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CASE REPORT

A Roy Adaptation Model-Based Nursing Approach to a Patient Awaiting Liver Transplantation and His Family Caregiver: A Case Report

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Abstract

Organ transplantation causes significant physical, psychological, and social stress for both patients and caregivers. This study aimed to plan and implement nursing care based on the Roy Adaptation Model (RAM) for a patient awaiting transplantation. Data were collected from a 48-year-old male with chronic liver failure and his 42-year-old brother caregiver through four semi-structured, observational sessions. Assessments followed RAM's physiological, self-concept, role function, and interdependence modes. Interventions included physical support, psychosocial counseling, communication enhancement, and referral to social resources. RAM-based nursing care promoted multidimensional adaptation in both individuals. The study demonstrates the effective application of family-centered, holistic, theory-based nursing care in clinical practice.

Keywords: Caregiver; Case reports; Liver transplantation; Nursing models

Liver failure is a severe chronic condition characterized by high mortality and morbidity, significantly diminishing patients' quality of life. This multisystem disorder disrupts homeostatic regulation, psychological resilience, self-perception, and social functioning.[1] Despite advances in immunosuppressive therapy and transplantation technology, the prognosis remains unpredictable, compounding distress for patients and caregivers.

Liver transplantation markedly improves survival outcomes; however, prolonged waiting periods provoke intense psychological stress, including anxiety, uncertainty, role confusion, and social isolation.[2,3] Existing literature emphasizes physiological monitoring during the pre-transplant period but largely overlooks caregiver well-being, increasing their susceptibility to secondary traumatization and burnout.[4] Accordingly, nursing care must encompass both patients and caregivers, integrating procedural competence with therapeutic support to strengthen adaptive coping and address psychosocial needs.[5]

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This study introduces the concurrent application of the Roy Adaptation Model (RAM) to both patient and caregiver populations during the pre-transplant phase. The paucity of published evidence in this domain underscores the critical need for such integrative frameworks.

Roy Adaptation Model (RAM)

RAM provides a systematic framework for evaluating patients' uncertainty, anxiety, and multidimensional adaptive responses during the transplantation process. It integrates physiological, psychological, and sociocultural domains of adaptation. Developed by Sister Callista Roy in the 1960s, and grounded in General Systems Theory and the Adaptation-Level Framework, the model was formally introduced in 1970 and refined in 1986, becoming a cornerstone of contemporary nursing theory.[6]

The individual is conceptualized as an open system in continuous interaction with environmental stimuli focal, contextual, or residual that elicit coping mechanisms to preserve integrity and equilibrium. Adaptive or maladaptive behaviors manifest across four adaptive modes: physiological, self-concept, role function, and interdependence. The physiological mode addresses biological and physical regulation, while the self-concept mode reflects cognitive-emotional perceptions of self that sustain psychological integrity. The role function mode pertains to social identity and fulfillment of societal roles, and the interdependence mode encompasses supportive relationships and relational commitment.[6]

The RAM rests on eight core principles, emphasizing the person as a holistic, adaptive being capable of learning, growth, and transformation in response to environmental change. Health and illness are viewed as continuous, adaptive processes essential to human development and survival.[6]

The Integration of Key Concepts and Definitions from the Roy Adaptation Model with Nursing Care for Patients and Families Awaiting Liver Transplantation

Within the RAM, the primary objective of nursing intervention is to promote adaptive responses through effective coping mechanisms. Adaptation unfolds across four domains: physiological integrity, self-concept, role function, and interdependence. Candidates for liver transplantation experience multifaceted physiological, psychological, and social challenges due to disease progression and prolonged treatment regimens. Psychological distress including uncertainty, anxiety, and depression is common before transplantation. Care based on the RAM framework supports both psychosocial adjustment and physiological stability.[2,6]

RAM categorizes stimuli influencing adaptation into focal, contextual, and residual types. Focal stimuli elicit immediate adaptive responses, such as ascites, fatigue, and coagulopathy associated with end-stage liver disease. Accurate identification enhances the precision and efficacy of nursing care plans. Contextual stimuli, including polypharmacy, financial strain, and lifestyle disruption, indirectly affect adaptation. Residual stimuli, such as fear of transplantation, negative prior healthcare experiences, and cultural beliefs, are subjective and less quantifiable. Comprehensive assessment of these stimuli through patient history enables individualized, patient-centered care, fostering optimal adaptive functioning among patients and their families awaiting transplantation.[3,6]

Case Report

This case report is based on four semi-structured interviews and naturalistic observation sessions conducted between November 27 and December 7, 2024, in home and inpatient settings. Each session lasted 45-60 minutes. Interviews in home environments were conducted in quiet, private areas, while hospital sessions were scheduled at non-disruptive times to ensure privacy and psychosocial safety. All procedures complied with institutional ethics protocols, infection control standards, and the CARE guidelines.[7] Written informed consent was obtained, and participant confidentiality was rigorously maintained.

The patient, M.K., a 48-year-old liver transplant candidate with end-stage chronic liver disease secondary to hepatitis B, had been followed in the gastroenterology outpatient clinic for approximately three years. Over the preceding six months, his functional dependency had significantly increased, accompanied by fatigue, anorexia, weight loss, and recurrent abdominal discomfort and nausea. Physical examination revealed mild jaundice, pruritus, and sleep disturbances. Laboratory findings showed hyperbilirubinemia, hypoalbuminemia, and an elevated international normalized ratio (INR).

His caregiver and younger brother, A.K. (42 years), simultaneously managed occupational and familial responsibilities. The caregiving burden led to insomnia, fatigue, occupational impairment, and social withdrawal, culminating in role strain, emotional exhaustion, and social isolation.

Figure 1. Stages of the RAM-based nursing process.

During the pre-interview phase, potential emotionally charged topics were identified to anticipate participant reactions. The interview environment prioritized privacy, empathy, and psychological safety. Trust and rapport were established through open-ended questioning and active listening. Data were analyzed using Roy's Adaptation Model (RAM), encompassing the physiological, self-concept, role function, and interdependence modes.[6]

In the physiological mode, M.K. exhibited fatigue, anorexia, and sleep disruption, while A.K. experienced physical exhaustion and insufficient rest. Within the self-concept mode, M.K. demonstrated diminished self-esteem, and A.K. expressed reduced self-efficacy and guilt. Under the role-function mode, both displayed role conflict and productivity loss. In the interdependence mode, difficulty seeking assistance and social detachment were evident in both participants.

RAM-Based Nursing Care Plan

RAM based nursing process comprises six sequential stages: identifying stimuli and adaptive behaviors, formulating nursing diagnoses, establishing adaptive goals, designing interventions, and evaluating implementation outcomes (Figure 1).[6] Figure 2 outlines the individualized RAM care plan for patient M.K. and caregiver A.K.[8]

Persistent uncertainty regarding the transplantation process, prolonged waiting periods, and previous losses fostered profound hopelessness among patients and families. However, nurse-led interventions incorporating hope-enhancing strategies, motivational counseling, structured goal setting, and spiritual support elicited more optimistic perspectives on recovery.

Conversely, increased caregiving burden, impaired family communication, and preexisting conflict diminished coping capacity. Weekly role-allocation sessions and communication-skills training enhanced familial cohesion and openness.

Recurrent hospitalizations and social withdrawal intensified social isolation for both patients and relatives. Following referrals to peer-support programs and social-engagement opportunities, participants gradually initiated contact and acknowledged their need for social connection.

Operational unpredictability, prolonged medical treatment, and prior adverse outcomes heightened anxiety and hopelessness. Transparent information sharing, spiritual guidance, and relaxation training markedly reduced anxiety and improved perceived internal control.

Discussion

This study demonstrated that a nursing approach grounded in the RAM effectively facilitates adaptive processes among both patients and caregivers prior to liver transplantation. The integration of RAM's four adaptive modes provides a theoretically informed framework that guides nursing interventions through the stimulus-coping-adaptation cycle.[6] Recent evidence indicates that RAM based care significantly reduces anxiety, depression, and sleep disturbances while enhancing postoperative recovery trajectories.[9]

In a representative case, the patient experienced fatigue, insomnia, and diminished self-esteem, while the caregiver exhibited guilt, burnout, and social withdrawal. Targeted interventions such as structured activity scheduling, sleep hygiene protocols, hope reinforcement, and role redistribution plans yielded immediate benefits, including enhanced patient autonomy, reduced caregiver guilt, and improved familial communication. These findings align with previous research underscoring RAM's efficacy in promoting psychosocial adaptation in populations with chronic conditions.[10]

A key contribution of this study lies in conceptualizing the caregiver as a "hidden patient." Literature recognizes that caregivers frequently endure role conflict, psychological distress, and exhaustion throughout the transplantation continuum.[3,11] In this case, RAM-guided interventions partially alleviated these burdens, reinforcing the importance of family-centered nursing to enhance treatment adherence and overall care quality.

RAM's stimuli classification system distinguishing focal, contextual, and residual factors proved instrumental in clinical decision-making. Here, fatigue and uncertainty were identified as focal stimuli, whereas prolonged therapy and frequent medical visits served as contextual stimuli, and adverse medical histories as residual stimuli. Interventions at both regulator (physiological) and cognator (cognitive-affective) levels such as activity regulation, sleep management, emotional support, and problem-solving guidance collectively enhanced psychological adjustment and adherence. The observed reductions in anxiety and hopelessness further confirm the effectiveness of RAM-based nursing interventions in optimizing cognitive and affective adaptation.[6,11]

Conclusion

RAM provides a comprehensive, psychosocial, and family-centered framework for nursing practice, extending beyond mere physiological observation. This study demonstrated

Figure 2. Nursing care plan for M.K. and A.K. With RAM-based care plan.

that simultaneous application of RAM to patients and caregivers during the pre-transplant waiting period markedly enhances short-term adaptive responses. Findings confirm that RAM facilitates individualized care planning, promotes psychosocial well-being, and alleviates caregiver burden. Therefore, RAM should be regarded as an evidence-informed clinical tool that translates theoretical constructs into effective bedside practice. Future studies should evaluate its applicability across diverse patient populations using larger samples and extended follow-up periods.

Ethics Committee Approval: This is a single case report, and therefore ethics committee approval was not required in accordance with institutional policies.

Informed Consent: Written informed consent was obtained from the patient or legal guardian for publication of clinical details and images.

Conflict of Interest: None declared.

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