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11th EBHC International Conference
Taormina, 21st – 24th October 2026

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International Society for Evidence-Based Health Care

A Scoping Review to Inform Development of a Tool for Risk of bias Assessment of Meta-research (TRAM)

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Background

What We Know

- Meta-research or “research on research” is increasingly being conducted and being used to inform decisions (e.g., funding, methods standards)
- Emerging efforts on reporting guidelines for meta-research

What We Do Not Know

- There is no common definition of meta-research
- There is no standard approach to identifying “good” meta-research
- There is no specific quality assessment or risk of bias (RoB) tool specific to meta-research studies

Aims

Immediate Aims

- Determine how meta-research is currently defined
- Generate initial items for future consideration to develop a risk of bias assessment tool for meta-research studies

Long Term Aims

- Determine a common and consensus-based definition of meta-research
- Develop and empirically test a risk of bias assessment tool to enable the identification of rigorous meta-research studies

Methods

Key Questions

- How is meta-research defined within meta-research studies?
- What criteria have been used to evaluate meta-research studies in systematic reviews?

Our *working definition of meta-research* is that it is research on research which summarizes and evaluates the funding, conduct, reporting, and evaluation of research

Methods

Inclusion Criteria

Systematic review

- Search of at least two bibliographic databases
- Apply any form of quality or RoB assessment
- Synthesis of the evidence

Includes meta-research studies

Provides details about either

- how meta-research is defined in the systematic review or included studies
- the evaluation of meta-research studies

Methods

Data Extraction

Phase 1: Systematic Review Assessment (completed)

- Aim
- Search strategies
- Definition of meta-research
- Methods for quality or RoB assessment
- Design of included studies

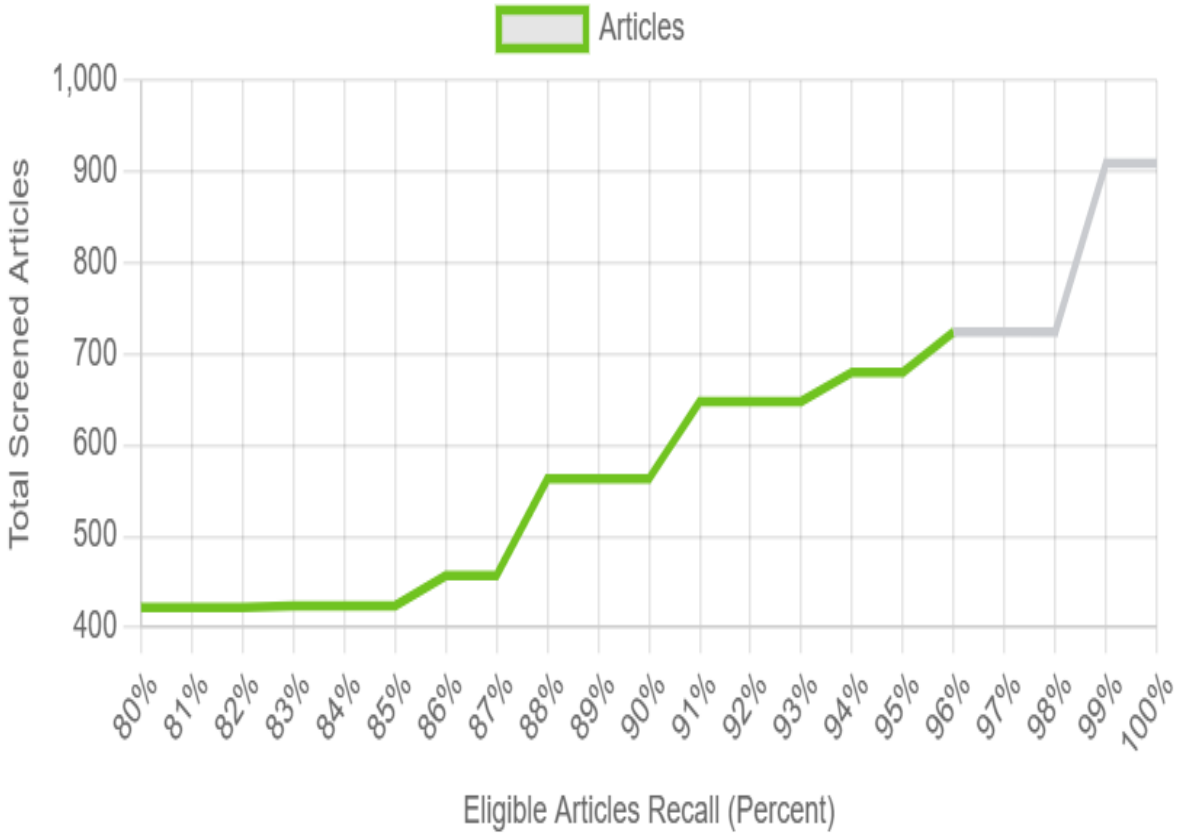
Phase 2: Primary Studies Assessment (in progress)

- Definition of meta-research
- Study design (reported & assessed)
- Data (source, unit of analysis)

Results

Title & Abstract Screening

- Machine learning-assisted screening function of PICO Portal
- Human screening stopped once 90% of eligible citations for full text were identified
- 724 of 3,067 citations (~ 20%) via human screening



Results

Definitions of Meta-Research

Reported in 4 of 9 systematic reviews

- "*The study of research itself: its methods, reporting, reproducibility, evaluation and incentives*" by Ioannidis, 2018 (n=3)
- "*Studies where researchers investigated the prevalence of, or factors associated with [x] … (meta-research studies) across a sample of published scientific articles presenting … related research findings (termed primary articles)*" (n=1)

Results

Designs of Included Studies

Reported in 6 of 9 systematic reviews

- Cross-sectional studies (n=4)
- Evidence syntheses (n=3)
- Mixed research design (n=1)
- Methodological studies (n=1)
- RCTs (n=1)

Results

Quality or RoB Assessment

Existing Tools (n=1)

- Appraisal Tool for Cross-sectional Studies (AXIS)

Researcher Developed Criteria (n=8)

Results

Preliminary Components of Quality or RoB Assessment

- Clarity of Aims/Objectives (n=5)
- Appropriateness of Design (n=5)
- Justification of Sample Size (n=1)
- Clarity of Population (n=1)
- Sampling (n=8)
- Selection (n=4)
- Selective Reporting (n=6)
- Data Collection (n=7)
- Data Analysis (n=3)
- Description of Results (n=1)
- Limitations (n=2)
- Funding/Conflicts of Interest (n=1)
- Publication Bias (n=1)

Limits

- Missing relevant systematic reviews
- Study quality vs. risk of bias assessment

Conclusions

Meta-research in not well, nor consistency, defined in systematic reviews of meta-research studies

Meta-research studies are being evaluated for quality or RoB, but

- there is inconsistency in the areas being evaluated
- tools, when used, used lack validity and reliability for meta-research studies

Preliminary findings support next steps to

- determine a common and consensus-based definition of meta-research
- develop, test, and disseminate an assessment tool to enable the identification of rigorous meta-research studies