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From hesitation to participation: a narrative review of facilitators and barriers for healthcare professionals' engagement in medical education research

Ya-Shin Chen¹, Kuo-Chen Liao^{2,3} and Sze-Yuen Yau^{1*}

Abstract

Background Medical education research plays a critical role in improving patient care and advancing medical practices, yet the engagement among healthcare professionals remains limited. This study aims to explore the factors that influence participation in medical education research and provide recommendations to foster a research-inclusive culture within healthcare institutions.

Methods A comprehensive literature review was conducted across four databases: Web of Science, MEDLINE, Scopus, and Airtiti Library. The search focused on studies published between 2002 and 2024, utilizing keywords related to 'medical education research,' 'facilitate,' 'engage,' and 'involve.' The initial search yielded 814 records. After removing duplicates and conducting a thorough screening process based on predefined inclusion and exclusion criteria, eight studies were selected for in-depth analysis. These studies were evaluated to identify key facilitators and barriers that influence research participation among healthcare professionals.

Results The analysis, guided by the Ecological Model, revealed a complex interplay of facilitators and barriers affecting research engagement. At the individual level, opportunities for professional development and career advancement emerged as significant facilitators. The interpersonal level highlighted the importance of leadership, mentorship, and peer support in fostering engagement. The environmental level, including institutional policies, funding availability, and protected research time, were identified as critical influences on participation.

Conclusions The findings suggest that a holistic approach is needed to promote participation in medical education research, addressing factors at the individual, interpersonal and environmental levels. Recommendations include developing targeted strategies to improve intrinsic motivation among healthcare professionals, strengthening mentorship and peer support programs, and implementing supportive institutional policies that allocate dedicated research time and secure financial resources. By fostering a culture that values and facilitates medical education research, healthcare institutions can drive innovation in medical education, ultimately enhancing the quality of patient care and safety.

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Keywords Medical education research, Healthcare professionals, Ecological model, Narrative review

Background

Medical education research plays a vital role in advancing healthcare delivery and professional development. Since its emergence in the 1950s, this field has evolved from a narrow focus on teaching methods and curriculum design to encompass complex methodologies and interdisciplinary approaches that address contemporary challenges in healthcare education [21, 35, 39]. The scope of medical education research now extends to investigating curriculum effectiveness, assessment innovations, teaching quality, professional development, educational reforms, and initiatives promoting diversity within medical training programs [2, 10].

The primary significance of medical education research lies in its capacity to enhance healthcare quality through evidence-based educational practices. By examining educational methodologies and their outcomes, researchers contribute to developing healthcare professionals who are not only technically competent but also adaptable to evolving healthcare demands [4, 5, 21]. This research has fostered the development of a specialized academic community dedicated to advancing educational practices through empirical evidence and theoretical frameworks, directly influencing the quality of healthcare services by ensuring educational practices align with current healthcare needs [14, 22].

However, despite its recognized importance [1, 33], medical education research faces significant challenges in attracting active participation from healthcare professionals. Several barriers impede engagement, including time constraints from clinical duties, high-stress work environments, and perceived disconnection from clinical practice [16]. Limited access to resources, funding, and mentorship further compounds these challenges [19, 20, 23]. On the contrary, some healthcare professionals are motivated to participate by opportunities for career advancement, professional development, and the potential to improve medical education and patient care outcomes [9, 15].

Although the existing literature has separately examined various facilitators and barriers to research participation, there remains a critical gap in understanding how these factors interact within a unified framework. This narrative review aims to address this gap by synthesizing the diverse factors that influence the participation of healthcare professionals in medical education research. By comprehensively examining both internal and external factors that affect participation, this study seeks to identify practical strategies for fostering a more inclusive and dynamic research community. Specifically, this review addresses two key questions: What motivates healthcare

professionals to engage in medical education research and what obstacles do they encounter? Additionally, what factors influence their level of participation?

Methods

This study employs a systematic narrative review methodology to explore the complex landscape of involvement of healthcare professionals in medical education research. By adopting this approach, enhanced by the application of the Ecological Model as a guiding theoretical framework, we aim to synthesize existing research findings and critically examine the literature. The Ecological Model, drawing from Bronfenbrenner's ecological psychology, offers a comprehensive framework for understanding the complexity of educational phenomena. This theory is widely applied in fields such as education, psychology, sociology, and medicine, studying the process of adaptation within complex social and cultural contexts [30]. This multidimensional model allows for a detailed synthesis of both the facilitators behind and barriers to engagement in medical education research, facilitating a nuanced understanding of how individual, interpersonal, and environmental factors collectively shape the participation of research by healthcare professionals' research engagement.

Search strategy

In August 2022, the research team conducted a comprehensive literature search across four major databases: Web of Science, MEDLINE, Scopus, and Airiti Library. A combination of keywords relevant to the research questions was employed, utilizing Boolean operators to refine the search. The primary search terms included: "medical education research" AND ("facilitate*" OR "engage*" OR "involve*"). This search captured a wide range of studies published between 2002 and 2022 in English and Chinese, forming the first phase of the review. To ensure the study's currency and robustness, the search strategy was re-executed in January 2025. This updated search included studies published between August 2022 and December 2024, ensuring that the analysis reflects the latest developments and trends in medical education research. By combining these two phases, we ensured comprehensive coverage of relevant literature and maintained the relevance of our findings to the current state of the field.

Selection process

The study selection process was designed to ensure transparency, consistency, and replicability. Titles and abstracts were initially screened independently

by researcher SYY to determine their relevance to the research questions. This screening process was guided by the predefined inclusion and exclusion criteria to ensure consistency. Following the initial screening, researcher YSC performed a duplicate check to eliminate redundancies and ensure that only unique and relevant studies were included in the next stage of the review. Any disagreements regarding the inclusion or exclusion of specific studies were resolved through iterative discussions between researchers SYY and YSC. These discussions focused on aligning the decisions with the study's objectives and inclusion criteria. Disagreements were resolved through discussion, and in cases where consensus was not reached, a third-party expert in medical education research was consulted for a final decision. This external expert provided an impartial perspective, ensuring that the selection process adhered to the study's rigorous methodological standards. The inclusion and exclusion criteria were rigorously applied throughout the process, with included studies meeting the following conditions (Table 1):

Table 1 The inclusion and exclusion criteria

	Inclusion Criteria	Exclusion Criteria
Population	Studies focusing on healthcare professionals, including clinical staff, educators, and administrators, involved in medical education research.	Studies focusing exclusively on students, patients, or non-healthcare professionals.
Focus	Studies examining factors influencing healthcare professionals' engagement in medical education research, including facilitators and barriers.	Articles that do not explicitly address factors influencing engagement in medical education research (e.g., studies solely on curriculum design or pedagogy without considering research engagement).
Publication Type	Peer-reviewed articles published in academic journals.	Conference proceedings, editorials, commentaries, opinion pieces, or unpublished manuscripts.
Language	Articles written in English or Chinese.	Articles published in languages other than English or Chinese.
Study Design	Empirical studies, including qualitative, quantitative, or mixed-methods research, that report findings relevant to the research objectives.	Theoretical or methodological studies without empirical data.
Other	Timeframe: Studies published between 2002 and 2024.	Scope: Studies that concentrate solely on organizational teaching and learning strategies without discussing research engagement.

Data extraction

We extracted detailed data from the selected studies, including authors, publication year, geographical location, research methods, subjects, sample size, and main findings. This process was structured to facilitate an analysis rooted in the Ecological Model. Using an open-coding strategy, we meticulously analysed each study, categorizing key terms and concepts into distinct themes. This process was guided by our research questions and informed by the emphasis of the Ecological Model on the dynamic interplay between various levels of influence on the research engagement of healthcare professionals' research engagement.

Synthesis of findings

Using thematic analysis, we systematically examined the results sections, author interpretations, and direct quotes presented in the included studies. These data sources were chosen to ensure a comprehensive understanding of the reported findings. The analysis involved open coding to identify recurring themes and patterns, followed by categorization into overarching themes that aligned with the levels of the Ecological Model. The research team began by reading a subset of the full-text papers, followed by discussions to identify themes emerging within the literature. A coding framework document was then developed to describe each theme, including detailed inclusion and exclusion criteria to ensure coding consistency. Subsequently, all the selected literature was coded according to this framework. Any new themes identified during the process were developed through team consultation. Additionally, the frequency of citation was coded to provide further insights into the prominence of specific themes. This approach allowed us to synthesize the facilitators and barriers affecting research engagement while ensuring the credibility and richness of our findings.

Results

The initial systematic database search yielded 216 records. After deduplication and selection, eight eligible studies were selected for in-depth analysis (phase one). We deliberately conducted an extended search (phase two) for relevant studies during the preparation of this manuscript to ensure that we included the most recent publications and improved the robustness of this review study. However, no more new publications met the inclusion criteria (Fig. 1; Table 2). These studies, which span from 2004 to 2021, originated in the United States, the United Kingdom, Canada, and Germany and employed diverse research methods, including questionnaire surveys, qualitative interviews, focus groups, and grounded theory research. Participants included clinical physicians, medical school faculty, and directors of medical

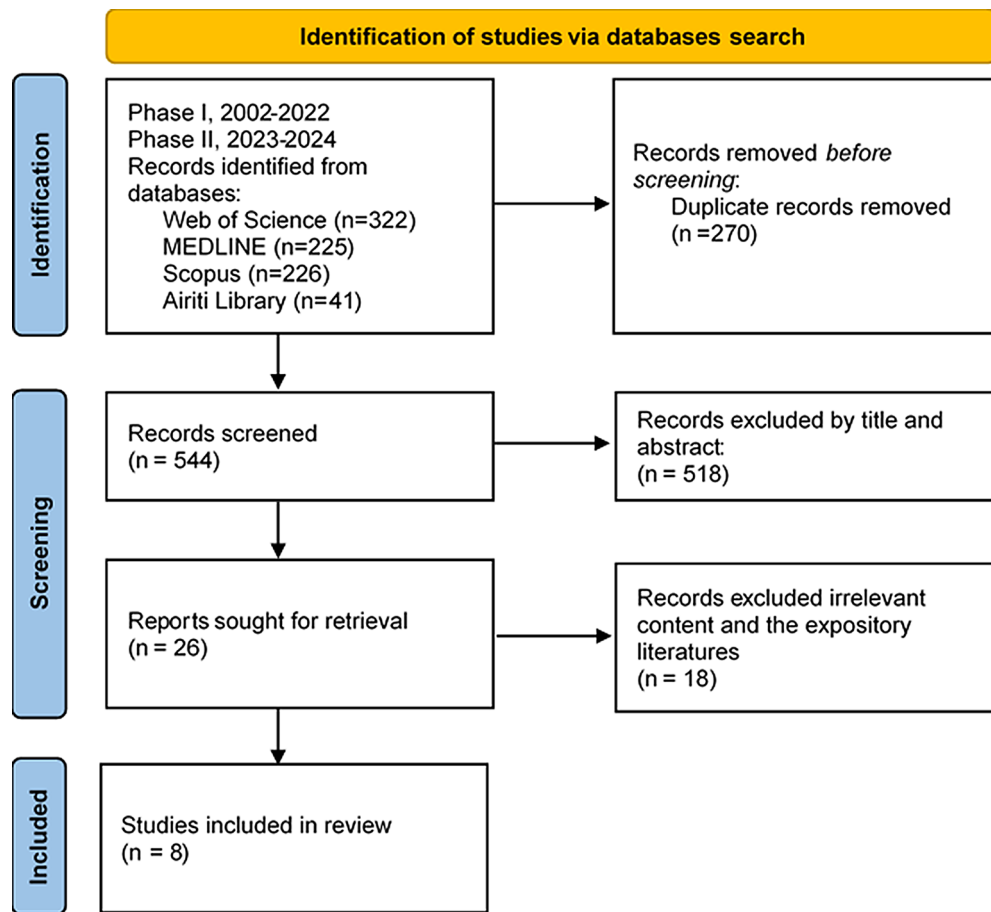


Fig. 1 PRISMA flowchart showing the selection of studies

education research units, with sample sizes ranging from 6 to 855 individuals.

We used data extracted from the included studies' results sections, direct quotations, and, where relevant, author interpretations. Using the Ecological Model as a framework, various factors at the individual, interpersonal, and environmental levels are classified as essential to shaping research engagement. The analysis reveals a multifaceted interaction between these factors, highlighting both the facilitators that encourage participation and the barriers that hinder it (Fig. 2). The following sections go into these themes in detail, exploring the complex interplay of influences that shape the engagement in research among healthcare professionals. INDIVIDUAL LEVEL encompasses the individual characteristics and attributes of healthcare professionals that affect their engagement in research, including their knowledge base, attitudes toward research, past experiences, beliefs, and personality traits. INTERPERSONAL LEVEL refers to the dynamics of relationships and interactions within the workplace, such as support from peers, mentorship, and leadership. ENVIRONMENTAL LEVEL includes the broader systemic and structural elements that impact the

engagement of research, such as institutional policies, resource availability, and financial support.

Facilitators– individual level

Individual level facilitators for healthcare professionals' engagement in medical education research emerge through a complex interplay of expertise, career aspirations, and professional development. Although healthcare professionals typically possess less knowledge of medical education research compared to educational specialists, those with relevant expertise demonstrate heightened motivation to engage in research activities or pursue additional research training [34]. This motivation often intertwines with professional ambitions, as participation in medical education research offers pathways to enhance professional reputation, advance academic rank, and gain organizational influence [38].

The acquisition of educational research skills and development of a robust knowledge framework proves crucial for sustainable career growth in medical education. Healthcare professionals equipped with these competencies are better positioned to secure leadership roles and gain recognition as experts in the field [18].

Table 2 List of study characteristics

Reference	Region	Object	Methods	No.	Outcome	The strategy in overcoming the barriers
1.Christiaanse [9]	USA	Faculty of Medicine	Questionnaire Survey	<i>n</i> = 855	The response rate was 31%, more than half interested in education research. The reason faculty involved in MER is aware that education scholarship can lead to advancement. Barriers: funding, protected time, statistician support.	Setting up a Web-based communication board for networking and collaboration, linking with research resources. Improve mentoring relationships.
2.Tavakol [34]	U.K.	Clinicians	Interview	<i>n</i> = 20	Factors that affect clinician participation in MER are effective leadership, promoting professional growth, and all-encompassing support. Barriers: lack of time, resources, and support from peers.	Inspirational leaders, training in education research methods, more funding. Awarding specific points to medical education research
3.Darbyshire [13]	U.K.	Physicians	Focus group	<i>n</i> = 6	Protected time for research and teaching within clinical jobs can encourage new physicians to do MER. Barriers: education administration was very time consuming.	Discuss with supervisors and maintain education and research time
4.Varpio[38]	Canada	The directors MERI units	Grounded theory	<i>n</i> = 14	The metrics of success: teaching, faculty mentoring, building collaborations, delivering conference presentations, winning grant funding, and disseminating publications.	Analysis the forms of habitus directors use to negotiate, strategies, and position the unit within their local context. These findings may assist institutions developing a new or reorganizing an existing MERI unit, improve their academic output, and their status in the MERI context.
5.Yarris[41]	USA	—	Expert consensus	—	Barriers: lack of expertise, time, funding, mentorship, and reward, and feelings of isolation.	Building communities of education researchers for collaboration and networking, trying to secure increased funding opportunities, developing mentoring programmes, and encouraging mechanisms to ensure protected time.
6.Prediger [27]	Germany	Teaching coordinators and executive directors	Questionnaire Survey	<i>n</i> = 60	Regular educational research meetings and the acquisition of cooperation partners were perceived as beneficial supportive structures in MER. Barriers: lack of support from institute heads, increasing competition for funding from other fields, no sufficiently competent with educational research methodology	An analysis to define the status quo of medical education research for the development of a strategy. A network for educational researchers could be a workshop comprising faculty members who are interested in educational research
7.Archibald [3]	Canada	Physicians	Interview	<i>n</i> = 16	The participants had improved confidence and felt well supported, fostering the development of a scholarly environment. Barriers: lack of time and leave support, workload	Maintain and expand the funding of the training project's funding.
8.Jordan[18]	USA	Physicians	Qualitative-phone interviews	<i>n</i> = 12	The training program helped participants improve their MER career. The more early engaged with the program, may be more beneficial. Currently, all hold leadership positions in medical education leadership positions.	The project (include networking/ collaboration, mentorship, informational framework to build upon, and the application of theoretical knowledge through experiential learning) may inform other faculty development the program in medical education research

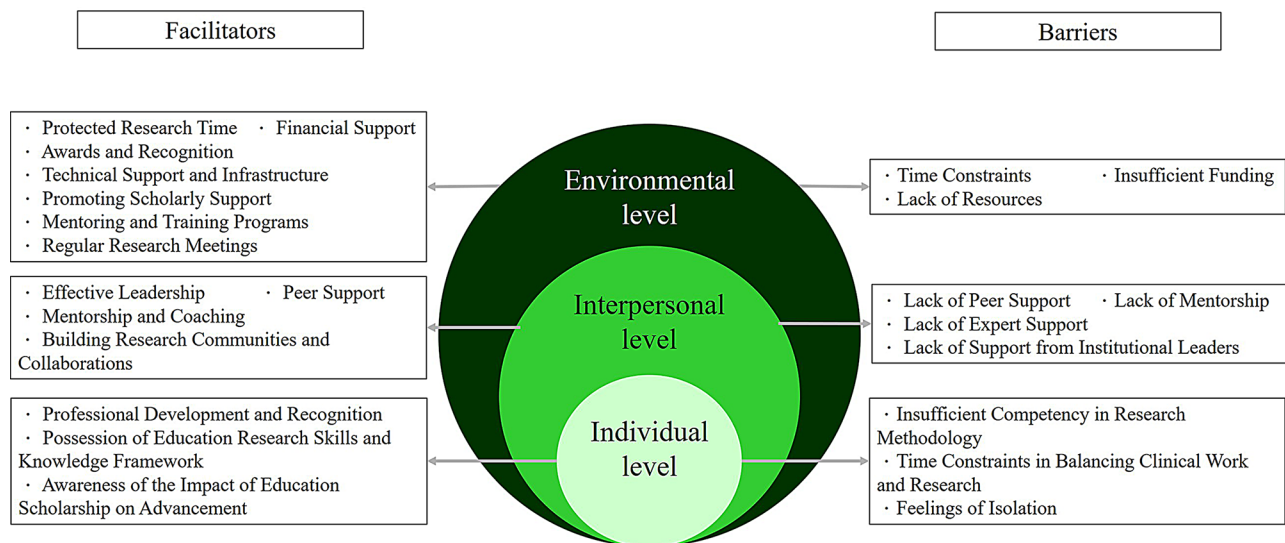


Fig. 2 Factors that influence the engagement of healthcare professionals in medical education research

This professional advancement often creates a virtuous cycle, where increased expertise leads to greater research engagement and further career opportunities.

The motivation to participate in medical education research is further strengthened when healthcare professionals recognize its practical benefits for curriculum development, instructional methods, and student outcomes [9]. This recognition fosters a commitment to educational innovation and continuous improvement, creating a dynamic in which research engagement simultaneously enhances teaching effectiveness and builds professional influence within both institutional and broader academic contexts. The resulting contributions to the evidence base not only advance the field but also reinforce the researcher's professional standing and academic impact.

Facilitators–interpersonal level

At the interpersonal level, a constellation of leadership, mentorship, and community support emerges as crucial facilitators for healthcare professionals' engagement in medical education research. Effective leadership serves as a cornerstone, with leaders who provide clear direction and actively support research initiatives significantly enhancing participation in research activities [34]. This leadership influence manifests particularly strongly when academic supervisors adopt inspirational mentoring roles, creating an environment that nurtures research engagement and professional growth [13].

The impact of mentorship extends beyond mere guidance, functioning as a catalyst for transforming academic ideas into viable research projects. Experienced researchers who serve as mentors not only provide direction, but also facilitate career recognition and professional advancement [3, 38]. While mentorship focuses

on broader career development, coaching offers more targeted support, helping researchers navigate specific challenges and refine their skills, though this approach remains less widely implemented [27]. Large research communities particularly emphasize the critical role of access to expertise and mentorship in fostering sustained research involvement [41].

The establishment of supportive peer networks and research communities creates a robust framework for sustained research engagement. These collaborative structures provide both emotional and practical support, fostering a culture where research becomes an integrated part of professional practice [13]. Research communities and networks facilitate knowledge sharing, professional development, and interdisciplinary collaboration, significantly enhancing both research productivity and engagement [3, 18, 27]. This interconnected support system creates a synergistic environment where individual researchers can thrive while contributing to the broader advancement of medical education research.

Facilitators–environmental level

The environmental factors that facilitate medical education research engagement operate through a complex ecosystem of institutional support mechanisms, resources, and structural enablers. At its foundation, protected research time emerges as a critical facilitator, allowing healthcare professionals to temporarily step away from clinical and teaching duties to focus deeply on their research endeavors. This dedicated time not only enhances research productivity but also enables more meaningful engagement with complex research questions [3, 13, 41].

The effectiveness of protected time is amplified when coupled with robust institutional support systems,

including both financial and technical resources. Financial support helps offset the economic implications of reducing clinical work for research activities [3, 41], while the comprehensive technical infrastructure - encompassing library services, data management tools, and research resources - provides the practical foundation for conducting high-quality research [3, 13, 27].

Recognition and professional development opportunities form another crucial dimension of environmental support. Institutional acknowledgment through awards and credits serves as both validation and motivation for continued research engagement [34]. This recognition system operates alongside structured professional development programs, including workshops, journal clubs, Ph.D. seminars, and symposia, providing essential platforms for skill development and career advancement [18, 27, 41].

The environmental infrastructure is further strengthened through regular research meetings and knowledge dissemination channels. Research meetings facilitate collaboration, peer feedback, and community building [13, 27], while institutional communications such as newsletters and research bulletins keep the community informed and engaged [27, 34]. Together, these elements create a comprehensive support system that nurtures research engagement and professional growth within medical education.

Barriers– individual level

Healthcare professionals encounter several interrelated barriers that challenge their engagement in medical education research. A fundamental obstacle lies in the perceived insufficient competency in research methodology, where many professionals lack confidence in their ability to design and execute educational research effectively [34]. This methodological uncertainty often creates a self-perpetuating cycle where fear of producing inadequate work or facing peer criticism further inhibits research participation [27].

These competency concerns are exacerbated by the pressing demands of clinical and teaching responsibilities, which create significant time constraints. The challenge of balancing research activities with primary duties in patient care and education often results in research being deprioritized, potentially compromising academic career advancement opportunities [3]. This time pressure not only affects the quantity of research output, but also can impact the depth and quality of research engagement.

The individual challenges of methodological uncertainty and time constraints are further complicated by a pervasive sense of isolation within the research community. When institutional roles and research contributions are not clearly valued or integrated into the professional

framework, researchers may experience diminished motivation and limited access to collaborative opportunities. The isolation can significantly impair research productivity and sustainability, as the absence of a supportive community and recognition system undermines the fundamental drivers of research engagement [41]. These interconnected barriers create a complex web of challenges that can significantly impact healthcare professionals' ability and willingness to participate in medical education research.

Barriers– interpersonal level

At the interpersonal level, healthcare professionals face a complex web of barriers related to insufficient support systems that can significantly impede their engagement in medical education research. The absence of robust peer support networks emerges as a fundamental challenge, undermining motivation and limiting collaborative opportunities that are essential for sustaining research activities [34]. This limitation in peer support often intersects with restricted access to experienced educational researchers and experts, creating a compound effect that hampers professionals' ability to generate research ideas, execute projects effectively, and successfully publish their findings [27, 41].

The challenge of inadequate mentorship further compounds these interpersonal barriers. The scarcity of dedicated mentors creates significant obstacles for healthcare professionals attempting to navigate the complexities of research methodology and academic publishing [41]. This mentorship void often results in unmet guidance needs that directly impact research productivity and quality. The situation is further exacerbated by insufficient support from institutional leadership, which plays a crucial role in establishing a research-conducive environment. When institutional leaders fail to provide necessary resources or foster a supportive research culture, healthcare professionals face additional hurdles in their attempts to contribute meaningfully to educational research [27].

Barriers– environmental level

Environmental barriers to medical education research manifest through a complex interplay of resource limitations that significantly impact the ability of healthcare professionals to engage in meaningful research activities. Time constraints emerge as a pervasive challenge, with the demanding nature of clinical and teaching responsibilities creating a fundamental tension between service delivery and research pursuits [3, 34, 41]. This scarcity of protected time interacts synergistically with other resource deficiencies to create a challenging research environment.

The impact of time limitations is amplified by inadequate access to essential research infrastructure and support services. Healthcare professionals frequently encounter difficulties accessing crucial resources such as statistical expertise and research materials, which compromises their capacity to design rigorous studies and conduct robust analyses [9, 34]. These operational constraints are further compounded by the systemic issue of insufficient funding for medical education research. The scarcity of financial resources, combined with intense competition for limited grant opportunities, creates a deterrent effect that extends beyond immediate project feasibility to impact long-term research sustainability [9, 34, 41].

Discussion

This study aimed to explore the factors that motivate and hinder healthcare professionals' involvement in medical education research, with the objective of identifying effective pathways to enhance research engagement. The results comprehensively highlight key influences at the individual, interpersonal, and environmental levels, illustrating their complex interactions. These findings confirm certain perspectives in the existing literature while also offering new insights and implications, showing that the decision to engage in research is influenced by a multifaceted interplay of internal and external factors. By categorizing these factors into three levels using the ecological model, the study covers 25 subthemes, including 15 facilitators and 10 barriers.

Professional achievement, academic reputation, and career development are recognized as key intrinsic motivators for engaging in medical education research [11]. The understanding that advancements in this field ultimately contribute to improved healthcare quality serves as a powerful incentive for participation. A significant factor influencing healthcare professionals' involvement in medical education research is their research capabilities and familiarity with the field. Clinical staff with a background in social science or qualitative research often possess foundational knowledge applicable to medical education research, thereby reducing the learning curve and facilitating their engagement in research activities.

Time allocation remains a persistent challenge, as healthcare professionals struggle to balance demanding clinical duties with research responsibilities [12]. Demonstrating the link between research activities and tangible improvements in teaching practices and patient care enables healthcare professionals to more intuitively recognize the value of research. This connection not only underscores the practical benefits of participating in research but also strengthens their commitment to advancing the field of medical education.

The findings underscore the critical role of leadership, mentorship, and peer support in fostering research engagement, while also highlighting the significance of establishing research communities and facilitating cross-disciplinary collaborations. The attitudes and support provided by supervisors and institutions toward medical education research have been shown to have a profound impact on the likelihood that healthcare professionals engage in research activities [24]. Support from mentors and peers offers not only guidance in developing research skills and managing workloads, but also strengthens a sense of group identity and belonging [26, 28]. Collaborative relationships built among individuals with shared research goals can result in stable, long-term partnerships. Additionally, leaders and institutions must actively foster a culture that values and encourages research to address these challenges and enable healthcare professionals to contribute meaningfully to medical education research.

The interconnected interpersonal factors create a challenging environment where the absence of one form of support often amplifies the impact of others, collectively diminishing the capacity of healthcare professionals to engage effectively in medical education research. The synergistic nature of these factors suggests that addressing them requires a comprehensive approach that strengthens multiple facets of interpersonal support simultaneously.

Supportive environmental factors have a more significant influence on research productivity than individual motivators. Adequate funding and protected research time are essential for enabling clinical staff to conduct research without the added burden of financial pressures [17]. Institutional policies that offer technical support and structured training programs in medical education research play a crucial role in improving access to research resources. These policies also equip healthcare professionals with the necessary skills, thus fostering greater motivation to engage in research activities [7].

The studies highlight the critical importance of technical support, protected research time, and financial resources in promoting research engagement. Furthermore, it underscores the value of diverse training opportunities, regular workshops, and incentive measures in attracting and motivating healthcare professionals to participate in research [32]. These findings suggest that the further exploration and implementation of such initiatives could significantly enhance research productivity and engagement in medical education.

The integrated approach to environmental support - combining protected time, financial resources, technical infrastructure, recognition systems, professional development opportunities, and community engagement platforms - creates a robust ecosystem that enables

and sustains meaningful research participation among healthcare professionals. The synergy between these various elements helps overcome common barriers to research engagement while fostering a culture of scholarly inquiry and continuous improvement in medical education.

Implications for practice - training opportunities

Healthcare professionals in medical education research often experience uncertainty about their theoretical knowledge and research skills [40], leading them to actively seek expert guidance, peer reviews, evaluation feedback, and skill development resources to enhance their professional competence [6]. Establishing broad partnerships with colleagues from diverse disciplines and international backgrounds can provide valuable learning opportunities. To make significant progress and innovation in medical education, it is essential to foster collaboration among curriculum planners, educators, learners, technical experts, instructional designers, and psychologists. Interdisciplinary exchanges foster progress by helping individuals integrate their identities as educators, researchers, and professionals [1].

Clear and practical career guidance, along with protected research time and funding, significantly influence clinical professionals' decisions to engage in research training. Early planning and continuous guidance are critical to maintaining engagement, providing greater certainty for future quality of life, income stability, and family planning [15]. Institutions should commit to providing early identification, guidance, and encouragement for individuals who are genuinely interested in pursuing a career in education research. Both novice and senior medical educators recognize mentorship as crucial for developing skills related to medical education, and mentor systems can effectively facilitate the matching between mentors and trainees [36]. Mentors provide continuous and reliable career advice, support, and specific research guidance, enhancing academic productivity and administrative familiarity [29].

Implications for practice - supportive organizations

The healthcare community has increasingly emphasized the importance of medical education and research, providing substantial support to healthcare professionals [7]. However, educators in clinical settings continue to face challenges such as a lack of recognition of promotion opportunities and unstructured career paths. Engaging in medical education requires relevant research, but is often undervalued as a career development component compared to clinical service and medical research [29]. Support from direct supervisors or department heads alleviates staff pressure, helps achieve work goals, and fosters personal growth and development, improving

confidence, determination, and sense of identity and belonging of medical educators, thus inspiring their potential [36].

The study by Sheu et al. highlights that unpaid educational leadership positions promote educator engagement due to intrinsic motivation rather than external rewards [31]. This motivation comes from a sense of mission and responsibility to pass on education, a willingness to master teaching skills, satisfaction with the relational and collaborative aspects of the position, and satisfaction with teaching activities [25]. However, these positions require high autonomy and flexibility, with minimal administrative burden, to ensure that individuals can focus on the role and maintain enthusiasm.

Implications for practice - creating educational research cultural environments

To advance medical education research, it is crucial for clinical teachers, educational leaders, innovators, and research scholars to explore emerging teaching methods and cultivate new medical education research talent. Communities of Practice (CoP) can effectively support the formation of professional identity and career development of future educators [40, 41]. Within the CoP framework, members with similar interests work collaboratively, share experiences, and practice collectively to achieve group goals. Through direct participation in group activities, members gradually develop a sense of identity, helping shape their roles as educators and researchers.

The exemplary imagery of members from different fields (including faculty and educational administrators) aids others in understanding and identifying with the teaching identity. Collaboration and interaction allow members to observe each other's values and concepts, fostering an early passion for teaching and research, and developing an interest in becoming educators and researchers. Once members contribute collectively to the field, their sense of identity and belonging is further enhanced. This approach provides clinical professionals with vision and guidance in educational work, helping them form and developing their identities as educators [8].

The search for individual support for educational work allows each medical educator to become the centre of his small community of practice, drawing experience from networks across roles and tasks, regaining or strengthening confidence and abilities, and leading to supportive behaviours [36]. This modelling increases newcomers' willingness to invest in education and encourages them to devote time and energy to their teaching professional development [37]. Through communities of practice and modelling, a favourable cultural environment for educational research can be created, cultivated, and supporting

the professional identity and career development of medical educators, thus promoting the flourishing development of medical education research.

Implications for practice - provision of funding

Research indicates that educators without funding experience higher burnout rates than those with financial support [31]. Medical education is fundamentally a science-driven social discipline, and its progress depends on the evidence provided through research publications, which reflect both professionalism and scholarly rigor [33]. Demonstrating scientific and academic excellence enhances the ability to secure funding from diverse sources, including commercial entities, medical associations, patient organizations, and government agencies, thereby supporting the effective implementation and advancement of educational initiatives.

However, within the environmental framework of the healthcare institution, education is often sacrificed during fiscal constraints. Seeking funding sources through research development and valuable innovative teaching activities is necessary to promote a positive cycle. Factors supporting or hindering research can be reshaped, and designed interventions, such as setting up relevant channels and plans to encourage new-generation clinical professionals to complete academic research projects, can potentially introduce personnel into research. If their professional attitudes can be changed, it will cultivate young clinical professionals' career skills and self-efficacy [19]. A model that provides flexible pathways for the transformation of professional identity, appropriate funding, and continuous guidance can positively impact career decisions in research [15].

Limitations and future research

This study uses a narrative literature review approach, which inherently carries certain limitations. One of the primary limitations is the potential for selection bias, as inclusion of studies may not fully capture the entire spectrum of relevant factors influencing healthcare professionals' engagement in medical education research. Additionally, narrative reviews do not employ rigorous systematic methods of meta-analysis, which may affect the comprehensiveness of the findings. Furthermore, the diverse nature of healthcare professions means that each discipline may have unique facilitators and barriers that this review has not explored in depth. This diversity highlights the need for caution when generalizing findings across all healthcare fields. The applicability of the discussions and recommendations to other educational research professionals, therefore, requires further empirical validation through additional studies.

Despite these limitations, this review offers a valuable synthesis of the current state and challenges of

talent cultivation within the field of medical education research. The impact of medical education research is widely recognized [33]. However, there has been little significant progress in the development of research talent in recent years. This study aims to reaffirm that the cultivation of talent in the field of clinical education should receive more proactive attention and support. It provides insights into the complex interplay of factors at various levels that affect research engagement. As a foundational step in understanding these dynamics, this study sets the stage for future investigations.

To address identified gaps, future research should focus on conducting qualitative interviews and case studies to gain more insight into the specific facilitators and barriers faced by different professional groups within healthcare. Such studies could help tailor support measures and interventions that are more effectively aligned with the unique needs and contexts of these groups, ultimately fostering a more inclusive and robust culture of research in medical education.

Conclusion

Medical education research plays a crucial role in the future development of clinical healthcare professionals, making it urgent to advance medical education research. To encourage more healthcare professionals to engage in medical education research, it is essential to foster relevant skills at the individual level, expand collaborative research fields, and strengthen the networks of the research community at the interpersonal level, and support and value medical education research from top to bottom at the environmental level.

This study provides a comprehensive examination of the factors influencing healthcare professionals' engagement in medical education research, using the Ecological Model to categorize these factors at the individual, interpersonal, and environmental levels. Our analysis highlights the complexity of research engagement, with a multifaceted interplay of facilitators and barriers that shape the participation of clinical staff in medical education research. Future research should explore tailored interventions to address the specific needs and barriers faced by different professional groups within healthcare. Qualitative studies and case analyses can provide deeper insights into the unique challenges and opportunities present in various contexts, ultimately guiding the development of targeted support measures. By implementing these strategies and addressing identified barriers, we can improve the participation of healthcare professionals in medical education research, driving innovation and improvement in educational practices. Such efforts will contribute to the general advancement of medical education, ultimately improving patient care quality and safety. This study lays the groundwork for future exploration

and intervention, emphasizing the importance of sustained efforts to promote research engagement and cultivate talent within the field of medical education.

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Author contributions

YSC and SY Y contributed to the development of the study, analysis, writing, reviewing, and finalizing of the manuscript. KCL provided feedback and commented on manuscript revisions. All authors approved the final manuscript for submission.

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Data availability

All data generated during this study are included in this published article (Table 2).

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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References

- Ahmed Y, Khayal S. Advancing Research Training in Medical Education: global perspectives and paradigms for Future Development. *Cureus*. 2024;16(2):e54559. <https://doi.org/10.7759/cureus.54559>.
- Anu Atluru AW, Maurer K, Kochar A, London D, Kane E, Spear K. Research in Medical Education in a primer for medical students. Association of American Medical Colleges; 2015.
- Archibald D, Hogg W, Lemelin J, Dahrouge S, St Jean M, Boucher F. Building capacity for medical education research in family medicine: the Program for Innovation in Medical Education (PIME). *Health Res Policy Syst*. 2017;15(1):91. <https://doi.org/10.1186/s12961-017-0256-y>.
- Atluru A, Wadhwani A, Maurer K, Kochar A, London D, Kane E. Research in medical education: a primer for medical students. Association of American Medical Colleges; 2015.
- Baker LR, Phelan S, Woods NN, Boyd VA, Rowland P, Ng SL. Re-envisioning paradigms of education: towards awareness, alignment, and pluralism. *Adv Health Sci Educ*. 2021;26(3):1045–58. <https://doi.org/10.1007/s10459-021-10036-z>.
- Bantounou MA, Kumar N. Peer-led Versus Conventional Teacher-Led Methodological Research Education Sessions: an Initiative to improve Medical Education Research Teaching. *Med Sci Educ*. 2023;33(4):935–43. <https://doi.org/10.1007/s40670-023-01818-8>.
- Browne J, Webb K, Bullock A. Making the leap to medical education: a qualitative study of medical educators' experiences. *Med Educ*. 2018;52(2):216–26. <https://doi.org/10.1111/medu.13470>.
- Chen HC, Wamsley MA, Azzam A, Julian K, Irby DM, O'Sullivan PS. The Health professions Education Pathway: preparing students, residents, and fellows to become future educators. *Teach Learn Med*. 2017;29(2):216–27. <https://doi.org/10.1080/10401334.2016.1230500>.
- Christiaanse ME, Russell EL, Crandall SJ, Lambros A, Manuel JC, Kirk JK. Development of an asset map of medical education research activity. *J Contin Educ Health Prof*. 2008;28(3):186–93. <https://doi.org/10.1002/chp.173>.
- Cook DA, Bordage G, Schmidt HG. Description, justification and clarification: a framework for classifying the purposes of research in medical education. *Med Educ*. 2008;42(2):128–33. <https://doi.org/10.1111/j.1365-2923.2007.02974.x>.
- D'Arrietta LM, Vangaveti VN, Crowe MJ, Malau-Aduli BS. Exploring the motivation of health professionals to engage with research at various career stages. *BMC Health Serv Res*. 2024;24(1):305. <https://doi.org/10.1186/s12913-024-10772-z>.
- Daouk-Öyry L, Zaatari G, Sahakian T, Alameh R, B, Mansour N. Developing a competency framework for academic physicians. *Med Teach*. 2017;39(3):269–77. <https://doi.org/10.1080/0142159X.2017.1270429>.
- Darbyshire D, Baker P. Encouraging new doctors to do medical education research. *Clin Teach*. 2013;10(6):358–61. <https://doi.org/10.1111/tct.12038>.
- Dolmans DH, n der Vleuten CP. (2010). Research in medical education: practical impact on medical training and future challenges. (1860–3572 (Electronic)).
- Eley DS, Jensen C, Thomas R, Benham H. What will it take? Pathways, time and funding: Australian medical students' perspective on clinician-scientist training. *BMC Med Educ*. 2017;17(1):242. <https://doi.org/10.1186/s12909-017-1081-2>.
- Ge J, He J, Liu Y, Zhang J, Pan J, Zhang X, Liu D. Effects of effort-reward imbalance, job satisfaction, and work engagement on self-rated health among healthcare workers. *BMC Public Health*. 2021;21(1):195. <https://doi.org/10.1186/s12889-021-10233-w>.
- Gruppen LD, Durning SJ. (2016). Needles and haystacks: Finding Funding for Medical Education Research. *Acad Med*, 91(4). https://journals.lww.com/academicmedicine/fulltext/2016/04000/needles_and_haystacks_finding_funding_for_medical.19.aspx
- Jordan J, Coates WC, Gottlieb M, Soares WE 3rd, Shah KH, Love JN, Medical Education Research Faculty Development Program on Career Development. (2021). The Impact of a, Through the Lens of Social Cognitive Career Theory. *AEM education and training*, 5(3), e10565. <https://doi.org/10.1002/aet2.10565>
- Krupat E, Camargo CA Jr., Stewler GJ, Espinola JA, Fleenor TJ Jr., Dienstag JL. Factors associated with physicians' choice of a career in research: a retrospective report 15 years after medical school graduation. *Adv Health Sci Educ Theory Pract*. 2017;22(1):5–15. <https://doi.org/10.1007/s10459-016-9678-5>.
- Liu JX, Goryakin Y, Maeda A, Bruckner T, Scheffler R. Global Health Workforce Labor Market Projections for 2030. *Hum Resour Health*. 2017;15(1):11. <https://doi.org/10.1186/s12960-017-0187-2>.
- Mamede S. Desafios e Oportunidades para o Desenvolvimento Da Pesquisa em Educação Médica. Volume 119. Arquivos Brasileiros de Cardiologia; 2022.
- McGaghie WC. Medical Education Research as Translational Science. *Sci Transl Med*. 2010;2(19). 19cm18–19cm18.
- Mills JMZ, Januszewski AS, Robinson BG, Traill CL, Jenkins AJ, Keech AC. Attractions and barriers to Australian physician-researcher careers. *Intern Med J*. 2019;49(2):171–81. <https://doi.org/10.1111/imj.14086>.
- Nearing KA, Nuechterlein BM, Tan S, Zerzan JT, Libby AM, Austin GL. (2020). Training Mentor–Mentee pairs to build a Robust Culture for Mentorship and a Pipeline of Clinical and Translational Researchers: the Colorado Mentoring Training Program. *Acad Med*, 95(5). https://journals.lww.com/academicmedicine/fulltext/2020/05000/training_mentor_mentee_pairs_to_build_a_robust.23.aspx
- O'Sullivan PS, Irby DM. What motivates Occasional Faculty Developers to lead Faculty Development Workshops? A qualitative study. *Acad Med*. 2015;90(11):1536–40. <https://doi.org/10.1097/acm.0000000000000767>.
- Pololi LH, Evans AT. (2015). Group peer mentoring: an answer to the Faculty Mentoring Problem? A successful program at a large Academic Department of Medicine. *J Continuing Educ Health Professions*, 35(3). https://journals.lww.com/jcehp/fulltext/2015/35030/group_peer_mentoring_an_answer_to_the_faculty.6.aspx
- Prediger S, Harendza S. Analysis of educational research at a medical faculty in Germany and suggestions for strategic development - a case study. *GMS J*

- Med Educ. 2016;33(5):Doc71. <http://ovidsp.ovid.com/ovidweb.cgi?T=JS.&PAGE=reference&D=med13&NEWS=N&AN=27990467>.
- 28 Roberts SE, Nehemiah A, Butler PD, Terhune K, Aarons CB. Mentoring residents underrepresented in Medicine: strategies to ensure Success. *J Surg Educ*. 2021;78(2):361–5. <https://doi.org/10.1016/j.jsurg.2020.08.002>.
- 29 Sabel E, Archer J. & Educators, o. b. o. t. E. C. W. G. a. t. A. o. M. (2014). Medical Education Is the Ugly Duckling of the Medical World and Other Challenges to Medical Educators' Identity Construction: A Qualitative Study. *Academic Medicine*, 89(11), 1474–1480. <https://doi.org/10.1097/acm.0000000000000420>
- 30 Sallis JF, Owen N, Fisher E. (2015). Ecological models of health behavior. *Health behavior: Theory, research, and practice*, 5(43–64).
- 31 Sheu L, Charondo LB, O'Sullivan PS. Faculty motivations for leading clinical clerkship electives: a qualitative study. *Med Teach*. 2022;44(10):1109–15. <https://doi.org/10.1080/0142159X.2022.2058388>.
- 32 Sonstein SA, Jones CT. Joint Task Force for Clinical Trial Competency and Clinical Research Professional Workforce Development [Review]. *Front Pharmacol*. 2018. <https://doi.org/10.3389/fphar.2018.01148>. 9.
- 33 Sukhera J, Fung CC, Teherani A, Wyatt TR, Schumacher DJ, Hunderfund L, A. N. What are we made for? Mobilizing Medical Education Research for Impact. *Acad Med*. 2024;99(11):1177–80. <https://doi.org/10.1097/acm.0000000000005850>.
- 34 Tavakol M, Murphy R, Rahemei-Madeseh M, Torabi S. The involvement of clinicians in medical education research. *Qual Prim Care*. 2008;16(5):335–40. <http://ovidsp.ovid.com/ovidweb.cgi?T=JS.&PAGE=reference&D=med7&NEWS=N&AN=18973714>.
- 35 ten Cate O. Health professions education scholarship: the emergence, current status, and future of a discipline in its own right. *FASEB BioAdvances*. 2021;3(7):510–22. <https://doi.org/10.1096/fba.2021-00011>.
- 36 van den Berg JW, Verberg CPM, Scherpier AJA, Jaarsma ADC, Lombarts KMJM. Is being a medical educator a lonely business? The essence of social support. *Med Educ*. 2017;51(3):302–15. <https://doi.org/10.1111/medu.13162>.
- 37 van Lankveld T, Thampy H, Cantillon P, Horsburgh J, Kluijtmans M. Supporting a teacher identity in health professions education: AMEE Guide 132. *Med Teach*. 2021;43(2):124–36. <https://doi.org/10.1080/0142159X.2020.1838463>.
- 38 Varpio L, Bidlake E, Humphrey-Murto S, Sutherland S, Hamstra SJ. Key considerations for the success of Medical Education Research and Innovation units in Canada: unit director perceptions. *Adv Health Sci Education: Theory Pract*. 2014;19(3):361–77. <https://doi.org/10.1007/s10459-013-9479-z>.
- 39 Vinson AH. Articulating the Canon: the sociology of medical education from 1980 to 2000. *Health*. 2023;27(2):169–85. <https://doi.org/10.1177/13634593211013886>.
- 40 Woodruff JN, Vela MB, Lee WW, McConville JF. Enhancing the Graduate Medical Education Clinical Learning Environment through Community of Practice forums. *Acad Med*. 2024;99(12S Suppl 1):S20–7. <https://doi.org/10.1097/acm.0000000000005862>.
- 41 Yarris LM, Juve AM, Artino AR Jr, Sullivan GM, Rougas S, Joyce B, Eva K. (2014). Expertise, Time, Money, Mentoring, and Reward: Systemic Barriers That Limit Education Researcher Productivity-Proceedings From the AAMC GEA Workshop. *Journal of graduate medical education*, 6(3), 430–436. <https://doi.org/10.4300/JGME-D-14-00340.1>

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