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Dispositional Optimism and Quality of Life in Chronic Kidney Disease: A Serial Mediation Model Through Coping Self-Efficacy and Treatment Adherence

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1. Round 1

1.1. Reviewer 1

Reviewer:

The recruitment description requires greater methodological transparency. The manuscript states, "Participants were recruited from healthcare facilities located in Toronto, Hamilton, and Ottawa between September 2025 and February 2026," but it does not identify the number or type of participating facilities, the number recruited at each site, or whether site-level differences were examined. The authors should report how many nephrology clinics and dialysis centers participated, how recruitment was distributed across locations, whether patients were nested within facilities, and whether site was considered as a potential covariate. Without this information, it is difficult to evaluate selection effects, representativeness, and possible clustering of observations.

The sample-size justification is too general for a study testing multiple indirect effects. The manuscript states, "Assuming a medium effect size, a statistical power of 0.90, an alpha level of 0.05, four principal variables, and the inclusion of relevant

demographic and clinical covariates, the required minimum sample was estimated to be approximately 220 participants." The authors should report the software or simulation procedure used, the exact assumed effect size, the number of predictors, and the statistical test on which the calculation was based. Standard multiple-regression power calculations may not adequately determine power for a serial indirect effect. A Monte Carlo simulation or a mediation-specific power analysis would provide a more defensible justification for the final sample of 286 participants.

The eligibility criteria introduce substantial clinical heterogeneity that should be more carefully addressed. The sample included patients with stages 3–5 CKD, nondialysis stage 5 disease, hemodialysis, and peritoneal dialysis. These groups differ considerably in symptom burden, treatment structure, adherence requirements, and quality-of-life determinants. The statement that "the study included patients with varying levels of disease severity to increase the clinical representativeness of the sample" is reasonable, but representativeness does not eliminate measurement non-equivalence. The authors should justify pooling these groups, describe whether the primary measures function similarly across treatment modalities, and consider interaction or multigroup analyses beyond the limited dialysis versus nondialysis sensitivity analysis.

The handling of missing data may introduce bias. The Data Analysis section states, "When fewer than 10% of the items within a scale were missing and the remaining items were valid, missing values were replaced using the participant's mean score for the completed items within the same scale." Person-mean substitution can artificially reduce variance and inflate internal consistency or associations. The authors should report the amount and pattern of missingness for each measure, assess whether data were missing completely at random or missing at random, and justify the selected method. Multiple imputation or full-information maximum likelihood would generally be preferable, particularly when estimating indirect effects.

The covariate-selection strategy should be revised to avoid data-dependent adjustment. The manuscript states that variables showing a statistically significant association with quality of life "or" having theoretical relevance were considered for inclusion, after which age, sex, disease stage, illness duration, dialysis status, and comorbidity burden were retained. Covariates should ideally be prespecified on theoretical and clinical grounds rather than selected partly through bivariate significance testing. The authors should explain why each included covariate may confound the exposure–mediator, mediator–outcome, or exposure–outcome relationship. They should also consider socioeconomic status, hospitalization history, medication burden, depression, and health literacy, which may be important common causes of adherence and quality of life.

The regression diagnostics are described but not reported. The Methods section specifies thresholds for Mahalanobis distance, Cook's distance, leverage, tolerance, and variance inflation factors, yet the Results only state that influential observations were excluded in a sensitivity analysis. The authors should provide the observed ranges or maximum values for variance inflation factors, tolerance, Cook's distance, and leverage, and report whether residual linearity and homoscedasticity assumptions were satisfied. The number of multivariate outliers identified and the decision rules applied to them should also be stated explicitly. This information is necessary to evaluate the robustness of the ordinary least-squares estimates.

Authors revised the manuscript and uploaded the document.

1.2. Reviewer 2

Reviewer:

The ethics statement is incomplete for publication. The Methods section states that the protocol "was approved by the institutional research ethics board of the coordinating Canadian healthcare institution," but neither the institution nor the approval number is provided. The authors should report the full name of the approving research ethics board, the protocol or approval identifier, the approval date, and whether additional site-specific approvals or data-sharing agreements were required. The consent procedure should also clarify whether participants received compensation and whether medical-record verification was covered by the same consent form.

The adaptation of the End-Stage Renal Disease Adherence Questionnaire is a major methodological concern. The manuscript states that the instrument was used "with wording adapted where necessary to ensure applicability to both dialysis-dependent patients and individuals with advanced nondialysis chronic kidney disease." The original instrument was developed for a specific clinical population, and altering its items, response requirements, and applicable domains may change its validity.

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The authors should provide the exact adaptations, identify which items were removed or modified, explain the cognitive-testing or pilot-testing process, and report evidence of content validity and construct validity. Expert review by two nephrologists and one psychologist is not sufficient by itself to establish psychometric equivalence.

The calculation of a standardized composite adherence score requires a reproducible explanation. The manuscript states, "Responses were converted into standardized domain scores to permit comparison across treatment modalities," but it does not explain the transformation formula, weighting of domains, treatment of nonapplicable dialysis items, or required number of completed items. The authors should provide the full scoring algorithm and justify whether medication adherence, dietary adherence, fluid restriction, dialysis attendance, and appointment attendance should contribute equally to a single score. Separate reporting of domain-specific adherence outcomes may be more clinically interpretable and would permit assessment of whether the mediation model is driven by one particular adherence behavior.

The scoring of the Kidney Disease Quality of Life 36-Item Short Form should be reconsidered. The Methods section states, "For the primary analysis, an overall quality-of-life score was calculated by averaging the standardized domain scores." The KDQOL-36 is generally interpreted through distinct physical, mental, burden, symptom, and effects domains, and a single global mean may not have established validity. The authors should cite a scoring precedent for this composite or present evidence supporting its dimensionality in the current sample. At minimum, a confirmatory factor analysis or sensitivity analysis should demonstrate that averaging the five domains yields a psychometrically defensible overall construct rather than obscuring clinically meaningful differences among domains.

The manuscript reports Cronbach's alpha and McDonald's omega but provides no evidence regarding factorial validity in the Canadian CKD sample. The paragraph following Table 1 states that reliability coefficients "demonstrat[ed] satisfactory to excellent internal consistency for all measures." High internal consistency does not establish that each measure is unidimensional or that adapted instruments assess the intended construct. The authors should conduct and report confirmatory factor analyses, particularly for the modified adherence measure and the proposed overall quality-of-life score. Factor loadings, fit indices, and possible correlated residuals should be presented, and measurement invariance across dialysis and nondialysis groups should be considered.

Authors revised the manuscript and uploaded the document.

2. Revised

Editor's decision: Accepted.
Editor in Chief's decision: Accepted.

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