

CADTH Reference List

Dietary Interventions for Chronic Kidney Disease

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Authors: Weiyi Xie, Sharon Bailey

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Key Messages

- We found 1 non-randomized study about the clinical effectiveness of plant-based protein diets in adults with non-dialysis chronic kidney disease.
- We found 1 non-randomized study about the clinical effectiveness of high dietary intake of fruits and vegetables in adults with non-dialysis chronic kidney disease.

Research Questions

1. What is the clinical effectiveness of plant-based protein diets in adults with non-dialysis chronic kidney disease?
2. What is the clinical effectiveness of high dietary intake of fruits and vegetables in adults with non-dialysis chronic kidney disease?

Methods

Literature Search Methods

A limited literature search was conducted by an information specialist on key resources including MEDLINE, the Cochrane Database of Systematic Reviews, the international HTA database, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search strategy comprised both controlled vocabulary, such as the National Library of Medicine’s MeSH (Medical Subject Headings), and keywords. The main search concepts were chronic kidney disease and diet interventions. CADTH-developed search filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, network meta-analyses, or any types of clinical trials or observational studies. Comments, newspaper articles, editorials, and letters were excluded. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2017 and October 11, 2022. Internet links were provided, where available.

Selection Criteria

One reviewer screened literature search results (titles and abstracts) and selected publications according to the inclusion criteria presented in [Table 1](#). Full texts of study publications were not reviewed.

Table 1: Selection Criteria

Criteria	Description
Population	Adult patients with chronic kidney disease not receiving dialysis
Intervention	Q1: Plant-based or plant-dominant protein diets Q2: Diets that include a high intake of fruits and vegetables

Criteria	Description
Comparator	Q1: Animal-based protein diets; usual, standard, control diets Q2: Diets that include sub-optimal fruit and vegetable intake
Outcomes	Clinical benefits (e.g., delayed progression to end-stage renal disease, initiation of maintenance dialysis, kidney transplantation, mortality, change in estimated glomerular filtration rate, quality of life, dietary adherence, serum electrolyte profiles, blood pressure, nutritional status [e.g., weight, body mass index, serum albumin, global assessment, malnutrition-inflammation score]) and harms (e.g., adverse events, complications)
Study designs	Health technology assessments, systematic reviews, randomized controlled trials, non-randomized studies

Results

One non-randomized study¹ was identified regarding the clinical effectiveness of high dietary intake of fruits and vegetables in adults with non-dialysis chronic kidney disease (CKD). One non-randomized study² was identified regarding the clinical effectiveness of plant-based protein diets in adults with non-dialysis CKD. No relevant health technology assessments, systematic reviews, or randomized controlled trials were identified.

Additional references of potential interest that did not meet the inclusion criteria are provided in [Appendix 1](#).

References

Health Technology Assessments

No literature identified.

Systematic Reviews

No literature identified.

Randomized Controlled Trials

No literature identified.

Non-Randomized Studies

1. Banerjee T, Carrero JJ, McCulloch C, et al. Dietary factors and prevention: Risk of end-stage kidney disease by fruit and vegetable consumption. *Am J Nephrol.* 2021;52(5):356-367. [PubMed](#)
2. D'Alessandro C, Cumetti A, Pardini E, et al. Prevalence and correlates of hyperkalemia in a renal nutrition clinic. *Intern Emerg Med.* 2021;16(1):125-132. [PubMed](#)

Appendix 1: References of Potential Interest

Systematic Reviews

Alternative Population – Non-Dialysis CKD Not Specified

Quintela B, Carioca AAF, de Oliveira JGR, Fraser SDS, da Silva Junior GB. Dietary patterns and chronic kidney disease outcomes: A systematic review. *Nephrology (Carlton)*. 2021;26(7):603-612. [PubMed](#)

Unclear Intervention – Diet Not Specified

Aycart DF, Acevedo S, Eguiguren-Jimenez L, Andrade JM. Influence of plant and animal proteins on inflammation markers among adults with chronic kidney disease: A systematic review and meta-analysis. *Nutrients*. 2021;13(5):14. [PubMed](#)

Randomized Controlled Trials

Unclear Population – Population Age Not Specified

Hansen NM, Berg P, Rix M, et al. The New Nordic Renal Diet induces a pronounced reduction of urine acid excretion and uremic toxins in CKD patients (stage 3 and 4). *J Ren Nutr*. 2022;01:01. [PubMed](#)

Salomo L, Rix M, Kamper AL, Thomassen JQ, Sloth JJ, Astrup A. Short-term effect of the New Nordic Renal Diet on phosphorus homeostasis in chronic kidney disease Stages 3 and 4. *Nephrol Dial Transplant*. 2019;34(10):1691-1699. [PubMed](#)

Alternative Comparator – Treatment for Metabolic Acidosis or Usual Care

Goraya N, Munoz-Maldonado Y, Simoni J, Wesson DE. Treatment of chronic kidney disease-related metabolic acidosis with fruits and vegetables compared to NaHCO₃ yields more and better overall health outcomes and at comparable five-year cost. *J Ren Nutr*. 2021;31(3):239-247. [PubMed](#)

Non-Randomized Studies

Alternative Population – Adults Receiving Hemodialysis

Saglimbene VM, Wong G, Teixeira-Pinto A, et al. Dietary patterns and mortality in a multinational cohort of adults receiving hemodialysis. *Am J Kidney Dis*. 2020;75(3):361-372. [PubMed](#)

Saglimbene VM, Wong G, Ruospo M, et al. Fruit and vegetable intake and mortality in adults undergoing maintenance hemodialysis. *Clin J Am Soc Nephrol*. 2019;14(2):250-260. [PubMed](#)

Unclear Population – Non-Dialysis CKD and/or Population Age Not Specified

Hossein Rouhani M, Mortazavi Najafabadi M, Esmailzadeh A, Feizi A, Azadbakht L. Direct association between high fat dietary pattern and risk of being in the higher stages of chronic kidney disease. *Int J Vitam Nutr Res*. 2019;89(5-6):261-270. [PubMed](#)

Chang CY, Chang HR, Lin HC, Chang HH. Comparison of renal function and other predictors in lacto-ovo vegetarians and omnivores with chronic kidney disease. *J Am Coll Nutr*. 2018;37(6):466-471. [PubMed](#)

Alternative Comparator – Low Adherence to Specialized Dietary Patterns

Hu EA, Coresh J, Anderson CAM, et al. Adherence to healthy dietary patterns and risk of CKD progression and all-cause mortality: Findings from the CRIC (Chronic Renal Insufficiency Cohort) study. *Am J Kidney Dis*. 2021;77(2):235-244. [PubMed](#)

Review Articles

Mocanu CA, Simionescu TP, Mocanu AE, Garneata L. Plant-based versus animal-based low protein diets in the management of chronic kidney disease. *Nutrients*. 2021;13(11):22. [PubMed](#)

Naber T, Purohit S. Chronic kidney disease: Role of diet for a reduction in the severity of the disease. *Nutrients*. 2021;13(9):3277. [PubMed](#)

Picard K, Mager DR, Richard C. The impact of protein type on phosphorus intake, serum phosphate concentrations, and nutrition status in adults with chronic kidney disease: A critical review. *Adv Nutr*. 2021;12(6):2099-2111. [PubMed](#)