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Review

# Diet and Depression during Peri- and Post-Menopause: A Scoping Review

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## Abstract

**Background/Objectives:** Despite the biological plausibility and public health relevance of diet as a modifiable risk factor for depression, research specifically targeting peri- and post-menopausal women remains scarce. To address this gap, we conducted a scoping review mapping and synthesizing existing literature on diet and depression in this population. **Methods:** Studies were identified through Medline, EMBASE, PsycINFO, CENTRAL, Web of Science, and Scopus. After deduplication in Covidence, two reviewers independently screened titles, abstracts, and full texts using predefined eligibility criteria. Data were extracted using standardized forms and summarized in tables and figures. Methodological quality was assessed using the Cochrane RoB-2 tool for randomized trials and the National Heart, Lung, and Blood Institute (NHLBI) tools for cohort, cross-sectional, and case-control studies. **Results:** Thirty-eight studies—most with observational designs, published between 2020 and 2025, and focused on healthy peri- and/or post-menopausal women—were included. Investigated diet-related variables included dietary patterns, food groups, individual foods, and nutrients. All observational studies had moderate or high risk of bias, while over half of experimental studies had low risk of bias. Dietary patterns and vitamin D<sub>3</sub> were the variables most consistently associated with depressive symptoms. In contrast, findings for other nutrients, foods, and food groups were inconsistent or conflicting. **Conclusions:** This review provides a comprehensive and up-to-date synthesis of evidence on diet and depression in peri- and post-menopausal women. By identifying critical gaps in the literature, particularly the need for high-quality prospective cohort studies and clinical trials, it offers a valuable foundation for guiding future research and informing health professionals working at the intersection of nutrition, psychiatry, and women's health. **Protocol registration:** [osf.io/b89r6](https://osf.io/b89r6).

**Keywords:** nutrition; dietary patterns; foods; nutrients; depression; depressive disorder; perimenopause; postmenopause; women; scoping review

## 1. Introduction

Depression is a pervasive mental health disorder that affected over 250 million individuals globally as of 2019, thereby ranking as the second leading cause of disability worldwide [1]. Beyond its psychological burden, depression significantly increases the risk of a range of comorbidities, including psychiatric conditions and cardiometabolic diseases [2–4]. Equally important, core symptoms of depression, such as persistent low mood, fatigue, and cognitive impairment, can severely impair one's ability to carry out daily activities and fulfill social, familial, and professional responsibilities [5–8]. These impairments not only reduce quality of life [9–12] but also translate into substantial societal costs due to lost productivity and increased healthcare needs [5,6]. Given its

significant individual and public health burden, improving the understanding, prevention, and management of depression remains a global health priority.

Importantly, depression does not affect all populations equally. Starting in adolescence, women are approximately twice as likely as men to experience depression, a disparity that is consistently observed across countries and cultures [7]. This gender difference is partly attributed to biological differences and psychosocial factors that increase women's vulnerability to depression, particularly during specific reproductive life stages, like puberty, pregnancy, and the menopausal transition, which are often characterized as windows of vulnerability [8]. Although this period has historically been understudied, menopausal transition is associated with an approximately 2- to 5-fold higher risk of developing major depression or clinically significant depressive symptoms compared to pre-menopausal women [13–20]. Large cohort studies have demonstrated that even women with no prior depressive history may develop depressive symptoms during the menopausal transition [15–20]. Hormonal fluctuations, particularly declining estrogen levels, have been implicated in this increased risk [16,17,21], alongside psychosocial stressors, physical comorbidities, and age-related changes such as weight gain, body fat distribution and sleep disturbances [16,18]. Affected peri- and post-menopausal women tend to exhibit a distinct symptom profile, characterized by rapid mood swings, heightened irritability, paranoia, and pronounced fatigue, rather than the persistent low mood more typical in younger adults [22,23]. They have also shown a poorer response to standard antidepressant medications relative to pre-menopausal women [22,24–27]. This combination of increased prevalence, atypical symptomatology, and suboptimal treatment response in midlife women highlights a critical need for targeted research and interventions.

In recent years, growing attention has turned to modifiable lifestyle factors as potential levers for preventing or managing depression. Among these, diet has emerged as a particularly promising target, fueling the emerging field of *nutritional psychiatry*. This field explores how dietary patterns and nutrient intake influence mental health, with mounting evidence associating high-quality diets, such as the Mediterranean diet and anti-inflammatory diets, to reduced depression risk [28–32], and low-quality diets, characterized by high intakes of refined sugars and ultra-processed foods, to increased depression risk [33–36]. Biological mechanisms proposed to explain these associations include inflammatory pathways [37–39], oxidative stress [40–42], hypothalamic-pituitary-adrenal axis (HPA) function [43,44], neurogenesis [45,46], and gut microbiota composition [47,48]. Chronic low-grade inflammation, in particular, is thought to mediate the association between poor diet and depression [49,50].

Despite the biological plausibility and public health significance of diet as a modifiable risk factor for depression, research specifically focused on peri- and post-menopausal women remains relatively limited. To date, most diet-depression research has been conducted in general adult populations or specific population groups (e.g., young adults, older men and women combined), with limited attention paid to the unique context of midlife women. This is an important oversight, given that menopause-related changes may influence not only depression risk but also how dietary factors interact with neurobiological and emotional processes.

To our knowledge, no prior review has systematically mapped the existing evidence on diet and depression in this specific subgroup. Thus, the objective of the present scoping review was to comprehensively identify, characterize, and synthesize available studies examining diet-related variables and depressive symptoms in this population. By doing so, this review aims to clarify what is currently known about the topic, highlight key knowledge gaps, and inform future research efforts to support the development of more targeted, evidence-based dietary strategies for the prevention and management of depression in peri- and post-menopausal women.

## 2. Materials and Methods

This scoping review is reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses checklist's extension for Scoping Reviews (PRISMA-ScR) (see *Supplementary Table 1*) [51]. The methods used for this scoping review were informed by Arksey & O'Maley's (2005) framework for conducting scoping reviews [52] as well as Peters et al.'s (2015) guidelines for scoping reviews [53]. The initial protocol has been prospectively registered on the Open Science Framework (<https://osf.io/b89r6/>). The detailed final protocol has been published as a protocol paper [54].

### 2.1. Deviations from the Intended Protocol

The only deviation from the published protocol is that one additional database, namely the Cochrane Central Register of Controlled Trials (CENTRAL), was searched.

### 2.2. Step 1 – Identifying the Research Questions

This scoping review aimed to answer the following question: "To date, what is the available evidence on diet-related variables and depression in peri- and post-menopausal women?". The sub-questions were:

1. What are the characteristics of available evidence on diet-related variables and depression in peri- and post-menopausal women?
2. What are the main findings of available evidence on diet-related variables and depression in peri- and post-menopausal women?
3. What are the main research gaps on the topic of diet-related variables and depression in peri- and post-menopausal women?

### 2.3. Step 2 – Identifying the Relevant Studies

Studies examining the associations between diet-related variables and depression in peri- and post-menopausal women were systematically retrieved via Medline, EMBASE, PsycINFO, CENTRAL, Web of Science, and Scopus. The search was conducted from the inception of each database to November 15th, 2024. Languages were restricted to English and French. A backward citation tracking of all included articles was conducted to identify any other pertinent articles. The search strategies for all databases are available in *Supplementary Tables 2-6* and the published protocol [54].

### 2.4. Step 3 – Study Selection

To be eligible for inclusion in this review, studies were required to meet the criteria described below regarding the types of participants, exposures, interventions, comparators, outcomes, and study designs.

#### 2.4.1. Type of Participants

Studies including (1) healthy peri- and post-menopausal women or (2) peri- and post-menopausal women with diagnoses of primary major or persistent depressive disorder prior to enrollment in the study were considered eligible for this review. No restrictions were applied as to participants' age or race. Only studies focusing exclusively on women with chronic health conditions other than those mentioned above, women on sex hormone replacement therapy, and women who underwent hysterectomies were excluded.

#### 2.4.2. Type of Exposures and Interventions

The exposures and interventions of the included studies could include a wide range of diet-related variables. Diet-related variables were only excluded if they were considered unusual, linked to an underlying health condition or surgical procedure, or were unlikely to be found in their

unaltered forms in foods. As such, while studies assessing macronutrients, vitamins, minerals, and phytonutrients (e.g., phenolic compounds, nondigestible carbohydrates) supplements were considered eligible, those involving herbal supplements (e.g., Ginkgo biloba, ginseng, St. John's Wort) or any pharmaceutical agents (e.g., Semaglutide, Naltrexone-bupropion, etc.) aimed at modifying eating behaviors, food intake, and/or nutrient metabolism were excluded. No restrictions were applied as to dietary intake assessment methods in observational studies nor intervention duration in experimental studies.

#### 2.4.3. Type of Comparators

Experimental studies were considered eligible if the dietary intervention of interest was compared to (i) a placebo, (ii) another dietary intervention, or (iii) no intervention.

#### 2.4.4. Type of Outcomes

Outcomes were limited to unipolar major and persistent depressive disorder with or without current treatment, as well as to depressive symptoms. No restrictions were applied as to the methods and tools used to assess depression and depressive symptoms. Studies focusing exclusively on depressive symptoms as part of the symptomatology of another physical (e.g., hypothyroid, anemia, cardiometabolic disorders, etc.) or mental health disorders (e.g., schizophrenia, eating disorders, personality disorders, declined cognitive functions, etc.) were excluded.

#### 2.4.5. Type of Study Designs

Primary experimental (i.e., randomized controlled parallel and crossover trials with individual and cluster randomization), quasi-experimental (e.g., non-equivalent groups designs, pretest-posttest non-equivalent groups designs (NEGD), difference-in-differences designs, etc.) and observational (e.g., cohort, case-control, and cross-sectional studies) studies were considered eligible. Preclinical trials, case studies, and case series were excluded.

#### 2.4.6. Selection of Studies

All records identified through the database search were imported into Covidence (<https://www.covidence.org>) and duplicates were removed. All remaining records were screened against the title and abstract independently by two authors (A.M.B. and M.D.). At this stage, articles were only excluded if it was clearly determined by the title or abstract that they did not meet the inclusion criteria. Articles deemed eligible based on the title and abstract underwent full-text reviewing by the same two assessors. Discrepancies between authors assessments were resolved through discussion and consensus.

### 2.5. Step 4 – Charting the Data

One author (A.M.B.) performed data extraction from papers of eligible studies. The following data was extracted: (i) authors, (ii) publication year, (iii) protocol registration number (where applicable), (iv) protocol publication reference (where applicable), (v) study location, (vi) study design, (vii) study duration (where applicable), (viii) participant recruitment type, (ix) type of randomization (where applicable), (x) number of participants, (xi) age, (xii) menopause stage(s), (xiii) dietary variable(s) name(s), (xiv) tools used to assess dietary variables, (xv) variables types, (xvi) outcome name, (xvii) tools used to assess depression or depressive symptoms, (xviii) quantitative results with description of statistical analysis type, and (xix) statistical analysis adjustments (where applicable).

### 2.6. Step 5 – Collating, Summarizing and Reporting Results

Three summary tables were produced to present the main characteristics and findings of the studies included in the review. A narrative summary of the general characteristics of included studies

was performed, encompassing aspects related to the types of participants, exposures and interventions, outcomes, study types, and methodological quality. The main findings of the included studies were narratively summarized by type of nutritional exposure or intervention. Research gaps are highlighted and discussed in the discussion section of the manuscript.

### 2.7. Step 6 – Methodological Quality Appraisal

The risk of bias in randomized trials, cohort and cross-sectional studies, and case-control studies was assessed using the revised Cochrane risk-of-bias (RoB-2) tool [55], the National Heart, Lung, and Blood Institute (NHLBI) Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies [56], and the NHLBI Quality Assessment Tool for Case-Control studies [57], respectively.

The Cochrane RoB-2 tool assesses five bias domains known to affect the results of randomized and quasi-randomized trials, namely, (i) bias arising from the randomization process, (ii) bias due to deviations from intended interventions, (iii) bias due to missing outcome data, (iv) bias in the measurement of the outcomes, and (v) bias in the selection of the reported results. Each of these domains contains guiding questions, which were answered by “yes”, “probably yes”, “no”, “probably no”, or “no information”. Using the judgements reached for each domain, the studies themselves were rated as:

1. *Being at low risk of bias* when all domains were rated as such;
2. *Raising some concerns* when at least one domain was rated as such, but no domain was rated as being at high risk of bias;
3. *Being at high risk of bias* when at least one domain was rated as such, or when multiple domains were rated as raising some concerns.

The NHLBI Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies and the NHLBI Quality Assessment Tool for Case-Control Studies consist of 14 and 12 items, respectively, assessing common sources of bias in observational studies, namely, (i) bias from participants' recruitment or selection methods and sample size; (ii) bias in the measurement of the exposures; (iii) bias in the measurement of the outcomes; (iv) bias due to the handling of potential confounders; and (v) bias in the selection of the reported results. Each item included in the NHLBI Quality Assessment Tools was answered by “yes”, “no”, or “no information”. Cohort and cross-sectional studies were considered as being at a “low risk of bias” when the answer to  $\geq 13$  items was “yes”; at a “moderate risk of bias” when the answer to 10, 11, or 12 items was “yes”; and at a “high risk of bias” when the answer to  $<10$  items was “yes”. Case-control studies were considered to be at a “low risk of bias” when the answer to  $\geq 11$  items was “yes”; at a “moderate risk of bias” when the answer to 8, 9, or 10 items was “yes”; and at a “high risk of bias” when the answer to  $< 8$  items was “yes”.

## 3. Results

Figure 1 illustrates the study identification and selection process. The initial database searches yielded 1,928 records, with one additional record found through backward citation tracking. From this total, 880 duplicates were removed, leaving 1,049 unique records. From this total, 993 records were eliminated based on title and abstract, leaving 56 records to be retrieved for full-text review. During the full-text review, 18 papers were excluded for wrong language ( $n = 2$ , [58,59]), wrong publication type ( $n = 2$ , [60,61]), wrong population ( $n = 7$ , [62–68]), wrong exposure or intervention ( $n = 4$ , [69–72]), and wrong outcome ( $n = 3$ , [73–75]) (see *Supplementary Table 7*), leaving 38 papers to be included in this review. Out of this total, 10 papers reported results from the Studies of Women's Health Across the Nation (SWAN) [76–85] and five reported results from the Women's Health Initiative (WHI) studies [86–90]. Unless otherwise stated, all reported numbers and percentages are out of a total of 38 papers.

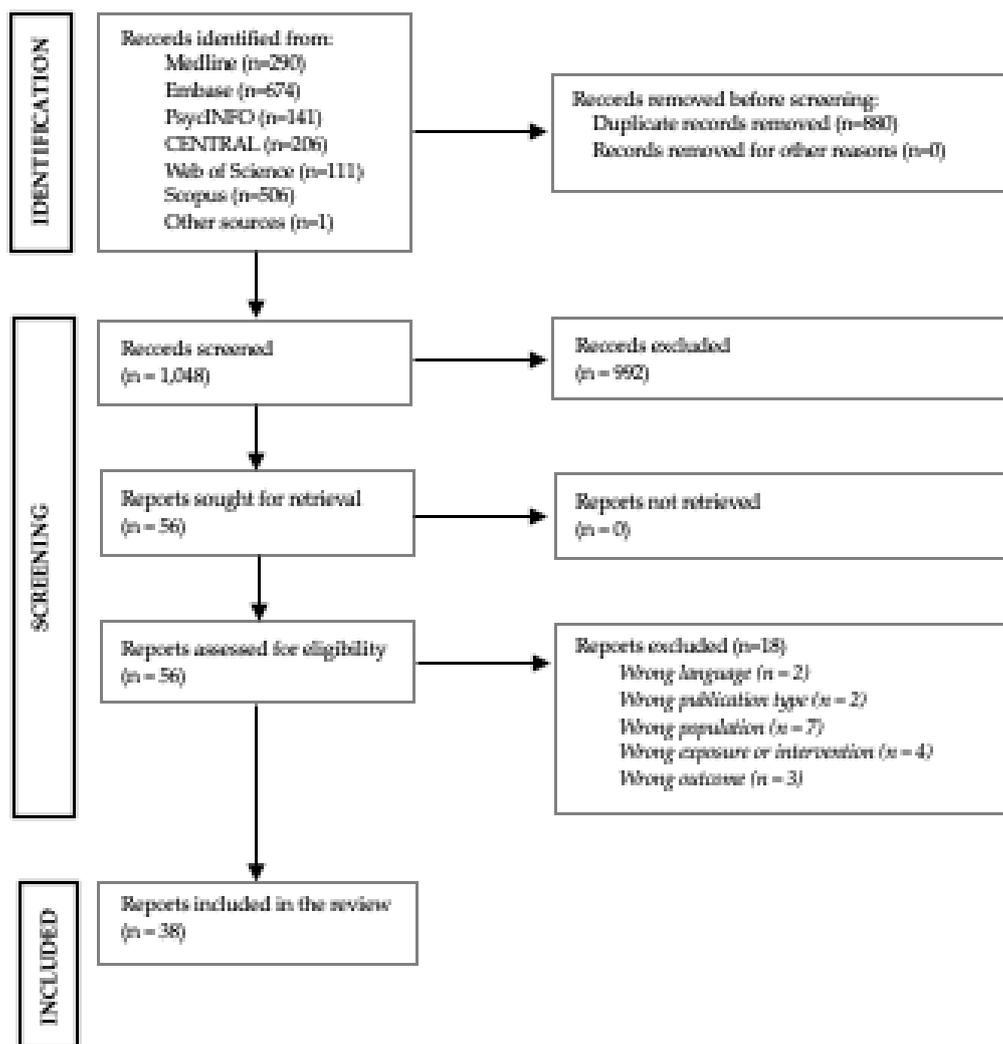


Figure 1. PRISMA flow diagram .

### 3.1. Study Characteristics

#### 3.1.1. Type of Participants

Sample sizes were [91] highly variable, with the smallest being 20 [92] and the largest 81,189 [86]. Participating women were aged between 40 and 85 years and were generally healthy. The majority of included papers reported on studies conducted among post-menopausal women (n=21, 55.2%, [86–90,93–108]), six (15.8%, [76,78–81,83]) reported on studies conducted among peri-menopausal women, six (15.8%, [92,109–113]) reported on studies conducted among peri- and post-menopausal women, and five (13.2%, [77,82–85]) reported on studies conducted among pre- and post-menopausal women.

Across all studies that included post-menopausal women, post-menopause was defined as the absence of menses for at least 12 months and women's menopause stage categorization was made based on self-reported duration since the last menses or the date of last menses [86–90,92–113]. In most studies, peri-menopause was defined as menstrual irregularities or an absence of menses for less than 12 months, accompanied by the presence of peri-menopausal symptoms (e.g., vasomotor symptoms, urogenital symptoms) [77,82–85,92,109,110,112,113]. One study determined peri-menopausal status based on women's age (45 to 55 years), as data on peri-menopausal symptoms and amenorrhea were not collected as part of the larger national survey (National Health and Nutrition Examination Survey) used for study analyses [111]. In the SWAN cohort study, early peri-

menopause was specifically defined as menstrual bleeding in the past three months accompanied by changes in cycle regularity [77,82–85].

### 3.1.2. Type of Exposures, Interventions, and Comparators

Among included papers, the most frequent nutritional exposures and interventions were nutrients and other food components (n=30, 78.9%, [76–88,92,95,96,99,101–107,109,110,112–114]), followed by dietary patterns (n=7, 18.4%, [87,90,93,94,97,98,108]), and foods and food groups (n=2, 5.3%, [100,111]). Several studies focusing on nutrients and other food components assessed intakes or provided more than one nutrient or food component as an intervention (n=7, 23.3%, [99,101–103,105,109,110]). One study focused on both nutrients and other food components, as well as dietary patterns [87].

Dietary patterns were whole-diet interventions in experimental studies (n=2, [90,108]) and dietary patterns, defined either *a priori* (n=2, [87,94]) or *a posteriori* (n=3, [93,97,98]), in observational studies. Whole-diet interventions included the low-fat diet (n=2, [90,108]) and the Dietary Approach to Stop Hypertension (DASH) (n=1, [108]). Dietary patterns defined *a priori* were the Dietary Inflammatory Index (DII) (n=1, [94]) and the glycemic index (n=1, [87]). Dietary patterns defined *a posteriori* included the Dietary Total Antioxidant Capacity (DTAC) (n=1, [93]), as well as healthy (i.e., “healthy” and “whole-plant food”) (n=2, [97]) and highly processed (i.e., “processed food”, “sweets”, and “traditional Tianjin”) (n=2, [97]) dietary patterns.

Food and food groups included legumes (n=2, [110,111]), vegetables (n=1, [110]), fruit (n=1, [110]), milk and plain yogurt (n=1, [110]), ultra-processed foods (n=1, [110]), sweet foods (n=1, [110]), sugar-sweetened beverages (n=1, [110]), and saffron (n=1, [106]).

Most frequently assessed nutrients were dietary fiber (n=6, [80,87,96,110,113]), vitamin D<sub>3</sub> (n=5, [86,89,107,110,114]), eicosapentaenoic acid (EPA) + docosahexaenoic acid (DHA) (n=4, [88,92,104,112]), magnesium (n=4, [99,102,103,110]), zinc (n=4, [99,102,103,110]), vitamin A and vitamin A precursors (n=3, [81,82,109]), vitamin E (n=3, [105,109,110]), vitamin B<sub>9</sub> (n=3, [101,109,110]), EPA (n=2, [88,104]), DHA (n=2, [88,104]), total omega-3 fatty acids (n=2, [95,110]), saturated fatty acids (SFAs) (n=2, [84,110]), trans fatty acids (TFAs) (n=2, [85,110]), vitamin B<sub>12</sub> (n=2, [101,110]), vitamin C (n=2, [83,110]), copper (n=2, [103,110]), selenium (n=2, [103,110]), total carbohydrates (n=1, [110]), added sugar (n=1, [87]), total lipids (n=1, [110]), monounsaturated fatty acids (MUFAs) (n=1, [110]), total omega-6 fatty acids (n=1, [110]), linoleic acid (n=1, [77]), oleic acid (n=1, [77]), total proteins (n=1, [110]), manganese (n=1, [79]), and curcumin (n=1, [105]).

### 3.1.3. Type of Outcomes

Depressive symptoms were assessed using various validated tools, namely the Centre for Epidemiologic Studies Depression Scale (CES-D) (n=16, [76–85,90,98,101,104,110,111]), the Beck’s Depression Inventory (BDI) (n=4, [99,102,103,114]), the 9-item Patient Health Questionnaire (PHQ) (n=3, [94,96,109]), the 8-item Burnam Scale (BS) (n=3, [88]), the 22-item Depression Anxiety Stress Scale (DASS) (n=2, [93]), the 21-item Hamilton Depression Rating Scale (HDRS) (n=1, [106]), the Montgomery–Åsberg Depression Rating Scale (MADRS) (n=1, [92]), the 20-Item Hopkins Symptoms Checklist Depression Scale (HSCL-D) (n=1, [112]), the 18-item Brief Symptom Inventory (BSI) (n=1, [107]), the Zung Self-Rating Depression Scale (ZSRDS) (n=1, [97]), the Women’s Health Questionnaire (WHQ) (n=1, [100]), the Greene Climacteric Scale (GCS) (n=1, [105]), the depression subscale of the 37-item Profile of Mood State (POMS) (n=1, [108]), and a non-reported scale (n=1, [95]). In addition to the use of a questionnaire to identify depressive symptoms, some studies considered participants taking antidepressants as having depressive symptoms (n=6, [89]), and one study used self-reported depression diagnosis as indicative of depressive symptoms [95].

### 3.1.4. Type of Study Designs

Out of the 38 studies included in this review, 29 (76.3%, [72,76–88,93–98,100–104,109–111,114]) were observational, eight (21.1%, [89,90,105–108,112,113]) were randomized-controlled trials (RCTs), and one (2.6%, [92]) was a quasi-experimental pretest-posttest NEGD study. Observational studies were cross-sectional (n=21, 72.4%, [72,76–83,93–98,100–103,109,110,114]), prospective cohort (n=7, 24.1%, [84–88,104,111]), or case-control (n=1, 3.4%, [99]) studies.

Articles included in this review were all published between 2009 and 2024. More specifically, 19 papers (50.0%, [72,76–85,94–96,103,105,109,110,113,114]), were published between 2020 and 2024, 10 papers (26.3%, [87,90,93,97–100,104,106,107]) were published between 2015 and 2019, eight papers (21.1%, [86,88,89,92,101,102,108,111]) were published between 2010 and 2014, and one paper (2.6%, [112]) was published in 2009. Over half (n=22, 57.9%, [72,76–90,92,94,96,104,107,111,112]) of included papers reported on studies conducted in North America, 10 papers (26.3%, [93,95,97–99,101,105,106,109,113]) reported on studies conducted in Asia, three papers (7.9%, [102,103,114]) reported on studies conducted in Europe, two papers (5.3%, [100,110]) reported on studies conducted in South America, and one (2.6%, [108]) reported on a study conducted in Australia.

### 3.1.5. Methodological Quality

Out of the 29 observational studies, three (10.3%, [86–88]) were at low risk of bias, five (17.2%, [84,85,96,104,111]) were at moderate risk of bias, while the remaining 21 (72.4%, [72,75–83,93–95,97–103,109,110,114]) were at high risk of bias (See *Supplementary Table 8 and 9*). Out of the nine (quasi-)experimental studies, five (55.5%, [105–107,112,113]) were at low risk of bias, while the remaining four (44.5%, [89,90,92,108]) were at high risk of bias (See *Supplementary Table 10*).

## 3.2. Study of Study Findings

### 3.2.1. Dietary Patterns

#### Healthy Dietary Patterns

The associations between healthy dietary patterns and depression were assessed in three cross-sectional studies [93,97,98] and two RCTs [90,108], all conducted among post-menopausal women. One cross-sectional study of 222 women by Abshirini et al. (2019) reported a significant negative association between DTAC and depressive symptoms [93]. Similarly, two other cross-sectional studies with sample sizes of 953 [97] and 906 [98] women, respectively, found significant negative associations between adherence to a “healthy” [97] or a “whole-plant food” [98] diet and depressive symptoms. Both RCTs provided further support for the beneficial effect of healthy dietary patterns on depressive symptoms [90,108]. Specifically, a one-year open-label RCT involving 48,834 women found that participants following a low-fat diet experienced significant reductions in depressive symptoms compared to those receiving no intervention [90]. Similarly, a 14-week open-label RCT comparing the effects of the DASH diet and a low-fat diet in a sample of 95 women found that, although no significant differences were observed between the two diets, both interventions significantly decreased depressive symptoms from pre- to post-intervention [108].

#### Unhealthy Dietary Patterns

The associations between unhealthy dietary patterns and depression were assessed in three cross-sectional studies [94,97,98] and one prospective cohort study [87], all conducted among post-menopausal women. One cross-sectional study of 393 women, Azarmanesh et al. (2022) identified a significant positive association between DII and depressive symptoms [94]. Similarly, two other cross-sectional studies, involving 953 participants [97] and 906 participants [98], respectively, reported significant positive associations between adherence to a “sweets” diet [97], a “traditional Tianjin” diet [97], a “processed food” diet [98], or an “animal food” diet [98] and depressive symptoms. Additionally, a prospective cohort study involving 87,618 women reported a significant positive association between dietary glycemic index at baseline and depressive symptoms at the three-year follow-up [87].

### 3.2.2. Food and Food Groups

The associations between foods and food groups and depressive symptoms were assessed in one cross-sectional study [100], one prospective cohort study [111], and one RCT [106]. In a cross-sectional study of 213 post-menopausal women, Noll et al. (2019) found a significant negative association between vegetable intake and depressive symptoms, while intakes of ultra-processed food, fruit, legumes, milk and plain yogurt, sugar-sweetened beverages, and sweet foods were not significantly associated with depressive symptoms [100]. Li et al.'s (2010) prospective cohort study involving 3,302 women reported a U-shaped association between legume intake and severe depressed mood among peri-menopausal women (n=1,657), but not among post-menopausal women (n=1,645) [111]. Specifically, in peri-menopausal women, moderate (1-2x/wk) legume intake was associated with a lower risk of severely depressed mood as compared to infrequent (<1x/wk) intake, while no significant differences were observed when comparing frequent (>2x/wk) and infrequent (<1x/wk) legume intake [111]. Finally, Kashani et al.'s (2018) triple-blind RCT involving 60 post-menopausal women showed that daily supplementation with 30 mg of saffron for six weeks significantly reduced depressive symptoms compared to a placebo [106].

### 3.2.3. Macronutrients

#### Total Carbohydrate Intake

The association between total carbohydrate intake and depressive symptoms was assessed in one cross-sectional study involving 1,906 peri- and post-menopausal women [110]. No significant association was observed between these variables [110].

#### Added Sugar Intake

The association between added sugar intake and depressive symptoms was investigated in one prospective cohort study of 69,954 post-menopausal women [87]. Specifically, Gangwisch et al. (2015) reported that baseline consumption of added sugars was positively associated with depressive symptoms at the three-year follow-up [87].

#### Dietary Fiber Intake

The association between dietary fiber intake and depressive symptoms was assessed in three cross-sectional studies [80,96,110], one prospective cohort study [87], and one RCT [113]. Among the cross-sectional studies conducted in peri- and post-menopausal women, two studies involving 6,060 and 393 women, respectively, found no significant associations between dietary fiber intake and depressive symptoms [80,96], while one study involving 1,906 women reported a significant negative association between these variables [110]. Similarly, Gangwisch et al.'s (2015) prospective cohort study involving 69,954 post-menopausal women observed a significant negative association between baseline dietary fiber intake and depressive symptoms at the three-year follow-up [87]. In contrast, a 6-week triple-blind RCT including 81 peri- and post-menopausal women comparing the effects of daily consumption of prebiotic-enriched yogurt to that of regular yogurt found no significant effects on depressive symptoms [113].

#### Total Fat Intake

The association between total fat intake and depressive symptoms was assessed in one cross-sectional study conducted in a sample of 1,906 peri- and post-menopausal women [110]. No significant association was observed between these variables [110].

#### MUFA Intake

The association between MUFA intake and depressive symptoms was assessed in two cross-sectional studies [77,110]. In a study involving 1,906 peri- and post-menopausal women, Oldra et al. (2020) found no significant association between total MUFA intake and depressive symptoms [110]. Conversely, in a sample of 3,305 pre- and peri-menopausal women, Li et al. (2020b) found that oleic acid and linoleic acid intakes were both positively associated with depressive symptoms, independent of menopause status [77].

#### PUFA Intake

*Total PUFA Intake:* The association between total PUFA intake and depressive symptoms was assessed in one cross-sectional study involving including 1,906 peri- and post-menopausal women [110]. No significant association was observed between these variables [110].

*Total Omega-3 PUFA Intake:* The association between total omega-3 PUFA intake and depressive symptoms was assessed in two cross-sectional studies [76,110] and one prospective cohort study [88]. In a cross-sectional study involving 1,305 peri-menopausal women, Li et al. (2020a) found a significant negative association between total omega-3 PUFA intake and depressive symptoms [76]. In contrast, in a sample of 1,906 peri- and post-menopausal women, Oldra et al. (2020) found no significant association between these variables [110]. Supporting Oldra et al. (2020) findings, in a cohort of 1,746 post-menopausal women, Persons et al. (2014) found no significant association between total omega-3 PUFA intake at study baseline and depressive symptoms at the three-year follow-up [88].

*DHA Intake:* The association between DHA intake and depressive symptoms was assessed in two prospective cohort studies conducted among post-menopausal women [88,104]. In a cohort of 1,746 women, Persons et al. (2014) found that DHA intake at study baseline was not associated with depressive symptoms at the three-year follow-up [88]. Conversely, examining data from 2,157 women, Colangelo et al. (2017) found that DHA intake at study baseline was positively associated with depressive symptoms at the three-year follow-up [104].

*EPA Intake:* The association between EPA intake and depressive symptoms was assessed in two prospective cohort studies conducted among post-menopausal women [88,104]. In a cohort of 1,746 women, Persons et al. (2014) found that EPA intake at study baseline was not associated with depressive symptoms at the three-year follow-up [88]. Conversely, examining data from 2,157 women, Colangelo et al. (2017) found that DHA intake at study baseline was positively associated with depressive symptoms at the three-year follow-up [104].

*DHA+EPA Intake:* The association between DHA+EPA intake and depressive symptoms was assessed in two prospective cohort studies [88,104], one quasi-experimental pretest-posttest NEGD study [92], and one RCT [112]. In a cohort of 1,746 women, Persons et al. (2014) found that DHA+EPA intake at study baseline was negatively associated with depressive symptoms at the three-year follow-up [88]. Conversely, examining data from 2,157 women, Colangelo et al. (2017) found that DHA+EPA intake at study baseline was positively associated with depressive symptoms at the three-year follow-up [104]. In a one quasi-experimental pretest-posttest NEGD study involving 20 peri- and post-menopausal women, Freeman et al. (2011) observed significant reductions in depressive symptoms following eight weeks of daily supplementation with DHA (375 mg) and EPA (465 mg) [92]. Similarly, in a 8-week RCT involving 120 peri- and post-menopausal women, Lucas et al. (2009) found that daily supplementation with DHA (150 mg) and EPA (1,005 mg) was associated with a significantly greater reduction in depressive symptoms compared to placebo, but this effect was only evident when analyses were restricted to women without a major depressive episode at baseline, who comprised approximately 75% of the study sample [112].

*Total Omega-6 PUFA Intake:* The association between total omega-3 PUFA intake and depressive symptoms was assessed in one cross-sectional study involving 1,906 peri- and post-menopausal women [110]. No significant association was observed between these variables [110].

#### SFA Intake

The association between SFA intake and depressive symptoms was assessed in one cross-sectional study [110] and one prospective cohort study [84], both conducted in peri- and post-menopausal women. In a cross-sectional study involving 1,906 women, Oldra et al. (2020) found no significant association between these two variables [110]. Conversely, in a cohort of 1,579 women, Li et al. (2020f) found that SFA intake at study baseline was positively associated with depressive symptoms at the four-year follow-up, independent of menopause status [84].

#### TFA Intake

The association between TFA intake and depressive symptoms was assessed in one cross-sectional study [78] and one prospective cohort study [85]. In a cross-sectional study involving 1,416

peri-menopausal women, Li et al. (2020c) found no significant association between these two variables [78]. Conversely, in a cohort of 3,004 pre- and peri-menopausal women, Li et al. (2020g) found that TFA intake at study baseline was positively associated with depressive symptoms at the five-year follow-up, independent of menopause status [85].

#### Total Protein Intake

The association between total protein intake and depressive symptoms was assessed in one cross-sectional study involving 1,906 peri- and post-menopausal women [110]. No significant association was observed between these variables [110].

### 3.2.4. Micronutrients

#### Vitamin A and Vitamin A Precursors Intake or Plasma Levels

The association between plasma vitamin A levels, provitamin A intake, and  $\beta$ -carotene intake were assessed in one cross-sectional study involving 1,770 peri- and postmenopausal women [109], in one cross-sectional study involving 3,054 pre- and peri-menopausal women [83], and in one cross-sectional study involving 1,400 peri-menopausal women [81], respectively. All three studies observed no significant associations between the dietary variables and depressive symptoms [81,82,109].

#### Vitamin C Intake

The association between vitamin C intake and depressive symptoms was assessed in two cross-sectional studies [83,110]. In a sample of 1,906 peri- and post-menopausal women, Oldra et al. (2020) found a negative association vitamin C intake and depressive symptoms [110]. Similarly, assessing a sample of 3,043 pre- and peri-menopausal women, Li et al. (2022b) found that vitamin C intake was negatively associated with depressive symptoms, independent of menopause status [83].

#### Vitamin D<sub>3</sub> Intake or Status

The association between vitamin D<sub>3</sub> intake or status and depressive symptoms was assessed in two cross-sectional studies [110,114], one prospective cohort study [86], and two RCTs [89,107]. For studies with cross-sectional designs, Oldra et al. (2020) found a negative association between vitamin D<sub>3</sub> intake and depressive symptoms in a sample of 1,906 peri- and post-menopausal women [110], while Kostecka et al. (2022) found no significant association between vitamin D<sub>3</sub> status and depressive symptoms in a sample of 56 peri-menopausal women [114]. Supporting Oldra et al. (2020) findings, Bertone-Johnson et al. (2011) observed, in a cohort study of 81,189 post-menopausal women, a negative association between vitamin D<sub>3</sub> intake at study baseline and depressive symptoms at the three-year [86]. However, two triple-blind RCTs assessing daily supplementation with 1,000 IU of vitamin D<sub>3</sub> for three years [89] and daily supplementation with 2,000 IU of vitamin D<sub>3</sub> for one year [107] in samples of 36,282 and 218 post-menopausal women, respectively, reported no significant effects on depressive symptoms compared to placebo.

DIET-RELATED VARIABLE	ASSOCIATION DIRECTION
<b>DIETARY PATTERNS</b>	
HEALTHY DIETARY PATTERNS	
UNHEALTHY DIETARY PATTERNS	
<b>FOOD AND FOOD GROUPS</b>	
VEGETABLES	
FRUIT	
LEGUMES	 
MILK AND PLAIN YOGOURT	
ULTRA-PROCESSED FOODS	
SWEET FOODS	
SUGAR-SWEETENED BEVERAGES	
SAFFRON	
<b>NUTRIENTS</b>	

<i>MACRONUTRIENTS</i>	
TOTAL CARBOHYDRATES	⊗
ADDED SUGAR	+
DIETARY FIBER	⊖ ⊗ ⊗ ⊗ ⊗
TOTAL FAT	⊗
MUFAs	⊗
PUFAs	⊗
OMEGA-3 PUFAs	⊖ ⊗ ⊗
DHA	+ ⊗
EPA	+ ⊗
DHA + EPA	⊖ ⊖ ⊖ ⊗
OMEGA-6 PUFAs	⊗
SATURATED FATTY ACIDS	+ ⊗
TRANS FATTY ACIDS	+ ⊗
TOTAL PROTEIN	⊗
<i>VITAMINS</i>	
VITAMIN A PRECURSORS	⊗ ⊗ ⊗
VITAMIN C	⊖ ⊖
VITAMIN D <sub>3</sub>	⊖ ⊗ ⊗ ⊗ ⊗
VITAMIN E	⊗ ⊗
VITAMIN B <sub>6</sub>	⊗
VITAMIN B <sub>9</sub>	⊗ ⊗
VITAMIN B <sub>12</sub>	⊖ ⊗
<i>MINERALS</i>	
MAGNESIUM	⊖ ⊖ ⊖ ⊗
ZINC	⊖ ⊖ ⊖ ⊗
COPPER	⊗
SELENIUM	⊗
MANGANESE	⊗
<b>OTHER FOOD COMPONENTS</b>	
CURCUMIN	⊗

**Figure 2.** Summary of the direction and significance of associations between dietary-related variables and depressive symptoms among peri- and post-menopausal women. Each icon represents one paper. ⊗ (full circles) represent cross-sectional studies, ⊗ (empty circles) represent prospective cohort studies, and ⊗ (full squares) represent experimental studies. The colours green, red and blue indicate negative (-), positive (+), and null (x) associations, respectively.

#### Vitamin E Intake or Plasma Levels

The association between plasma vitamin E levels or intake and depressive symptoms was assessed in one cross-sectional study involving 1,770 peri- and postmenopausal women [109] and one triple-blind RCT involving 81 post-menopausal women [105]. In their cross-sectional study, Lee et al. (2023) reported no significant association between plasma vitamin E levels and depressive symptoms [109]. Similarly, in their triple-blind RCT of daily supplementation with 1,000 mg of vitamin E for a 8-week period, Farshbaf-Khalili et al. (2022) observed no significant effect of the intervention as compared to placebo [105].

#### Vitamin B<sub>6</sub> Intake

The association between vitamin B<sub>6</sub> intake and depressive symptoms was assessed in one cross-sectional study involving 1,906 peri- and post-menopausal women [110]. No significant association was observed between these variables [110].

#### Vitamin B<sub>9</sub> Intake or Plasma/Serum Levels

The association between vitamin B<sub>9</sub> intake and depressive symptoms was assessed in one cross-sectional study involving 1,906 peri- and post-menopausal women [110], while the association between plasma vitamin B<sub>9</sub> levels and depressive symptoms was assessed in one cross-sectional study involving 1,770 peri- and post-menopausal women [109] and one cross-sectional study involving 96 post-menopausal women [101]. All three studies observed no significant associations between the dietary variables and depressive symptoms [101,109,110].

#### Vitamin B<sub>12</sub> Intake or Plasma Levels

The association between vitamin B<sub>12</sub> intake and depressive symptoms was assessed in one cross-sectional study involving 1,906 peri- and post-menopausal women [110], while the association between plasma vitamin B<sub>12</sub> levels and depressive symptoms was assessed in one cross-sectional study involving 96 post-menopausal women [101]. While Oldra et al. (2020) found a negative association between vitamin B<sub>12</sub> intake and depressive symptoms [110], Lee et al. (2023) observed no significant associations between plasma vitamin B<sub>12</sub> levels and depressive symptoms [101].

#### Magnesium Intake or Plasma/Serum Levels

The association between magnesium intake and depressive symptoms was assessed in one cross-sectional study involving 1,906 peri- and post-menopausal women [110], while the association between magnesium plasma or serum levels and depressive symptoms was assessed in two cross-sectional studies involving 323 [102] and 298 [103] post-menopausal women, respectively, and one case-control study involving 171 [99] post-menopausal women. Oldra et al. (2020) reported a significant negative association between magnesium intake and depressive symptoms [110]. Similarly, Stanislawska et al. (2014) [102] and Nazari et al. (2019) [99] also both found negative association between plasma or serum magnesium levels and depressive symptoms. In contrast, Wieder-Huszla et al. (2020) found no significant association between serum magnesium levels and depressive symptoms [103].

#### Zinc Intake or Plasma/Serum Levels

The association between zinc intake and depressive symptoms was assessed in one cross-sectional study involving 1,906 peri- and post-menopausal women [110], while the association between plasma or serum zinc levels and depressive symptoms was assessed in two cross-sectional studies involving 323 [102] and 298 [103] post-menopausal women, respectively, and one case-control study involving 171 [99] post-menopausal women. Oldra et al. (2020) reported a significant negative association between zinc intake and depressive symptoms [110]. Similarly, Stanislawska et al. (2014) [102] and Nazari et al. (2019) [99] also both found negative association between plasma or serum zinc levels and depressive symptoms. In contrast, Wieder-Huszla et al. (2020) found no significant association between serum zinc levels and depressive symptoms [103].

**Table 2.** Study characteristics and findings summary from cross-sectional (n=21) and case-control\* (n=1) studies on diet and depressive symptoms in peri- and post-menopausal women.

Authors (year) Country	Population	Exposure	Outcome	Statistical adjustments	Results	RoB
Abshirini et al. (2019) [93] Iran	n=175 Post-MP	DTAC <u>Method:</u> FFQ (147 items) and PCA	Depressive symptoms <u>Method:</u> DASS-42	SEC; MPS	• DTAC was negatively associated with depressive symptoms ( $\beta=-0.11$ , $p=0.03$ ).	9/15 
Azarmanesh et al. (2022) [94] United States	n=2,392 Post-MP	DII <u>Method:</u> 24h dietary recall and DII	Depressive symptoms <u>Method:</u> PHQ-9	SEC; Anthropometrics; Health behaviors	• DII was positively associated with depressive symptoms (Q4 vs. Q1, OR: 2.1, 95%CI: 1.1–4.3).	9/15 

Chae et al. (2021) [95] <i>South Korea</i>	n=4,150 Post-MP	Omega-3 PUFA intake <u>Method:</u> 24h dietary recall	Depression dx or symptoms <u>Method:</u> Dx or NR questionnaire	SEC; Anthropometrics; Health behaviors; Diet	<ul style="list-style-type: none"> <li>Omega-3 PUFA intake was negatively associated with depression dx or symptoms (Q5 vs. Q1, OR: 0.52, 95%CI: 0.33–0.83).</li> </ul>	9/15 
Kim et al. (2021) [96] <i>United States</i>	n=2,858 Post-MP	Dietary fiber intake <u>Method:</u> 24h dietary recall	Depressive symptoms <u>Method:</u> PHQ-9	SEC; Anthropometrics; Health behaviors; Chronic diseases	<ul style="list-style-type: none"> <li>Dietary fiber intake was not associated with depressive symptoms.</li> </ul>	10/15 
Kostecka et al. (2022) [114] <i>Poland</i>	n=191 Peri-MP	Vit. D <sub>3</sub> status <u>Method:</u> NR	Depressive symptoms <u>Method:</u> BDI	None reported	<ul style="list-style-type: none"> <li>Vit. D<sub>3</sub> status was not associated with depressive symptoms.</li> </ul>	8/15 
Lee et al. (2023) [109] <i>South Korea</i>	n=1,770 Peri/Post-MN	Vit. B <sub>9</sub> , A and E serum levels <u>Method:</u> NR	Depressive symptoms <u>Method:</u> PHQ-9	SEC; Health behaviors	<ul style="list-style-type: none"> <li>Vit. B<sub>9</sub>, A and E serum levels were not associated with depressive symptoms.</li> </ul>	9/15 
Li et al. (2020a) [76] <i>United States</i>	n=1,406 Peri-MN	Omega-3 PUFA intake <u>Method:</u> FFQ (103 items)	Depressive symptoms <u>Method:</u> CES-D	SEC; Anthropometrics; Health behaviors; Diet; SH	<ul style="list-style-type: none"> <li>Omega-3 PUFA intake was negatively associated with depressive symptoms (Q4 vs. Q1, OR: 0.06, 95%CI: 0.01–0.46).</li> </ul>	9/15 
Li et al. (2020b) [77] <i>United States</i>	n=2,793 Pre/peri-MN	Oleic and linoleic acid intakes <u>Method:</u> FFQ (103 items)	Depressive symptoms <u>Method:</u> CES-D	SEC; MPS; Anthropometrics; Health behaviors	<ul style="list-style-type: none"> <li>Oleic (Q4 vs. Q1, OR: 2.00, 95%CI: 1.30–3.06) and linoleic (Q4 vs. Q1, OR: 1.59, 95%CI: 1.05–2.42) acid intakes were positively associated with depressive symptoms, even when adjusted for MPS.</li> </ul>	9/15 
Li et al. (2020c) [78] <i>United States</i>	n=1,403 Peri-MN	TFA intake <u>Method:</u> FFQ (103 items)	Depressive symptoms <u>Method:</u> CES-D	SEC; Anthropometrics; Health behaviors; Diet	<ul style="list-style-type: none"> <li>TFA intake was not associated with depressive symptoms.</li> </ul>	9/15 
Li et al. (2020d) [79] <i>United States</i>	n=1,359 Peri-MN	Mn intake <u>Method:</u> FFQ (103 items)	Depressive symptoms <u>Method:</u> CES-D	SEC; Anthropometrics; Health behaviors; Diet; VMS	<ul style="list-style-type: none"> <li>Mn intake was not associated with depressive symptoms.</li> </ul>	9/15 
Li et al. (2020e) [80] <i>United States</i>	n=1,403 Peri-MN	Dietary fiber intake <u>Method:</u> FFQ (103 items)	Depressive symptoms <u>Method:</u> CES-D	SEC; Anthropometrics; Health behaviors; Diet; SH	<ul style="list-style-type: none"> <li>Dietary fiber intake was not associated with depressive symptoms.</li> </ul>	9/15 
Li et al. (2021) [81] <i>United States</i>	n=1,400 Peri-MN	β-carotene intake <u>Method:</u> FFQ (103 items)	Depressive symptoms <u>Method:</u> CES-D	SEC; Anthropometrics; Health behaviors; Diet; SH, VMS	<ul style="list-style-type: none"> <li>β-carotene intake was not associated with depressive symptoms.</li> </ul>	9/15 
Li et al. (2022a) [82]	n=3,054	Provit. A intake	Depressive symptoms	SEC; Anthropometrics;	<ul style="list-style-type: none"> <li>Provit. A intake was not associated with</li> </ul>	9/15 

United States	Pre/peri-MN	<u>Method:</u> FFQ (103 items)	<u>Method:</u> CES-D	Health behaviors; Diet; SH	depressive symptoms, even when adjusted for MPS.	
Li et al. (2022b) [83] United States	n=3,088 Pre/peri-MN	Vit. C intake <u>Method:</u> FFQ (103 items)	Depressive symptoms <u>Method:</u> CES-D	SEC; Health behaviors; Diet; Chronic diseases	<ul style="list-style-type: none"> <li>Vit. C intake was negatively associated with depressive symptoms (OR: 0.70, 95%CI: 0.52–0.93), even when adjusted for MPS.</li> </ul>	9/15 ●
Liao et al. (2019) [97] China	n=2,051 Post-MP	Dietary patterns <i>a posteriori</i> <u>Method:</u> FFQ (100 items) and PCA	Depressive symptoms <u>Method:</u> ZSRDS	SEC; Health behaviors; Diet; Chronic diseases	<ul style="list-style-type: none"> <li>The “healthy” dietary pattern was negatively associated with depressive symptoms (Q4 vs. Q1, OR: 0.57, 95%CI: 0.33–0.97).</li> <li>The “sweets” (Q4 vs. Q1, OR: 1.66, 95%CI: 1.03–2.71) and “traditional Tianjin” (Q4 vs. Q1, OR: 2.53, 95%CI: 1.58–4.16) dietary pattern were positively associated with depressive symptoms.</li> </ul>	9/15 ●
Liu et al. (2016) [98] China	n=1,125 Post-MP	Dietary patterns <i>a posteriori</i> <u>Method:</u> FFQ (85 items) and PCA	Depressive symptoms <u>Method:</u> CES-D	SEC; Health behaviors; Diet; Chronic diseases	<ul style="list-style-type: none"> <li>The “whole-plant food” processed food dietary pattern was positively associated with depressive symptoms (T3 vs. T1, OR: 1.79, 95%CI: 1.18–2.72).</li> <li>The “processed food” dietary pattern was positively associated with depressive symptoms (T3 vs. T1, OR: 1.79, 95%CI: 1.18–2.72).</li> <li>The “animal food” dietary pattern was not associated with depressive symptoms.</li> </ul>	9/15 ●
Nazari et al. (2019)* [99] Iran	n=136 Post-MP	Mg and Zn serum levels <u>Method:</u> AAS	Depressive symptoms <u>Method:</u> BDI	NR	<ul style="list-style-type: none"> <li>Zn (OR: 0.97, 95%CI: 0.96–0.99) and Mg (OR: 0.30, 95%CI: 0.15–0.61) serum levels were negatively associated with depressive symptoms.</li> </ul>	7/15 ●
Noll et al. (2019) [100]	n=225 Post-MP	Intake of 7 food groups	Depressive symptoms	SEC; MPS	<ul style="list-style-type: none"> <li>Vegetable intake was negatively</li> </ul>	9/15 ●

<i>Brazil</i>			<u>Method:</u> 24h dietary recall	<u>Method:</u> WHQ		associated with depressive symptoms (T2-3 vs. T1, PR: 0.65, 95%CI: 0.43–0.98). <ul style="list-style-type: none"> <li>Ultra-processed food, sweet food, sugar sweetened beverage, fruit, legume, and milk and plain yogurt intakes were not associated with depressive symptoms.</li> </ul>
Oldra et al. (2020) [110] <i>Brazil</i>	n=400 Peri/post-MP	Intake of 19 nutrients <u>Method:</u> 3d food diary	Depressive symptoms <u>Method:</u> CES-D	NR		9/15 <ul style="list-style-type: none"> <li>Dietary fiber, PUFA, Mg, Zn, vit. C, D<sub>3</sub>, and B<sub>12</sub> intakes were negatively associated with depressive symptoms (p&lt;0.05).</li> <li>Carbohydrate, protein, lipid, SFA, MUFA, omega-3 and omega-6 PUFA, Se, vit. B<sub>6</sub> and B<sub>9</sub> intakes were not associated with depressive symptoms.</li> </ul>
Sengul et al. (2014) [101] <i>Turkey</i>	n=96 Post-MP	Serum vit. B <sub>9</sub> and B <sub>12</sub> levels <u>Method:</u> Autoanalyzer	Depressive symptoms <u>Method:</u> CES-D	NR		7/15 <ul style="list-style-type: none"> <li>Serum vit. B<sub>9</sub> and B<sub>12</sub> levels did not differ between women with and without depressive symptoms.</li> </ul>
Stanislawska et al. (2014) [102] <i>Pomeranian region</i>	n=171 Post-MN	Plasma Mg and Zn levels <u>Method:</u> AAS	Depressive symptoms <u>Method:</u> BDI	NR		7/15 <ul style="list-style-type: none"> <li>Mg plasma levels were lower in women with mild depressive symptoms than women without (p&lt;0.05).</li> <li>Zn plasma levels were lower in women with moderate depressive symptoms than women without (p&lt;0.05).</li> </ul>
Wieder-Huszla et al. (2020) [103] <i>Pomeranian region</i>	n=102 Post-MP	Mg, Zn, Cu, and Se serum levels <u>Method:</u> Mannovette system	Depressive symptoms <u>Method:</u> BDI-II	NR		7/15 <ul style="list-style-type: none"> <li>Mg, Zn, Cu, and Se serum levels were not associated with depressive symptoms.</li> </ul>

\*Case-control study. AAS: Atomic Absorption Spectrometry; BDI: Beck's Depression Inventory; CES-D: Centre for Epidemiologic Studies Depression Scale; CI: Confidence Interval; Cu: Copper; D: Day; DII: Dietary Inflammatory Index; DASS: Depression Anxiety Stress Scale; DTAC: Dietary Total Antioxidant Capacity; Dx: Diagnosis; FFQ: Food Frequency Questionnaire; h: Hour(s); MRS: Menopause Rating Scale; Mg: Magnesium; Mn: Manganese; MP: Menopause; MPS: Menopausal Symptoms; MRS: Menopause Rating Scale; MUFA(s): Monounsaturated Fatty Acid(s); NR: Non/Not/None Reported; OR: Odds Ratio; ORAC: Oxygen Radical

Absorbance Capacity; Mn: Manganese; PCA: Principal Component Analysis; PHQ: Patient Health Questionnaire; PR: Prevalence Ratio; PUFA(s): Polyunsaturated Fatty Acid(s); Q(1-4): Quartile 1-4; Q(1-5): Quintile 1-5; SFA(s): Risk of Bias; Se: Selenium; SEC: Socioeconomic Characteristics; SFA(s): Saturated Fatty Acid(s); SH: Sex Hormones; T(1-3): Tertile 1-3; TFA(s): Trans Fatty Acid(s); Vit: Vitamin; VMS: Vasomotor Symptoms; Vs: Versus; WHQ: Women Health Questionnaire; Zn: Zinc; ZSRDS: Zung Self-Rating Depression Scale.

**Table 3.** Study characteristics and findings summary from prospective cohort studies (n=7) on diet and depressive symptoms in peri- and post-menopausal women.

Authors (year) Country	Population	Exposure	Outcome	Statistical adjustments	Results	RoB
Bertone- Johnson et al. (2011) [86] United States Study duration: 3 y	n=81,189 Post-MP	Vit. D <sub>3</sub> intake Method: FFQ (122 items)	Depressive symptoms	SEC; Anthropometrics; Health behaviors; HT use; Diet; Chronic diseases; Solar irradiance	<ul style="list-style-type: none"> <li>Compared to vit. D<sub>3</sub> intakes &lt; 100 IU, vit. D<sub>3</sub> intakes ≥ 400 IU and &lt; 800 IU were associated with a lower risk of depressive symptoms (OR: 0.88, 95%CI: 0.79–0.97).</li> </ul>	13/15 ●
Colangelo et al. (2017) [104] United States Study duration: 3.2 y	n=1,616 Post-MP	DHA, EPA, and DHA+EPA intakes Method: FFQ (120 items)	Depressive symptoms	SEC; Anthropometrics; Health Behaviors; Diet; Chronic Diseases	<ul style="list-style-type: none"> <li>DHA (Q4 vs. Q1, RR: 2.39, 95%CI: 1.45–3.39), EPA (Q4 vs. Q1, RR: 2.10, 95%CI: 1.27–3.48), and EPA+DHA (Q4 vs. Q1, RR: 2.04, 95%CI: 1.24–3.37) intakes were positively associated with depressive symptoms.</li> </ul>	12/15 ●
Gangwisch et al. (2015) [87] United States Study duration: 3 y	n=69,954 Post-MP	Dietary glycemic index Added sugar intake Dietary fiber intake Method: FFQ (145 items)	Depressive symptoms	SEC; Anthropometrics; Health behaviors; Social support; Stressful life events; HT use; Diet; Chronic diseases	<ul style="list-style-type: none"> <li>Dietary glycemic index (Q5 vs. Q1, OR: 1.22, 95%CI: 1.09–1.37) and added sugar intake (Q5 vs. Q1, OR: 1.23, 95%CI: 1.07–1.41) were positively associated with depressive symptoms.</li> <li>Dietary fiber intake was negatively associated with depressive symptoms (Q5 vs. Q1, OR: 0.86, 95%CI: 0.76–0.98).</li> </ul>	13/15 ●
Li et al. (2010) [102,111] United States Study duration: 10.6 y	n=1,005 Peri/Post-MP	Weekly legume intake Method: FFQ	Severe depressed mood	SEC; Anthropometrics; Health behaviors; Diet; Food Allergies; Chronic diseases	<ul style="list-style-type: none"> <li>In peri-MP women, only moderate (1-2x/wk) vs. infrequent (&lt;1x/wk) legume intake was associated with a lower risk of severe</li> </ul>	12/15 ●

					depressed mood (RR: 0.52, 95%CI: 0.27–1.00). • In post-MP women, weekly legume consumption was not associated with severe depressed mood.	
Li et al. (2020f) [84] United States Study duration: 5 y	n=2,376 Pre/Post-MP	SFA intake Method: FFQ (103 items)	Depressive symptoms Method: CES-D	SEC; Anthropometrics; Health behaviors; Chronic stress; AD use; Diet; VMS; SH	SFA intake was positively associated with depressive symptoms (Q4 vs. Q1, OR: 2.61, 95%CI: 1.15 – 5.93), even when adjusted for MPS.	12/15 
Li et al. (2020g) [85] United States Study duration: 5 y	n=2,376 Pre/Post-MP	TFA intake Method: FFQ (103 items)	Depressive symptoms Method: CES-D	Anthropometrics; Health behaviors; Chronic stress; AD use; Diet; SH	TFA intake was positively associated with depressive symptoms (Q4 vs. Q1, OR: 1.64, 95%CI: 1.09–2.47), even when adjusted for MPS.	12/15 
Persons et al. (2014) [88] United States Study duration: 3 y	n=7,066 Post-MP	Omega-3 PUFA intake DHA, EPA, DHA+EPA intakes RBC omega-3 PUFAs, DHA, and EPA Methods: FFQ (120 items; intake) NR (RBC)	Depressive symptoms Method: 8-BS/AD use	SEC; Health behaviors; HT use; Bilateral oophorectomy; Chronic diseases	Omega-3 PUFA, DHA, and EPA intakes were not associated with depressive symptoms. • DHA+EPA intakes were negatively associated with depressive symptoms (T3 vs. T1, OR: 0.71, 95%CI: 0.50–0.99). • RBC omega-3 PUFA, DHA, EPA, and DHA+EPA levels were not associated with depressive symptoms.	13/15 

AD: Antidepressant; BS: Burnam Scale; CES-D: Centre for Epidemiologic Studies Depression Scale; CI: Confidence Interval; DHA: Docosahexaenoic Acid; EPA: Eicosapentaenoic Acid eicosapentaenoic; FFQ: Food Frequency Questionnaire; HT: Hormone Therapy; IU: International Units; MP: Menopause; MPS: Menopausal Status; OR: Odds Ratio; PUFA(s): Polyunsaturated Fatty Acid(s); Q(1-4): Quartile 1-4; RBC: Red Blood Cell; RoB: Risk of bias; RR: Risk Ratio; SEC: Socioeconomic Characteristics; SH: Sex Hormones; SFA(s): Saturated Fatty Acid(s); T(1-3): Tertile; TFA(s): Trans Fatty Acid(s); Vit(s): Vitamin(s); VMS: Vasomotor Symptoms; Vs: Versus; Wk: Week; Y: Year(s).

**Table 4.** Study characteristics and findings summary from (quasi)-experimental studies (n=9) on diet and depressive symptoms in peri- and post-menopausal women.

Authors (year) Country	Study design	Population	Interventions		Outcome	Results	RoB
			Experimental	Control			

Assaf et al. (2016) [90] <i>United States</i>	Open-label RCT <b>Duration:</b> 1 y n=48,834	Post-MP	Low-fat diet	No intervention	Depressive symptoms <u>Method:</u> Modified CES-D	<ul style="list-style-type: none"> <li>The low-fat diet (vs. no intervention) significantly decreased depressive symptoms (MD: 0.07, 95%CI: 0.02 – 0.12).</li> </ul>	High 
Bertone-Johnson et al. (2012) [89] <i>United States</i>	TB-RCT <b>Duration:</b> 3 y n=36,282	Post-MP	Daily vit. D <sub>3</sub> (400 IU) + Ca (1,000 mg) supplement capsules	Placebo capsule	Depressive symptoms <u>Method:</u> 8-BS/AD use	<ul style="list-style-type: none"> <li>No significant difference was observed between the effects of the experimental and the control interventions.</li> </ul>	High 
Farshbaf-Khalili et al. (2022) [105] <i>Iran</i>	TB-RCT <b>Duration:</b> 8 wks n=81	Post-MP	<u>Experimental intervention #1:</u> Daily curcumin (1,000 mg) supplement capsules  <u>Experimental intervention #2:</u> Daily vit. E (1,000 mg) supplement capsules	Placebo capsule	Depressive symptoms <u>Method:</u> GCS	<ul style="list-style-type: none"> <li>While all interventions decreased depressive symptoms from pre- to post-intervention, no significant differences were observed between their individual effects.</li> </ul>	Low 
Freeman et al. (2011) [92] <i>United States</i>	Pre-Post NEGD <b>Duration:</b> 8 wks n=20	Peri/Post-MP	Daily ethyl-DHA (375 mg) + EPA (465 mg) supplement capsules	None	Depressive symptoms <u>Method:</u> MADRS	<ul style="list-style-type: none"> <li>The intervention decreased depressive symptoms from pre- to post-intervention (MD: -12.0, SD: 8.3, p&lt;0.0001).</li> </ul>	High 
Kashani et al. (2018) [106] <i>Iran</i>	DB-RCT <b>Duration:</b> 6 wks n=56	Post-MP	Daily saffron (30 mg) supplement capsules	Placebo capsule	Depressive symptoms <u>Method:</u> HDRS	<ul style="list-style-type: none"> <li>The experimental intervention (vs. control) significantly decreased depressive symptoms (SMD: 19.6, 95%CI: 9.00–30.28, p=0.001).</li> </ul>	High 
Lucas et al. (2009) [112] <i>Canada</i>	TB-RCT <b>Duration:</b> 8 wks n=120	Peri/Post-MP	Daily ethyl-DHA (150 mg) + EPA (1,005 mg) supplement capsules	Placebo capsule	Depressive symptoms <u>Method:</u>	<ul style="list-style-type: none"> <li>The experimental intervention (vs. control) significantly</li> </ul>	Low 

					HSCL-D-2 and HDRS-21	decreased depressive symptoms when assessed with the HSCL-D-20 (SMD: -0.85 vs. -0.50 with placebo, $p<0.05$ ) and the HDRS-21 (SMD: -0.74 vs. -0.38 with placebo, $p<0.05$ ). These effects were however restricted to women without a major depressive episode at baseline (n=91).	
Mason et al. (2016) [107] <i>United States</i>	TB-RCT <b>Duration:</b> 1 y n=218	Post-MP	Daily vit. D <sub>3</sub> (2,000 IU) supplement capsules	Placebo capsule	Depressive symptoms <u>Method:</u> BSI-18	<ul style="list-style-type: none"> <li>No significant difference was observed between the effects of the experimental and the control interventions.</li> </ul>	Low 
Shafie et al. (2022) [73] <i>Iran</i>	TB-RCT <b>Duration:</b> 6 wks n=60	Peri/Post-MP	Prebiotic-enriched yoghurt	Regular yoghurt placebo	Depressive symptoms <u>Method:</u> DASS-21	<ul style="list-style-type: none"> <li>No significant difference was observed between the effects of the experimental and the control interventions.</li> </ul>	Low 
Torres et al. (2012) [108] <i>Australia</i>	Open-label RCT <b>Duration:</b> 14 wks n=95	Post-MP	<u>Experimental intervention #1:</u> DASH diet <u>Experimental intervention #2:</u> Low-fat diet	None	Depressive symptoms <u>Method:</u> 37-item POMS	<ul style="list-style-type: none"> <li>Both the DASH diet (MD: -1.1, SEM: 0.8, <math>p&lt;0.01</math>) and the low-fat diet (MD: -0.6, SEM: 0.4, <math>p&lt;0.01</math>) decreased depressive symptoms from pre- to post-intervention, but no significant difference was observed between their individual effects.</li> </ul>	High 

AD: Antidepressant; BS: Burnam Scale; BSI: Brief Symptom Inventory; Ca: Calcium; CES-D: Centre for Epidemiologic Studies Depression Scale; CI: Confidence Interval; DASH: Dietary Approach to Stop Hypertension; DASS: Depression Anxiety Stress Scale; DB-RCT: Double-Blind Randomized Controlled Trial;

DHA: Docosahexaenoic Acid; EPA: Eicosapentaenoic Acid; Exp.: Experimental Intervention; GCS: Greene Climacteric Scale; HDRS: Hamilton Depression Rating Scale; HSCL: Hopkins Symptoms Checklist Depression Scale; IU: International Units; MADRS: Montgomery-Åsberg Depression Rating Scale; MD: Mean Difference; MP: Menopause; NEGD: Non-Equivalent Groups Design; POMS: Profile of Mood State; RoB: Risk of Bias; RT: Randomized Trial; SD: Standard Deviation; SEM: Standard Error of the Mean; SMD: Standard Mean Difference; TB-RCT: Triple-Blind Randomized Controlled Trial; Vit(s): Vitamin(s); Wk(s); Week(s); Y: Year(s).Selenium Intake or Plasma Levels.

The association between selenium intake and depressive symptoms was assessed in one cross-sectional involving 1,906 peri- and post-menopausal women, which found no significant results [110]. Similarly, no significant results were found when the association between plasma selenium levels and depressive symptoms was assessed in a cross-sectional involving 298 post-menopausal women [101].

#### Copper Serum Levels

The association between serum copper levels and depressive symptoms was assessed in one cross-sectional study involving 298 post-menopausal women [103]. No significant association was observed between these variables [103].

#### Manganese Intake

The association between manganese intake and depressive symptoms was assessed in one cross-sectional study involving 1,359 early peri-menopausal women [78]. No significant association was observed between these variables [78].

### 3.2.5. Other Food Components

#### Curcumin

The effect of daily supplementation with 1,000 mg of curcumin for a 8-week period on depressive symptoms was examined in one triple-blind RCT conducted in a sample of 81 post-menopausal women [105]. The results showed no significant difference between the curcumin and the placebo groups [105].

## 4. Discussion

### 4.1. Summary of Study Findings

This scoping review identified and synthesized currently available evidence on the association between diet and depression in peri- and post-menopausal women. A total of 38 studies were included, encompassing both observational and interventional designs. Most studies were either cross-sectional or cohort in nature and published within the past decade. These studies primarily explored the relationship between dietary patterns, nutrient intake, or specific foods and depressive symptoms. A smaller number of RCTs evaluated the effects of nutritional interventions.

A consistent pattern emerged across the literature: adherence to “*healthy*” dietary patterns, characterized by higher intakes of fruits, vegetables, whole grains, and lean proteins, was associated with a lower risk of depressive symptoms, while “*unhealthy*” dietary patterns, characterized by higher consumption of processed foods, added sugars, and saturated fats, were associated with a higher risk of depressive symptoms.

In contrast to dietary patterns, findings related to individual nutrients, food components, and specific foods or food groups were more heterogeneous and inconclusive. For example, studies examining specific omega-3 fatty acids, B vitamins, magnesium, zinc, and other micronutrients yielded mixed results, with many reporting a combination of positive, negative, and null associations with depressive symptoms. Similarly, studies on specific foods and food groups (e.g. fruit, vegetables, dairy) did not reveal any clear or consistent patterns of association with depressive symptoms.

#### 4.2. Findings in Relation to Other Studies

The findings of this scoping review on peri- and post-menopausal women generally align with the broader nutritional psychiatry literature in adult populations. Numerous prior reviews and meta-analyses in predominantly general adult samples have shown diets abundant in plant foods (vegetables, fruits, legumes, whole grains) and fish, often characterized as “Mediterranean”, “anti-inflammatory”, or other “healthy” patterns, are associated with a significantly lower risk of depression or depressive symptoms [28–32], whereas highly-processed “Western-style” diets are associated with higher depression risk [33–36]. For instance, a recent systematic review and meta-analysis of RCTs reported that Mediterranean diet interventions significantly reduced depressive symptoms among young and middle-aged adults with major depression or mild-to-moderate depressive symptoms [31]. Similarly, an umbrella review reported significant inverse associations between adherence to Mediterranean and anti-inflammatory dietary patterns (reflected by low DII scores) and depression risk [115]. Our scoping review corroborates that these pattern-level associations are similarly observed in women undergoing the menopausal transition. This alignment is particularly noteworthy, as it suggests that the core associations between diet and depressive symptoms persist despite the distinct hormonal and metabolic changes characteristic of women’s midlife. The inconsistencies noted for individual foods and nutrients also mirror some of the findings reported in broader adult populations [116,117], and may, in part, be attributable to the limited ability of reductionist approaches to capture the complex interactions between nutrients and the overall dietary context.

Despite these similarities, our review adds meaningful nuance to the existing literature, with our results also identifying patterns and inconsistencies that might be less visible in the overall adult population data. While some associations observed in general populations appear to hold true in peri- and post-menopausal women, others may manifest differently. For example, one cohort study reported that moderate legume intake was negatively associated with depressed mood in peri-menopausal women, but not in their post-menopausal counterparts [111]. Similarly, data from the SWAN study indicated that higher omega-3 fatty acid intake was associated with fewer depressive symptoms in peri-menopausal, but not pre-menopausal, women [76]. Although the number of studies that have specifically focused on peri- and post-menopausal women remains limited, these findings suggest that menopausal status may act as a modifier of certain diet–depression associations. Thus, while our results reinforce some past findings on the benefits of healthy diets for the prevention and management of depression, they also brought to light inconsistencies that may be more prevalent among peri- and post-menopausal women, supporting the need for more tailored research in this demographic.

#### 4.3. Strengths and Limitations of the Evidence

While the risk of bias within the body of evidence included in this scoping review was moderate-to-high, some methodological aspects can still be considered strengths. For example, most studies employed validated dietary assessment instruments and depression scales, supporting the reliability of exposure and outcome measurements. Additionally, some studies adjusted their analyses for a wide array of confounding variables, enhancing the internal validity of their findings.

Still, significant limitations overshadow these methodological strengths. Most included studies were observational, inherently limiting causal inference. Among the relatively few RCTs, many employed open-label designs without active comparators, reducing internal validity. Definitions of peri- and post-menopause varied considerably, with some studies relying solely on age-based thresholds rather than standardized clinical staging criteria, thereby increasing the risk of misclassification. Dietary exposures were predominantly assessed using self-reported methods, such as food frequency questionnaires or 24-hour recalls, which are known to be prone to recall bias and measurement error. Similarly, depressive symptoms were measured using a range of instruments, contributing to outcome heterogeneity. Residual confounding remains a critical concern, particularly in relation to unmeasured or insufficiently adjusted variables such as physical activity, severity of

menopausal symptoms, and psychosocial stressors. These challenges are especially pertinent to the nutrition research field, where exposures are complex, error-prone, and strongly interrelated with other lifestyle and behavioral factors.

#### 4.4. Strengths and Limitations of the Review

To date, this review represents the most comprehensive synthesis on diet and depression among peri- and post-menopausal women. It was conducted using rigorous methodology, including prospective protocol registration, comprehensive database searches, and dual independent screening. Additionally, while not a mandatory step in the scoping review methodology, a formal risk of bias assessment of the included studies was conducted, enhancing the ability to identify key methodological limitations and have an overall portrait of the quality of the evidence. Adherence to the PRISMA-ScR reporting guidelines further strengthened the methodological transparency, reproducibility, and credibility of the review process.

However, certain limitations also warrant consideration. The inclusion of only English- and French-language publications may have introduced language bias and excluded relevant studies published in other languages. Additionally, due to the wide variability in populations and dietary exposures across studies, our synthesis was necessarily descriptive rather than quantitative.

#### 4.5. Research Gaps and Future Directions

This scoping review highlights several critical gaps in the current literature that warrant further investigation:

**Limited interventional research:** Few RCTs have specifically examined dietary interventions in peri- and post-menopausal women. Future RCTs are needed to evaluate the effectiveness of dietary strategies for preventing or managing depressive symptoms during and after the menopausal transition.

**Lack of standardization in exposure and outcome measures:** Greater consistency is needed in how dietary exposures (e.g., specific dietary patterns, nutrient intake) and depressive outcomes (e.g., validated symptom scales, diagnostic criteria) are defined and measured. Standardization would improve the comparability and synthesis of findings across studies.

**Inadequate consideration of menopause-specific factors:** Many studies overlook important contextual variables such as hormonal status, severity of menopausal symptoms, and hormone therapy use. These factors may act as effect modifiers and should be systematically considered in future research to better understand the diet–depression relationship in this population.

**Limited population diversity:** Existing studies are often restricted to specific geographic regions or demographically homogeneous cohorts. There is a need for research in more diverse populations to capture how cultural, socioeconomic, and racial/ethnic factors influence dietary intakes and mental health outcomes among midlife women.

**Insufficient investigation of biological mechanisms:** Although mechanisms such as sub-chronic inflammation, oxidative stress, and gut microbiota dysbiosis have been proposed, few studies have directly assessed these pathways in peri- and post-menopausal women. Incorporating biomarker analyses and mechanistic approaches into future studies could provide critical insights into how diet influences mental health during midlife.

#### 4.6. Implications for Research and Practice

As the burden of depression continues to rise among midlife women, and given the limitations of current pharmacological treatments, there is a crucial need to explore effective non-pharmacological strategies. Dietary modifications represent a promising avenue, with preliminary evidence suggesting that healthy dietary patterns may help protect against depression during the peri- and post-menopausal periods. However, the current evidence base remains limited by its predominantly observational design, heterogeneity in dietary assessment methods, variability in

outcome measures, and a lack of standardized definitions of menopausal status. Longitudinal studies with rigorous methodologies and high-quality RCTs, are crucially needed to establish causal relationships, clarify underlying biological mechanisms, and develop specific, evidence-based dietary recommendations for this population.

In clinical settings, healthcare providers working with peri- and post-menopausal women should consider diet as one component of a broader, integrative approach to mental health promotion. While acknowledging the limitations of the existing evidence, encouraging dietary patterns known to benefit physical health may also provide ancillary mental health benefits. Similarly, public health initiatives aimed at promoting healthy eating habits among midlife women could yield the dual advantage of improving both mental and cardiometabolic health outcomes, thereby simultaneously addressing multiple health priorities.

## 5. Conclusions

This scoping review offers a comprehensive overview of the current evidence linking diet-related factors to depression in peri- and post-menopausal women. While emerging findings suggest that dietary patterns may influence depression during this critical life period, the overall evidence remains limited and methodologically diverse. Bridging these gaps will require well-designed, high-quality studies that employ standardized methodologies, clearly define menopausal status, and ensure the inclusion of diverse populations. Such efforts are essential to deepen the current understanding of the diet–depression relationship and to develop evidence-informed clinical and public health strategies that support the mental well-being of peri- and post-menopausal women.

**Supplementary Materials:** The following supporting information can be downloaded at: <https://www.mdpi.com/article/doi/s1>, Table S1: Preferred Reporting Items for Systematic Reviews and Meta-Analyses Checklist’s Extension for Scoping Review (PRISMA-ScR); Table S2: Full Search Strategy for Medline; Table S3: Full Search Strategy for Embase; Table S4: Full Search Strategy for PsycInfo; Table S5: Full Search Strategy for CENTRAL; Table S6: Full Search Strategy for Web of Science; Table S7: Paper Excluded After Full-Text Review; Table S8: Risk of Bias Assessment for Cross-Sectional (n=22) and Prospective Cohort (n=7) Studies; Table S9: Risk of Bias Assessment for Case-Control Studies (n=1); Table S10: Risk of Bias Assessment for Experimental Studies (n=9).

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## Abbreviations

The following abbreviations are used in this manuscript:

<b>BDI</b>	<b>Beck’s Depression Inventory</b>
BS	Burnam Scale
BSI	Brief Symptom Inventory

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CENTRAL	Cochrane Central Register of Controlled Trials
CES-D	Centre for Epidemiologic Studies Depression Scale
DASH	Dietary Approach to Stop Hypertension
DASS	Depression Anxiety Stress Scale
DHA	Docosahexaenoic Acid
DII	Dietary Inflammatory Index
DTAC	Dietary Total Antioxidant Capacity
EPA	Eicosapentaenoic Acid
GCS	Greene Climacteric Scale
HDRS	Hamilton Depression Rating Scale
HPA	Hypothalamic-pituitary-adrenal
HSCL-D	Hopkins Symptoms Checklist Depression Scale
MADRS	Montgomery-Åsberg Depression Rating Scale
MUFA(s)	Monounsaturated Fatty Acid(s)
NEGD	Non-Equivalent Groups Design
NHLBI	National Heart, Lung, and Blood Institute
PHQ-9	Patient Health Questionnaire
POMS	Profile of Mood State
PRISMA	Preferred Reporting Items for Systematic Reviews Meta-Analyses
PRISMA-ScR	PRISMA Checklist's Extension for Scoping Reviews
PUFA(s)	Polyunsaturated Fatty Acid(s)
RCT(s)	Randomized controlled trial(s)
RoB	Risk of Bias
SFA(s)	Saturated Fatty Acid(s)
SWAN	Studies of Women's Health Across the Nation
TFA(s)	Trans Fatty Acid(s)
WHI	Women's Health Initiative
WHQ	Women's Health Questionnaire
ZSRDS	Zung Self-Rating Depression Scale

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