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Negosanu, C; Sintoma, D; Tatar, AS.

Corresponding author:

Claudiu Negoşanu

claudiu.negosanu@ubbcluj.ro

Author Affiliation:

Department of Clinical Psychology and Psychotherapy, Babeş-Bolyai University, Cluj-Napoca, Romania

ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Completed but not published.

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 20 February 2025 and was last updated on 20 January 2026.

INTRODUCTION

Review question / Objective This systematic review and meta-analysis addresses two primary research questions: (1) What are the typical levels of acculturative stress among migrants, refugees, and international students, and what are the magnitudes of associations between acculturative stress and depression, anxiety, and loneliness? (2) Do host-society cultural value configurations—operationalized using Hofstede's cultural dimensions (Power Distance, Individualism, Masculinity, Uncertainty Avoidance, Long-Term Orientation, Indulgence)—systematically moderate acculturative stress levels and its associations with mental health outcomes? Secondary objectives include examining whether methodological factors (measurement instruments, study design, assessment methods) and sample characteristics (age, gender composition, student status, publication year) explain between-study

heterogeneity. The overarching objective is to test whether acculturative stress functions as a culture–psychology interface whose impact on mental health depends on measured receiving-context characteristics rather than assumed cultural differences.

Rationale Acculturative stress is a well-documented risk factor for mental health difficulties among migrants, refugees, and international students, yet its magnitude and the cultural conditions that amplify or buffer its effects remain inadequately quantified. Existing research is scattered across heterogeneous samples, measurement approaches, and geographic contexts, making it difficult to determine (1) typical levels of acculturative stress, (2) the strength of its associations with key mental health outcomes (depression, anxiety, loneliness), and (3) whether host-society cultural value configurations systematically moderate these relationships. Most prior studies treat culture as an assumed

background difference rather than measuring it explicitly, limiting cross-cultural theory development. This systematic review and meta-analysis addresses these gaps by synthesizing evidence across multiple outcomes and testing whether Hofstede's cultural dimensions—reflecting norm clarity, social evaluation, and relational access in receiving contexts—explain between-study heterogeneity. Findings will inform cross-cultural acculturation theory, guide culturally responsive mental health interventions, and identify priorities for measurement harmonization in acculturative stress research.

Condition being studied This review synthesizes evidence on acculturative stress levels and their associations with key internalizing outcomes, with particular attention to how host-society cultural value configurations (measured via Hofstede's dimensions) moderate these relationships.

METHODS

Search strategy Reputable databases (PubMed, PsycINFO, Scopus, ProQuest, Web of Science, ScienceDirect, Springer) will be searched from their inception to October 2025 for studies published from 1990 onward. Boolean operators (AND, OR) and truncation symbols (e.g., depress*) will be used to systematically identify records. The main search strings will include terms relevant to the review objectives (e.g., "acculturative stress" OR "acculturation stress" AND depress*, "acculturative stress" OR "acculturation stress" AND anxiety, "acculturative stress" OR "acculturation stress" AND loneliness). Searches will be supplemented by manual screening of reference lists from relevant reviews and included studies. To reduce publication-status bias, searches will be extended to unpublished records; only accepted manuscripts with extractable data will be included. Grey literature will be explored using indexes such as Google Scholar. No language restrictions will be applied at the search stage, but only English-language studies will be eligible for inclusion.

Participant or population Older than 18 years of age migrants, refugees, asylum seekers, international students, and other acculturating populations of any age who have relocated from their heritage culture to a receiving (host) society. This includes individuals undergoing voluntary migration (e.g., labor migrants, international students) and forced displacement (e.g., refugees, asylum seekers). Studies with both clinical (e.g., diagnosed mental health conditions) and non-clinical samples are eligible. No restrictions are placed on duration of residence in the host

country, migration generation (first-generation only), country of origin, or destination country, ensuring broad representation of acculturative contexts globally.

Intervention N/A.

Comparator N/A.

Study designs to be included The study is a systematic review and meta-analysis of observational studies. Eligible study designs include cross-sectional studies, longitudinal studies, cohort studies, and case-control studies that report quantitative data on acculturative stress levels and/or associations between acculturative stress and mental health outcomes (depression, anxiety, loneliness). Both published peer-reviewed studies and accepted unpublished manuscripts are eligible.

Eligibility criteria Inclusion criteria: Studies will be eligible if they (1) are published in English between 1990 and October 2025, (2) include migrants, refugees, asylum seekers, international students, or other acculturating populations of any age, (3) assess acculturative stress using a validated or author-developed quantitative measure, and (4) report extractable data on acculturative stress levels (mean, SD, N, scale range) and/or zero-order correlations between acculturative stress and at least one outcome (depression, anxiety, loneliness). Both clinical and non-clinical samples are eligible, as are cross-sectional, longitudinal, and cohort designs.

Information sources Electronic databases: PubMed, PsycINFO, Scopus, ProQuest, Web of Science, ScienceDirect, and Springer. Additional sources include manual screening of reference lists from relevant systematic reviews and meta-analyses, forward citation searching of key studies, and grey literature searches via Google Scholar. Unpublished accepted manuscripts will be eligible if extractable data are available. Study authors may be contacted for clarification of data or to request additional unpublished results when primary studies report insufficient information for effect size calculation. No language restrictions will be applied during the search phase, but only English-language studies will be included in the final synthesis.

Main outcome(s) The review examines four primary outcomes: (1) mean levels of acculturative stress, indexed as standardized mean differences (Hedges' *g*) relative to scale midpoints; (2) the association between acculturative stress and

depressive symptoms; (3) the association between acculturative stress and anxiety symptoms; and (4) the association between acculturative stress and loneliness. All outcomes are analyzed separately with moderator tests examining methodological, sample, and host-society cultural dimension factors.

Data management Search results will be imported into EPPI-Reviewer for screening and data management. Two independent reviewers will screen titles and abstracts; full texts of potentially eligible studies will be independently assessed by both reviewers. Disagreements will be resolved through discussion and consultation with a senior author. Data extraction will be conducted by one reviewer using a structured, pilot-tested codebook and verified by a second reviewer. Extracted data will include study identifiers (author, year, country), sample characteristics (N, mean age, percentage women, student status, migration type), acculturative stress measure and scoring details, outcome measures (depression, anxiety, loneliness), and effect size data (means, standard deviations, correlation coefficients, sample sizes). When studies report multiple eligible estimates for the same outcome (e.g., multiple instruments or time points), a single estimate will be selected using a predefined priority rule (total score over subscales; baseline over follow-up; primary outcome as author-defined). Host-society cultural dimension scores will be coded using Hofstede's published country-level indices. All data will be exported to Stata for statistical analysis.

Quality assessment / Risk of bias analysis Included studies will be assessed using an adapted version of the National Heart, Lung, and Blood Institute (NHLBI) Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (National Heart and Blood Institute, 2021). Nine items from the original tool will be applied, covering sample representativeness, validity of measures, confirmation of exposure and outcome status, and appropriateness of statistical methods. One reviewer will assess all studies; a second reviewer will independently verify the quality ratings. Disagreements will be resolved through discussion and consultation with a senior author.

Strategy of data synthesis All syntheses will be conducted in Stata Statistical Software (StataCorp, 2023). For the acculturative stress levels outcome, Hedges' *g* will be computed using the one-sample standardized mean difference approach relative to each scale's midpoint, with small-sample correction and the corresponding sampling-variance formulation (Borenstein et al., 2009;

Morris & DeShon, 2002). All totals will be converted to per-item means, with *M* and *SD* scaled on the same metric, and response anchors will be verified (e.g., SAFE 0–5; higher scores = higher stress). Random-effects models will be fitted using maximum likelihood (ML) estimation (Veroniki et al., 2016). For correlational outcomes, correlation coefficients (*r*) and sample sizes (*N*) will be extracted and synthesized via Fisher's *r*-to-*z* transformation (van Aert, 2023; Schulze, 2004).

Subgroup analysis Subgroup comparisons will use mixed-effects models (random effects within groups, fixed effects between groups), and continuous moderators will be examined via meta-regression. Heterogeneity will be quantified using τ^2 and I^2 . Publication bias will be assessed using Egger's test, Begg's test, and trim-and-fill analysis.

Sensitivity analysis Several sensitivity analyses will be conducted to assess the robustness of findings. First, outlier diagnostics using Cook's distance will identify extreme values; analyses will be repeated after excluding outliers to determine their influence on pooled estimates. Second, study quality will be examined as a moderator by comparing pooled effect sizes across high-quality versus average-quality studies. Third, subgroup analyses will test whether results differ by study design (cross-sectional vs. longitudinal vs. prospective), assessment method (self-report vs. interview vs. mixed methods), clinical status (clinical vs. non-clinical vs. mixed samples), and acculturative stress instrument (ASSIS, SAFE, RASI, MASI, other). Fourth, publication bias will be assessed using Egger's regression test, Begg's rank correlation test, and Duval and Tweedie's trim-and-fill method; where bias is detected, adjusted pooled estimates will be calculated and compared to unadjusted estimates. Finally, influence diagnostics will identify studies with disproportionate impact on pooled estimates; analyses will be repeated excluding high-influence studies to verify stability of findings.

Language restriction English.

Country(ies) involved Romania, Ireland.

Keywords acculturative stress; acculturation; migration; refugees; international students; depression; anxiety; loneliness; mental health; cross-cultural psychology; cultural dimensions; Hofstede; cultural values; meta-analysis; systematic review

Dissemination plans To be decided.

Contributions of each author

Author 1 - Claudiu Negoşanu - Author 1 performed the searches, independently screened and coded full texts, and performed the statistical analyses.

Email: claudiu.negosanu@ubbcluj.ro

Author 2 - Daria Sântoma - Independently screened and coded the full texts.

Email: daria.sintoma@ubbcluj.ro

Author 3 - Aurora Szentágotai-Tătar - Supervising Senior Resarcher.

Email: auraszentagotai@psychology.ro