

# INPLASY

## Pooled Prevalence of Depression among Chronic Kidney Disease Patients in Thailand: A Systematic Review and Meta-analysis

INPLASY202620044

doi: 10.37766/inplasy2026.2.0044

Received: 11 February 2026

Published: 11 February 2026

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### ADMINISTRATIVE INFORMATION

**Support** - This study received no external funding. The research was self-funded by the authors.

**Review Stage at time of this submission** - Completed but not published.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202620044

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 11 February 2026 and was last updated on 11 February 2026.

### INTRODUCTION

**Review question / Objective** Review Question: What is the pooled prevalence of depression among adult patients with chronic kidney disease (CKD) receiving renal replacement therapy (RRT) in Thailand?

**Objective:** To systematically review and meta-analyze the prevalence of depression among chronic kidney disease patients receiving renal replacement therapy in Thailand.

**PICOS Framework:** Population (P): Adult patients diagnosed with chronic kidney disease receiving renal replacement therapy (hemodialysis or continuous ambulatory peritoneal dialysis) in Thailand.

**Intervention/Exposure (I):** Presence of chronic kidney disease treated with renal replacement therapy.

**Comparator (C):** Not applicable (prevalence study).

**Outcome (O):** Prevalence of depression measured using validated assessment tools (e.g., PHQ-9, BDI-II, CES-D).

**Study design (S):** Observational studies, including cross-sectional and cohort studies conducted in Thailand.

**Rationale** Chronic kidney disease (CKD) is a major global public health concern and represents a growing burden in Thailand. Patients receiving renal replacement therapy (RRT), including hemodialysis and continuous ambulatory peritoneal dialysis, experience significant physical, social, and psychological challenges. Depression is one of the most common psychiatric comorbidities among CKD patients and has been associated with increased mortality, reduced quality of life, poor treatment adherence, and

higher hospitalization rates. Despite its clinical importance, depression in CKD patients remains under-recognized and insufficiently addressed in routine nephrological care.

International meta-analyses have estimated the prevalence of depression among CKD patients to range between 25% and 30%, with substantial heterogeneity across countries. However, pooled global estimates may not be directly applicable to the Thai context due to differences in healthcare systems, socioeconomic conditions, cultural expression of depressive symptoms, and dialysis service delivery models. Thailand has a unique universal health coverage system and distinct regional disparities in CKD prevalence and access to RRT services. Cultural factors may also influence how depressive symptoms are expressed and reported, often through somatic complaints rather than emotional disclosure.

Several primary studies conducted in Thailand have reported varying prevalence rates of depression among CKD patients receiving RRT, using different screening tools and study designs. However, these findings have not yet been systematically synthesized. The absence of a Thailand-specific systematic review and meta-analysis limits the ability of clinicians and policymakers to understand the true magnitude of depression among CKD patients within the national context.

Therefore, a comprehensive synthesis of available Thai evidence is needed to provide a pooled prevalence estimate and to explore potential sources of heterogeneity, such as type of RRT and depression assessment tools. Generating country-specific evidence will support more informed screening strategies, mental health integration in dialysis care, and policy planning tailored to the Thai healthcare system.

**Condition being studied** The condition being studied is depression among patients with chronic kidney disease (CKD) receiving renal replacement therapy (RRT). CKD is a progressive and irreversible loss of kidney function that may ultimately lead to end-stage renal disease (ESRD), requiring long-term treatment with hemodialysis (HD) or continuous ambulatory peritoneal dialysis (CAPD). CKD is associated with substantial physical burden, including fatigue, anemia, sleep disturbances, and reduced functional capacity, which significantly affect patients' quality of life.

Depression is a common psychiatric comorbidity in CKD patients and is characterized by persistent

low mood, loss of interest or pleasure, feelings of hopelessness, impaired concentration, and somatic symptoms. In patients undergoing dialysis, depressive symptoms may overlap with uremic symptoms, complicating accurate diagnosis. Depression in CKD patients has been associated with increased mortality, poor treatment adherence, higher hospitalization rates, and reduced quality of life.

This review focuses specifically on depression prevalence among adult CKD patients receiving RRT in Thailand, as cultural, healthcare system, and socioeconomic factors may influence both the manifestation and reporting of depressive symptoms within the Thai context.

## METHODS

**Search strategy** A comprehensive systematic search will be conducted to identify studies reporting the prevalence of depression among chronic kidney disease (CKD) patients receiving renal replacement therapy (RRT) in Thailand.

### Electronic Databases

The following electronic databases will be searched:

Thai Journal Online (ThaiJo)

PubMed/MEDLINE

Scopus

Science Direct

International databases will be accessed through institutional subscriptions, and ThaiJo will be searched directly. In addition, manual searches of reference lists of relevant articles will be performed to identify additional eligible studies. Grey literature will also be considered where accessible.

### Time Frame

Studies published between April 2015 and April 2025 will be included.

### Language

Studies published in English or Thai will be eligible.

### Search Terms

The search strategy will combine controlled vocabulary (where applicable) and free-text terms

using Boolean operators (AND, OR). The following core search string will be used and adapted appropriately for each database:

("chronic kidney disease" OR "CKD" OR "end-stage renal disease" OR "ESRD")

AND

("renal replacement therapy" OR "dialysis" OR "hemodialysis" OR "peritoneal dialysis")

AND

("depression" OR "depressive symptoms")

AND

"prevalence"

AND

"Thailand"

Equivalent Thai-language terms will be used for ThaiJo searches with the same Boolean structure.

Search Management

All retrieved records will be exported to reference management software for duplicate removal and screening. The search strategy will be adapted for each database while maintaining consistency in the core concepts of population (CKD patients receiving RRT), outcome (depression), and geographic focus (Thailand).

**Participant or population** The population of interest includes adult patients (aged 18 years or older) diagnosed with chronic kidney disease (CKD) who are receiving renal replacement therapy (RRT) in Thailand. RRT modalities include hemodialysis (HD) and continuous ambulatory peritoneal dialysis (CAPD).

Participants must have been clinically diagnosed with CKD or end-stage renal disease (ESRD) and undergoing maintenance dialysis at the time of the study. Both hospital-based and community-based dialysis settings will be considered.

There will be no restrictions regarding sex, socioeconomic status, duration of dialysis, or geographic region within Thailand. Studies involving mixed populations will be included only if data specific to CKD patients receiving RRT in Thailand can be extracted separately.

Pediatric populations (under 18 years), kidney transplant recipients, and patients not receiving dialysis will be excluded.

**Intervention** Not applicable.

This systematic review and meta-analysis is designed to estimate the prevalence of depression among adult patients with chronic kidney disease (CKD) receiving renal replacement therapy (RRT) in Thailand. As this is a prevalence-focused review of

observational studies, no intervention is being evaluated. The review examines the occurrence of depression within the specified population rather than the effects of a therapeutic or preventive intervention.

**Comparator** Not applicable.

This systematic review and meta-analysis focuses on estimating the pooled prevalence of depression among adult patients with chronic kidney disease (CKD) receiving renal replacement therapy (RRT) in Thailand. As this is an observational prevalence study, no comparative intervention or control group is defined. The review aims to quantify the occurrence of depression within the specified population rather than compare treatment effects.

**Study designs to be included** Observational studies conducted in Thailand will be included. Eligible designs comprise cross-sectional studies and cohort studies that report the prevalence of depression among adult patients with chronic kidney disease receiving renal replacement therapy (hemodialysis or continuous ambulatory peritoneal dialysis). Only full-text peer-reviewed articles published in Thai or English will be considered.

**Eligibility criteria** Additional eligibility criteria include studies published between April 2015 and April 2025 in Thai or English. Only full-text peer-reviewed articles will be included. Studies must report sufficient data to calculate prevalence estimates. Case reports, reviews, qualitative studies, conference abstracts without full text, duplicate publications, and studies with incomplete or unclear outcome data will be excluded.

**Information sources** The following information sources will be used to identify relevant studies: Electronic databases will include Thai Journal Online (ThaiJo), PubMed/MEDLINE, Scopus, and Science Direct. These databases were selected to ensure comprehensive coverage of both national (Thai) and international literature relevant to depression prevalence among CKD patients receiving renal replacement therapy in Thailand.

In addition to electronic database searching, manual screening of reference lists from included articles and relevant review papers will be conducted to identify additional eligible studies. Where necessary, corresponding authors may be contacted for clarification of incomplete or unclear data.

Grey literature will be considered where accessible, particularly institutional publications and local academic journals indexed in the Thai Citation Index (TCI). However, only studies meeting the

predefined eligibility criteria and providing sufficient data for prevalence estimation will be included in the final analysis.

**Main outcome(s)** The primary outcome of this review is the pooled prevalence of depression among adult patients with chronic kidney disease (CKD) receiving renal replacement therapy (RRT) in Thailand.

Depression must be assessed using validated and reliable screening or diagnostic instruments, such as the Patient Health Questionnaire-9 (PHQ-9), Beck Depression Inventory-II (BDI-II), or Center for Epidemiologic Studies Depression Scale (CES-D). Only studies reporting sufficient data to calculate prevalence estimates (e.g., number of cases and total sample size) will be included.

The effect measure will be the proportion (prevalence) of patients with depression, reported with corresponding 95% confidence intervals (CIs). Prevalence estimates will be pooled using a random-effects meta-analysis model. No specific follow-up timing is required, as most included studies are cross-sectional; however, studies must report depression prevalence during the dialysis treatment period.

**Additional outcome(s)** Additional outcomes will include subgroup analyses of depression prevalence according to:

Type of renal replacement therapy (hemodialysis versus continuous ambulatory peritoneal dialysis); Depression assessment instruments used (e.g., PHQ-9, BDI-II, CES-D);

Methodological quality of included studies (high versus moderate quality based on JBI criteria).

Where sufficient data are available, heterogeneity across subgroups will be explored. Publication bias will also be assessed using funnel plot asymmetry and statistical tests when appropriate.

**Data management** All records identified through database searches will be exported into reference management software for organization and duplicate removal. The screening process will be conducted in two stages: (1) title and abstract screening, followed by (2) full-text assessment for eligibility.

A standardized data extraction form will be developed in Microsoft Excel to ensure consistency across reviewers. Extracted data will include study characteristics, participant characteristics, depression assessment tools, and prevalence outcomes. Data extraction will be performed independently by two reviewers, and discrepancies will be resolved through discussion or consultation with a third reviewer.

All extracted data will be securely stored in password-protected electronic files. The final dataset will be transferred to statistical software for meta-analysis. Backup copies of the dataset will be maintained to ensure data integrity and prevent loss.

**Quality assessment / Risk of bias analysis** The methodological quality and risk of bias of included studies will be assessed using the Joanna Briggs Institute (JBI) critical appraisal checklist for prevalence studies. This tool consists of nine items evaluating sampling methods, sample size adequacy, measurement validity, statistical analysis, and response rates.

Quality assessment will be conducted independently by two reviewers. Each item will be rated as “yes,” “no,” “unclear,” or “not applicable.” Discrepancies between reviewers will be resolved through discussion, and if necessary, consultation with a third reviewer.

Studies will be categorized as high quality (7–9 points), moderate quality (4–6 points), or low quality (0–3 points). The results of the quality assessment will be presented in tabular and graphical formats and considered during interpretation of pooled estimates.

**Strategy of data synthesis** Data synthesis will be conducted using a meta-analysis of prevalence estimates. The pooled prevalence of depression will be calculated using a random-effects model due to anticipated clinical and methodological heterogeneity across studies. To stabilize variance in proportion data, the Freeman–Tukey double arcsine transformation will be applied where appropriate.

Statistical heterogeneity will be assessed using Cochran’s Q test and quantified with the  $I^2$  statistic, with values of 25%, 50%, and 75% representing low, moderate, and high heterogeneity, respectively. Subgroup analyses will be performed based on type of renal replacement therapy and depression assessment tools.

If sufficient data are available, sensitivity analyses will be conducted to evaluate the robustness of pooled estimates. Publication bias will be assessed using funnel plots and appropriate statistical tests. All analyses will be performed using statistical software.

**Subgroup analysis** Subgroup analyses will be conducted to explore potential sources of

heterogeneity in the pooled prevalence estimates. Planned subgroup analyses include:

Type of renal replacement therapy (hemodialysis versus continuous ambulatory peritoneal dialysis);

Depression assessment tools used (e.g., PHQ-9, BDI-II, CES-D);

Methodological quality of included studies (high versus moderate quality based on JBI criteria).

Subgroup differences will be examined where sufficient studies are available within each category. Results will be interpreted cautiously, particularly in subgroups with a limited number of studies.

**Sensitivity analysis** Sensitivity analyses will be performed to evaluate the robustness and stability of the pooled prevalence estimates. Where sufficient data are available, analyses will be repeated by excluding studies with moderate methodological quality to assess the influence of study quality on the overall results.

Additional sensitivity analyses may include excluding studies with extreme prevalence values or small sample sizes to determine their impact on heterogeneity and pooled estimates. Changes in pooled prevalence and heterogeneity statistics ( $I^2$ ) will be examined to assess consistency of findings.

**Language restriction** Studies published in English or Thai will be included. No other language restrictions will be applied.

**Country(ies) involved** Thailand.

**Other relevant information** This review focuses exclusively on studies conducted in Thailand to generate nationally relevant prevalence estimates and to avoid heterogeneity introduced by pooling data across different healthcare systems and cultural contexts. The protocol has been developed in accordance with PRISMA 2020 guidance. Any amendments to the protocol will be documented and updated in the registry to ensure transparency.

**Keywords** Chronic kidney disease; Depression; Hemodialysis; Peritoneal dialysis; Renal replacement therapy; Prevalence; Systematic review; Meta-analysis; Thailand.

**Dissemination plans** The findings of this systematic review and meta-analysis will be disseminated through submission to peer-reviewed

national or international journals in the fields of nephrology, psychiatry, or public health. Results will also be presented at academic conferences and research seminars. The review aims to inform clinical practice and healthcare policy in Thailand by providing nationally relevant evidence on depression prevalence among CKD patients receiving renal replacement therapy.

#### **Contributions of each author**

Author 1 - Ariyachart Kalawa - Author 1 conceptualized the study, developed the methodology, conducted the literature search, performed data extraction and statistical analysis, and drafted the manuscript.

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Author 2 - Tum Boonrod - Author 2 contributed to data extraction, study screening, validation of findings, and critically reviewed and revised the manuscript.

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