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Determinants of Dialysis Patients' Interest in Selecting Continuous Ambulatory Peritoneal Dialysis (CAPD) Therapy at Murni Teguh Hospital Medan in 2025

Determinan Minat Pasien Dialisis dalam Memilih Terapi Continuous Ambulatory Peritoneal Dialysis (CAPD) di Rumah Sakit Murni Teguh Medan Tahun 2025

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Abstract

Background: Continuous ambulatory peritoneal dialysis (CAPD) is a home-based option for kidney replacement therapy, but interest in this modality may depend on patients' understanding, perceived risks, confidence, family resources, and the education they receive. **Objective:** To examine the associations of knowledge, perceived infection risk, family support, self-efficacy, and healthcare-provider education with interest in CAPD among patients receiving maintenance hemodialysis. **Methods:** This quantitative, cross-sectional correlational study was conducted at Murni Teguh Hospital, Medan, from November 2025 to February 2026. A purposive sample of 149 adults was selected from a reference population of 254 hemodialysis patients. Structured questionnaires assessed the five explanatory domains and interest in CAPD. Analyses included descriptive statistics, Pearson chi-square tests, crude prevalence ratios (PRs) with 95% confidence intervals (CIs), and exploratory simultaneous-entry binary logistic regression. **Results:** High interest in CAPD was reported by 59 participants (39.6%). The proportions with high interest were 90.0%, 43.8%, and 7.3% in the good-, fair-, and poor-knowledge groups, respectively. All five domains were associated with interest in unadjusted analyses (all $p < 0.001$). Good versus poor knowledge yielded a crude PR of 12.38 (95% CI, 4.78–32.04). No participant in the low-perception category reported high interest. The exploratory multivariable model did not converge, limiting interpretation of adjusted associations.**Conclusion:** Knowledge, perceived infection risk, family support, self-efficacy, and healthcare-provider education were associated with CAPD interest. These findings support individualized, family-inclusive counseling and prospective evaluation of balanced education and shared decision-making.

Keywords: continuous ambulatory peritoneal dialysis; hemodialysis; patient interest; knowledge; shared decision-making.

Abstrak

Latar belakang: Continuous ambulatory peritoneal dialysis (CAPD) merupakan pilihan terapi pengganti ginjal berbasis rumah. Minat terhadap modalitas ini dapat berkaitan dengan pemahaman pasien, persepsi risiko, keyakinan diri, sumber daya keluarga, dan edukasi yang diterima. **Tujuan:** Menganalisis hubungan pengetahuan, persepsi risiko infeksi, dukungan keluarga, efikasi diri, dan edukasi tenaga kesehatan dengan minat memilih CAPD pada pasien yang menjalani hemodialisis pemeliharaan. **Metode:** Penelitian kuantitatif dengan desain korelasional potong lintang ini dilaksanakan di Rumah Sakit Murni Teguh Medan pada November 2025–Februari 2026. Sebanyak 149 pasien dewasa dipilih secara purposif dari populasi acuan sebanyak 254 pasien hemodialisis. Kuesioner terstruktur digunakan untuk menilai kelima domain penjelas dan minat memilih CAPD. Analisis meliputi statistik deskriptif, uji chi-square Pearson, rasio prevalensi (RP) kasar beserta interval kepercayaan (IK) 95%, serta regresi logistik biner eksploratif dengan pemasukan variabel secara simultan. **Hasil:** Sebanyak 59 responden (39,6%) memiliki minat tinggi terhadap CAPD. Proporsi minat tinggi pada kelompok pengetahuan baik, cukup, dan kurang masing-masing sebesar 90,0%, 43,8%, dan 7,3%. Kelima domain berhubungan dengan minat dalam analisis tanpa penyesuaian (seluruh $p < 0,001$). Pengetahuan baik dibandingkan pengetahuan kurang menghasilkan RP kasar sebesar 12,38 (IK 95%, 4,78–32,04). Tidak terdapat responden dengan minat tinggi dalam kategori persepsi rendah. Model multivariabel eksploratif tidak mencapai konvergensi sehingga interpretasi hubungan tersesuaikan terbatas. **Kesimpulan:** Pengetahuan, persepsi risiko infeksi, dukungan keluarga, efikasi diri, dan edukasi tenaga kesehatan berhubungan dengan minat memilih CAPD. Temuan ini mendukung konseling yang disesuaikan dengan kebutuhan individu dan melibatkan keluarga, serta evaluasi prospektif terhadap edukasi berimbang dan pengambilan keputusan bersama.

Kata kunci: continuous ambulatory peritoneal dialysis; hemodialisis; minat pasien; pengetahuan; pengambilan keputusan bersama

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Introduction

Chronic kidney disease (CKD) is defined by abnormalities of kidney structure or function persisting for at least three months and carrying implications for health. When kidney failure necessitates kidney replacement therapy, treatment planning must integrate clinical eligibility, anticipated treatment burden, access to care, and the patient's preferences rather than rely on a single physiological threshold. Hemodialysis, peritoneal dialysis, and kidney transplantation impose different practical demands, making informed discussion of available options an essential component of care [1,2].

Continuous ambulatory peritoneal dialysis (CAPD) uses manual exchanges of dialysate and can be performed at home after appropriate training. It offers an alternative to repeated facility-based hemodialysis visits, although its suitability depends on the individual's circumstances and the support available from the dialysis service. International differences in peritoneal dialysis use reflect service organization and policy as well as clinical factors [3]. Its potential advantages should be discussed alongside the daily exchange workload, catheter care, and the risks of peritonitis and catheter-related infection; neither freedom from complications nor uniformly superior outcomes can be assumed [4,5].

Indonesian economic evaluations have identified a continuing imbalance between hemodialysis and peritoneal dialysis use and have supported consideration of CAPD within kidney replacement therapy policy. However, favorable model-based economic estimates do not establish that CAPD is feasible or preferred for every patient [6,7]. Evidence from Asian settings also indicates that modality decisions involve interactions among patients, clinicians, and family members. Qualitative studies have described both the influence of these relationships and discrepancies between expectations formed during counseling and the subsequent experience of home dialysis [8,9]. These considerations are particularly relevant when CAPD is discussed with patients already accustomed to maintenance hemodialysis.

This study examined the associations of knowledge, perceived infection risk, family support, self-efficacy, and healthcare-provider education with interest in selecting CAPD at Murni Teguh Hospital, Medan. Each domain was hypothesized to be associated with CAPD interest, and exploratory multivariable analysis examined their joint associations. By assessing these complementary domains within one maintenance-hemodialysis population, the study provides setting-specific evidence to inform modality counseling. The outcome was expressed interest in CAPD rather than subsequent treatment initiation.

Methods

Study design and setting

This quantitative, cross-sectional correlational study was conducted in the Hemodialysis Unit of Murni Teguh Hospital, Medan, North Sumatra, Indonesia, from November 2025 to February 2026. Patient characteristics, questionnaire domains, and CAPD interest were assessed at a single observation point without an intervention.

Participants and sampling

The reference population comprised 254 patients receiving hemodialysis at the hospital in 2025. Participants were selected purposively according to eligibility criteria, and the analytic sample comprised 149 adults. Eligibility required age ≥18 years, maintenance hemodialysis for at least three months, a stable clinical condition during hemodialysis, and willingness to participate. Patients with severe dyspnea, hypotension,

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altered consciousness, or cognitive impairment were excluded. The selection framework and analytic sample are summarized in Figure 1.

Purposive sampling enabled recruitment of patients who met the clinical eligibility criteria and could participate in a questionnaire-guided interview. The analysis therefore concerned the recruited clinical sample rather than a probability sample of the wider dialysis population.

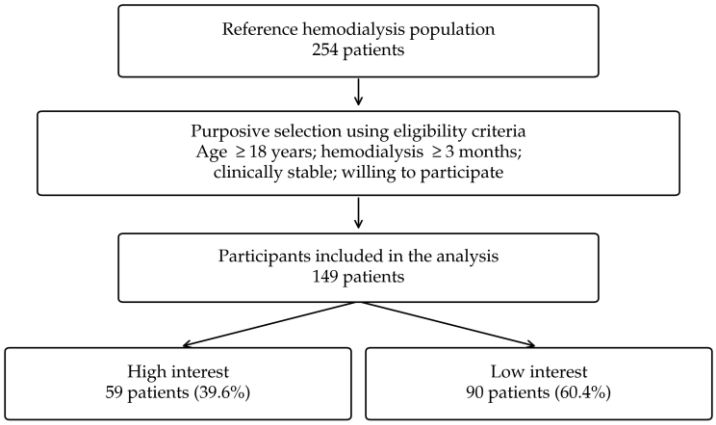

Figure 1. Sampling framework and analytic sample (n = 149).

Questionnaire domains and measurement

The questionnaire assessed five explanatory domains and one outcome domain (Table 1). The knowledge questionnaire contained 20 true–false items on CAPD principles, procedures, benefits, risks, prevention, and follow-up. Correct answers received one point and incorrect answers zero points, yielding a score from 0 to 20. The percentage-based categories correspond to scores of 16–20 for good knowledge, 12–15 for fair knowledge, and 0–11 for poor knowledge.

The remaining five domains each comprised ten four-point Likert items, with responses ranging from strongly disagree to strongly agree and possible total scores of 10–40. The perception, family-support, and self-efficacy questionnaires included reverse-keyed items. Healthcare-provider education measured patients' assessments of the clarity, completeness, and instructional support provided about CAPD. Self-efficacy measured confidence in performing CAPD-related tasks, while the outcome measured interest, willingness to learn, and anticipated preference for the modality. The questionnaire was pretested in 30 patients at RSU Rasyda Medan whose characteristics were similar to those of the study population. Item validity was assessed using Pearson item–total correlations, with the calculated correlation compared against the critical value. Internal consistency was assessed using Cronbach's alpha, with a prespecified acceptance criterion of $\alpha > 0.60$.

Table 1. Questionnaire domains, measurement structure, and categories.

Domain	Construct and content	Measurement	Categories / interpretation
Knowledge	Understanding of CAPD principles, exchanges, benefits, risks, prevention, and follow-up.	20 true–false items; 0/1 per item; total 0–20.	Good: 16–20; fair: 12–15; poor: 0–11.
Perceived infection risk	Perceived susceptibility, seriousness, safety, and prevention/control of infection.	10 Likert items; total 10–40; reverse-keyed items 5 and 10.	High / low.
Family support	Emotional, practical, informational, and appraisal support.	10 Likert items; total 10–40; reverse-keyed item 6.	Good / poor.
Self-efficacy	Confidence in learning and carrying out CAPD-related tasks.	10 Likert items; total 10–40; reverse-keyed item 5.	High / low.
Healthcare-provider education	Patient-reported clarity, completeness, demonstration, counseling, and educational support.	10 Likert items; total 10–40.	Good / poor.
Interest in CAPD	Interest, willingness to learn, anticipated preference, and willingness to use CAPD.	10 Likert items; total 10–40.	High / low interest; not actual uptake.

All domains were analyzed categorically. Likert response options were scored 1–4; reverse-keyed items were identified in the questionnaire. Knowledge categories correspond to ≥76%, 56–75%, and ≤55% correct responses on 20 equally weighted items.

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Data collection and analysis

Questionnaire-guided interviews were conducted with eligible patients during their hemodialysis visits. Data processing comprised completeness checks, coding, scoring, and computerized entry. Frequencies and percentages summarized participant characteristics and questionnaire categories. For comparisons of interest, percentages were calculated within each explanatory category, while marginal percentages used the full analytic sample as the denominator.

Pearson chi-square tests evaluated unadjusted associations at a two-sided significance level of 0.05. Crude prevalence ratios (PRs) for high interest were calculated from the contingency-table counts, with the low or poor category as the reference. Log-scale Wald intervals were calculated when both comparison groups contained participants with high interest. The perception comparison had no finite PR because the reference group contained no high-interest responses. Within-category proportions were also presented with 95% Wilson score intervals (Figure 2) [10].

Exploratory multivariable analysis used simultaneous-entry binary logistic regression. All five explanatory variables met the prespecified screening threshold of $p < 0.25$ and were entered together. This screening threshold allowed potentially relevant covariates to be retained before multivariable analysis [11]. Simultaneous entry preserved the five hypothesized domains in the model. Low interest was coded as 1 and high interest as 0; knowledge was entered as a single model term. Model assessment included the estimation history, standard errors, goodness-of-fit statistics, and in-sample classification.

Ethical considerations

Administrative permission to conduct the study was issued by Murni Teguh Memorial Hospital on 13 February 2026 (No. 131/SP/MTMH/II/2026). Willingness to participate was an eligibility criterion, and the participant information sheet specified confidentiality, use of information for research purposes, and a request for written agreement before answering the questionnaire.

Results and Discussion

Participant characteristics and CAPD interest

The analysis comprised 149 participants. The largest age group was 56–65 years (39.6%), followed by those older than 65 years (32.9%). Men accounted for 59.7% of the sample, and 47.7% had completed secondary education. Most participants were not employed (60.4%; Table 2).

High interest in CAPD was reported by 59 participants (39.6%), while 90 (60.4%) reported low interest. Fair knowledge was the most frequent knowledge category (43.0%). Poor family support and poor healthcare-provider education were reported by 55.7% and 65.8%, respectively. The high and low categories were almost equally distributed for perceived infection risk and self-efficacy (Table 3).

Table 2. Participant characteristics (n = 149).

Characteristic	n	%
Age, years		
36–45	8	5.4
46–55	33	22.1
56–65	59	39.6
>65	49	32.9
Sex		
Male	89	59.7
Female	60	40.3
Education		
Tertiary	20	13.4
Secondary / high school	71	47.7
Primary / junior secondary	58	38.9
Employment		
Employed	59	39.6
Not employed	90	60.4
Total	149	100.0

Percentages use the full sample as the denominator; totals may differ slightly from 100% because of rounding.

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Table 3. Associations of questionnaire domains with interest in CAPD (n = 149).

Domain / category	Total, n (%)	High interest, n (%)	Low interest, n (%)	Crude PR (95% CI)
Knowledge — $\chi^2(2) = 56.353$; $p < 0.001$				
Good	30 (20.1)	27 (90.0)	3 (10.0)	12.38 (4.78–32.04)
Fair	64 (43.0)	28 (43.8)	36 (56.3)	6.02 (2.25–16.09)
Poor	55 (36.9)	4 (7.3)	51 (92.7)	1.00 (reference)
Perceived infection risk — $\chi^2(1) = 98.998$; $p < 0.001$				
High	74 (49.7)	59 (79.7)	15 (20.3)	Not finite
Low	75 (50.3)	0 (0.0)	75 (100.0)	1.00 (reference)
Family support — $\chi^2(1) = 44.880$; $p < 0.001$				
Good	66 (44.3)	46 (69.7)	20 (30.3)	4.45 (2.64–7.51)
Poor	83 (55.7)	13 (15.7)	70 (84.3)	1.00 (reference)
Self-efficacy — $\chi^2(1) = 66.291$; $p < 0.001$				
High	75 (50.3)	54 (72.0)	21 (28.0)	10.66 (4.52–25.13)
Low	74 (49.7)	5 (6.8)	69 (93.2)	1.00 (reference)
Healthcare-provider education — $\chi^2(1) = 53.953$; $p < 0.001$				
Good	51 (34.2)	41 (80.4)	10 (19.6)	4.38 (2.82–6.79)
Poor	98 (65.8)	18 (18.4)	80 (81.6)	1.00 (reference)

PR, prevalence ratio; CI, confidence interval. High- and low-interest percentages use the category total as the denominator; percentages in the total column use n = 149. Pearson chi-square tests were performed without continuity correction. The perception PR is not finite because the low category contained no high-interest responses. Percentages may not sum to 100% because of rounding.

Unadjusted associations

All five explanatory domains were associated with CAPD interest (all $p < 0.001$; Table 3). Relative to poor knowledge, crude PRs were 12.38 (95% CI, 4.78–32.04) for good knowledge and 6.02 (95% CI, 2.25–16.09) for fair knowledge.

Good family support, high self-efficacy, and good healthcare-provider education were associated with high interest, with crude PRs of 4.45 (95% CI, 2.64–7.51), 10.66 (95% CI, 4.52–25.13), and 4.38 (95% CI, 2.82–6.79), respectively. High interest occurred in 59 of 74 participants in the high-perception category and in none of the 75 participants in the low-perception category. Figure 2 presents the within-category proportions and 95% CIs.

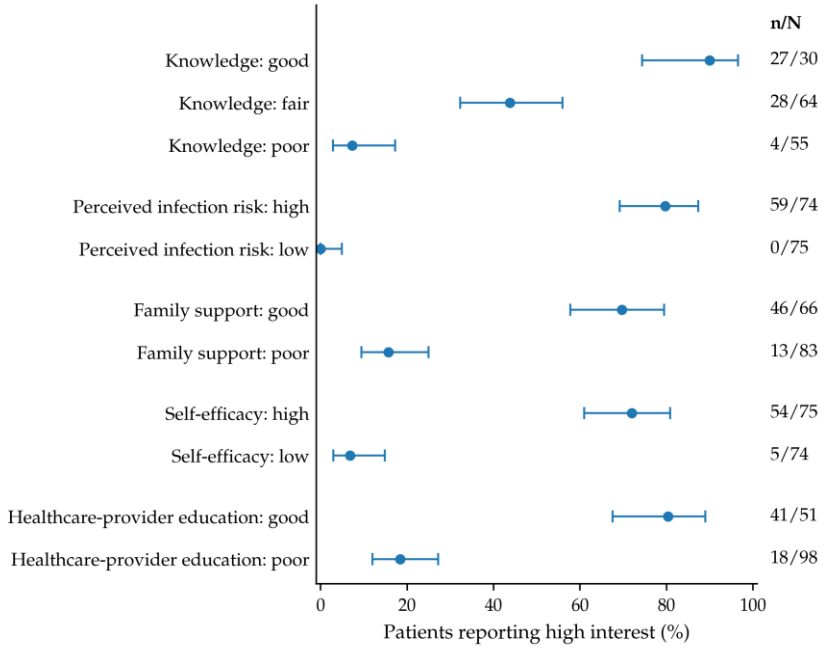

Figure 2. Proportion of participants reporting high interest in CAPD within each questionnaire category. Points indicate observed proportions and horizontal lines indicate 95% Wilson score intervals. n/N denotes the number with high interest divided by the category total. Categories across different domains describe overlapping groups of participants.

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Exploratory multivariable analysis

In the exploratory logistic model, the knowledge term yielded B = 1.721, exp(B) = 5.592 (95% CI, 1.673–18.698), and p = 0.005 (Table 4). The perception term had a markedly large coefficient and standard error, consistent with quasi-complete separation. Estimation reached the maximum of 20 iterations without convergence; the adjusted coefficients were therefore treated as exploratory rather than definitive estimates of independent associations [12].

The final-iteration −2 log likelihood was 60.509, compared with 200.061 for the intercept-only model. Cox–Snell and Nagelkerke pseudo-R^2 values were 0.608 and 0.823, respectively. The Hosmer–Lemeshow statistic was 1.674 (6 degrees of freedom; p = 0.947), and apparent classification accuracy was 90.6% at a cutoff of 0.50 (Table 5). These statistics summarize the terminal iteration and in-sample classification.

Table 4. Coefficients from the exploratory simultaneous-entry logistic model.

Term	B	SE	p value	exp(B)	95% CI
Knowledge	1.721	0.616	0.005	5.592	1.673–18.698
Perception	22.116	4382.960	0.996	4.027×10^9	Not estimable
Family support	−0.550	0.523	0.293	0.577	0.207–1.607
Self-efficacy	−0.347	1.081	0.748	0.707	0.085–5.884
Healthcare-provider education	1.277	0.953	0.180	3.587	0.554–23.240

B, regression coefficient; SE, standard error; CI, confidence interval. Low interest = 1 and high interest = 0. The model did not converge after 20 iterations. Values are terminal-iteration estimates; the perception CI was not estimable. Knowledge was entered as a single term, not as a good-versus-fair/poor categorical contrast.

Table 5. Model diagnostics and in-sample classification.

Diagnostic / classification result	Value
Intercept-only −2 log likelihood	200.061
Final-iteration −2 log likelihood	60.509
Omnibus model χ^2 (df); p	139.552 (5); <0.001
Cox–Snell / Nagelkerke pseudo-R^2	0.608 / 0.823
Hosmer–Lemeshow χ^2 (df); p	1.674 (6); 0.947
Observed high interest: predicted high / low	55 / 4
Observed low interest: predicted high / low	10 / 80
Correct classification: high / low interest	93.2% / 88.9%
Overall apparent accuracy; cutoff	90.6%; 0.50
Convergence	Not achieved

Classification used a probability cutoff of 0.50. Fit statistics and apparent accuracy summarize the nonconverged model and do not constitute external validation.

Discussion

Interpretation of the principal findings

Interest in CAPD was associated with cognitive, perceptual, family, and care-related domains among patients receiving maintenance hemodialysis. The progressive increase in high interest from poor to fair to good knowledge suggests that understanding the modality is relevant to its consideration as an alternative treatment. The cross-sectional design nevertheless allows a reciprocal explanation: patients already interested in CAPD may seek more information and discuss it more frequently with clinicians or family members.

These findings concern willingness to consider CAPD while established on hemodialysis. Expressed interest represents an early stage of decision-making and should be distinguished from clinical eligibility, an implemented treatment choice, and subsequent treatment outcomes. Clinical circumstances, prior experience, family resources, and service access may shape several of the measured domains simultaneously.

Knowledge, information, and the decision-making process

The knowledge gradient is consistent with evidence on structured modality education. Ribitsch and colleagues observed a higher proportion of peritoneal dialysis initiation among patients who attended a predialysis education program than among those receiving standard care [13]. Cao and colleagues examined automated peritoneal dialysis selection among patients already receiving home peritoneal dialysis [14]. Although both studies inform the role of information in modality decisions, their populations and outcomes

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differ from questionnaire-defined CAPD interest among established hemodialysis patients; direct numerical comparison with the present PRs is therefore inappropriate.

The PRECEDE–PROCEED framework distinguishes predisposing understanding, reinforcing support, and enabling resources [15]. In this context, knowledge is one component of informed deliberation rather than a reason to direct every patient toward CAPD. The present findings identify practical topics for individualized discussion, including exchange procedures, follow-up requirements, recognition of complications, and compatibility with everyday life.

Perceived infection risk and CAPD interest

Perceived infection risk was associated with CAPD interest, but the questionnaire addressed several related constructs: concern about infection, perceived seriousness, and confidence in prevention and control. These constructs are distinct from a generally favorable attitude toward CAPD. The Health Belief Model provides a framework for considering susceptibility, seriousness, benefits, and barriers when interpreting such perceptions [16]. Counseling can therefore explore both the patient's concerns and their understanding of risk-reduction measures.

The absence of high-interest responses in the low-perception category describes this sample; it does not establish an absolute barrier to interest in other populations. The same sparse outcome pattern was associated with quasi-complete separation in the logistic model, under which conventional maximum-likelihood estimates and Wald-based inference may be unstable [12]. Accordingly, the adjusted estimates were not used to rank the five domains as independent determinants.

Family support, self-efficacy, and participant characteristics

The associations involving family support and self-efficacy indicate that discussions about CAPD should encompass both confidence and practical assistance. Chou and colleagues described modality decisions as involving interconnected contributions from patients, clinicians, and family members [8]. In the present setting, family-inclusive counseling may help clarify who would provide support and what responsibilities that support would entail, while respecting the patient's preferences and autonomy.

Older adults accounted for a substantial proportion of participants, making individual support needs particularly relevant. Age alone, however, is not equivalent to frailty or inability to undertake home treatment, and self-reported confidence does not establish procedural competence. The ISPD position paper on assisted peritoneal dialysis describes support approaches that can address barriers to self-care [17]. The distributions of age, sex, education, and employment characterize the population studied; their independent associations with CAPD interest were not evaluated.

Implications for counseling and Indonesian service delivery

The results support evaluating a balanced counseling pathway rather than a program whose success is defined solely by increasing CAPD uptake. For patients approaching kidney failure, modality discussions can be integrated with individualized treatment planning; for those already receiving hemodialysis, the discussion can revisit preferences when clinically appropriate [1]. Nephrology clinicians can establish medical suitability, while trained dialysis nurses can explain the exchange routine, demonstrate relevant tasks, and assess learning needs. With the patient's agreement, relatives or prospective care partners can participate. The 2025 ISPD teaching position paper emphasizes preparation, tailored training, ongoing support, and assessment of the patient's experience, while acknowledging limitations in the certainty of the evidence [18].

Practical counseling content should include the expected daily workload, a clean exchange environment, hand hygiene, catheter care, warning symptoms, and routes for timely clinical contact, consistent with infection-prevention guidance [4,5]. Information should be understandable to the patient, with teach-back and opportunities for questions rather than an assumption that formal schooling predicts comprehension. Counseling should also address the possibility that CAPD may not match the patient's priorities. Ho and colleagues reported discrepancies between expectations formed during shared decision-making and the lived demands of peritoneal dialysis, underscoring the importance of avoiding promotional descriptions that minimize treatment burden [9].

Future evaluation of a counseling pathway could assess the proportion of eligible patients offered a documented modality discussion, changes in understanding, participation of a chosen care partner, and agreement between the eventual decision and the patient's informed preference. For patients choosing CAPD,

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competency assessment, continued access to support, and infection outcomes would provide complementary indicators of implementation and safety.

Indonesian economic evaluations have examined the costs and outcomes of CAPD and hemodialysis under national health-service arrangements [6,7]. Their model-based findings provide a service-planning perspective but are distinct from household feasibility. Counseling should therefore address insurance arrangements, travel, supply delivery, storage, and assistance needs. Household expenditure and logistical barriers were not measured in this study, so no conclusions about individual affordability or the cost-effectiveness of a local education program can be drawn.

Study Limitations

The cross-sectional design limits causal and temporal interpretation. Purposive recruitment at a single hospital restricts generalizability, particularly to patients not yet receiving dialysis or those unable to participate because of clinical or cognitive limitations. Questionnaire-guided interviews may also be affected by social desirability, interviewer effects, and shared-method bias. Self-reported categorical measures may not fully capture the complexity of treatment preferences or practical readiness for home dialysis.

The model did not incorporate comorbidity, frailty, dialysis duration beyond the eligibility threshold, previous CAPD exposure, home circumstances, household finances, or clinician recommendations. Sparse outcome patterns and nonconvergence limited multivariable inference. Prospective studies could follow the transition from initial interest to treatment choice, while qualitative and intervention studies could examine individual barriers and the effects of balanced education on decision quality and patient-centered outcomes.

Conclusions

Knowledge, perceived infection risk, family support, self-efficacy, and healthcare-provider education were associated with CAPD interest among maintenance-hemodialysis patients at Murni Teguh Hospital, Medan. These findings support individualized education, family-inclusive counseling, and shared decision-making. Longitudinal studies should examine how expressed interest translates into informed treatment choices and subsequent home-dialysis experiences.

Declaration of No Conflict of Interest

The author declares that there is no conflict of interest associated with this research. The entire research process, from study design, data collection, and analysis to the writing of this article, was conducted independently without any influence, pressure, or interest from any other party.

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