

Renotude

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Abstract

Chronic kidney disease (CKD) is recognized as a multidimensional condition with biological, psychological, and social domains. Current evidence links illness perception, affective burden, and coping behaviours with clinical outcomes. However, each of these domains are usually examined in isolation. We introduce "Renotude", a novel conceptual framework defined as the structured, integrative characterization of cognitive-affective-behavioural phenotypes ("sapiopsychetypes") in individuals living with CKD. Renotude aims to unify disparate psychosocial constructs into a coherent taxonomy that may better explain inter-individual variability in adaptation, adherence, and outcomes. This framework proposes distinct sapiopsychetypes with potential clinical, prognostic, and interventional relevance. Renotude represents a step toward precision psychosocial nephrology and warrants clinical validation.

Keywords: chronic renal insufficiency, illness behaviour, psychological adaptation, depressive disorder, coping behaviour

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Introduction

Chronic kidney disease (CKD) imposes a sustained and complex burden extending beyond physiological dysfunction into the psychological and social domains. Accumulating evidence demonstrates that depression, anxiety, maladaptive illness perceptions, and impaired coping are highly prevalent and independently associated with adverse clinical outcomes, including hospitalization and mortality.¹⁻³ Despite this, psychosocial variables in nephrology research remain largely fragmented, often operationalized as discrete constructs rather than components of an integrated patient phenotype. The absence of a unifying conceptual model limits both mechanistic understanding and clinical translation. In

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response, we propose Renotude, a novel framework that conceptualizes the psychosocial experience of CKD as a structured, multidimensional phenotype derived from sapiopsychotyping, the systematic classification of individuals according to their cognitive, affective, and behavioural responses to chronic illness.

Conceptual Foundations of Renotude

Renotude is anchored in three empirically validated domains:

- **Illness Perception (Cognitive Domain)**- Illness perception encompasses patients' beliefs regarding disease identity, causality, controllability, and consequences. These cognitive schemas significantly influence health behaviours and outcomes. Prior work has demonstrated that maladaptive illness perceptions correlate with poorer adherence and reduced quality of life.¹⁻³
- **Affective Burden (Emotional Domain)**- Depression and anxiety are highly prevalent in CKD, with estimates exceeding those of the general population. These conditions are not merely comorbidities but are mechanistically linked to inflammation, autonomic dysregulation, and adverse outcomes.⁴⁻⁶
- **Coping and Behavioural Adaptation (Behavioural Domain)**- Coping strategies, including problem-focussed, emotion-focussed, and avoidant patterns, mediate the relationship between disease burden and patient outcomes. Adaptive coping is associated with improved psychosocial adjustment, whereas avoidance predicts poorer engagement and prognosis.^{2,3}

Operational Definition of Renotude

We define Renotude as- "A multidimensional, integrative phenotype representing the structured interaction of cognitive appraisal, affective response, and behavioural adaptation in individuals living with kidney disease." This construct posits that psychosocial experience is not reducible to isolated variables but instead reflects an organized, internally coherent pattern, analogous to phenotypic expression in biological systems.⁷

Sapiopsychotyping: A Taxonomic Proposal

Within the Renotude framework, we propose four primary sapiopsychotypes, derived from theoretical integration and

empirical consistency across studies.^{8,9}

1. Integrative-Adaptive Phenotype

Characterized by coherent illness understanding, emotional regulation, and proactive coping. These individuals demonstrate high treatment adherence and resilience, aligning with evidence linking positive illness perception to favourable outcomes.¹⁰

2. Socio-Relationally Anchored Phenotype

Characterized by reliance on interpersonal networks for coping and decision-making. Social support acts as a buffering mechanism, consistent with literature demonstrating its protective role in chronic disease adaptation.³

3. Affective-Dysregulated Phenotype

Defined by predominant emotional distress, including depression and anxiety, often coupled with catastrophic illness beliefs. This phenotype is associated with increased symptom burden, reduced quality of life, and higher healthcare utilization.^{4,5}

4. Avoidant-Maladaptive Phenotype

Marked by denial, disengagement, and low disease salience. Patients exhibit poor adherence, delayed presentation, and suboptimal clinical trajectories, reflecting avoidant coping paradigms.¹¹

Theoretical and Clinical Implications

Renotide leads us towards precision psychosocial nephrology. It enables stratification of patients based on psychosocial phenotype rather than isolated variables, aligning with broader movements toward personalized medicine. By integrating cognitive, emotional, and behavioural domains, Renotide provides a framework for understanding how psychosocial factors interact to influence biological and clinical outcomes. Renotide also helps in interventional targetting. Different phenotypes may require distinct therapeutic approaches- cognitive restructuring for maladaptive illness perceptions, pharmacologic and psychotherapeutic interventions for affective dysregulation, behavioural activation for avoidance patterns, and family-centered care for socially anchored individuals.^{3,4,10,11} Lastly, renotide offers a testable model that can be operationalized using validated instruments (e.g., Illness Perception Questionnaire, Beck Depression Inventory, coping scales), enabling empirical validation and longitudinal study.

Integration with Existing Evidence

Prior studies have consistently demonstrated that psychosocial factors influence CKD outcomes;³⁻⁵ however, these findings have not been synthesized into a unified conceptual structure. For example:

Table: Renotide Sapiopsychotyping Framework.

Phenotype	Cognitive Features	Affective Profile	Behavioural Pattern	Clinical Implications
Integrative-Adaptive	Accurate illness model	Emotional stability	Active engagement	Optimal adherence, improved outcomes
Affective-Dysregulated	Catastrophic beliefs	Depression, anxiety	Inconsistent engagement	High morbidity, poor QoL
Avoidant-Maladaptive	Denial/minimization	Blunted or suppressed effect	Disengagement	Non-
Socio-Relationally Anchored	Shared illness perception	Moderated distress	Support-dependent coping	Benefit from social buffering

Illness perception shapes adherence and quality of life

Depression independently predicts adverse outcomes

Coping strategies modulate adaptation and resilience

Social support mitigates psychosocial burden

Renotide integrates these domains into a coherent taxonomy, advancing from associative observations to a structured theoretical model.

Conclusion

Renotide represents a novel and theoretically grounded framework for understanding the psychosocial phenotype of individuals living with CKD. By introducing the concept of sapiopsychotyping, it advances the field beyond reductionist approaches toward a structured, integrative model. This framework has potential implications for risk stratification, personalized intervention, and mechanistic research. Future work should focus on operationalization, validation, and integration into clinical practice to determine its utility in improving patient-centered outcomes.

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