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A Systematic Review of Validated Mindset Instruments in Health Professions Education

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ADMINISTRATIVE INFORMATION

Support - Self.

Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202630016

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 6 March 2026 and was last updated on 6 March 2026.

INTRODUCTION

Review question / Objective To systematically review and appraise instruments designed to measure mindsets in health professions education students, with a focus on their reported psychometric properties.

Rationale Mindsets, namely growth and fixed mindsets are increasingly recognized as essential for effective learning and student performance in health professions education. However, instruments used to measure this construct vary and their psychometric quality has not been systematically evaluated. A systematic review is therefore needed to identify available instruments and appraise their psychometric properties to guide appropriate tool selection in research and educational practice.

Condition being studied Mindset refers to individuals' underlying beliefs about the nature of their abilities and whether these abilities can be developed. According to mindset theory, individuals may hold a growth mindset, where abilities are viewed as improvable through effort, learning, and persistence, or a fixed mindset, where abilities are perceived as innate and largely unchangeable. These beliefs influence how individuals respond to challenges, effort, feedback, and failure, thereby shaping their motivation, learning behaviors, and academic development. In educational contexts, mindset plays an important role in determining how learners engage with feedback and opportunities for improvement.

METHODS

Participant or population Undergraduate and post graduate students in health professions education.

Intervention No interventions, only questionnaire based.

Comparator No comparators.

Study designs to be included Cross-sectional study designs, Randomised control trials, Interventional studies with measurement, Mixed methods designs.

Eligibility criteria The following inclusion and exclusion criteria was applied to assess the identified article:
Inclusion Criteria:
1. Original studies published in peer-reviewed journals
2. English language studies.
3. Studies published in any year.
4. Studies on both undergraduate and postgraduate studies in health professions education.
5. Studies measuring student mindset using the original instrument or any adaptation of the original mindset instrument.
Exclusion criteria:
1. Correlational studies that used the mindset instrument to relate to other attributes eg: grit, anxiety, communication skills without individual psychometric properties of the mindset instrument.
2. The studies which focused mainly on mindset interventions rather than the psychometric properties of the mindset instrument.
3. Studies which provide abstracts in English but non-English texts.
4. Reviews, short reports, opinion pieces, editorials, or perspectives
5. Theses, dissertations, unpublished reports, conference presentations which constitute gray literature)
6. No available full text.

Information sources Four databases: Embase, Scopus, Web of Science and Medline. In addition, a manual search was also conducted for relevant articles including screening of references and citations.

Main outcome(s) The primary outcome of this review will be the identification and evaluation of instruments used to measure mindsets among health professions education students. Specifically, the review will examine the psychometric properties of these instruments, including content validity, structural validity, internal consistency, reliability (e.g., test–retest), measurement error, criterion validity, construct validity (e.g., hypothesis testing), responsiveness, and interpretability, in accordance with COSMIN guidelines. Data will be extracted from studies reporting the development, validation, or psychometric testing of mindset instruments.
The outcomes will be assessed based on the reported psychometric evidence at the time the instruments were evaluated in the included studies, rather than at a specific follow-up period. Effect measures will include statistical indicators of measurement properties, such as Cronbach's alpha for internal consistency, intraclass correlation coefficients (ICC) for reliability, factor loadings and model fit indices for structural validity, and correlation coefficients for construct or criterion validity. The findings will be synthesized narratively and, where appropriate, summarized to indicate the overall quality and strength of evidence for each instrument.

Additional outcome(s) Nil.

Data management The data will be stored by soft copy as a passworded file by the main researcher. This will be kept safe for 5 years after which it will be completely destroyed.

Quality assessment / Risk of bias analysis The methodological quality and risk of bias of the included studies will be assessed using the COSMIN Risk of Bias checklist for studies on measurement properties. This tool evaluates the methodological rigor of studies that develop or validate measurement instruments. Two reviewers will independently assess each included study across relevant domains of measurement properties, including content validity, structural validity, internal consistency, reliability, measurement error, criterion validity, construct validity (hypothesis testing), and responsiveness. Each domain will be rated according to COSMIN standards as "very good," "adequate," "doubtful," or "inadequate." The overall methodological quality for each measurement property will be determined using the "worst score counts" principle recommended by COSMIN. Any disagreements between reviewers will be resolved through discussion or consultation with a third reviewer. The results of the quality assessment will be summarized in tables and used to interpret the strength and credibility of the evidence for each mindset instrument.

Strategy of data synthesis Data from the included studies will be synthesized following the COSMIN guidelines for systematic reviews of measurement instruments. Extracted data on study characteristics, instrument features, and reported psychometric properties will first be summarized in descriptive tables. The measurement properties of each instrument, including content validity, structural validity, internal consistency, reliability, measurement error, criterion validity, construct validity, and responsiveness, will be evaluated against COSMIN quality criteria.

A narrative synthesis will be conducted to summarize the evidence for each instrument. Where multiple studies report the same measurement property for an instrument, the findings will be qualitatively compared and summarized to determine the overall level of evidence. The evidence for each measurement property will then be graded based on the quality and consistency of the results, allowing identification of instruments with the strongest psychometric support for measuring mindset among health professions education students.

Subgroup analysis If sufficient data are available, subgroup analyses will be conducted to explore potential differences in the psychometric performance of mindset instruments across relevant contexts. Possible subgroups may include type of health professions education program (e.g., medicine, nursing, physiotherapy, allied health), level of training (preclinical vs. clinical students, undergraduate vs graduate, undergraduate vs postgraduate), and geographical or educational settings.
Subgroup analysis may also consider instrument characteristics, such as the number of items, domains measured, or method of administration (e.g., self-report questionnaires). These analyses will be conducted through qualitative comparison of findings across studies, as meta-analysis is unlikely due to the expected heterogeneity in study designs, instruments, and reported measurement properties.

Sensitivity analysis A sensitivity analysis will be conducted to assess the robustness of the review findings and determine whether the conclusions are influenced by the methodological quality or risk of bias of included studies. This will involve excluding studies rated as “doubtful” or “inadequate” in the COSMIN risk of bias assessment and comparing the synthesized results with the full dataset.
Additional sensitivity analyses may explore the impact of study characteristics, such as sample size, educational level of participants, or instrument administration method, on the reported psychometric properties. The results of these analyses will help evaluate the stability and reliability of the evidence and provide more confidence in identifying instruments with strong measurement properties for assessing mindset in health professions education students.

Language restriction Yes, Only English language articles will be included due to the author's expertise.

Country(ies) involved Malaysia.

Other relevant information Nil

Keywords Mindsets; growth mindsets.

Dissemination plans The findings of this systematic review will be disseminated through multiple channels to reach both academic and educational stakeholders:
Peer-reviewed Publication: The full review will be submitted to a reputable journal in health professions education or medical education to ensure accessibility to researchers, educators, and curriculum developers.

Conference Presentations: Key findings will be presented at national and international conferences in medical and health professions education to facilitate discussion and knowledge translation.

Workshops and Seminars: Summarized results and recommendations for selecting valid instruments may be shared in faculty development sessions, workshops, or webinars aimed at educators involved in feedback practices.
Open Access and Institutional Repositories: Data tables and the final review may be uploaded to open-access platforms or institutional repositories to promote wider accessibility and usability by researchers and educators.
Practical Guidelines: Where possible, a summary guideline or decision aid will be developed to help educators choose psychometrically robust instruments for measuring feedback literacy in health professions students.

Contributions of each author

Author 1 - Reshma Mohamed Ansari - This author drafted the search strategy, identified articles and finalised the selected studies.
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Author 2 - Foong Chan Choong - This author conceptualized the study, identified articles and finalized the selected studies individually from the first author.
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Author 3 - Hidayah Mohd Fadzil - The third author will check the final data extraction and risk of bias. She is also responsible for the writeup of the findings which will be triangulated by the first and second authors.
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