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Factors Influencing Effective Feedback in Underperforming Medical Students: A Scoping Review Protocol

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ABSTRACT

Feedback is essential in medical education, especially for supporting underperforming students. Despite its importance, no standardised feedback model has been developed to address the needs of underperforming students in undergraduate medical education. Therefore, this scoping review protocol outlines a structured approach to identify, screen, and synthesise studies published in the past decade to map existing feedback practices for underperforming undergraduate medical students. It also explores the extent and nature of the current literature to inform the development of future support strategies. This review will be conducted in accordance with the Joanna Briggs Institute guidelines for scoping reviews. The review will include original qualitative and quantitative studies, along with relevant reviews, to examine feedback strategies or interventions for undergraduate medical students who are struggling academically. Eligible studies must have been published between June 2015 and May 2025 and report clear qualitative or quantitative outcomes related to feedback. Studies focusing on postgraduate learners, lacking defined outcomes, or not addressing underperformance will be excluded. A three-step search strategy will be implemented. First, an initial limited search of PubMed and Scopus will be conducted to identify relevant keywords and indexing terms. Second, a comprehensive search using the refined strategy will be applied across four databases: PubMed, Web of Science, PsycINFO, and Scopus. Third, the reference lists of all included studies and relevant reviews will be hand-searched to identify additional sources. Five reviewers will independently conduct title and abstract screening and full-text assessment in accordance with the predefined eligibility criteria. Data extraction will be conducted using a standardised form developed in line with JBI methodology. The review is expected to identify gaps in structured feedback mechanisms tailored to underperforming medical students. Findings will inform the development of evidence-based strategies, which will be communicated via peer-reviewed publications and presentations at national and international conferences.

Keywords: *Feedback, Feedback literacy, Underperformance, Academically struggling students, Undergraduate medical students*

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INTRODUCTION

Feedback is a foundational component of progress and professional development in medical education. It facilitates formative assessment and guides professional development (1–3). However, the efficacy of feedback delivery and reception, particularly among underperforming medical students, varies considerably in both implementation and reception (4,5). Although feedback is theoretically intended to be a constructive mechanism for improvement, in practice, its impact is often blunted by miscommunication, psychological resistance, or contextual barriers, such as fear of judgement, time constraints, and lack of trust. For underperforming students who are already struggling, the stakes are higher, such that ineffective feedback can widen performance gaps rather than remedy them (4,6). Multiple interconnected factors, including cognitive, emotional, and interpersonal ones influence underperforming students. Given this complexity, it is essential to examine how these elements hinder feedback effectiveness (7,8). To date, the literature addressing this issue is fragmented, drawing on varied disciplines, methodologies, and theoretical paradigms without a unifying framework.

A scoping review is particularly valuable for systematically identifying research gaps within feedback practices in medical education. Given the breadth and heterogeneity of the existing literature, this approach enables comprehensive mapping of evidence on feedback for underperforming medical students. More importantly, it facilitates the clarification of the conceptual landscape by identifying key factors and their interrelationships within the research domain. This can be done by linking identified factors in the literature to the designated conceptual framework. Moreover, a scoping review can offer critical insights into the extent, diversity, and intrinsic nature of research activities undertaken within the scope of the review. A comprehensive scoping review is warranted to map this landscape systematically. The scoping review protocol outlines a Joanna Briggs Institute (JBI)- guided methodology and aims to explore key factors influencing feedback effectiveness and those contributing to ineffective feedback experiences among underperforming medical students (9,10). When feedback is delivered constructively, it can illuminate performance gaps, foster metacognitive awareness, and re-engage learners with their professional identity. It can transform perceived failure into a scaffolded learning opportunity, mitigating the emotional dimension often associated with underperformance (11). Ineffective feedback may reinforce a fixed mindset, discourage engagement, or erode trust between student and educator. By clarifying expectations, enhancing self-efficacy, and promoting accountability, well-executed feedback can be a turning point in the remediation trajectory. Therefore, understanding the elements that hinder its impact, especially for underperforming students, is essential.

Ineffective feedback can diminish underperforming students' academic self-efficacy by fostering negative emotional responses and inaccurate self-assessments. This hampers motivation and learning strategies, particularly when feedback is overly directive, while comments without clear rationale are perceived as controlling or uninformative. Such feedback may inadvertently lead to feelings of incompetence and disengagement (12). Recent studies indicate that while effective feedback is well researched, a notable gap remains in

the literature on feedback for underperforming students. For instance, a study by Das in 2023 emphasised the need for more targeted research in this area (13). Similarly, Liu et al. (14) highlighted the challenges instructors face in addressing the needs of underperforming students. These findings underscore the necessity for further exploration into feedback mechanisms tailored for students who are struggling academically. In addition, a recent scoping review examined how feedback processes are organised in undergraduate clinical workplace-based learning settings and emphasised the importance of sociocultural factors and structured feedback (15). Meanwhile, another recent scoping review explored how feedback is delivered and received in interprofessional education contexts, which highlighted the complexities and challenges of feedback in collaborative settings (16). A recent systematic review and meta-analysis assessing the effectiveness of various feedback modalities in enhancing medical students' knowledge, attitudes, and skills identified positive associations when feedback was used purposefully and integrated into learning (17).

OBJECTIVE AND RESEARCH QUESTION

This scoping review synthesises factors that influence or hinder the effectiveness of feedback among underperforming medical students across academic, clinical, and professional domains. This review addresses the question: What key factors influence the effectiveness of feedback for underperforming medical students? Mapping these factors is a critical first step towards designing a feedback model that ensures underperforming medical students effectively receive, process, and apply feedback.

The review team will comprise five medical educationists, three from Malaysia and two from Pakistan. The team includes KF, SNH, MAA, MSBY, and NKH. Their combined expertise comprises instructional design, assessment, curriculum development, and evidence-based feedback practices in undergraduate medical education.

METHODS AND ANALYSIS

This scoping review is developed in accordance with the JBI methodology for scoping and reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist (18–20). The review will be conducted based on studies published between June 2015 and May 2025. Any modifications to the protocol will be reported transparently in the final review report.

Inclusion Criteria

Participants

The review will include studies on feedback for undergraduate medical students identified as underperforming based on academic, clinical, or professional criteria. Academic underperformance is defined as consistent difficulties in understanding theoretical knowledge, poor performance in examinations and coursework. It is typically evidenced by repeated failures in assessments or an inability to meet the cognitive demands of the medical curriculum (19). Clinical underperformance refers to the inability to apply medical knowledge competently in real-life or simulated patient care settings. This includes poor clinical reasoning, inadequate procedural skills, difficulty with history taking, or failure

to create appropriate management plans (21). Professional underperformance involves behaviours that do not align with the ethical, interpersonal, or professional standards set for medical students. This includes poor communication, lack of punctuality, inadequate teamwork, dishonesty, or breaches in confidentiality (22,23).

Concept

The review will focus on factors that underpin the effectiveness of feedback in facilitating learners' improvement, as well as those that impede its intended purpose. For this review, ineffective feedback is defined as feedback that fails to achieve its educational purpose, such as when it is unclear, inconsistently delivered, or misunderstood by learners (24–26).

Context

The review will include studies involving undergraduate medical students identified as underperforming across diverse educational settings, including clinical placements, academic classrooms, simulation environments, and hybrid contexts. To ensure broad representation, the review will consider studies from high-income and low-/middle-income country contexts.

TYPE OF EVIDENCE SOURCES

The review will include qualitative, quantitative, and mixed-methods studies; primary and secondary studies; all types of reviews; and theoretical papers and commentaries, provided they address the phenomenon of interest. Table 1 lists the eligibility criteria used to screen the title, abstract, and full text.

Table 1: Eligibility criteria for title, abstract and full text screening

Selection	Criteria
Title	a. Title in English b. Year of publication from June 2015-May 2025 c. Title reflects feedback practices in medical education
Abstract examination	a. Abstract depicts that the article is research article b. Abstract reflects that study design and methodology is rigorous c. Abstract shows presence of at least on quantitative or qualitative outcome
Full-text examination	a. Article provides the elements of effective or ineffective practices in feedback in medical education b. The article has clear research methodology and at least one quantitative or qualitative outcome c. The article has well designed research intervention
Procedure for solving disagreements between the reviewers (Research team)	Researchers resolve disagreements during scoping review screening through discussion, consensus-building, and, if unresolved, a third independent reviewer will be involved to ensure objective and consistent article selection.

A three-step search strategy will be employed. The search strategy will be peer-reviewed, and an independent review will be conducted using the Peer Review of Electronic Search Strategies (PRESS).

Step – 1 Exploratory searching: The first step will be an initial exploratory search of the Medical Literature Analysis and Retrieval System Online (MEDLINE) via Public/Publisher Medline (PubMed) and Education Resources Information Center (ERIC). This research aims to identify 'seed references' or foundational studies relevant to the scoping review question and inclusion criteria. The following search string was used for searching databases (feedback OR formative assessment AND (effective* OR quality OR impact OR factor* OR influence* OR barrier* OR facilitator*) AND (medical education OR medical student* OR clinical education OR health professional education) AND (Academic Underperformance OR academic weakness OR clinical underperformance OR student support OR remediation OR unsatisfactory performance OR academic failure).

Google Scholar and the library discovery tool Primary Resource for Information Management and Organization PRIMO will be used for this purpose. Following this exploratory search, the keywords in titles and abstracts and the index terms (MeSH terms or controlled vocabulary) used to describe these articles will be analysed.

Step – 2 Comprehensive searching: The second step will be a comprehensive search using these harvested keywords and index terms. This search will be conducted across four selected databases: Web of Science (WoS), Psychological Information Database (PsycINFO), Scopus, and PubMed.

Step – 3 Supplementary searching: The third step will be a supplementary search of grey literature, reference list screening and hand searching. The reference lists of all included sources will be screened for additional relevant studies (26). The date restrictions will be applied during this search. Only articles published in English will be included due to resource constraints. At each step, authors will review and revise the search strategy to improve results and outcomes. Table 2 summarises the three-step search strategy, including the databases, search terms, and inclusion criteria applied at each stage.

Table 2: The three-step-search strategy

Steps	Description
Step-1 Initial limited search	An initial limited search of MEDLINE (via PubMed) and ERIC will be undertaken to identify relevant articles. The text words in titles and abstracts and the index terms used to describe these articles will be analysed. Identifying seed references.
Step- 2 Comprehensive search	It will be conducted across four selected databases like, ERIC, PsycINFO, Scopus and PubMed and five researchers. Using harvested keywords. Boolean search string (medical students OR medical education AND (underperform OR struggling students) AND (feedback OR formative assessment)
Step-3 Reference list screening	The reference lists of all included sources will be screened for additional relevant studies. Hand searching reference lists and additional resources.

SELECTION OF SOURCES

Identified sources will be exported to Microsoft Excel, and duplicate research studies will be removed. Studies will be selected in accordance with predefined inclusion criteria. Five researchers will independently screen the titles, abstracts, and full text of the included records. Research articles that cannot fulfil the eligibility and inclusion criteria will be excluded from the record, and the reason for the exclusion will be justified. Disagreements among researchers will be resolved through team discussions to achieve a consensus, or else the issue will be escalated to a third reviewer.

DATA EXTRACTION

Data will be extracted using a draft template for charting information from each research article (Figure 1). The template will be piloted on a subset of studies to ensure clarity and comprehensiveness. Extracted information will include author(s), year of publication, country, study design and methods, participant characteristics, identification of underperformance, identified barriers or factors contributing to ineffective feedback, and key findings with interpretations.

Author(s)	Year of Publication	Country	Study Design and Methods	Participant Characteristics	Identification of Underperformance	Barriers/Factors Contributing to Ineffective Feedback	Key Findings and Interpretations

Figure 1: Example of data charting table.

ANALYSIS OF EVIDENCE

Extracted data will be analysed using qualitative content analysis with an inductive coding approach. Two reviewers will independently code the data to enhance reliability, then group the codes into categories and synthesise them into broader themes reflecting the factors that influence feedback. A codebook will be iteratively developed and refined during the coding process. Frequency will be operationalised as the recurrence with which a factor or concept is reported across included studies, while intensity will be operationalised as the depth, emphasis, or richness of description given to a factor within individual studies (e.g., extent of elaboration, contextual detail, or perceived strength of influence). Both common and nuanced patterns will be examined. Reviewers will resolve coding discrepancies through discussion until consensus is reached. Findings will be presented in both narrative and tabular formats.

Step-by-step analysis plan:

1. Data familiarisation: All reviewers will read the extracted data independently to gain an initial understanding of the content and context. A short summary note for each study will be recorded.
2. Initial coding: Relevant data (e.g., study findings, author discussions, conceptual definitions) will be coded inductively. Codes will capture meaning units related to effective or ineffective feedback mechanisms, underperformance, and contextual factors.
3. Categorisation: Similar codes will be grouped into descriptive categories (e.g., barriers to effective feedback, student characteristics, feedback delivery styles). Categories will be developed through consensus discussions among the review team.

4. Theme development: Categories will be synthesised into higher-order themes that reflect broader concepts (e.g., Feedback receptiveness, Faculty development needs, or Assessment-driven feedback).

5. Data display: Findings will be presented in tabular and narrative formats to show frequency, recurrence, and conceptual relationships among themes. A conceptual map will illustrate the interplay between different factors affecting feedback effectiveness.

6. Maintaining rigour: To enhance trustworthiness, coding will be conducted by two reviewers independently, followed by discussion to resolve discrepancies. A third reviewer will be consulted when necessary. NVivo or similar qualitative data management software may be used for coding and organising data.

PRESENTATION OF RESULTS

The results of the scoping review will be presented in accordance with the JBI methodology and reported following the PRISMA-ScR checklist. Data extracted from the included sources will be charted and synthesised using descriptive statistics (e.g., frequencies, counts), then summarised in the PRISMA-ScR flow diagram (see Figure 2) and through qualitative thematic analysis. Key characteristics of the included studies will also be summarised in tabular and graphical formats where appropriate, covering author, year of publication, country, study population, concept, context, methodology, and relevant findings. The tabular and graphical outputs will be accompanied by a descriptive narrative that interprets and contextualises the data presented. This narrative synthesis will describe the distribution and nature of the evidence, identify recurring themes, and highlight gaps in the literature. Conceptual maps may also be used to illustrate relationships among factors affecting feedback effectiveness.

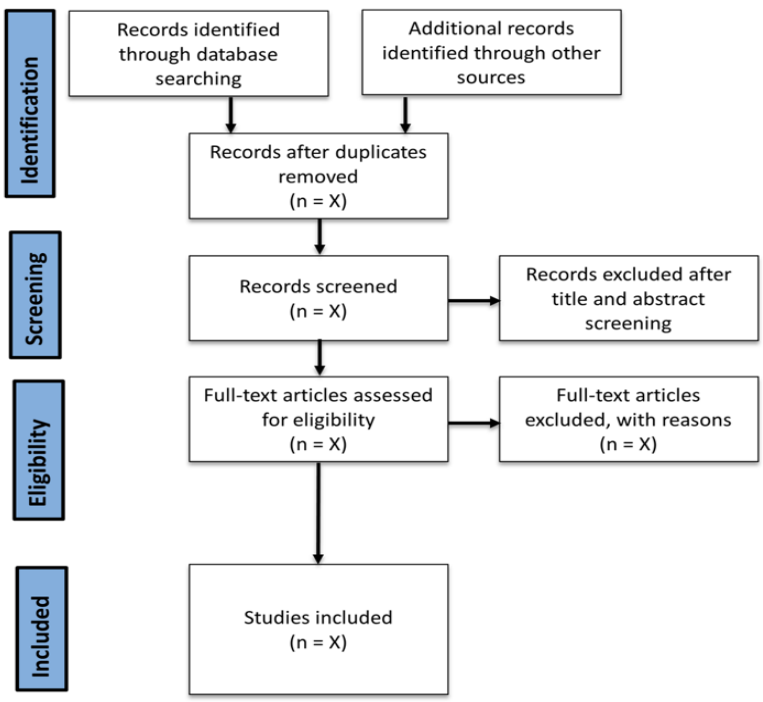

Figure 2: A flow diagram illustrating the article selection process.

DISSEMINATION

The results of the scoping review will be submitted for publication in a peer-reviewed medical education journal and presented at relevant academic conferences. Insights from this review will inform educational interventions and faculty development aimed at enhancing feedback efficacy for struggling learners.

LIMITATIONS

This review is limited to English-language publications and may therefore exclude relevant perspectives published in other languages. In addition, the variability in how 'underperformance' and 'ineffective feedback' are defined across studies may complicate synthesis. However, transparent reporting can mitigate this challenge.

CONCLUSION

This scoping review will systematically map the existing literature on feedback practices for underperforming undergraduate medical students. By identifying current strategies, gaps, and opportunities for improvement, the review aims to inform the development of structured, evidence-based feedback mechanisms tailored to this student population. The findings will provide valuable insights for educators, curriculum developers, and academic support programmes seeking to enhance learning outcomes and promote academic success in medical education.

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ETHICAL APPROVAL

As this study involves the analysis of published literature and publicly available data, ethical approval is not required.

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