



Association Between Western-Style Dietary Exposures and Hypertension Among Adults: A Systematic Review

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ARTICLE INFO	ABSTRACT
Manuscript Received: 27 June 2026 Revised: 17 July 2026 Accepted: 23 July 2026 Date of Publication: 28 July 2026 Volume: 6 Issue: 2 DOI: 10.24252/algizzai.v6i2.69722 KEYWORDS <i>western food consumption;</i> <i>adult;</i> <i>hypertension;</i> <i>diet;</i> <i>unhealthy food.</i>	Introduction: Hypertension is a major global public health issue, affecting over 1.28 billion adults worldwide, with increasing prevalence in both developed and developing countries. Western dietary patterns, characterized by high consumption of processed meats, ultra-processed foods, sugary beverages, and high-sodium items, alongside low intake of fruits, vegetables, and whole grains, have been linked to elevated blood pressure and cardiovascular risk. This systematic review summarizes the evidence on the association between Western food consumption (including ultra-processed and fast foods) and hypertension in adults, and discusses its implications for public health and future research. Methods: Following PRISMA 2020 guidelines, a literature search was conducted in PubMed, Scopus, and ScienceDirect using keywords such as "Adult," "Western diet," and "hypertension." Inclusion criteria encompassed original quantitative studies on adults (≥ 18 years). Quality was assessed using Joanna Briggs Institute tools for cross-sectional and cohort studies. Data extraction focused on study characteristics, exposures, outcomes, and findings, with narrative synthesis applied. Results: From 646 records, five studies (four cross-sectional, one prospective cohort) from Norway, Nigeria, the United States, Vietnam, and South Korea were included, all with low risk of bias (87.5-100% JBI scores). Western-style patterns were associated with increased hypertension risk, uncontrolled hypertension, and metabolic syndrome components. Protective factors included plant-based diets and higher vegetable intake. No significant link was found in one study for hypertension specifically, but overall trends showed dose-response relationships. Conclusion: Western food consumption consistently elevates hypertension risk in adults across diverse populations, underscoring the need for public health interventions like sodium reduction, food reformulation, and nutrition education to mitigate this global burden.
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INTRODUCTION

Hypertension in adults has become one of the biggest public health problems globally, with prevalence rates continuing to increase in both developed and developing countries. According to the World Health Organization, more than 1.28 billion adults worldwide live with hypertension, and most are unaware of their condition or do not receive adequate treatment. In Indonesia, based on data from the 2018 Basic Health Research, the prevalence of hypertension among people aged ≥ 18 years reached 34.1% (Kementerian Kesehatan RI, 2018). This data shows an increase from the prevalence of 25.8% in 2013. Furthermore, based on the results of the 2023 Basic Health Survey (SKI), hypertension remains a major health problem, as it is the fourth leading risk factor for death in Indonesia, and the proportion of adults with hypertension is expected to continue to increase (Kementerian Kesehatan RI, 2023). Parallel to this growing burden of hypertension, the consumption of fast food and Western-style diets has increased globally. A multinational study involving 153,496 adolescents from 54 low- and middle-income countries reported that 55.2% consumed fast food at least once per week, reflecting the widespread adoption of Westernized dietary behaviors across diverse populations (L. Li et al., 2020).

In this review, the term Western-style diet is used as an overarching concept to describe dietary exposures characterized by a high intake of energy-dense and highly processed foods commonly observed in Westernized eating patterns. These dietary exposures include ultra-processed foods (according to the NOVA classification), processed meat, fast food, sugar-sweetened beverages, and high-sodium processed foods. Although these represent distinct dietary constructs rather than a single dietary pattern, they share common nutritional characteristics, including excessive sodium, saturated fat, added sugars, and high energy density. These nutritional profiles have consistently been associated with elevated blood pressure, endothelial dysfunction, chronic low-grade inflammation, obesity, insulin resistance, and an increased risk of cardiometabolic diseases, including hypertension. Therefore, this review synthesizes evidence across these related dietary exposures while acknowledging their conceptual differences when interpreting the findings. Epidemiological evidence from cohort and observational studies further supports that adherence to Western dietary patterns and higher consumption of ultra-processed foods are associated with an increased risk of hypertension and cardiovascular disease (Rai et al., 2017). Similarly, studies conducted in Indonesia have reported mixed associations between the consumption of prepared foods, fast foods, and modern dietary patterns with blood pressure indicators and hypertension prevalence, suggesting that the relationship remains complex and may vary according to dietary assessment methods and population characteristics (Anyanwu & Elena, 2022).

Recent evidence consistently indicates that the global transition toward Western-style dietary patterns characterized by frequent consumption of processed foods, fast food, red meat, saturated fats, refined carbohydrates, and excessive sodium and added sugars has contributed substantially to the increasing burden of hypertension among adults. A population-based study in Australia demonstrated that individuals adhering to Western dietary patterns were significantly more likely to develop hypertension than those consuming healthier traditional diets (Khalessi et al., 2016). Similar findings were reported in a prospective cohort study in Mexico, where modern dietary patterns rich in processed and energy-dense foods were associated with a higher incidence of hypertension among adult women (Monge et al., 2018). Evidence from China further showed that diets characterized by high sodium intake and greater consumption of animal-based foods contributed to the high prevalence of hypertension in urban populations (Zheng, 2016). Moreover, studies conducted in Asian populations suggest that frequent consumption of fast food and Western-style foods may increase the risk of hypertension and other cardiometabolic disorders through multiple biological pathways, including chronic inflammation, oxidative stress, weight gain, endothelial dysfunction, and metabolic dysregulation (Andrew O, 2014).

Despite the growing body of evidence linking Western dietary patterns with hypertension, the available literature remains fragmented because most studies have focused on individual dietary

components, such as fast food, processed meat, sugar-sweetened beverages, or ultra-processed foods, rather than evaluating these dietary exposures within the broader framework of Western-style dietary patterns. Furthermore, differences in study design, dietary assessment methods, definitions of dietary exposures, and population characteristics have resulted in heterogeneous findings, making it difficult to draw comprehensive conclusions regarding the overall impact of Western-style diets on hypertension risk. To date, few reviews have comprehensively synthesized these diverse but closely related dietary exposures into a unified conceptual framework that reflects contemporary Westernized eating behaviors. A comprehensive synthesis is therefore needed to clarify the current evidence and identify consistent patterns regarding the association between Western-style diets and hypertension among adults. Accordingly, this review aims to summarize and critically evaluate the available evidence on the relationship between Western-style dietary patterns including ultra-processed foods, fast food, processed meat, sugar-sweetened beverages, and other highly processed foods and hypertension in adult populations.

METHODS

This systematic review was conducted and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines (Page et al., 2021). A comprehensive literature search was performed in three electronic databases: PubMed, Scopus, and ScienceDirect. The searches were conducted on September 13, 2025.

Search Method

The search strategy combined controlled vocabulary (Medical Subject Headings [MeSH] in PubMed) and free-text terms related to the population, exposure, and outcome. The search terms included concepts for adults ("Adult", "Young Adult", "Middle Aged"), Western-style dietary exposures ("Western diet", "Western dietary pattern", "Western-style diet", "Westernized diet", "Western food pattern", "Western eating habits", "Western lifestyle diet", "fast food diet", "processed food diet", "ultra-processed food diet", "unhealthy diet", "modern diet", "industrialized diet", "globalized diet", and "nutritional transition"), and hypertension ("Hypertension" and "high blood pressure"). Boolean operators (AND/OR) were used to combine the search terms appropriately according to the syntax requirements of each database. Searches were limited to English-language articles, human studies, adult populations (≥ 18 years), and publications published between 2015 and 2025, in accordance with the predefined eligibility criteria.

Definition of Western-Style Dietary Exposures

Western-style dietary exposures were operationally defined a priori as dietary patterns or food-related exposures characterized by one or more nutritional characteristics commonly observed in Westernized diets, including high intake of processed or ultra-processed foods, processed meat, high-sodium foods, sugar-rich foods, energy-dense foods, alcohol consumption, or low intake of protective foods such as vegetables. Because dietary westernization is expressed differently across populations, studies evaluating individual dietary components that share these nutritional characteristics were considered eligible.

Eligibility Criteria

Inclusion criteria are defined as follows: (1) original quantitative studies with primary data; (2) participants aged 18 years and older; (3) exposure defined as consumption of Western food (including ultra-processed and fast food); (4) outcome defined as hypertension; (5) articles published between 2015 and 2025; and (6) full-text articles written in English. Exclusion criteria included review articles, case reports, proceedings, theses or dissertations, animal studies, studies involving children or adolescents, and studies without a clear definition of hypertension. The methodological quality of the included studies was evaluated using a critical appraisal tool, which assessed both external validity (the generalizability of the findings) and

internal validity (potential sources of bias (Hoy et al., 2012). Data extraction was performed systematically to capture the main characteristics of each study, including authors, year, study location, design, sample size, exposure, outcomes, and main findings (Schmidt et al., 2025). Evidence was synthesized narratively to describe the relationship between Western food consumption and hypertension in the adult population

Quality Assessment

The methodological quality of the included studies was independently assessed using the Joanna Briggs Institute (JBI) critical appraisal checklist for Cross Sectional Studies and Cohort Studies. The JBI evaluates several aspects, such as the clarity of inclusion criteria, the validity and reliability of measurement methods, the identification and control of confounding factors, the appropriateness of statistical analysis, and the completeness of outcome data.

Table 1. JBI Quality Assessment of The Include Study

JBI for Cross Sectional Study											
Author	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
Ase Mari Moe., et al (2024)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
Akinbule., et al (2022)	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes			
Felicia J setiono., et al (2019)	NA	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
Hung Nguyen Trong., et al (2024)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
JBI for Cohort Study											
Hye Ah Lee., et al (2018)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes

Based on quality assessment using JBI, Overall, most studies fulfilled the majority of the JBI appraisal criteria. Common strengths included clearly defined inclusion criteria, valid exposure and outcome measurements, and appropriate statistical analyses. Only a small number of domains were rated as "No", primarily related to confounding factors or measurement issues. This systematic review protocol has been prospectively registered in the Prospero registry with registration number PROSPERO 2025 CRD420251241326. Available from <https://www.crd.york.ac.uk/PROSPERO/view/CRD420251241326>. This ensuring methodological transparency and reducing the risk of duplication.

Data Extraction

Studies included in the analysis were categorized based on research methods. Data extraction was performed systematically to capture the main characteristics of each study, including author, year, study location, design, sample size, exposure, results, and main findings. The evidence was synthesized narratively to describe the relationship between western food consumption and hypertension in the adult population.

Syntesis Method

Data from the included studies were synthesized using a narrative and thematic approach. The extracted data were systematically organized based on study characteristics, such as design, population

setting, measurement of western food consumption, and hypertension-related outcomes. This synthesis focused on identifying similarities and differences in western food consumption patterns and their relationship with obesity in the adult population. Thematic patterns were developed to explore factors influencing these relationships, including socioeconomic status, food environment, and lifestyle behaviors. Quantitative findings were compared descriptively, with an emphasis on the direction and magnitude of the observed relationships rather than combined statistical estimates. This narrative synthesis allows for an integrated understanding of how Western food consumption contributes to the risk of hypertension.

RESULTS

Study Selection

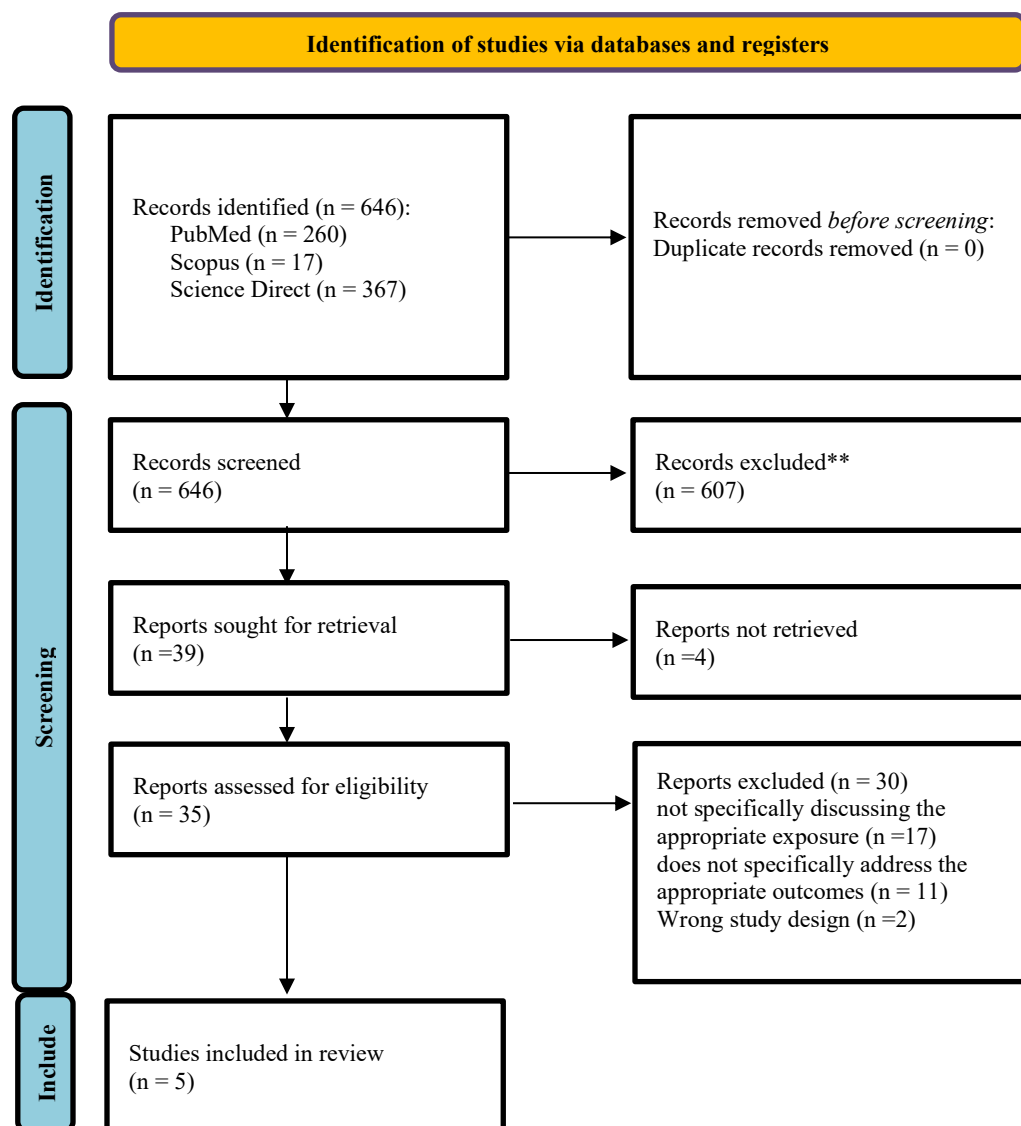


Figure 1. PRISMA Flow chart

The study selection process followed the PRISMA 2020 guidelines. A total of 646 records were identified from three databases: PubMed (n = 260), Scopus (n = 17), and Science Direct (n = 367). No

duplicate records were found during the initial screening. All 646 records proceeded to title and abstract screening, where 607 records were excluded for not meeting eligibility criteria. A total of 39 articles were then retrieved for full-text retrieval, but 4 reports were inaccessible, leaving 36 full-text articles for eligibility assessment. After detailed evaluation, 31 articles were excluded for reasons such as not discussing appropriate exposure ($n = 18$), not addressing relevant outcomes ($n = 11$), and using inappropriate study designs ($n = 2$). Finally, 5 studies met all inclusion criteria and were included in the final review. The complete selection process is illustrated in the PRISMA flow diagram, ensuring transparency at each stage of identification, screening, eligibility, and inclusion.

Table 2. Characteristics and key findings of studies examining dietary patterns and cardiometabolic health outcomes.

Author (Country)	Design	Population	Exposure	Outcome	Main Findings	Effect Size
Moe et al. (2024), Norway	Cross-sectional	10,750 adults ≥ 40 years	Meat and Sweet; Plant-based and Tea dietary patterns	Metabolic syndrome	Meat and Sweet pattern increased the risk of metabolic syndrome, whereas Plant-based and Tea reduced hypertension and hypertriglyceridemia.	OR 1.11–1.16; OR 0.91
Akinbule et al. (2022), Nigeria	Cross-sectional	250 women (18–49 years)	Food consumption score, dietary diversity, BMI	Hypertension	Low food consumption score and overweight/obesity were associated with hypertension.	OR 0.37; OR 3.60
Setiono et al. (2019), USA	Cross-sectional	580 adults	Five dietary patterns	Hypertension, obesity, T2DM	Processed foods increased diabetes risk, while meat and fried foods increased obesity; no association with hypertension.	OR 3.41; OR 2.63
Nguyen et al. (2024), Vietnam	Cross-sectional	272 hypertensive adults ≥ 60 years	Vegetable intake, processed foods, alcohol	Uncontrolled hypertension	High alcohol intake and low vegetable consumption increased the risk of uncontrolled hypertension.	OR 8.05; OR 2.40
Lee et al. (2018), South Korea	Prospective cohort	6,792 adults	Salted seafood, meat, eggs	Incident hypertension	High salted seafood intake and low meat consumption increased hypertension risk during follow-up.	HR 1.28; HR 1.46

Based on a literature review conducted using the PRISMA method, five studies that met the inclusion criteria were analysed to examine the association between the consumption of a Western-style diet including processed foods, meat, sugary foods and foods high in salt and the risk of hypertension in adults. The five studies were conducted in various countries, namely Norway, Nigeria, the United States, Vietnam and South Korea, and employed a range of research designs, from cross-sectional to prospective cohort studies.

DISCUSSION

This systematic review synthesized evidence on the association between Western-style dietary exposures and hypertension among adults across diverse populations. Overall, the available evidence suggests that dietary exposures characterized by high consumption of processed foods, processed meat, high-sodium foods, sugar-rich foods, and other energy-dense foods were generally associated with a greater likelihood of hypertension or hypertension-related outcomes. Although the included studies evaluated different dietary exposures and were conducted in diverse geographical settings, the direction of the observed associations was broadly similar. Nevertheless, these findings should be interpreted cautiously because most included studies employed cross-sectional designs and considerable heterogeneity existed in exposure definitions, dietary assessment methods, and outcome measurements.

This systematic review synthesized evidence on the association between Western-style dietary exposures and hypertension across diverse populations. Overall, the findings indicate that dietary patterns characterized by high consumption of processed foods, ultra-processed foods (UPFs), processed meat, sugary foods, and high-sodium foods were consistently associated with an increased risk of hypertension (Kim et al., 2024; Rai et al., 2022; Nguyen et al., 2023). Although the included studies differed in dietary assessment methods, study populations, and definitions of Western dietary exposure, the direction of the association was generally consistent. In addition to dietary factors, body mass index (BMI), alcohol consumption, age, and dietary diversity were identified as important factors influencing hypertension risk (Nguyen et al., 2023; Olatona et al., 2024).

High-Sodium Dietary Exposures and Hypertension

High-sodium dietary exposures emerged as one of the most consistent findings across the included studies. Diets characterized by frequent consumption of salty seafood and processed foods were associated with an increased risk of incident and uncontrolled hypertension, particularly among adult populations (Kim et al., 2024; Nguyen et al., 2023). Excess sodium intake promotes hypertension by increasing extracellular fluid volume, stimulating the renin–angiotensin–aldosterone system, and impairing endothelial function (He & MacGregor, 2020). These findings are consistent with current recommendations that reducing sodium intake remains one of the most effective dietary approaches for hypertension prevention (Mizuta et al., 2025).

Western-style Dietary Exposures

Another consistent theme identified in this review was the positive association between Western-style dietary patterns and ultra-processed food consumption with hypertension. Although the included studies examined different dietary exposures including Western dietary patterns, processed foods, processed meat, and UPFs—they shared common nutritional characteristics such as high sodium, saturated fat, added sugars, and energy density (Rai et al., 2022; Kim et al., 2024). These nutritional profiles contribute to obesity, chronic inflammation, insulin resistance, oxidative stress, and endothelial dysfunction, thereby increasing blood pressure (Wang et al., 2022; Lane et al., 2024). The consistency of the present findings is supported by previous prospective studies, including the SUN cohort and the China Health and Nutrition Survey, which reported significantly higher risks of hypertension among individuals with greater UPF consumption (Mendonça et al., 2017; Li, 2022).

Protective Dietary Patterns and Dietary Diversity

Conversely, healthier dietary patterns appeared to have protective associations with hypertension. Greater dietary diversity and higher consumption of vegetables and minimally processed foods were associated with a lower risk of hypertension, particularly among women of reproductive age (Olatona et al., 2024). Likewise, adherence to plant-based dietary patterns was associated with a lower prevalence of

hypertension compared with Western-style dietary patterns (Rai et al., 2022). These findings suggest that diets rich in fruits, vegetables, legumes, and other whole foods provide beneficial nutrients, including potassium, magnesium, dietary fiber, and antioxidants, which contribute to blood pressure regulation and improved vascular function (Naja et al., 2020).

Between Study Heterogeneity

Despite the generally consistent direction of the findings, several sources of heterogeneity should be considered when interpreting the results. First, the included studies differed in how Western-style dietary exposures were conceptualized and measured. While some studies evaluated overall Western dietary patterns characterized by high consumption of meat and sweet foods (Rai et al., 2022), others focused on specific dietary exposures such as salted seafood (Kim et al., 2024), ultra-processed or processed dietary patterns (Al-Shaar et al., 2024), dietary diversity measured using the Food Consumption Score (Olatona et al., 2024), or dietary behaviors including alcohol and vegetable consumption (Nguyen et al., 2023).

These differences reflect the absence of a standardized definition of Western-style dietary exposure across studies. Second, methodological differences in dietary assessment may have contributed to variability in the reported associations. Dietary intake was assessed using different approaches, including food frequency questionnaires (FFQs), dietary pattern analysis, Food Consumption Score (FCS), and food-specific intake measurements. These instruments capture different aspects of dietary behavior and may introduce variation in exposure classification, making direct comparison between studies challenging. Third, heterogeneity was also observed in the outcome definitions and study populations. Some studies investigated incident hypertension using prospective cohort designs, whereas others assessed prevalent or uncontrolled hypertension using cross-sectional data. Furthermore, the studies were conducted in countries with diverse dietary cultures and levels of nutrition transition, including Norway, South Korea, Vietnam, Nigeria, and the United States. Differences in cultural eating habits, food availability, and socioeconomic conditions may have influenced both dietary patterns and hypertension risk. Finally, variations in statistical adjustment for potential confounding factors should also be acknowledged. Although most studies adjusted for common variables such as age, sex, body mass index, smoking, alcohol consumption, and physical activity, the selection of covariates was not uniform across studies. Consequently, while the overall evidence consistently suggests an association between Western-style dietary exposures and hypertension, differences in exposure definitions, dietary assessment methods, study populations, outcome measurements, and confounder adjustment should be considered when interpreting and comparing the findings.

Geographical and Socio-cultural Context

The association between Western-style dietary exposures and hypertension was observed across diverse geographical settings, suggesting that dietary westernization has become a global public health concern. Studies conducted in Europe, Asia, Africa, and North America consistently demonstrated that increased consumption of processed and convenience foods was associated with a greater risk of hypertension (Rai et al., 2022; Kim et al., 2024; Nguyen et al., 2023; Olatona et al., 2024). These findings reflect the global nutrition transition driven by urbanization, industrialization, and increasing availability of processed foods, particularly in low- and middle-income countries (Monge et al., 2018). Nevertheless, contextual factors such as socioeconomic status, dietary diversity, and food accessibility remain important determinants that may influence the strength of these associations.

Public Health Implication

The findings of this review have important implications for hypertension prevention at both individual and population levels. Since Western-style dietary exposures consistently share nutritional characteristics such as excessive sodium, saturated fat, and added sugars, comprehensive public health

strategies should prioritize reducing the consumption of processed and ultra-processed foods. Population-based interventions, including salt reformulation in processed foods, the use of low-sodium salt substitutes, nutrition education, and dietary counselling, have been shown to effectively reduce blood pressure and should be integrated into national hypertension prevention programs (Aliasgharzadeh et al., 2022; Mizuta et al., 2025; Sun, 2023).

Limitations and Future Directions

Several limitations should be considered when interpreting the findings of this review. First, most of the included studies employed cross-sectional designs, limiting the ability to establish causal relationships between Western-style dietary exposures and hypertension. Second, substantial heterogeneity existed in the definition and assessment of Western-style dietary exposures. While some studies evaluated overall Western dietary patterns using food frequency questionnaires (FFQs), others focused on ultra-processed foods based on the NOVA classification, specific food groups such as salted seafood or processed meat, or dietary diversity indicators, which may have contributed to variability across studies (Lane et al., 2024). In addition, the search strategy was limited to PubMed, Scopus, and ScienceDirect. Although these databases cover a large proportion of biomedical literature, relevant studies indexed in other databases, such as Embase or Web of Science, may have been missed. This review may also be subject to publication bias because unpublished studies and grey literature were not included, and only English-language articles were considered, which may have introduced language bias. Furthermore, only five studies met the eligibility criteria, limiting the overall strength and generalizability of the available evidence. Finally, the certainty of evidence was not formally assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) framework, which may limit readers' confidence in the overall strength of the synthesized evidence. Future studies should prioritize large prospective cohort designs using standardized definitions of Western-style dietary patterns and validated dietary assessment instruments. Harmonizing exposure definitions across studies would improve comparability between populations and strengthen future evidence synthesis. In addition, future systematic reviews should formally assess the certainty of evidence using frameworks such as GRADE to provide a more comprehensive evaluation of the available evidence.

CONCLUSION

The available evidence suggests an association between Western-style dietary exposures and hypertension-related outcomes among adults. However, the findings should be interpreted cautiously because only a limited number of studies were included, most employed cross-sectional designs, and substantial methodological heterogeneity existed across studies. Further prospective studies with standardized definitions of Western-style dietary exposures are needed to strengthen the evidence.

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CONFLICTS OF INTEREST

The authors declare no competing interests.

ARTIFICIAL INTELLIGENCE STATEMENT

The authors confirm that no artificial intelligence (AI) or AI-assisted technologies were used in the preparation of this manuscript.

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