, partially alleviated work-related stress among carers, and heightened their knowledge and positive emotions around children's diseases. Empowerment-based

education may promote children's autonomy and alleviate parental stress. The findings of this study indicate that incorporating health education may reduce the burden of caregiving stress experienced by the primary carer and enhance overall life satisfaction.

### CONCLUSION

Assessing the preparedness of parents of children with liver transplantation to be discharged is crucial for ensuring a seamless transition of the child into family life. There are general measures available in clinical practice to evaluate the preparedness of parents of children who have had liver transplantation for release. However, there is a need for more research to develop specialized scales for evaluating the discharge readiness of parents in this particular context. Assessment tools should be selected based on practical judgment, and further study should be undertaken to determine the validity of their content.

With the advancement of paediatric liver transplantation technology in China, there is an increasing number of children awaiting treatment. In order to decrease the occurrence of postoperative complications and unplanned re-admissions among children who have undergone liver transplantation, it is crucial to enhance the readiness of parents for their child's discharge. This will facilitate a smooth transition from the hospital to the home and ultimately improve the children's quality of life and satisfaction.

Currently, there is a limited amount of research on the willingness of carers of pediatric liver transplant patients to be discharged, and the majority of the studies have primarily examined the psychological factors affecting carers. Future research should prioritize enhancing the discharge readiness of carers for child liver transplant patients. This entails improving support and education for carers to enhance their quality of life and satisfaction.

### CONFLICT OF INTEREST

The authors declare no conflict of interest.

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## AUTHOR CONTRIBUTION

All members have contributed equally to the writing of this manuscript.

## REFERENCES

1. Shen ZY, Gu CH, Zheng H, Pan C, Deng YL, Du HY, et al. A 20-year review of clinical liver transplantation. *Chinese Emergency Medicine for Critical Illness*. 2019;31(3):269-80.
2. Lee EJ, Vakili K. Pediatric liver transplantation. *Pediatric Solid Organ Transplantation: a Practical Handbook*. 2023:415-27.
3. Xia Q, Zhu XY. Current status and prospects of liver transplantation in children. *Journal of Clinical Pediatric Surgery*. 2022).
4. Tang R, Li CH, Zhang YH. Advances in postoperative care for children undergoing liver transplantation. *Advances in Clinical Medicine*. 2022;12(6143.) 5.
5. Xu Chencheng, Jiang Dapeng. Donor factors requiring attention in paediatric renal transplantation. *Journal of Clinical Pediatric Surgery*. 2022).
6. Fenwick AM. An interdisciplinary tool for assessing patients' readiness for discharge in the rehabilitation setting. *Journal of Advanced Nursing*. 1979;4(1):9-21.
7. Galvin EC, Wills T, Coffey A. Readiness for hospital discharge: A concept analysis. *Journal of advanced nursing*. 2017;73(11):2547-57.
8. Meleis AI, Sawyer LM, Im E, Messias DKH, Schumacher K. Experiencing transitions: an emerging middle-range theory. *Advances in nursing science*. 2000;23(1):12-28.
9. Weiss ME, Piacentine LB. Psychometric properties of the readiness for hospital discharge scale. *Journal of nursing measurement*. 2006;14(3):163-80.
10. Dionne-Odom JN, Azuero A, Taylor RA, Wells RD, Hendricks BA, Bechthold AC, et al. Resilience, preparedness, and distress among family caregivers of patients with advanced cancer. *Supportive care in cancer: official journal of the Multinational Association of Supportive Care in Cancer*. 2021;29(11):6913-20.
11. Camicia M, Lutz BJ, Joseph JG, Harvath TA, Drake CM, Theodore BR, et al. Psychometric Properties of the Preparedness Assessment for the Transition Home After Stroke Instrument. *Rehabilitation nursing: the official journal of the Association of Rehabilitation Nurses*. 2021;46(2):113-21.
12. Zhang Hong, Shen Min, Zhang Qiuxiang, Zhang Yuanyuan, Zheng Yaning. Effectiveness of health education for preterm carers using the preterm infant discharge family readiness self-assessment scale. *Journal of Nursing*. 2019;26(9):69-73.
13. Archbold PG, Stewart BJ, Greenlick MR, Harvath T. Mutuality and preparedness as predictors of caregiver role strain. *research in nursing & health*. 1990;13(6):375-84.
14. Liu YJ, Wang M, Dong SF. Reliability and validity of the Chinese version of the Caregiver Readiness Scale. *Chinese Journal of Practical Nursing*. 2016;32(14):1045-8.
15. Hawes K, McGowan E, O'Donnell M, Tucker R, Vohr B. Social emotional factors increase risk of postpartum depression in mothers of preterm infants. *the Journal of pediatrics*. 2016;179(61-7).
16. Lin M, Chen JL. Progress in the study of discharge readiness of hospitalised children. *Journal of Nursing*. 2019;34(23):95-8.
17. Sun Yan, Yu LX, Wang WL. Impact of graft weight to recipient volume ratio on the prognosis of liver transplantation in children. *Chinese Journal of Organ Transplantation*. 2016;37(6):321-5.
18. Zhang Haiming, Zhu Zijun. Indications for liver transplantation in children with liver malignancies. *Journal of Clinical Hepatology/Linchuang Gandanbing Zazhi*. 2021;37(2).
19. Yi Shuhong, Yang Yang, Chen Planning. Multidisciplinary collaboration to achieve optimal outcomes in paediatric liver transplantation. *Organ Transplantation/Qi Guan Yi Zhi*. 2020;11(4). 20.
20. Gao W. Expanding donor sources for paediatric liver transplantation. *Journal of Clinical Pediatric Surgery*. 2022).

21. Boillot O, Guillaud O, Pittau G, Rivet C, Boucaud C, Lachaux A, et al. Determinants of short-term outcomes after pediatric liver transplantation: a single centre experience over 20 years. *Clinics and Research in Hepatology and Gastroenterology*. 2021;45(6):1015-65.
22. Sin P, Díaz LA, Martínez M, Vizcaya C, D Agostino D, Gana JC. Acute liver injury among Pediatric Liver Transplantation recipients with COVID-19: An International Collaborative Study. *Journal of Pediatric Gastroenterology and Nutrition*. 2021.
23. Zhang ZQ, Zhao Y, He EH, Wang J, Cui XL, Sun LY, et al. Analysis of a questionnaire survey on the current vaccination status of paediatric liver transplant recipients. *China Pharmacol*. 2021;35(4):462-70.
24. Rajan G, Nikam V, Shrimal A, Prashantha SR, Mitul S, Mohanka R. Mono-segment (segment 2) donor hepatectomy for pediatric liver transplantation. *Annals of Hepato-Biliary-Pancreatic Surgery*. 2021;25(1):S268.
25. Huang YK, Liu XL. Progress in the study of risk factors for infection after liver transplantation. *Electronic Journal of Developmental Medicine*. 2023;11(2):148-53, 160.
26. Lv Luyang, Wang Hafen, Lu Fangyan, Wang Yan, Jiang Shuying. A qualitative study of family carers' experiences of discharge preparation for children with liver transplantation. *Journal of Nursing*. 2023;30(9):13-7.
27. Alfares BA, Bokkers RP, Verkade HJ, Dierckx RA, Gupte G, Franchi-Abella S, et al. Portal vein obstruction after pediatric liver transplantation: a systematic review of current treatment strategies. *Transplantation Reviews*. 2021;35(4):1006-30.
28. Zhao W, Chen YY, Wang LY. Construction and effectiveness analysis of extended care model after liver transplantation in children. *Chinese Journal of Practical Nursing*. 2016.
29. Li Juan, Wang Huanhuan, Tian Bingjie. Correlation between psychological resilience and anxiety and depression in paediatric related living donor liver transplantation. *Chinese Journal of Organ Transplantation*. 2019;40(3):162-5.