**Supplement 1: MOOSE Statement - Reporting Checklist for Authors of Meta-analyses of Observational Studies**

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| --- | --- | --- |
| **Reporting Criteria** | **Reported** | **Reported on Page** |
| Reporting of Background | Yes | 3 |
| Problem definition | Yes | 3 |
| Hypothesis statement | Yes | 4 |
| Description of Study Outcome(s) | Yes | 3-4 |
| Type of exposure or intervention used | Yes | 3-4 |
| Type of study design used | Yes | 4 |
| Study population | Yes | 4 |
| Reporting of Search Strategy | Yes | Suplement 2 |
| Qualifications of searchers (eg, librarians and investigators) | Yes | 6 |
| Search strategy, including time period included in the synthesis and keywords | Yes | 5 and Supplement 2 |
| Effort to include all available studies, including contact with authors | Yes | 6 |
| Databases and registries searched | Yes | 5 |
| Search software used, name and version, including special features used (eg, explosion) | Yes | Supplement 2 |
| Use of hand searching (eg, reference lists of obtained articles) | Yes | 6 and Figure 1 |
| List of citations located and those excluded | Yes | Figure 1 |
| Method for addressing articles published in languages other than English | Not applicable | 8 |
| Method of handling unpublished studies | Not applicable | -- |
| Description of any contact with authors | Yes | 6 |
| Reporting of Methods | Yes | 4-8 |
| Description of relevance or  appropriateness of studies assembled for  assessing the hypothesis to be tested | Yes | 5 |
| Rationale for the selection and coding of data | Yes | 5 |
| Documentation of how data were classified and coded | Yes | Supplement 4-8 |
| Assessment of confounding | Yes | 6 |
| Assessment of study quality, including blinding of quality assessors; stratification or regression on possible predictors of study results | Yes | Supplement 3 |
| Assessment of heterogeneity | Yes | 7 |
| Description of statistical methods (eg, complete description of fixed or random effects models, justification of whether  the chosen models account for predictors of study results, dose-response models, or cumulative meta-analysis) in sufficient detail to be replicated | Yes | 7,8 |
| Provision of appropriate tables and graphics | Yes | Figures 1-3. Supplements 3-8 |
| Reporting of Results | Yes | 8-12 |
| Table giving descriptive information for each study included | Yes | Supplements 5-8 |
| Results of sensitivity testing | Yes | 9,10 |
| Indication of statistical uncertainty of findings | Yes | 9,10 |
| Reporting of Discussion | Yes | 13-15 |
| Quantitative assessment of bias (eg, publication bias) | Yes | Supplement 3 |
| Justification for exclusion (eg, exclusion of non–English-language citations) | Not applicable | 5,6 |
| Assessment of quality of included studies | Yes | Supplement 3 |
| Reporting of Conclusions | Yes | 15 |
| Consideration of alternative explanations for observed results | Yes | 14 |
| Generalization of the conclusions (ie, appropriate for the data presented and within the domain of the literature review) | Yes | 15 |
| Guidelines for future research | Yes | 15 |
| Disclosure of funding source | Yes | 15 |

**Supplement 2. Strategy used in electronic search**

1- "Depression"[Mesh]

2- "Depressive Disorder"[Mesh]

3- "Anxiety"[Mesh]

4- "Anxiety Disorders"[Mesh]

5- "Schizophrenia"[Mesh]

6- "Bipolar Disorder"[Mesh]

7- "Personality Disorders"[Mesh]

8- 1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7

9- "Diabetes Mellitus"[Mesh]

10- "Hypertension"[Mesh]

11- "Smoking"[Mesh]

12- "Dyslipidemias"[Mesh]

13- 9 OR 10 11 OR 12 OR 13

14- "Healthcare Disparities"[Mesh]

15- "Mass Screening"[Mesh]

16- "Diagnosis"[Mesh]

17- "Therapeutics"[Mesh]

18- "Disease Management"[Mesh]

19- 14 OR 15 OR 16 OR 17 OR 18

20- 8 AND 13 AND 19

**Supplement 3. Quality assessment of studies included in this review**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Criteria | Golberg 1980 | Anda 1990 | Simonsick 1995 | Breslau 1998 | Zhu  1999 | Wang 2005 | Roberts 2007 | Richardson 2008 | Heckbert 2010 | Hilliard 2011 | Byrd 2012 | Lahti 2012 | Fond 2013 | Bot 2013 | Stepankova 2013 | Piñeiro  2013 | Musselman 2014 | Laursen 2014 | Kostev 2015 | Cooper  2016 |
| 1. Was the research question clearly stated? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 2. Was the study population clearly defined? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 3. Was the participation rate of eligible persons at least 50%? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 4. Were all the subjects selected or recruited from the same or similar populations? Were inclusion and exclusion criteria prespecified and applied uniformly to all participants? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 5. Was a sample size justification, power description, or variance and effect estimates provided? | No | No | No | No | No | Yes | Yes | Yes | Yes | No | Yes | Yes | No | Yes | No | Yes | No | No | No | Yes |
| 6. For the analyses in this paper, were the exposure(s) measured prior to the outcome(s) measured? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 7. Was the timeframe sufficient so that associations be seen if they existed? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 8. For exposures that can vary in amount or level, did the study examine different levels of the exposure as related to the outcome? | No | No | Yes | No | No | Yes | Yes | NA | NA | No | Yes | Yes | No | Yes | Yes | Yes | NA | Yes | NA | Yes |
| 9. Were the exposures clearly defined, valid, reliable, and implemented consistently across all study participants? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 10. Was the exposure(s) assessed more than once over time? | No | No | Yes | No | No | Yes | Yes | Yes | NA | Yes | Yes | Yes | No | Yes | Yes | Yes | NA | Yes | NA | Yes |
| 11. Were the outcomes clearly defined, valid, reliable, and implemented consistently across all study participants? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 12. Were the outcome assessors blinded to the exposure status of participants? | No | No | No | No | No | Yes | Yes | No | Yes | No | Yes | Yes | No | Yes | No | Yes | No | No | No | Yes |
| 13. Was loss to follow-up after baseline 20% or less? | Yes | Not reporter | Not reported | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes | No | Not reporter | No | Yes |
| 14. Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure(s) and outcome(s)? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| QUALITY (total number of positive items) | 10 | 8 | 11 | 10 | 10 | 14 | 14 | 12 | 12 | 11 | 14 | 14 | 10 | 14 | 11 | 14 | 9 | 11 | 9 | 14 |

**Supplement 4. Studies reporting differences in the management of smoking.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Author year, country | N | Psychiatric disorder (measure) | Follow up (years) | Fe male % | Age (years) | Outcome | Measure of association |
| Anda 1990 USA | 1167 | Depression (CES-D) | 9 | -- | 24-74 | Quitting | HR: 0.6 (0.3-1.0) p<0.05 |
| Breslau 1998 USA | 974 | Depression  (NIMHDIS) | 5 | 62 | 21-30 | Quitting | OR: 0.81(0.44-1.64) p=0.55 |
| Zhu 1999  USA | 633 | Depression  (DML) | 4 | 47 | 12-19 | Not quitting | OR: 1.87 (1.04–3.35) p<0.05 |
| Roberts 2007 UK | 585 | Schizophre nia (MR) | 3 | 42 | 21-64 | Smoking status record | OR: 1.16 (0.65-2.07) p=0.61 |
| Stepankova 2010  Czech Republic | 1730 | Depression  (Self reported past medical history) | 1 | 50 | ≥18 | Quitting | Women OR: 0.87  (0.55-1.39) p=0.57  Men OR: 0.57  (0.30-1.10) p=0.09 |
| Fond 2013  France | 1020 | Depression  (HADS) | 1 | 53 | 43±11 | Smoking after smoking cessation treatment | HR: 1.23(1.02;1.47) p=0.03 |
| Piñeiro 2013 Spain | 168 | Personality Disorder  (IPDEQ) | 1 | 59 | ≥18 | Abstinence after quitting | Schizoid Personality disorder  OR: 3.83 (1.32–11.11) at 6 months  OR: 3.11(1.14-8.49) at 12 months |
| Cooper 2016  Canada, USA, UK, Australia | 3558 | Depression  (Self-reported medical history of previous year) | 4 | 59 | ≥18 | Quitting | OR: 0.48 (0.38–0.61) |

CES-D: Centre for Epidemiologic Studies Depression scale; NIMHDIS: National Institute of Mental Health Diagnostic interview schedule; DML: Depressive mood list; MR: Medical Records; HADS: Hospital Anxiety and Depression Scale; IPDEQ: International Personality Disorder Examination Questionnaire; CIDI: Composite International Diagnostic Interview.

**Supplement 5. Studies reporting differences in the management of Type 1 Diabetes.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Author year, country | N | Psychia  tric disorder (measure) | Follow up (years) | Fe male % | Age (years) | Outcome | Measure of association |
| Hilliard 2011 USA | 145 | Depression  (CDI)  Anxiety  (STAIC) | 1 | 51 | 16±1 | HbA1c% | Depression β: 0.44 NS.  Anxiety β:0.42 p=0.008 |
| Bot 2013 The Netherlands | 277 | Depression (PHQ-9) | 1 | 57 | ≥ 18 years | HbA1c (mmol/mol) | β: 0.115 p=0.076 |

CDI: Children's Depression Inventory; STAIC: State trait anxiety inventory for children; NS:Not significant; PHQ-9: Patient Health Questionnaire

**Supplement 6. Studies reporting differences in the management of Type 2 Diabetes**.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Author year, country | N | Psychiatric disorder (measure) | Follow up (years) | Female % | Age (years) | Outcome | Measure of association |
| Richardson 2008 USA | 11525 | Depression (MR) | 10 | 3 | Mean:66 | HbA1c% | β: 0.13 (0.03-0.22) p=0.008 |
| Heckbert 2010 USA | 3762 | Depression (PHQ9) | 5 | 48 | 64±13 | HbA1c% | Mean difference:  Minor depression:0.19 (0.06-0.31)  Major depression: 0.22(0.08-0.35) |
| Bot 2013  The Netherlands | 365 | Depression  (PHQ9) | 1 | 47 | ≥18 | HbA1cmmol/mol | β:0.0555 p=0.346 |
| Musselman 2014 USA | 172 | Depression  (MINI) | 1 | 62 | 50±10 | HbA1c% | β: 0.911 p=0.002 |
| Kostev 2015 Germany | 4837 | Depression(MR) | 0.25 | 44 | Mean:66-69 in different groups | Discontinuation of insulin | OR: 1.31 (1.01–1.70) p=0.0402 |

MR: Medical records; PHQ-9: Patients Health Questionnaire; MINI: Mini International Neuropsychiatric Interview

**Supplement 7. Studies reporting differences in the management of Hypertension.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Author year, country | N | Psychiatric disorder (measure) | Follow up (years) | Female % | Age (years) | Out  come | Measure of association |
| Goldberg 1980 USA | 190 | Depression (CES-D) | 3 | 61 | ≥18 | Hypertension treat ment | No association with depression |
| Simonsick 1995 USA | 3530 | Depression  (CES-D) | 3 | 69 | ≥65 | Hypertension control | Depression associated with lower rate of BP ≤160/90 for women in one site. |
| Wang 2005 USA | 51517 | Depression (MR or prescriptions of antidepressants) | 1 | -- | ≥65 | Hypertension treatment | OR: 0.50 (0.45–0.55) |
| Roberts 2007 UK | 585 | Schizophrenia (MR) | 3 | 43 | 21-64 | BP record | OR: 0.43(0.23-0.80) p<0.01 |
| Lahti 2012 Finland | 10915 | Schizophrenia (MR) | 35 | 47 | >24 | Hypertension treatment | Lower use of HTN drugs |
| Byrd 2012 USA | 168630 | Anxiety  Depression  (MR) | 4 | 52 | Mean: 52 | Time from  1st elevated BP to 2nd BP reading  Time from 2nd BP reading to Record of Hypertension | Anxiety HR: 1.28 (1.24–1.33)  Depression HR:1.21 (1.18-1.23)  Anxiety HR: 0.93(0.88–0.99)  Depression HR: 0.93(0.90–0.97) |
| Laursen 2014 Denmark | 1061532 | Schizophre nia  Bipolar disorder  (MR) | 14 | -- | >10 | CV drug use | Schizophrenia: lower use of ACEI/ARB, CCB and beta blockers. Higher use of diuretics.  Bipolar disorder: lower use of ACEI/ARB. Higher use of diuretics, CCB or B blockers |

CESD: Center for Epidemiology Depression Scale; MR: Health records;

ACEI: angiotensin-converting-enzyme inhibitors; ARB: angiotensin II receptor blockers; CCB: Calcium channel blockers.

**Supplement 8. Studies reporting differences in the management of dyslipidaemia.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Author, year, country | N | Psychiatric disorder Mental disorder (measure) | Followup  (years) | Fema le% | Age | Out come | Measures of Association |
| Roberts 2007  UK | 585 | Schizophrenia (MR) | 3 |  | 21-64 | Choles terol record | OR: 0.46 (0.24-0.88) p=0.02 |
| Lahti 2012 Finland | 10915 | Schizophrenia (MR) | 35 | 47 | >24 | Purchase of lipid lowering drugs | HR: 0.47 (0.27–0.80) p=0.005 |
| Laursen 2014 Denmark | 1061532 | Schizophenia  Bipolar disorderBPD  (MR) | 14 | -- | >10 | Use of lower lipid lowering drugs | Schizophrenia and bipolar disorder associated with lower use of lipid lowering drugs. |

MR: Medical records