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**Supplementary Material**

Article title: The social determinants of suicide: an umbrella review

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## Table S1

**PubMed search strategy and results**

| Search number (Concept) | Query | Results |
|---|---|---|
| #1 (Suicide) | Suicide [MeSH Terms] OR Suicid* [Title/Abstract] | 117,837 |
| #2 (Access to affordable health services of decent quality) | "Health care facilities, manpower, and services"[MeSH Terms] OR Healthcare* [Title/Abstract] OR "Health Services Accessibility" [MeSH Terms] OR "Health Services Accessibility"[Title/Abstract] OR "Universal Health Care"[MeSH Terms] OR "Universal Health Care"[Title/Abstract] OR "Right to Health"[MeSH Terms] OR "Right to Health"[Title/Abstract] OR "Healthcare Disparities"[MeSH Terms] OR "Healthcare Disparit*"[Title/Abstract] OR "Delivery of Health Care"[MeSH Terms] OR "Delivery of Health Care"[Title/Abstract] OR "Community Health Services"[MeSH Terms] OR "Community Health Services"[Title/Abstract] OR "Health Equit*"[Title/Abstract] OR "Emergency Healthcare"[Title/Abstract] | 4,181,253 |
| #3 (Education) | Education [MeSH Terms] OR Educat*[Title/Abstract] OR "Educational status"[MeSH Terms] OR "Educational status"[Title/Abstract] OR "Literacy"[MeSH Terms] OR "Literacy"[Title/Abstract] OR "Educational level"[Title/Abstract] OR "Educational achievement*"[Title/Abstract] OR "Academic performance"[Title/Abstract] OR "Academic success"[Title/Abstract] | 1,468,653 |
| #4 (Income and social protection) | Income [MeSH Terms] OR Income [Title/Abstract] OR Poverty [MeSH Terms] OR Poverty [Title/Abstract] OR Earning* [Title/Abstract] OR Wage* [Title/Abstract] OR "Income level*"[Title/Abstract] OR "Economic Status"[MeSH Terms] OR "Economic status"[Title/Abstract] OR "Socioeconomic Factors"[MeSH Terms] OR "Socioeconomic Factors"[Title/Abstract] OR "Economic Inequalit*"[Title/Abstract] OR "Economic Security"[Title/Abstract] OR "Social Class"[MeSH Terms] OR "Social Class"[Title/Abstract] | 677,382 |
| #5 (Early childhood development) | "Child Development"[MeSH Terms] OR "Child Development" [Title/Abstract] OR Child [MeSH Terms] OR Child* [Title/Abstract] OR "Language Development"[MeSH Terms] OR "Language Development"[Title/Abstract] OR "Adverse Childhood Experiences" [MeSH Terms] OR "Adverse Childhood Experience*" [Title/Abstract] OR "Adverse Childhood Event*" [Title/Abstract] OR "Early Childhood Development"[Title/Abstract] | 2,781,944 |
| #6 (Food insecurity) | "Food Insecurity"[MeSH Terms] OR "food insecurit*"[Title/Abstract] OR "Food Security"[MeSH Terms] OR "Food Security"[Title/Abstract] OR "healthy food*"[Title/Abstract] OR "Food deprivation"[Title/Abstract] OR "Food poverty"[Title/Abstract] OR "Nutritional deficiency"[Title/Abstract] OR "eating behavi*"[Title/Abstract] OR "Food intake"[Title/Abstract] OR "Hunger"[Title/Abstract] | 106,248 |
| #7 (Structural conflict) | "Social Structure"[MeSH Terms] OR "Structural Conflict"[Title/Abstract] OR "Social Structure"[Title/Abstract] OR "Social protection"[All Fields] OR "Social gradient"[Title/Abstract] OR "Policy"[Title/Abstract] OR "Social Policy"[Title/Abstract] | 284,038 |
| #8 (Social inclusion and non-discrimination) | "Social Inclusion"[MeSH Terms] OR "Social Inclusion"[Title/Abstract] OR "Sociological Factors"[MeSH Terms] OR "Sociological Factors"[Title/Abstract] OR "Social Behavior"[MeSH Terms] OR "social behavi*"[Title/Abstract] OR "Lifestyle"[Title/Abstract] OR "social attitude*"[Title/Abstract] OR "Social Deprivation"[MeSH Terms] OR "Social Deprivation"[Title/Abstract] OR "Social Participation"[MeSH Terms] OR "Social Participation"[Title/Abstract] OR "Social Discrimination"[MeSH Terms] OR "Social Discrimination"[Title/Abstract] OR "Discrimination"[Title/Abstract] OR "Social cohesion"[Title/Abstract] OR "interpersonal | 1,299,700 |

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|---|---|---|
| | relations*"[Title/Abstract] OR "Social Norms"[MeSH Terms] OR "Social Norms"[Title/Abstract] OR "Prejudice"[MeSH Terms] OR "Prejudice"[Title/Abstract] OR "Racism"[MeSH Terms] OR "Racism"[Title/Abstract] OR "Equality"[Title/Abstract] OR "Social status"[Title/Abstract] OR "social environment*"[Title/Abstract] | |
| #9<br>(Unemployment and job security) | "Employment"[MeSH Terms] OR "Employment"[Title/Abstract] OR "Unemployment"[MeSH Terms] OR "Unemployment"[Title/Abstract] OR "employment, supported"[MeSH Terms] OR "Employment status"[Title/Abstract] OR "job loss*"[Title/Abstract] OR "Job security"[Title/Abstract] OR "Joblessness"[Title/Abstract] OR "Redundancy"[Title/Abstract] OR "Working status"[Title/Abstract] OR "Employment situation"[Title/Abstract] | 187,810 |
| #10<br>(Working life conditions) | "Occupational Health"[MeSH Terms] OR "Occupational Health"[Title/Abstract] OR "Occupational Safety"[Title/Abstract] OR "Teleworking"[MeSH Terms] OR "Teleworking"[Title/Abstract] OR "remote work*"[Title/Abstract] OR "Workplace Flexibility"[Title/Abstract] OR "Occupational Exposure"[MeSH Terms] OR "Occupational Exposure"[Title/Abstract] OR "Workplace"[MeSH Terms] OR "Workplace"[Title/Abstract] OR "Occupational stress"[MeSH Terms] OR "Occupational stress"[Title/Abstract] OR "workload"[MeSH Terms] OR "workload*"[Title/Abstract] OR "Work Load"[Title/Abstract] OR "Working Conditions"[MeSH Terms] OR "working condition*"[Title/Abstract] OR "burnout, professional"[MeSH Terms] OR "Burnout"[Title/Abstract] OR "Job Enrichment"[Title/Abstract] OR "employee wel*"[Title/Abstract] OR "Job Demands"[Title/Abstract] OR "Organizational Climate"[Title/Abstract] OR "Quality of Work Life"[Title/Abstract] OR "work related illness*"[Title/Abstract] OR "Work-Life Balance"[Title/Abstract] OR "Work Environment"[Title/Abstract] | 269,529 |
| #11<br>(Housing, basic amenities and the environment) | "Ill-Housed Persons"[MeSH Terms] OR Homeless* [Title/Abstract] OR Housing [MeSH Terms] OR Housing [Title/Abstract] OR "Medically Underserved Area" [MeSH Terms] OR "Medically Underserved Area" [Title/Abstract] OR "Neighborhood Characteristics" [MeSH Terms] OR "Neighborhood Characteristics" [Title/Abstract] OR "Neighbourhood Characteristics" [Title/Abstract] OR Sanitation [MeSH Terms] OR Sanitation [Title/Abstract] OR Environment [MeSH Terms] OR Environment* [Title/Abstract] | 2,779,620 |
| #12 | #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 | 101,705,49 |
| #13 | "Systematic review*" [Title/Abstract] OR "Meta analy*" [Title/Abstract] | 456,153 |
| #14 | #1 AND #12 AND #13 | 1,744 |

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# Table S2

**Studies in which outcomes for suicide mortality could not be separated for overall results.**

| Author, Year | Title | Social Determinant |
|---|---|---|
| Ati *et al*., 2021 | What are the risk factors and protective factors of suicidal behavior in adolescents? A systematic review | Early childhood development |
| Carrasco-Barrios *et al*., 2020 | Determinants of suicidality in the European general population: A systematic review and meta-analysis | Early childhood development, social inclusion and non-discrimination, unemployment and job insecurity |
| Gariépy *et al*., 2021 | The mental health of young people who are not in education, employment, or training: A systematic review and meta-analysis | Education, unemployment and job insecurity |
| Gelvez-Gafaro *et al*., 2022 | Psychosocial risk factors associated with suicide in youth and adolescents: A systematic review | Early childhood development |
| Hu *et al*., 2023 | Effects of social support on suicide-related behaviors in patients with severe mental illness: A systematic review and meta-analysis | Social inclusion and non-discrimination |
| Hua *et al*., 2019 | A systematic review on the relationship between childhood exposure to external cause parental death, including suicide, on subsequent suicidal behaviour | Early childhood development |
| Kim and Leventhal, 2013 | Bullying and suicide | Early childhood development |
| Kim *et al*., 2012 | Differences in incidence of injury between rural and urban children in Canada and the USA: a systematic review. | Housing, basic amenities and the environment, early childhood development |
| Lai *et al*., 2017 | Factors Influencing Suicide Behaviours in Immigrant and Ethno-Cultural Minority Groups: A Systematic Review | Social inclusion and non-discrimination |
| Lee *et al*., 2023 | Meta-Analysis of Acculturation and Suicide-Related Outcomes: A Test of the Immigrant Paradox | Social inclusion and non-discrimination |
| Liu *et al*., 2021 | Is there an association between hot weather and poor mental health outcomes? A systematic review and meta-analysis | Housing basic amenities and the environment |
| Mohatt *et al*., 2021 | A Systematic Review of Factors Impacting Suicide Risk Among Rural Adults in the United States | Housing, basic amenities and the environment |
| Moore *et al*., 2022 | Investigating the relationship between bullying involvement and self-harmful thoughts and behaviour in young people: A systematic review | Early childhood development |
| Ragguett *et al*., 2017 | Air pollution, aeroallergens and suicidality: a review of the effects of air pollution and aeroallergens on suicidal behavior and an exploration of possible mechanisms | Housing, basic amenities and the environment |
| Reed *et al*., 2021 | Suicide, Race, and Social Work: A Systematic Review of Protective Factors among African Americans | Social inclusion and non-discrimination |
| Todeshkchuei *et al*., 2018 | Psychosocial Factors Associated with Suicidal Behavior among Iranian Women: A Meta-analysis | Education, housing basic amenities and the environment |
| Valente *et al*., 2023 | Psychosocial Factors Associated with Suicidal Ideation and Behaviour: A Systematic Review | Income and social protection, early childhood development and social isolation and non-discrimination |
| Vásquez-Vera *et al*., 2017 | The threat of home eviction and its effects on health through the equity lens: A systematic review | Housing, basic amenities and the environment, Income and social protection |
| Williamson *et al*., 2018 | Occupational moral injury and mental health: Systematic review and meta-analysis | Working life conditions |
| Wu *et al*., 2023 | Suicide and suicidality in people exposed to pesticides: A systematic review and meta-analysis | Housing basic amenities and the environment |
| Yıldız, 2018 | Suicide in sexual minority populations: A systematic review of evidence-based studies | Social inclusion and non-discrimination |
| Zanchi *et al*., 2023 | Could pesticide exposure be implicated in the high incidence rates of depression, anxiety and suicide in farmers? A systematic review | Housing, basic amenities and the environment |

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## Table S3

**Data Extraction Template**

| | |
|---|---|
| **Title of Systematic Review** | |
| **URL to paper** | |
| **Author, year of publication** | |
| **Aim of review** | |
| **Type of review** | |
| **Inclusion/exclusion criteria** | |
| **Social determinant(s) examined, and definition(s) used** | |
| **Number of included studies** | |
| **Types of included studies** | |
| **Year range of included studies** | |
| **Appraisal tool used / operationalised** | |
| **Countries** | |
| **Study settings** | |
| **Populations of interest** | |
| **Age range** | |
| **Gender** | |
| **Measurement tools used (if applicable)** | |
| **Total sample size (or study specific sample sizes for meta analysis)** | |
| **Findings (for each SD):** | |
| **Total number of events** | |
| **Descriptive conclusions** | |
| **Effect estimates with 95% CI** | |
| **Qualitative findings** | |
| **Stratification of evidence** | |
| **Risk of bias/quality assessment** | |

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# Appendix S1

**AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both**

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

For Yes:
- Population
- Intervention
- Comparator group
- Outcome

Optional (recommended)
- Timeframe for follow-up

- Yes
- No

**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 deviationsfrom the protocol?**

For Partial Yes:
The authors state that they had a written protocol or guide that included ALL the following:
- review question(s)
- a search strategy
- inclusion/exclusion criteria
- a risk of bias assessment

For Yes:
As for partial yes, plus the protocol should be registered and should alsohave specified:
- a meta-analysis/synthesis plan,if appropriate, *and*
- a plan for investigating causesof heterogeneity
- justification for any deviationsfrom the protocol

- Yes
- Partial Yes
- No

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

For Yes, the review should satisfy ONE of the following:
- *Explanation for* including only RCTs
- OR *Explanation for* including only NRSI
- OR *Explanation for* including both RCTs and NRSI

- Yes
- No

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

For Partial Yes (all the following):
- searched at least 2 databases (relevant to research question)
- provided key word and/or search strategy
- justified publication restrictions (e.g. language)

For Yes, should also have (all the following):
- searched the reference lists / bibliographies of included studies
- searched trial/study registries
- included/consulted content experts in the field
- where relevant, searched forgrey literature
- conducted search within 24 months of completion of the review

- Yes
- Partial Yes
- No

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

For Yes, either ONE of the following:
- at least two reviewers independently agreed on selection of eligible studiesand achieved consensus on which studies to include
- OR two reviewers selected a sample of eligible studies and achieved good agreement (at least 80 percent), with the remainder selected by one reviewer.

- Yes
- No

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