DETERMINANTS OF QUALITY OF LIFE AND TREATMENT SUSTAINABILITY IN PATIENTS UNDERGOING PERITONEAL DIALYSIS: A STUDY OF PSYCHOSOCIAL ADAPTATION AND LONG-TERM OUTCOMES

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Introduction

Chronic kidney disease represents a progressive and irreversible decline in renal function that affects millions of individuals worldwide and constitutes a major public health burden. As kidney function deteriorates to the stage defined as end-stage renal disease, patients require renal replacement therapy to survive. Traditionally, in-center hemodialysis has been the dominant modality; however, over the past decades, peritoneal dialysis has emerged as a viable and, in many cases, advantageous alternative. Peritoneal dialysis offers greater flexibility, home-based management, and increased autonomy, which may profoundly influence patients' physical, psychological, and social well-being. Despite these potential advantages, the lived experience of individuals undergoing long-term peritoneal dialysis remains complex and multifaceted.

The concept of quality of life has become central in evaluating outcomes among patients with chronic illnesses. In nephrology, survival alone is no longer considered a sufficient endpoint. Instead, attention has shifted toward patient-reported outcomes, functional status, emotional resilience, and social integration. Individuals with end-stage renal disease frequently experience fatigue, dietary and fluid restrictions, reduced physical capacity, sexual dysfunction, financial strain, and uncertainty regarding the future. These factors interact dynamically with treatment modality, duration of therapy, comorbid conditions, and the availability of psychosocial support systems.

Peritoneal dialysis differs from hemodialysis not only in its physiological mechanisms but also in its impact on daily routines. Continuous ambulatory peritoneal dialysis and automated peritoneal dialysis enable patients to perform exchanges at home, often allowing greater independence and less rigid scheduling compared to in-center hemodialysis sessions. However, home-based therapy transfers responsibility from healthcare professionals to patients and their families. This shift can be empowering for some but overwhelming for others, particularly in older individuals or those with limited health literacy. The need for strict aseptic technique, the risk of peritonitis, and the constant presence of dialysis equipment within the domestic environment may alter perceptions of normalcy and personal identity.

Globally, the prevalence of chronic kidney disease continues to rise, largely driven by aging populations, increasing rates of diabetes mellitus, hypertension, and cardiovascular disease. As a consequence, the number of individuals requiring renal replacement therapy has expanded substantially. In this context, understanding the determinants of quality of life in patients undergoing peritoneal dialysis is essential for optimizing long-term outcomes. Unlike acute medical interventions, dialysis is not a temporary treatment but rather a sustained, life-altering condition that shapes daily behavior, interpersonal relationships, employment opportunities, and mental health trajectories.

Psychological adaptation plays a critical role in treatment sustainability. Patients newly initiated on peritoneal dialysis often experience fear, anxiety, and grief related to the loss of previous health status. Concerns about body image, catheter visibility, and dependency on medical procedures can contribute to depressive symptoms. Over time, many individuals develop coping mechanisms, establish routines, and integrate dialysis into their identity. However, adaptation is not uniform. Some patients experience persistent distress, social withdrawal, or treatment burnout, which may result in modality switch, non-adherence, or reduced survival.

Furthermore, socioeconomic factors significantly influence patient outcomes. Access to clean water, adequate housing conditions, caregiver support, and educational resources are prerequisites for successful home dialysis. In resource-limited settings, these requirements may present barriers, potentially exacerbating inequalities in health outcomes. Employment status also intersects with dialysis modality. While peritoneal dialysis may facilitate continued work participation due to scheduling flexibility, fatigue and comorbidities can still limit productivity and income stability.

Another crucial dimension involves the duration of therapy. Early months after initiation often represent a period of intense adjustment characterized by frequent clinical monitoring and heightened vigilance for complications. Intermediate stages may reflect relative stability, during which patients gain confidence and independence. In contrast, long-term therapy can be complicated by membrane failure, recurrent infections, abdominal hernias, and progressive cardiovascular disease. These complications may undermine previously achieved stability and negatively impact perceived quality of life.

The multidimensional nature of quality of life necessitates comprehensive assessment tools that capture both physical and mental domains. Instruments such as the SF-36 and kidney disease–specific questionnaires provide structured frameworks for evaluating functional capacity, pain, vitality, emotional well-being, and social functioning. However, quantitative scores alone may not fully reflect the nuanced experiences of patients adapting to chronic therapy within their homes. Qualitative insights into coping strategies, family dynamics, and cultural beliefs further enrich understanding of patient-centered outcomes.

In recent years, healthcare systems have increasingly emphasized patient empowerment, shared decision-making, and individualized care plans. For peritoneal dialysis patients, structured educational programs, peer support networks, and telemedicine follow-up have shown promise in enhancing adherence and reducing anxiety. Multidisciplinary teams comprising nephrologists, nurses, dietitians, psychologists, and social workers are pivotal in addressing the complex interplay of medical and psychosocial factors.

Given the expanding population of individuals maintained on peritoneal dialysis and the shifting paradigm toward patient-centered care, systematic investigation into quality of life determinants is both timely and necessary. This study aims to analyze how treatment duration, psychosocial adaptation, and clinical variables influence the quality of life among patients receiving long-term peritoneal dialysis. By examining patterns of adjustment across different stages of therapy, the research seeks to identify critical periods for intervention and propose strategies to enhance both well-being and treatment sustainability.

Materials and Methods

This cross-sectional and longitudinal observational study was conducted at a tertiary nephrology center specializing in home-based renal replacement therapies. A total of 120 adult patients diagnosed with end-stage renal disease and treated with peritoneal dialysis for at least three months were enrolled. Inclusion criteria comprised age over 18 years, stable clinical condition, and the ability to provide informed consent. Patients with acute psychiatric disorders, severe cognitive impairment, or recent hospitalization within the preceding month were excluded to minimize confounding variables.

Participants were stratified into three groups according to treatment duration: less than one year, between one and seven years, and more than seven years of continuous peritoneal dialysis. This categorization was designed to reflect early adaptation, intermediate stabilization, and long-term treatment phases. Demographic data, including age, sex, employment status, educational level, and marital status, were collected. Clinical variables such as primary cause of renal failure, comorbid conditions, dialysis adequacy parameters, frequency of peritonitis episodes, and residual renal function were recorded.

Quality of life was assessed using the validated SF-36 questionnaire supplemented by a kidney disease–specific module addressing symptom burden, dietary restrictions, sleep quality, and perceived treatment intrusiveness. Scores for each domain ranged from 0 to 100, with higher values indicating better perceived health status. Psychological distress was measured using standardized depression and anxiety scales. In addition, structured interviews were conducted to explore coping strategies, family involvement, and perceived autonomy.

Statistical analysis involved descriptive statistics, analysis of variance for group comparisons, and multivariate regression to identify independent predictors of quality of life. Correlations between dialysis duration, frequency of complications, and psychosocial indicators were examined. A p-value below 0.05 was considered statistically significant.

Results

The median age of participants was 52 years, with a range from 23 to 78 years. The cohort included 58 men and 62 women. The most common etiologies of renal failure were diabetic nephropathy, chronic glomerulonephritis, and hypertensive nephrosclerosis. Approximately 46 percent of patients were employed either full-time or part-time, while the remainder were retired or unemployed.

Patients in the early-treatment group demonstrated significantly lower scores in physical functioning, role limitations due to physical health, and emotional well-being compared to those in the intermediate group. Many newly initiated patients reported fear of performing exchanges independently and anxiety related to infection risk. Depression scores were highest during the first year of therapy, indicating substantial emotional burden during initial adaptation.

In the intermediate-duration group, quality of life indicators improved across most domains. Participants described greater confidence in managing their therapy and reported more stable daily routines. Social functioning scores were notably higher, suggesting improved reintegration into community and family life. Employment rates were also higher in this group compared to the early-treatment cohort.

However, in patients undergoing peritoneal dialysis for more than seven years, a decline in physical functioning and vitality was observed. Recurrent peritonitis episodes and declining residual renal function were significantly associated with lower quality of life scores. Chronic fatigue and musculoskeletal discomfort were common complaints. Although many long-term patients exhibited strong coping mechanisms, the cumulative burden of complications negatively influenced overall well-being.

Multivariate regression analysis identified depression severity, frequency of peritonitis, and unemployment as independent predictors of reduced quality of life. Conversely, strong family support and participation in structured educational programs were associated with higher mental health and social functioning scores.

Discussion

The findings demonstrate that quality of life among peritoneal dialysis patients follows a dynamic trajectory influenced by adaptation processes and treatment duration. The initial phase is characterized by psychological vulnerability and physical discomfort as patients confront the realities of chronic therapy. With time, many individuals achieve relative stability and improved emotional resilience, reflecting successful adaptation and mastery of self-care skills. Nevertheless, prolonged exposure to dialysis-related complications can erode these gains.

These results underscore the importance of early psychosocial intervention. Comprehensive education, peer mentoring, and psychological counseling during the first year of therapy may mitigate anxiety and depressive symptoms. Encouraging active patient participation in decision-making fosters autonomy and enhances self-efficacy, which are crucial for sustainable home-based treatment.

The decline observed in long-term patients highlights the need for vigilant monitoring of complications and proactive management of comorbidities. Nutritional counseling, physical rehabilitation programs, and timely evaluation for kidney transplantation may help preserve functional capacity. Addressing employment barriers and providing social support services further contribute to improved quality of life outcomes.

Importantly, the study emphasizes that treatment modality alone does not determine patient well-being. Instead, a complex interplay of medical stability, psychological adaptation, and social environment shapes long-term outcomes. Integrating mental health services into routine nephrology care is therefore essential.

Conclusion

Peritoneal dialysis offers significant opportunities for autonomy and flexibility in patients with end-stage renal disease, yet it imposes substantial physical and psychological demands. Quality of life is lowest during the initial phase of therapy, improves with successful adaptation, and may decline again in the context of long-term complications. Depression, infection frequency, and socioeconomic challenges are major determinants of reduced well-being, whereas family support and structured education enhance resilience.

Optimizing patient outcomes requires a multidisciplinary, patient-centered approach that addresses not only medical adequacy but also emotional and social dimensions. Early intervention, continuous education, and proactive management of complications are critical for sustaining both survival and quality of life. Future research should explore targeted psychosocial interventions, telemedicine integration, and strategies to extend membrane longevity in order to further enhance the lived experience of individuals dependent on peritoneal dialysis.

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