INPLASY

Global prevalence of loneliness among adolescents in pre, peri and post – COVID-19 era: A systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 28 May 2026 and was last updated on 28 May 2026.

INTRODUCTION

Review question / Objective This review is guided by the following primary question- "What is the global prevalence of loneliness among adolescents?"
Secondary Review Questions:
- "How does the prevalence of loneliness among adolescents vary across different geographical regions (or low-, middle-, and high-income countries)?"
- "Are there significant differences in the prevalence of loneliness based on age sub-groups (early vs. late adolescence)
- "Has the global prevalence of adolescent loneliness changed significantly over the last decade (e.g., pre- vs. post-COVID-19 pandemic era)?"

Condition being studied Loneliness is a subjective, distressing internal state resulting from a discrepancy between an individual's desired and actual level of social connection.

METHODS

Search strategy ("Loneliness"[Mesh] OR lonel*[tiab]) AND ("Adolescent"[Mesh] OR adolescen*[tiab] OR teen*[tiab] OR teenager*[tiab] OR "school student*"[tiab]) AND ("Prevalence"[Mesh] OR prevalence[tiab] OR epidemiolog*[tiab] OR proportion*[tiab]).

Participant or population Adolescents belonging to the age group 10-19 years.

Intervention There is no intervention.

Comparator There are no comparators.

Study designs to be included Cross-sectional studies and those cohort studies which give a baseline data on prevalence of loneliness among adolescents.

Eligibility criteria
1. 10-19 years age range

2. Community-based samples, school-going adolescents, or household surveys
3. Global studies
4. Cross-sectional studies which provide prevalence or studies with a baseline data on prevalence of loneliness
5. Use of validated scales (UCLA loneliness scale, De Jong Gierveld Loneliness Scale, Single-item measures (e.g., "How often do you feel lonely?") from large national surveys)
6. English language
7. Studies of last 10 years.

Information sources A comprehensive, systematic search will be conducted across the following electronic databases:
• MEDLINE
• EMBASE
• SCOPUS
• Web of Science
We will search in the WHO Global Index Medicus, UNICEF, OECD, national survey repositories, and preprint servers (medRxiv) for literature.
Supplementary searches will be conducted through: (1) manual reference list screening of all included studies and relevant systematic reviews; (2) review of grey literature including reports from various countries' official government reports.

Main outcome(s)
Primary Outcome
Pooled Prevalence of Loneliness
Measurement Criteria: To be included, the outcome must be measured using:
o Validated psychometric scales (e.g., UCLA Loneliness Scale, De Jong Gierveld Loneliness Scale]).
o Single-item direct questions (e.g., "How often do you feel lonely?"), provided they offer clear categorical response options (e.g., "Most of the time", "Always").
Secondary Outcomes
• Prevalence rates broken down by continent/ region and country income levels as defined by the World Bank classification (Low-, Middle-, and High-Income Countries).
• Prevalence rates stratified by age subgroups to distinguish between early adolescence (typically 10–13 years), middle adolescence (14-16 years) and late adolescence (typically 17–19 years).
• Prevalence rates categorised into the following three periods:
• Pre-COVID: Data collection completed prior to March 2020 (before the WHO pandemic declaration).
• Peri-COVID: Data collection occurring between March 2020 and May 2023 (the period encompassing the acute pandemic phase and the WHO-designated Public Health Emergency of International Concern).
• Post-COVID: Data collection initiated after May 2023 (following the formal end of the global health emergency) to evaluate significant macro-level shifts.

Quality assessment / Risk of bias analysis The methodological quality and risk of bias of the included studies will be independently assessed by two reviewers. Since this review evaluates prevalence, appraisal will be conducted using validated tools tailored for observational data:
• Cross-Sectional and Descriptive Studies: The Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Prevalence Studies will be utilized. This tool assesses bias across key domains, including sample representativeness, recruitment strategies, sample size adequacy, data analysis, the validity of the loneliness measurement tool, and the response rate.
• Cohort Studies (Baseline Data): For studies extracting baseline data from longitudinal designs, the relevant sample selection and measurement domains of the JBI Critical Appraisal Checklist for Cohort Studies will be applied.
Overall risk of bias for each study will be categorized as low, moderate, or high based on the proportion of fulfilled criteria. Disagreements between the two reviewers will be resolved through consensus or consultation with a third reviewer. A summary risk of bias visualization will be generated using the robvis package in R. Finally, the risk of bias scores will be directly considered in the interpretation of findings and incorporated into sensitivity analyses to evaluate the robustness of the pooled prevalence estimates.
Note: The COVID-19 era classification (pre-, peri-, and post-COVID) is utilized strictly for contextual and temporal comparisons of loneliness prevalence and will not influence the individual Risk of Bias (RoB) rating.

Strategy of data synthesis Meta-Analysis
Where studies are sufficiently homogeneous in terms of population, context, and condition measurement, a random-effects meta-analysis will be conducted to estimate the pooled prevalence of adolescent loneliness. Due to the expected high heterogeneity in global epidemiological data, a random-effects model is preferred over a fixed-effects model.
To normalise the distribution of proportions, raw prevalence rates from individual studies will be transformed using the logit transformation or the Freeman-Tukey double arcsine transformation before pooling. The final pooled estimates and their corresponding 95% confidence intervals (CI)

will then be back-transformed to percentages for ease of interpretation.

Heterogeneity

Statistical heterogeneity across the included studies will be evaluated quantitatively using the Cochran's Q test (with significance set at $p < 0.10$) and quantified using the I2 statistic, where I2 values of 25%, 50%, and 75% will represent low, moderate, and high heterogeneity, respectively. To explore sources of heterogeneity, subgroup analyses or meta-regressions will be performed based on pre-specified variables, including adolescent developmental stages (early, middle, late), geographical regions, country income-level classifications, and the timing of data collection relative to the COVID-19 pandemic.

Subgroup and Sensitivity Analyses

To explore potential sources of statistical heterogeneity and investigate variations in global estimates, pre-specified subgroup analyses will be conducted based on the following criteria:

1. Adolescent Developmental Stages: Stratified by early (10–13 years), middle (14–16 years), and late (17–19 years) adolescence.
2. Geographical and Economic Classifications: Categorized by global regions/continents and World Bank country income-level classifications (Low-, Middle-, and High-Income Countries);
3. Study Setting: Stratified by environment (e.g., school-based, community-based vs. online surveys) and region (urban vs. rural);
4. Loneliness Measurement Method: Compared by the type of tool utilized (e.g., multi-item validated scales like the UCLA Loneliness Scale vs. single-item direct questions); and
5. Temporal/Pandemic Timeline: Segmented by the timing of data collection to assess macro-level shifts (pre-, peri- & post-COVID-19 pandemic eras).

Sensitivity analyses will be performed to test the robustness of the primary pooled prevalence estimates. This will involve: (1) excluding studies determined to be at a high risk of bias during the critical appraisal stage; and (2) performing a leave-one-out sensitivity analysis (omitting one study at a time) to identify if any single dataset disproportionately distorts the overall pooled prevalence. Furthermore, a separate sensitivity analysis will be conducted by excluding studies where loneliness was measured as a secondary variable within a highly specific cohort (such as primary substance-use surveys) to ensure estimates reflect general population levels.

Subgroup analysis To explore potential sources of statistical heterogeneity and investigate variations in global estimates, pre-specified subgroup analyses will be conducted based on the following criteria:

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Sensitivity analysis Sensitivity analyses will be performed to test the robustness of the primary pooled prevalence estimates. This will involve: (1) excluding studies determined to be at a high risk of bias during the critical appraisal stage; and (2) performing a leave-one-out sensitivity analysis (omitting one study at a time) to identify if any single dataset disproportionately distorts the overall pooled prevalence. Furthermore, a separate sensitivity analysis will be conducted by excluding studies where loneliness was measured as a secondary variable within a highly specific cohort (such as primary substance-use surveys) to ensure estimates reflect general population levels.

Language restriction English.

Country(ies) involved India.

Keywords Adolescents, Loneliness, Prevalence, COVID.

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