**Table S1.** Search Strategy

|  |  |
| --- | --- |
| **Categories (AND terms)** | **Keyword search words used (‘OR’ terms)** |
| Population | - |
| Exposure | "ultra-processed food" OR "ultraprocessed food" OR "ultra-processed foods" OR "ultraprocessed foods" OR UPF OR "NOVA food classification system" OR "Nova food classification system" |
| Comparator | - |
| Outcomes | - |
| Study Design | "meta-analysis" OR metaanaly\* OR "meta regression" OR metareg\* OR "systematic review" OR "systematic-review" |

**Table S2.** Summary characteristics of included original research article characteristics

| **Outcome** | **Author** | | **Year** | **Study design** | **Population** | **Exposure measurements** |
| --- | --- | --- | --- | --- | --- | --- |
| **Cancer** |  | |  |  |  |  |
| Breast cancer |  | |  |  |  |  |
|  | Romaguera et al. | | 2021 | Case-control | Adults | FFQ |
|  | Fiolet et al. | | 2018 | Prospective cohort | Adults | 24-hr recall |
|  | Jacobs et al. | | 2022 | Case-control | Adults | FFQ |
|  | Romieu et al. | | 2022 | Case-control | Adults | FFQ |
|  | Queiroz et al. | | 2018 | Case-control | Adults | FFQ |
|  | Chang et al. | | 2023 | Prospective cohort | Adults | 24-hr recall |
| Cancer overall |  | |  |  |  |  |
|  | Fiolet et al. | | 2018 | Prospective cohort | Adults | 24-hr recall |
|  | Fiolet et al. | | 2018 | Prospective cohort | Adults | 24-hr recall |
|  | Fiolet et al. | | 2018 | Prospective cohort | Adults | 24-hr recall |
|  | Fiolet et al. | | 2018 | Prospective cohort | Adults | 24-hr recall |
|  | Wang et al. | | 2022 | Prospective cohort | Adults | FFQ |
|  | Wang et al. | | 2022 | Prospective cohort | Adults | FFQ |
|  | Zhong et al. | | 2022 | Prospective cohort | Adults | Diet history |
| *Central nervous system tumours* | | |  |  |  |  |
|  | Esposito et al. | | 2023 | Case-control | Adults | FFQ |
|  | Chang et al. | | 2023 | Prospective cohort | Adults | 24-hr recall |
| Chronic lymphocytic leukemia | | |  |  |  |  |
|  | Solans et al. | | 2021 | Case-control | Adults | FFQ |
|  | Chang et al. | | 2023 | Prospective cohort | Adults | 24-hr recall |
| Colorectal cancer |  | |  |  |  |  |
|  | Romaguera et al. | | 2021 | Case-control | Adults | FFQ |
|  | Fiolet et al. | | 2018 | Prospective cohort | Adults | 24-hr recall |
|  | Jafari et al. | | 2022 | Case-control | Adults | FFQ |
|  | Wang et al. | | 2022 - | Prospective cohort | Adults - Men | FFQ |
|  | Wang et al. | | 2022 | Prospective cohort | Adults - Women | FFQ |
|  | El Kinany et al. | | 2022 | Case-control | Adults | FFQ |
|  | Chang et al. | | 2023 | Prospective cohort | Adults | 24-hr recall |
| **Cardiometabolic conditions** | | |  |  |  |  |
| Abdominal obesity |  | |  |  |  |  |
|  | Silva et al. | | 2018 | Cross-sectional | Adults | FFQ |
|  | Juul et al. | | 2018 | Cross-sectional | Adults | 24-hr recall |
|  | Rauber et al. | | 2020 | Cross-sectional | Adults | 24-hr recall |
|  | Sandoval-Insausti et al. | | 2020 | Prospective cohort | Adults | 24-hr recall |
| Cardiovascular disease events combined (morbidity and mortality) | | | |  |  |  |
|  | Rico-Campa | | 2019 | Prospective cohort | Adults | FFQ |
|  | Kim | | 2019 | Prospective cohort | Adults | 24-hr recall |
|  | Srour | | 2019 | Prospective cohort | Adults | 24-hr recall |
|  | Zhong | | 2019 | Prospective cohort | Adults | FFQ |
|  | Bonaccio | | 2021 | Prospective cohort | Adults | FFQ |
|  | Du | | 2021 | Prospective cohort | Adults | FFQ |
| Cardiovascular disease morbidity | | |  |  |  |  |
|  | Srour | | 2019 | Prospective cohort | Adults | 24-hr recall |
|  | Du | | 2021 | Prospective cohort | Adults | FFQ |
| Hyperglycaemia |  | |  |  |  |  |
|  | Nasreddine et al. | | 2018 | Cross-sectional | Adults | FFQ |
|  | Lavigne-Robichaud et al. | | 2018 | Cross-sectional | Adults | 24-hr recall |
|  |  | |  |  |  |  |
|  |  | |  |  |  |  |
| Hypertension |  | |  |  |  |  |
|  | Ivancovsky-Wajcman et al. | | 2021 | Cross-sectional | Adults | FFQ |
|  | Lavinge-Robichaud et al. | | 2018 | Cross-sectional | Adults | FFQ |
|  | Martinez Steele et al. | | 2019 | Cross-sectional | Adults | FFQ |
|  | Mendoca et al. | | 2017 | Prospective cohort | Adults | FFQ |
|  | Monge et al. | | 2021 | Prospective cohort | Adults | FFQ |
|  | Nardocci et al. | | 2021 | Cross-sectional | Adults | 24-hr recall |
|  | Nasreddine et al. | | 2018 | Cross-sectional | Adults | FFQ |
|  | Rezende-Alves et al. | | 2021 | Prospective cohort | Adults | FFQ |
|  | Scaranni et al. | | 2021 | Prospective cohort | Adults | FFQ |
| Hypertriglyceridaemia |  | |  |  |  |  |
|  | Nasreddine et al. | | 2018 | Cross-sectional | Adults | FFQ |
|  | Lavigne-Robichaud et al. | | 2018 | Cross-sectional | Adults | 24-hr recall |
| Low high-density lipoprotein concentration | | |  |  |  |  |
|  | Nasreddine et al. | | 2018 | Cross-sectional | Adults | FFQ |
|  | Lavigne-Robichaud et al. | | 2018 | Cross-sectional | Adults | 24-hr recall |
| Metabolic syndrome |  | |  |  |  |  |
|  | Barbosa et al. | | 2023 | Cross-sectional | Adults | 24-hr recall |
|  | Canhada et al. | | 2023 | Prospective cohort | Adults | 24-hr recall |
|  | Ivancokvsky-Wajcman et al. | | 2021 | Cross-sectional | Adults | FFQ |
|  | Magalhaes et al. | | 2022 | Prospective cohort | Adults | FFQ |
|  | Martinez-Steele et al. | | 2019 | Cross-sectional | Adults | 24-hr recall |
|  | Nasreddine et al. | | 2018 | Cross-sectional | Adults | FFQ |
|  | Pan et al. | | 2023 | Prospective cohort | Adults | 24-hr recall |
|  | Tavares et al. | | 2012 | Cross-sectional | Adults | FFQ |
|  | Lavigne-Robichaud et al. | | 2018 | Cross-sectional | Adults | 24-hr recall |
| Non-alcoholic fatty liver disease | | |  |  |  |  |
|  | Zhang et al. | | 2022 | Prospective cohort | Adults | FFQ |
|  | Ivancovsky-Wajcman et al. | | 2021 | Cross-sectional | Adults | FFQ |
|  | Friden et al. | | 2022 | Cross-sectional | Adults | FFQ |
|  | Konieczna et al. | | 2022 | Prospective cohort | Adults | FFQ |
| Obesity |  | |  |  |  |  |
|  | Adams et al. | | 2015 | Cross-sectional | Adults | 24-hr recall |
|  | Louzada et al. | | 2015 | Cross-sectional | Adults | 24-hr recall |
|  | Silva et al. | | 2018 | Cross-sectional | Adults | FFQ |
|  | Juul et al. | | 2018 | Cross-sectional | Adults | 24-hr recall |
|  | Nardocci et al. | | 2019 | Cross-sectional | Adults | 24-hr recall |
|  | Nardocci et al. | | 2020 | Cross-sectional | Adults | 24-hr recall |
|  | Rauber et al. | | 2020 | Cross-sectional | Adults | 24-hr recall |
| Overweight |  | |  |  |  |  |
|  | Silveira et al. | | 2016 | Cross-sectional | Adults | FFQ |
|  | Silva et al. | | 2018 | Cross-sectional | Adults | FFQ |
|  | Juul et al. | | 2018 | Cross-sectional | Adults | 24-hr recall |
|  | Nardocci et al. | | 2019 | Cross-sectional | Adults | 24-hr recall |
| Overweight/obesity |  | |  |  |  |  |
|  | Adams et al. | | 2015 | Cross-sectional | Adults | 24-hr recall |
|  | Louzada et al. | | 2015 | Cross-sectional | Adults | 24-hr recall |
| **Gastrointestinal conditions** | | |  |  |  |  |
| Crohn's disease | Lo et al. | | 2021 | Prospective cohort | Adults | FFQ |
|  | Narula et al. | | 2021 | Prospective cohort | Adults | FFQ |
|  | Chen et al. | | 2022 | Prospective cohort | Adults | 24-hr recall |
|  | Meyer et al. | | 2022 | Prospective cohort | Adults | FFQ |
| Ulcerative colitis |  | |  |  |  |  |
|  | Lo et al. | | 2021 | Prospective cohort | Adults | FFQ |
|  | Narula et al. | | 2021 | Prospective cohort | Adults | FFQ |
|  | Chen et al. | | 2022 | Prospective cohort | Adults | 24-hr recall |
|  | Meyer et al. | | 2022 | Prospective cohort | Adults | FFQ |
| **Mental health** |  | |  |  |  |  |
| Adverse sleep-related outcomes | | |  |  |  |  |
|  | | Sousa et al. | 2020 | Cross-sectional | Adolescents | FFQ |
|  | Werneck et al. | | 2020 | Cross-sectional | Adolescents | FFQ |
| Anxiety outcomes |  | |  |  |  |  |
|  | Werneck et al. | | 2021 | Cross-sectional | Adolescents - Females | FFQ |
|  | Werneck et al. | | 2021 | Cross-sectional | Adolescents - Males | FFQ |
|  | Coletro et al. | | 2022b | Cross-sectional | Adults | FFQ |
|  | Noll et al. | | 2022 | Cross-sectional | Adults | 24-hr recall |
| Combined common mental disorder outcomes | | |  |  |  |  |
|  | Werneck et al. | | 2021 | Cross-sectional | Adolescents - Females | FFQ |
|  | Werneck et al. | | 2021 | Cross-sectional | Adolescents - Males | FFQ |
|  | Zheng et al. | | 2020 | Cross-sectional | Adults | 24-hr recall |
|  | Silva et al. | | 2021 | Cross-sectional | Adolescents | 24-hr recall |
|  | Coletro et al. | | 2022b | Cross-sectional | Adults | FFQ |
| Depressive outcomes |  | |  |  |  |  |
|  | Gomez-Donoso et al. | | 2019 | Prospective cohort | Adults | FFQ |
|  | Adjibade et al. | | 2019 | Prospective cohort | Adults | 24-hr recall |
| **Mortality** |  | |  |  |  |  |
| All-cause mortality |  | |  |  |  |  |
|  | Schnabel et al. | | 2019 | Prospective cohort | Adults | 24-hr recall |
|  | Rico-Campa et al. | | 2019 | Prospective cohort | Adults | FFQ |
|  | Kim et al. | | 2019 | Prospective cohort | Adults | 24-hr recall |
|  | Blanco-Rojo et al. | | 2019 | Prospective cohort | Adults | Diet history |
|  | Zhong et al. | | 2021 | Prospective cohort | Adults | FFQ |
|  | Bonaccio et al. | | 2021 | Prospective cohort | Adults | FFQ |
|  | Orlich et al. | | 2022 | Prospective cohort | Adults | FFQ |
| Cancer mortality |  | |  |  |  |  |
|  | Rico-campa et al. | | 2019 | Prospective cohort | Adults | FFQ |
|  | Bonaccio et al. | | 2021 | Prospective cohort | Adults | FFQ |
| Cardiovascular disease mortality | | |  |  |  |  |
|  | Rico-Campa et al. | | 2019 | Prospective cohort | Adults | FFQ |
|  | Kim et al. | | 2019 | Prospective cohort | Adults | 24-hr recall |
|  | Zhong et al. | | 2019 | Prospective cohort | Adults | FFQ |
|  | Bonaccio et al. | | 2021 | Prospective cohort | Adults | FFQ |
| Heart disease-related mortality | | |  |  |  |  |
|  | Bonaccio et al. | | 2021 | Prospective cohort | Adults | FFQ |
|  | Zhong et al. | | 2021 | Prospective cohort | Adults | FFQ |
| **Respiratory conditions** |  | |  |  |  |  |
| Asthma | Melo et al. | | 2018 | Cross-sectional | Adolescents | FFQ |
|  | Azerado et al. | | 2020 | Cross-sectional | Children and adolescents | FFQ |
| Wheezing |  | |  |  |  |  |
|  | Melo et al. | | 2018 | Cross-sectional | Adolescents | FFQ |
|  | Azerado et al. | | 2020 | Cross-sectional | Children and adolescents | FFQ |

*Note*24-hr call=twenty-four-hour dietary recall; FFQ=food frequency questionnaire

**Table S3.** Quality assessment using the GRADE framework of each pooled analysis assessing associations between ultra-processed food exposure and adverse health outcomes

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Certainty assessment** | | | | | | | **Certainty** |
| **№ of studies** | **Study design** | **Risk of bias** | **Inconsistency** | **Indirectness** | **Imprecision** | **Other considerations** |
|  |
| **Adverse sleep outcomes** | | | | | | | |  |
| 2 | observational studies | not serious | not serious | not serious | not serious | none | ⨁⨁◯◯ |  |
| Low |  |
| **Abdominal obesity** | | | | | | | |  |
| 4 | observational studies | not serious | seriousa | not serious | not serious | none | ⨁◯◯◯ |  |
| Very low |  |
| **All-cause mortality – dose-response** | | | | | | | |  |
| 9 | observational studies | not serious | not serious | not serious | not serious | dose response gradient | ⨁⨁⨁◯ |  |
| Moderate |  |
| **Abdominal obesity – dose-response** | | | | | | | |  |
| 6 | observational studies | not serious | seriousa | not serious | not serious | dose response gradient | ⨁⨁◯◯ |  |
| Low |  |
| **All-cause mortality** | | | | | | | |  |
| 7 | observational studies | not serious | not serious | not serious | not serious | none | ⨁⨁◯◯ |  |
| Low |  |
| **Anxiety** | | | | | | | |  |
| 4 | observational studies | not serious | not serious | not serious | not serious | none | ⨁⨁◯◯ |  |
| Low |  |
| **Asthma** | | | | | | | |  |
| 2 | observational studies | not serious | not serious | not serious | seriousb | none | ⨁◯◯◯ |  |
| Very low |  |
| **Breast cancer** | | | | | | | |  |
| 6 | observational studies | not serious | not serious | not serious | seriousb | none | ⨁◯◯◯ |  |
| Very low |  |
| **Cancer (overall)** | | | | | | | |  |
| 7 | observational studies | seriousc | not serious | not serious | not serious | none | ⨁◯◯◯ |  |
| Very low |  |
| **Cancer-related mortality** | | | | | | | |  |
| 2 | observational studies | not serious | not serious | not serious | not serious | none | ⨁⨁◯◯ |  |
| Low |  |
| **Central nervous system tumours** | | | | | | | |  |
| 2 | observational studies | not serious | seriousa | not serious | seriousd | none | ⨁◯◯◯ |  |
| Very low |  |
| **Colorectal cancer** | | | | | | | |  |
| 7 | observational studies | not serious | seriousa | not serious | not serious | none | ⨁◯◯◯ |  |
| Very low |  |
| **Chronic lymphocytic leukemia** | | | | | | | |  |
| 2 | observational studies | not serious | not serious | not serious | seriousd | none | ⨁◯◯◯ |  |
| Very low |  |
| **Common mental disorders** | | | | | | | |  |
| 6 | observational studies | not serious | not serious | not serious | not serious | none | ⨁⨁◯◯ |  |
| Low |  |
| **Crohn’s disease** | | | | | | | |  |
| 4 | observational studies | not serious | not serious | not serious | not serious | none | ⨁⨁◯◯ |  |
| Low |  |
| **CVD events and mortality – dose-response** | | | | | | | |  |
| 8 | observational studies | not serious | seriousa | not serious | not serious | dose response gradient | ⨁⨁◯◯ |  |
| Low |  |
| **CVD events and mortality** | | | | | | | |  |
| 6 | observational studies | not serious | seriousa | not serious | not serious | none | ⨁◯◯◯ |  |
| Very low |  |
| **CVD-related mortality – dose-response** | | | | | | | |  |
| 5 | observational studies | not serious | seriousa | not serious | not serious | dose response gradient | ⨁⨁◯◯ |  |
| Low |  |
| **CVD-related mortality** | | | | | | | |  |
| 4 | observational studies | not serious | seriousa | not serious | not serious | none | ⨁◯◯◯ |  |
| Very low |  |
| **CVD risk – dose-response** | | | | | | | |  |
|  | observational studies | not serious | seriousa | not serious | not serious | dose response gradient | ⨁⨁◯◯ |  |
| Low |  |
| **CVD risk** | | | | | | | |  |
| 2 | observational studies | not serious | not serious | not serious | not serious | none | ⨁⨁◯◯ |  |
| Low |  |
| **Depression** | | | | | | | |  |
| 2 | observational studies | not serious | not serious | not serious | not serious | none | ⨁⨁◯◯ |  |
| Low |  |
| **Heart-cause mortality** | | | | | | | |  |
| 2 | observational studies | not serious | not serious | not serious | not serious | none | ⨁⨁◯◯ |  |
| Low |  |
| **Hyperglycaemia** | | | | | | | |  |
| 2 | observational studies | serious | seriousa | not serious | very seriouse | none | ⨁◯◯◯ |  |
| Very low |  |
| **Hypertension** | | | | | | | |  |
| 9 | observational studies | serious | seriousa | not serious | not serious | none | ⨁◯◯◯ |  |
| Very low |  |
| **Hypertriglyceridaemia** | | | | | | | |  |
| 2 | observational studies | serious | not serious | not serious | seriousd | none | ⨁◯◯◯ |  |
| Very low |  |
| **Low HDL cholesterol** | | | | | | | |  |
| 2 | observational studies | serious | not serious | not serious | seriousd | none | ⨁◯◯◯ |  |
| Very low |  |
| **Metabolic syndrome** | | | | | | | |  |
| 9 | observational studies | not serious | seriousa | not serious | not serious | none | ⨁◯◯◯ |  |
| Very low |  |
| **NAFLD** | | | | | | | |  |
| 4 | observational studies | serious | not serious | not serious | not serious | none | ⨁◯◯◯ |  |
| Very low |  |
| **Obesity** | | | | | | | |  |
| 7 | observational studies | not serious | not serious | not serious | not serious | none | ⨁⨁◯◯ |  |
| Low |  |
| **Obesity – dose-response** | | | | | | | |  |
| 7 | observational studies | not serious | seriousa | not serious | not serious | dose response gradient | ⨁⨁◯◯ |  |
| Low |  |
| **Overweight** | | | | | | | |  |
| 4 | observational studies | not serious | seriousa | not serious | not serious | none | ⨁◯◯◯ |  |
| Very low |  |
| **Overweight – dose-response** | | | | | | | |  |
| 2 | observational studies | not serious | seriousa | not serious | not serious | dose response gradient | ⨁⨁◯◯ |  |
| Low |  |
| **Overweight/Obesity** | | | | | | | |  |
| 2 | observational studies | not serious | not serious | not serious | not serious | none | ⨁⨁◯◯ |  |
| Low |  |
| **Overweight/Obesity – dose-response** | | | | | | | |  |
| 3 | observational studies | not serious | not serious | not serious | not serious | dose response gradient | ⨁⨁⨁◯ |  |
| Moderate |  |
| **Pancreatic cancer** | | | | | | | |  |
| 2 | observational studies | not serious | seriousa | not serious | seriousd | none | ⨁◯◯◯ |  |
| Very low |  |
| **Prostate cancer** | | | | | | | |  |
| 4 | observational studies | not serious | not serious | not serious | not serious | none | ⨁⨁◯◯ |  |
| Low |  |
| **Type two diabetes – dose-response** | | | | | | | |  |
| 7 | observational studies | not serious | not serious | not serious | not serious | dose response gradient | ⨁⨁⨁◯ |  |
| Moderate |  |
| **Type two diabetes** | | | | | | | |  |
| 7 | observational studies | not serious | seriousa | not serious | not serious | none | ⨁◯◯◯ |  |
| Very low |  |
| **Ulcerative colitis** | | | | | | | |  |
| 4 | observational studies | not serious | seriousa | not serious | seriousd | none | ⨁◯◯◯ |  |
| Very low |  |
| **Wheezing** | | | | | | | |  |
| 2 | observational studies | not serious | not serious | not serious | not serious | none | ⨁⨁◯◯ |  |
| Low |  |
| **Heart-cause mortality - dose-response** | | | | | | | |  |
| 2 | observational studies | not serious | seriousa | not serious | not serious | dose response gradient | ⨁⨁◯◯ |  |
| Low |  |
| **Colorectal cancer - dose-response** | | | | | | | |  |
| 5 | observational studies | not serious | seriousa | not serious | not serious | dose response gradient | ⨁⨁◯◯ |  |
| Low |  |
| **Breast cancer – dose-response** | | | | | | | |  |
| 3 | observational studies | not serious | seriousa | not serious | not serious | dose response gradient | ⨁⨁◯◯ |  |
| Low |  |
| **Prostate cancer – dose-response** | | | | | | | |  |
| 3 | observational studies | not serious | not serious | not serious | not serious | dose response gradient | ⨁⨁⨁◯ |  |
| Moderate |  |

*Note*CI=confidence interval; CVD=cardiovascular disease; GRADE=Grading of Recommendations, Assessment, Development, and Evaluation; HDL=high density lipoprotein; and, NAFLD=non-alcoholic fatty liver disease.

#### Explanations

a. I2 value >50

b. Wide confidence intervals that include null effect and increased risk

c. Majority of studies rated as poor/fair quality by study authors

d. Wide confidence intervals that cross decision threshold

e. Very wide confidence intervals that cross decision thresholds

**Table S4.** The A Measurement Tool to Assess Systematic Reviews – second edition (AMSTAR 2) quality assessment tool

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Author(s)** | **Year** | **\*1** | **\*2** | **\*3** | **\*4** | **\*5** | **\*6** | **\*7** | **\*8** | **\*9** | **\*10** | **\*11** | **\*12** | **\*13** | **\*14** | **\*15** | **\*16** |
| Lian et al. | 2023 | 2 | 0 | 0 | 1 | 0 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 0 | 2 | 2 |
| Isaksen et al. | 2023 | 2 | 0 | 0 | 1 | 0 | 0 | 2 | 2 | 2 | 0 | 2 | 0 | 2 | 0 | 0 | 2 |
| Moradi et al. | 2023 | 2 | 0 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 0 | 2 | 2 | 2 | 0 |
| Yuan et al. | 2023 | 2 | 2 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 | 2 | 2 |
| Pagliai et al. | 2021 | 2 | 1 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 0 | 2 | 2 | 2 | 2 |
| Wang et al. | 2022 | 2 | 0 | 0 | 1 | 2 | 0 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 0 | 2 | 2 |
| Shu et al. | 2023 | 2 | 0 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 | 2 | 2 |
| Henney et al. | 2023 | 2 | 2 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 0 | 2 | 2 |
| Chen et al. | 2023 | 2 | 2 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 0 | 2 | 2 | 0 | 2 |
| Narula et al. | 2023 | 2 | 2 | 0 | 1 | 2 | 2 | 0 | 2 | 2 | 0 | 2 | 2 | 2 | 0 | 2 | 2 |
| Delpino et al | 2023 | 2 | 2 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| Lane et al. | 2022 | 2 | 2 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 0 | 2 | 0 | 0 | 2 |
| Suksatan et al. | 2021 | 2 | 0 | 0 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 | 2 | 2 |
| Lane et al. | 2021 | 2 | 2 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 | 0 | 2 |

*Note* 0 = No; 1 = Partial Yes; 2 = Yes. Shaded columns = AMSTART 2 critical domains

*\*1. Did the research questions and inclusion criteria for the review include the components of PICO?*

**\*2. *Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?***

\*3. *Did the review authors explain their selection of the study designs for inclusion in the review?*

***\*4. Did the review authors use a comprehensive literature search strategy?***

*\*5. Did the review authors perform study selection in duplicate?*

*\*6. Did the review authors perform data extraction in duplicate?*

***\*7. Did the review authors provide a list of excluded studies and justify the exclusions?*** *\*8. Did the review authors describe the included studies in adequate detail?*

***\*9. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?***

*\*10. Did the review authors report on the sources of funding for the studies included in the review?*

***\*11. If meta-analysis was performed, did the review authors use appropriate methods for statistical combination of results?***

*\*12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?*

***\*13. Did the review authors account for RoB in primary studies when interpreting/discussing the results of the review?***

*\*14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?*

*\*15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?*

*\*16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?*