

DIFFERENCES IN QUALITY OF LIFE AMONG PATIENTS UNDERGOING REGULAR HEMODIALYSIS AND CONTINUOUS AMBULATORY PERITONEAL DIALYSIS AT NGOERAH GENERAL HOSPITAL

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ABSTRACT

Background: End-Stage Renal Disease (ESRD) is characterized by permanent kidney function decline, requiring renal replacement therapy such as Haemodialysis (HD) and Continuous Ambulatory Peritoneal Dialysis (CAPD) to sustain life. Assessing the differences in quality of life between patients undergoing regular haemodialysis and CAPD is essential for defining important indicators in therapy evaluation.

Methods: This cross-sectional investigation explores the disparities in quality of life between 25 patients undergoing HD and 25 patients receiving CAPD at Ngoerah General Hospital, using the EQ5D questionnaire as a measurement tool. To compare the two groups quality of life, the data were examined using the Non-Parametric Mann-Whitney test.

Results: CAPD patients reported higher quality of life in mobility ($p = 0,04$), daily activities ($0,003$) pain ($0,006$), and anxiety/depression aspects ($p = 0,046$). However, there was not a significant difference in the self-care dimension between the two groups ($p = 0,65$). Overall, CAPD patients reported a higher quality of life ($p = 0,007$)

Conclusion: There is a significant difference in the quality of life between Regular Haemodialysis and CAPD patients at Ngoerah Hospital, with CAPD patients showing a better quality of life.

Keywords: End-Stage Renal Disease, Chronic Kidney Disease, Continuous Ambulatory Peritoneal Dialysis, Hemodialysis, Quality of Life, EQ-5D.

INTRODUCTION

End Stage Kidney Disease (ESKD) denotes the fifth stage of chronic kidney disease, characterized by a profound deterioration in renal functionality, as indicated by an estimated glomerular filtration rate ($GFR < 15 \text{ ml/minute/1.73 m}^2$),¹ wherein the patient necessitates renal replacement therapy, which may include dialysis or renal transplantation.² Chronic Kidney Disease (CKD) constitutes a significant health, social, and economic challenge, particularly in nations characterized by developing economies.

Epidemiologically, the global burden of CKD is substantial. In 2017, the global prevalence was estimated at 9.1%, affecting approximately 697.5 million individuals³, with patients requiring therapy for ESKD estimated to range from 4 to 7 million⁴. While data from developed nations, such as the United States, indicated a prevalence of 242 cases per million individuals in 2018.⁵ Until the present time, empirical data concerning the prevalence of ESKD in Indonesia remains unavailable. According to the data

from Riskesdas 2018, CKD According to the data from Riskesdas 2018, CKD affected around 0,38% of Indonesia's population, equating to roughly 713,783 individuals. The prevalence of CKD exhibited an increase of 0.18% from Riskesdas 2013. In Bali, the 2018 prevalence was approximately 0.44%, representing 12,092 individuals.⁶

Kidney replacement therapy for ESKD patients encompasses kidney transplantation and dialysis. Dialysis is further categorized into Hemodialysis (HD) and Continuous Ambulatory Peritoneal Dialysis (CAPD). While both modalities aim to eliminate uremic toxins and correct fluid imbalances to compensate for diminished renal function, they employ vastly different technical methodologies and impose different lifestyle constraints on the patient.^{7,8} The two modalities adopt varying technical methodologies. According to the 2018 Indonesian Renal Registry (IRR) report, there is a stark disparity in utilization: 98% of Indonesian patients utilize HD, while only 2% utilize CAPD. This report recorded a massive volume of HD activity alongside a

significantly smaller cohort of active CAPD patients. In Bali, this trend persists, with 2,478 new HD patients recorded in 2018 compared to only 57 active CAPD patients.⁹

Renal replacement therapy is linked to a patient's quality of life. The World Health Organization (WHO) defines quality of life as an individual's subjective evaluation of their status within the cultural context and value system,¹⁰ encompassing four domains: physical health, psychological well-being, social, and environmental.¹¹ In the context of chronic illness, QoL is not merely a subjective metric but a crucial clinical indicator of treatment effectiveness, a predictor of morbidity and mortality risks, and a guide for overall health preservation.¹² Given the distinct differences between the hospital-based nature of HD and the home-based autonomy of CAPD, understanding how these modalities differentially impact patient well-being is vital.

Despite the clear dominance of Hemodialysis in Indonesia, there is a need to understand the comparative impact of these treatments on patients' lives. Therefore, this study aims to assess and analyze the disparities in the Quality of Life among ESKD patients receiving Hemodialysis versus those receiving Continuous Ambulatory Peritoneal Dialysis (CAPD) at Ngoerah General Hospital. This assessment utilizes the EQ-5D instrument, a tool proven to be both valid and reliable for evaluating health-related quality of life across various medical conditions in Indonesia..

Design and Methods

This research was conducted as an analytical comparative study utilizing a cross-sectional design. The study took place at Prof. Dr. I.G.N.G. Ngoerah General Hospital in Denpasar, Bali. The overall research period spanned from January 2024 to December 2024, with data collection focused on patients undergoing active treatment.

The sample search and recruitment process began with a screening of the hospital's medical records to identify the accessible population of End-Stage Kidney Disease (ESKD) patients. Researchers identified patients who had been undergoing Hemodialysis (HD) or Continuous Ambulatory Peritoneal Dialysis (CAPD) for a minimum of three months. Following this identification, eligible candidates were approached directly by the researcher during their scheduled medical visits, HD patients during their dialysis sessions and CAPD patients during outpatient clinic visits. After receiving a comprehensive explanation of the study objectives, patients willing to participate provided written informed consent.

A total of 50 respondents were recruited, stratified equally into 25 HD patients and 25 CAPD patients. Due to the significant disparity in population sizes between the two treatment modalities, two distinct sampling techniques were employed to ensure a balanced comparison. The CAPD group was recruited using a total sampling technique, incorporating all registered

patients who met the criteria due to the limited size of this population. Conversely, the HD group was recruited using consecutive sampling, where patients were selected sequentially until the sample size matched that of the CAPD group. Inclusion criteria required HD patients to undergo dialysis at least twice weekly and CAPD patients to perform fluid exchanges at least four times daily. Patients were excluded if they presented with unstable clinical conditions, specifically hemodynamic instability, severe anemia ($Hb \leq 3g/dL$), or decreased consciousness (GCS <15), or an inability to cooperate.

Data collection was conducted through interviews using the Indonesian version of the EQ-5D questionnaire, which assesses Quality of Life across five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression.¹³ Responses were converted into an ordinal scale ranging from 5 to 15, categorizing Quality of Life as Good (score 5–8), Moderate (score 9–11), or Poor (score 12–15). Statistical analysis was performed using SPSS version 26.0. Univariate analysis was used to describe respondent characteristics, while bivariate analysis compared Quality of Life scores between the two groups. The Independent T-Test was utilized for normally distributed data, whereas the Mann-Whitney U test was applied for non-normally distributed data, with statistical significance established at a p-value <0.05 . This study was approved by the Ethics Committee of the Faculty of Medicine, Udayana University, under approval number 0017/UN14.2.2.VII.14/LT/2024 received a research permit from Ngoerah General Hospital (DP.04.04/D.XVII.2.2/10956/2024).

Results

Characteristics of Research Subject

A total of 50 patients completed the EQ-5D questionnaire, consisting of 25 patients undergoing hemodialysis (HD) and 25 patients receiving continuous ambulatory peritoneal dialysis (CAPD). Patient characteristics were categorized by sex, age group, duration of therapy, etiology, and comorbidities (Table 1). Among HD patients, the majority were male (56%) and predominantly in the late adulthood age group (64%). Similarly, most CAPD patients were male (60%), but the largest proportion belonged to the young adulthood age group (40%). The duration of dialysis therapy of 1–3 years was most common in both groups, observed in 60% of HD patients and 56% of CAPD patients. The principal etiologies among HD patients were diabetes mellitus (40%) and chronic glomerulonephritis (36%). In the CAPD group, the most frequent etiologies were chronic glomerulonephritis (60%) and hypertension (24%). Regarding comorbidities, 64% of HD patients had two comorbid conditions, whereas 48% of CAPD patients had one comorbidity. Hypertension was the most common comorbidity in both groups.

Table 1. General characteristics of patients undergoing hemodialysis and continuous ambulatory peritoneal dialysis.

Characteristic	Hemodialysis	CAPD
	N (%)	N (%)
Gender		
Male	14 (56)	15 (60)
Female	11 (44)	10 (40)
Age		
Adolescent (16-24 years old)	4 (16)	7 (28)
Young Adults (25-44 years old)	5 (20)	10 (40)
Late Adults (45-60 years old)	16 (64)	5 (20)
Elderly (60-75 years old)	0 (0)	3 (12)
Duration of Therapy		
6 months - 1 year	4 (16)	3 (12)
1-3 years	15 (60)	14 (56)
4-6 years	3 (12)	6 (24)
>6 years	3 (12)	2 (8)
Etiology		
Hypertension	3 (12)	6 (24)
Diabetes	10 (40)	2 (8)
Polycystic Kidney Disease	2 (8)	0 (0)
Chronic Glomerulonephritis	9 (36)	15 (60)
Chronic Pyelonephritis	1 (4)	1 (4)
Obstructive Nephropathy	0 (0)	1 (4)
Comorbidity		
No Comorbidity	0 (0)	1 (4)
1 Comorbidity	9 (36)	12 (48)
2 Comorbidity	16 (64)	9 (36)
>2 Comorbidity	0 (0)	3 (12)

Quality of Life Comparison in HD and CAPD Patients

As shown in Table 2, 60% of HD patients and 76% of CAPD patients reported good overall quality of life, and none reported poor quality of life. Normality testing using Kolmogorov-Smirnov demonstrated non-normal distribution ($p < 0.05$); therefore, the Mann-Whitney test was applied. The analysis revealed a statistically significant difference in overall

quality of life between HD and CAPD patients ($p = 0.007$), with CAPD patients demonstrating better quality of life (Table 3). Based on Table 4, significant differences were observed between HD and CAPD patients in the following EQ-5D dimensions: Mobility ($p = 0.040$), daily activities ($p = 0.003$), pain/discomfort ($p = 0.006$), anxiety/depression ($p = 0.046$). No significant difference was found in the self-care dimension ($p = 0.65$).

Table 2. Comparison of quality of life for hemodialysis and CAPD patients.

Quality of Life	Hemodialysis	CAPD
	N (%)	N (%)
Good	15 (60)	19 (76)
Moderate	10 (40)	6 (24)
Bad	0 (0)	0 (0)

Table 3. Analysis results from the Mann-Whitney test on quality of life differences between regular hemodialysis and CAPD patients.

	Renal Replacement Therapy	n	Mean Rank	Sum of Ranks	Significance (<i>p value</i>)
Quality of Life	Hemodialysis	25	30.98	774.50	0.007
	CAPD	25	20.02	500.50	
	Total	50			

Table 4. Quality of Life Components of regular hemodialysis and CAPD patients.

Components of Quality of Life	Hemodialysis	CAPD	<i>p value</i>
	N (%)	N (%)	
Ability to Walk/Mobility			
Good	8 (32)	15 (60)	0.040
Moderate	16 (64)	10 (40)	
Bad	1 (4)	0	
Self-Care			
Good	23 (92)	18 (72)	0.65
Moderate	2 (8)	6 (24)	
Bad	0	1 (4)	
Usual Activities			
Good	6 (24)	18 (72)	0.003
Moderate	17 (68)	6 (24)	
Bad	2 (8)	1 (4)	
Pain/Discomfort			
Good	2 (8)	10 (40)	0.006
Moderate	22 (88)	15 (60)	
Bad	1 (4)	0 (0)	
Anxiety/Sadness			
Good	8 (32)	16 (64)	0.046
Moderate	14 (56)	9 (36)	
Bad	3 (12)	0 (0)	

*Note: Bolded values indicate statistically significant results

DISCUSSION

The predominance of male patients in both HD and CAPD groups is consistent with findings from a study conducted at RSSA Malang, which reported male proportions of 53.3% in HD patients and 63.3% in CAPD patients.¹⁴ Additionally, a study at Dr. Moewardi Hospital found that HD patients had a higher mean age (49.23 years) compared to CAPD patients (41.13 years), supporting the age distribution observed in this study.¹⁵ The most common therapy duration of 1–3 years in both groups differs from findings at RSSA Malang, where HD patients more commonly underwent dialysis for 3–6 years (35.2%), while CAPD patients had durations similar to this study (1–3 years; 45.6%).¹⁶ These differences may be influenced by access to services, referral patterns, and patient preferences.

The dominant etiologies observed align with the Indonesian Renal Registry (IRR) 2018 report, which identified hypertensive kidney disease, diabetic nephropathy, and primary glomerulopathy as leading causes of stage 5 CKD.⁹ Similarly, hypertension and diabetes mellitus were the most frequent comorbidities, consistent with IRR data showing hypertension (51%) and diabetes mellitus (21%) as major comorbid conditions.⁹ Variations in patient characteristics may reflect socioeconomic status, geographic location, and cultural factors.

This study demonstrated that CAPD patients have significantly better overall quality of life than HD patients ($p = 0.007$). These findings are in agreement with Van et al. (2012) in Vietnam, who reported higher EQ-5D scores among CAPD patients compared with HD patients ($p = 0.03$), attributing this to

greater convenience and flexibility associated with CAPD.

¹⁷ Similar results were observed in a study at RSPAD Gatot Soebroto using the SF-36 instrument, where CAPD patients had higher average quality of life scores (≥ 70) than HD patients.¹⁸ However, research conducted at Dr Saiful Anwar Hospital in Malang presented different findings, with a p -value of 0.515, indicating an absence of statistical significance,¹⁶ potentially influenced by factors related to respondent health, methodological design, and distinct demographic characteristics.

In the mobility domain, CAPD patients demonstrated better mobility than HD patients, consistent with findings from Taipei Medical University showing superior mobility scores in CAPD patients ($p = 0.0011$).¹⁹ The increased mobility noted in patients undergoing CAPD can be linked to their greater freedom of movement and the seamless elimination of waste. In contrast, HD patients, who receive hospital-based interventions every two weeks, frequently report feelings of fatigue and physical discomfort.

No significant difference was found in the self-care domain ($p = 0.65$). This may be because basic self-care activities require minimal technical skill and patients in both groups adapt to their routines. Similar findings were reported at Dr. Saiful Anwar Hospital, where 92.8% of HD patients and 85.6% of CAPD patients were classified as having good self-care.¹⁶ Conversely, a study in Vietnam found a significant difference favoring CAPD patients ($p = 0.036$).²

CAPD patients demonstrated significantly better performance in daily activities ($p = 0.003$), consistent with studies from Malaysia ($p = 0.009$)²¹ and other reports indicating fewer

activity limitations among CAPD patients.²³ CAPD provides patients with a considerable level of flexibility regarding both time and location, allowing them to sustain an active lifestyle without the limitation imposed by the strict scheduling requirements by HD patients, who are obliged to undergo dialysis minimum of 3-4 hours per session at least biweekly. This enhances patients' availability of leisure time and facilitates greater engagement in their daily activities.²²

Pain/discomfort was significantly lower in CAPD patients ($p = 0.006$). A research in Vietnam indicated that patients receiving HD frequently reported symptoms of fatigue, dryness and pruritus of the skin, pain in the bones and joints, muscle cramps, at a higher incidence compared to patients undergoing CAPD.²⁰ Another research also presented a significance value of <0.001 , thus confirming a meaningful disparity between the two modalities.²³ This difference may be due to the pain linked with vascular access in HD, while in CAPD, the pain experienced is generally less severe, allowing patients greater independence in managing their care at home.

CAPD patients also showed better anxiety/depression scores ($p = 0.046$). Similar findings were reported at RSPAD Gatot Soebroto, where HD patients exhibited lower psychological scores than CAPD patients.¹⁸ Greater autonomy and independence in CAPD may reduce psychological distress, whereas regular hospital attendance for HD may increase anxiety. A previous study found higher depression prevalence among HD patients compared with CAPD patients.²⁴ Although a 2015 study at Ngoerah General Hospital found no significant correlation between HD and depression ($p > 0.05$), patients with depressive symptoms were more likely to have lower quality of life.²⁵

1. CONCLUSION AND RECOMMENDATIONS

The results of the study showed that CAPD patients demonstrating a better quality of life rather than HD patients. It is recommended to explore additional variables that may affect these differences and expand the study population by acquiring samples from other healthcare institutions to enhance the representativeness and generalizability of the findings.

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