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BMJ Open Interventions to enhance gender equity in academic medicine: a systematic review

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ABSTRACT

Objectives We aimed to describe the current evidence for interventions to enhance gender equality and equity in academic medicine. We also wished to characterise the nature of the interventions, who delivered them and whether they seek to ‘fix the women’, or target issues at organisational and systemic levels.

Design We extracted data using a form developed for the study and applied the Template for Intervention Description and Replication (TIDieR) and Morahan frameworks to describe and characterise interventions. We used the Quality Assessment with Diverse Studies (QUADS) tool to critically appraise included studies.

Data sources We searched five electronic databases in November 2022 and August 2023 (Medline (OVID), Embase, CINAHL, Web of Science, Google Scholar) and undertook handsearching.

Eligibility criteria for selecting studies We included qualitative or quantitative original studies published in full that described any new intervention designed to enhance gender equality/equity in recruitment, retention or promotion in academic medicine. The settings were Schools/Faculties of Medicine in Higher Education Institutions. The population of interest was female clinical academics/physician scientists.

Data extraction and synthesis Data were extracted by one researcher using an Excel form specifically designed for this study with a second researcher applying the form to a subset of seven studies; significant agreement was achieved. Four researchers applied the TIDieR framework to the included studies. Due to the small number of studies and significant heterogeneity, it was not possible to perform a meta-analysis.

Results The search of electronic databases yielded 1747 studies. A further 62 were identified through handsearching. Following removal of duplicates, 764 articles were screened for eligibility, and 199 full-text articles were screened. Of these, 27 met the inclusion criteria.

The most commonly reported interventions were career development or leadership skills programmes, followed by mentorship and multifaceted interventions. Most papers reported positive findings, but many relied on subjective measures. Robustly designed studies often reported mixed findings. The majority of interventions aimed to ‘fix the women’, with few addressing inequality at organisational level.

Conclusions Acknowledging the possibility of publication delay, we found that despite strong evidence of the negative effects of the pandemic on women’s research productivity, there were no new interventions designed

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ We applied the Template for Intervention Description and Replication framework to provide a complete description of interventions.
- ⇒ Interventions were further characterised using the Morahan framework to provide insight into whether interventions were aimed at individual or organisational level.
- ⇒ Publication bias may have affected our findings.
- ⇒ The study focused on women in academic medicine; other groups who are under-represented in medicine, women were excluded, thus consideration of intersectionality was beyond the scope of the review.

to mitigate this. Many existing interventions create ‘institutional housekeeping’ by relying on women for their delivery. This can result in failure, especially during a crisis like COVID. Most studies were low to moderate quality. More robust research and a more holistic approach are needed, moving away from ‘fixing the women’ to address the organisational and systemic structures which underpin inequality.

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BACKGROUND

In 1988, it was noted that the number of women medical faculty at junior academic grades was increasing rapidly, but this effect was not seen at senior grades.¹ Eight years later, in 1996, JAMA published a landmark paper describing the successful implementation of a multifaceted intervention addressing impediments to women’s career progression in academic medicine, reporting a 550% increase in the number of women associate professors over 5 years.² The future looked hopeful—surely the increase in women entering medicine, along with effective strategies for recruitment and retention, would eventually translate into more women at leadership level. Decades later, this hope has not been realised—women continue to enter medicine at high levels, exceeding the rate of male entrants in the USA in 2017³ and the UK in 2018,⁴ yet remain underrepresented at



the highest levels. Women make up 28.4% of full professors at US medical schools,⁵ 32% of professors in any field in UK Higher Education Institutions (HEIs)⁶ and occupy 26.2% of posts at the highest grade of academic staff in HEIs in 28 European Union countries.⁷

The reasons for this disparity are complex. Many factors have been described: women in medicine are exposed to stereotypes associating women with family and men with careers,⁸ research funding applications are viewed less favourably when the PI is a woman,⁹ women are significantly less likely than their male peers to be credited as an author on a research paper.¹⁰ A vicious cycle exists whereby women occupy lower academic ranks, have access to fewer resources and are, therefore, less productive, reinforcing stereotypes that women do not belong at higher academic levels.¹¹ Pay disparities remain pervasive,¹² and sexual and gender-based harassment directed against women in medicine and surgery is prevalent.^{13 14} The effects of a split between academic and clinical work, and the relative instability of clinical academic careers are as yet unknown; however, these and other factors may combine to create a culture that is not conducive to women's career advancement, in spite of evidence for the benefits of gender equity: groups with more women have higher collective intelligence,¹⁵ Fortune 500 companies with female CEOs are more profitable,¹⁶ and gender heterogeneous research teams produce better quality research.¹⁷ In biomedical research, sex remains largely under-reported, but papers with first and last female authors were more likely to report the sex of populations, which is key to improving disparities in research.¹⁸ From an economic perspective, failure to achieve equitable participation in academic medicine represents a loss of talent,¹⁹ a serious concern for a workforce already at risk of becoming an 'endangered species'.²⁰

The situation was exacerbated by the COVID-19 pandemic. As early as May 2020, data from preprint servers showed that across disciplines, women's publishing rate had fallen relative to men's. This was attributed to increased caregiving responsibilities during the pandemic, and the effect of shifting to online work. This shift simultaneously increased the workload associated with teaching, disproportionately affecting women, and decreased the workload associated with hiring and curriculum committees—disproportionately affecting men and releasing time to write research papers.^{21 22} This gap in academic productivity during the pandemic was particularly pronounced for women in health and medicine,²³ and female faculty at an academic medical centre in the USA were twice as likely to have considered leaving academic medicine since the onset of COVID-19 compared with before (28% vs 17%).²⁴ Women from less gender-equal countries with higher COVID-related mortality, and those from other groups who are under-represented in academic medicine, for example, racially and ethnically

marginalised groups, experienced the greatest impact on academic productivity.^{25–27}

Despite many papers highlighting the problem across an array of specialties,^{28–32} few provide evidence for successful interventions.^{33 34} Furthermore, the evidence that does exist is often weak and lacking in methodological rigour. A systematic review of papers focused on interventions to improve outcomes for women in any field of academia found only 18 studies that met the criteria for full review, and the overall quality was low to moderate.³⁴ Another systematic review of gender-concordant mentoring found a reliance on weak study designs; the authors cautioned against the use of interventions that seek to 'fix the women' while inadvertently reinforcing gender-based stereotypes.³⁵ This type of intervention, which relies on senior female faculty for its delivery, could be considered 'institutional housekeeping', that is, the supportive labour of women to improve women's situation in their institution, and which, like other forms of 'women's work', may be unrecognised and unrewarded,³⁶ paradoxically worsening the situation for women, although unintentionally.

The aim of this systematic review is to describe the current evidence for interventions to enhance gender equality and equity in recruitment and promotion in academic medicine, that is, 'the branch of medicine pursued by doctors who engage in a range of scholarly activities'.³⁷ We also set out to compare interventions pre, during and post-COVID-19, and explore whether any specific interventions were implemented to mitigate the effects of the pandemic. Lastly, we wished to characterise the nature of the interventions, who delivered them, and whether they seek to 'fix the women', or target issues at organisational and systemic levels.

METHODS

We drafted a protocol and registered our review with PROSPERO (CRD42023391086). We report our findings according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (online supplemental file 1).³⁸ We decided a systematic review was the most appropriate approach to address the question of whether or not interventions to enhance gender equity are based on relevant evidence, and to establish the quality of that evidence.³⁹

Search strategy

A search strategy was developed with a medical librarian (DM) for five databases (Medline (OVID), Embase, CINAHL, Web of Science, Google Scholar) and conducted in November 2022, repeated in August 2023. Handsearching was undertaken in August–September 2023 by review of the bibliographies of studies selected for inclusion. The full search strategy is available in online supplemental file 2. English language papers up to 15 years old were included.

Table 1 Inclusion and exclusion criteria

Types of studies	<p>Qualitative or quantitative original studies published in full including:</p> <ul style="list-style-type: none"> ▶ interviews/focus groups ▶ Surveys ▶ Randomised control trials ▶ Quasi-experimental preintervention and postintervention evaluations <p>We excluded conference papers, papers in languages other than English, book chapters, opinion pieces, perspectives, commentaries and editorials, and studies reporting secondary data, for example, systematic reviews and meta-analyses. We excluded studies >15 years old at the time of our first search (2022) because we felt that societal views pertaining to equity have shifted, and there have been many studies drawing attention to gender equity in recent years, suggesting a field that is rapidly evolving. Therefore, we excluded studies published prior to 2007.</p>
Study settings	<p>Schools/Faculties of Medicine in Higher Level Institutions or subdivisions, for example, clinical Departments or disciplines. We included interventions where the setting was unclear (eg, possibly hospital-based) when they were aimed at clinical academic medical faculty.</p>
Population	<p>The population of interest was female clinical academics/physician scientists, or faculty within medical schools. We included some studies which were aimed at female physician scientists but also included non-physician clinical academics, and studies where it was not clear whether all participants held a dual clinical and academic role or single academic role, as long as the setting was academic on the basis that clinical academics/physician scientists could also benefit from the intervention.</p> <p>We excluded studies whose participants were full-time clinicians or undergraduate students and studies where the intervention was not specifically targeted at women.</p>
Interventions	<p>Any new intervention designed to enhance gender equality or equity in recruitment, retention or promotion in academic medicine, for example, unconscious bias training for faculty and hiring committees, mentoring programmes etc.</p> <p>We excluded studies where no evaluation took place or outcomes were not reported, and evaluations of pre-existing practices.</p>
Outcomes	<p>Outcomes could include measurements of success of female candidates applying for academic roles or promotions, research productivity, retention of female clinical academic staff and satisfaction with career progression.</p>

Eligibility criteria

The review sought studies on new interventions implemented with the aim of improving recruitment, retention and promotion for female clinical academics (table 1).

Study selection processes

Study eligibility was assessed by five authors (EB, IMGT, CK, MH and NS) using Covidence software. Each title and abstract was independently screened by two authors. Articles' full texts were screened by four authors (EB, IMGT, CK and NS) with each full text being screened independently by two authors. Discrepancies were resolved by discussion. Search, screening and selection results are shown in the PRISMA diagram (figure 1).

Data extraction

Data were extracted by EB using an Excel data extraction form designed specifically for this study. The following data were extracted: first author, year of publication, place of publication, pre/during COVID, participants, study type, intervention type, duration of intervention, classification of intervention and results. Interventions were classified according to Morahan *et al's* framework for organisational and individual assessment relative to the advancement of women physicians and scientists⁴⁰ (box 1). This framework is based on a model of integrated leadership which starts at the early career stage

through leadership roles. It is an adaptation of the framework developed by Ely and Meyerson for understanding gender and organisational change.⁴¹ A second researcher, IMGT, applied the data extraction tool to a subset of 7 studies and found significant agreement with EB's findings for these studies, thereafter EB applied the tool to the remaining 20 studies.

To provide a complete description of the nature of the interventions, we applied the TIDieR (Template for Intervention Description and Replication) framework. TIDieR is a 12-item checklist (brief name, why, what (materials), what (procedure), who provided, how, where, when and how much, tailoring, modifications, how well (planned), how well (actual)) which can be applied to all evaluative study designs.⁴² EB applied the framework to all studies; three other authors (CK, CD and IMGT) each independently applied the framework to three subsets of studies and findings were collated; major discrepancies were resolved through discussion. The framework was applied by a single author (EB) to four studies; however, all authors reviewed the tables and manuscript and agreed with the findings.

Data synthesis

Due to the small number of studies retrieved and their significant heterogeneity regarding outcomes measured,

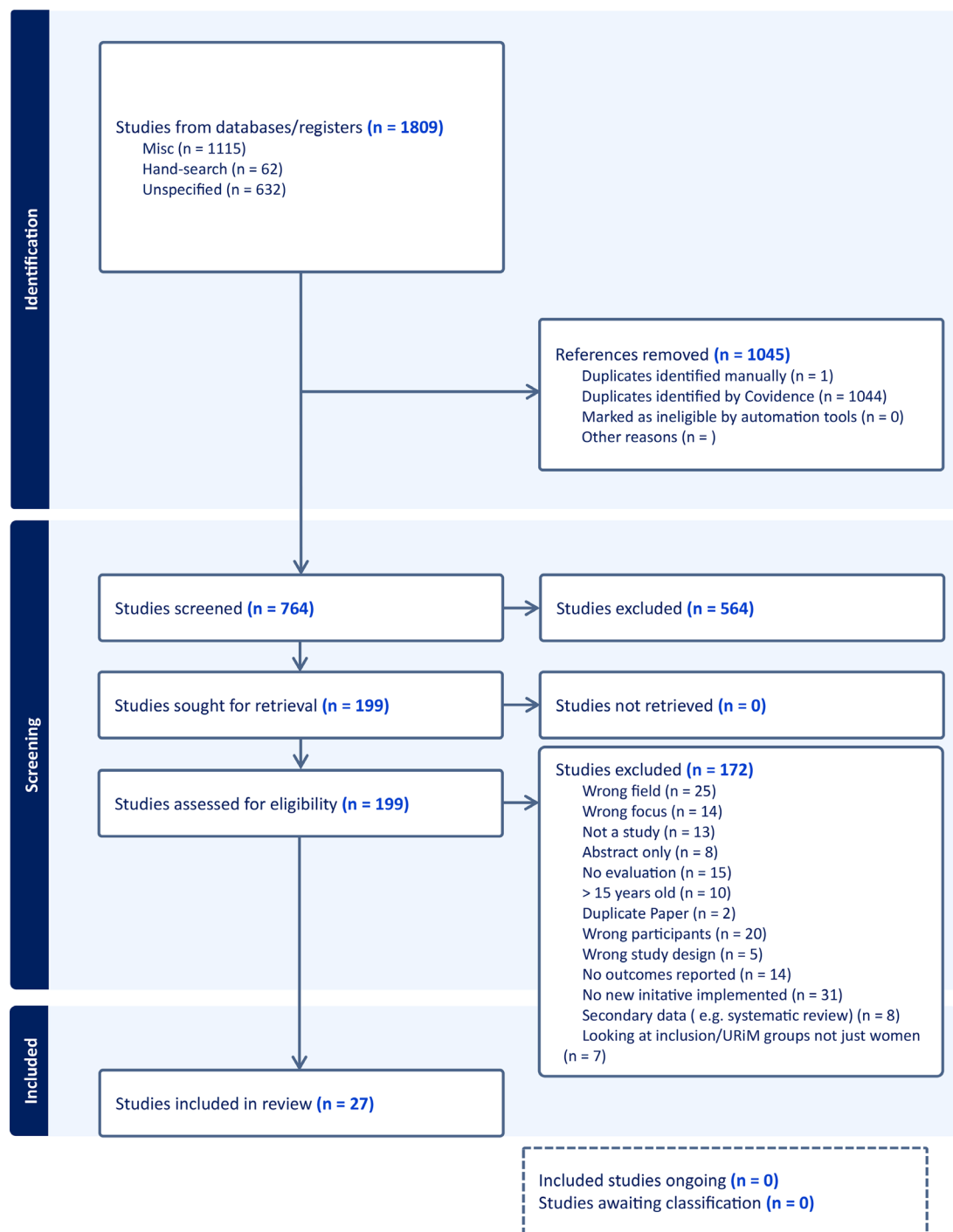


Figure 1 PRISMA diagram. PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses; URiM, under-represented in medicine.

Box 1 Framework for women's advancement in academic medicine

Institutionally based approaches to women's advancement (Morahan *et al*).⁴⁰

Equip the women.
Create equal opportunities.
Value relational skills and increase visibility.
Assess and revise work culture.

interventions, control group and statistical analysis, it was not possible to perform a meta-analysis.

Quality assessment

Quality assessment was undertaken using the Quality Appraisal for Diverse Studies (QUADS) tool. The QUADS tool was chosen because it has been developed for use in systematic reviews that include qualitative, quantitative and mixed-methods studies and has been shown to demonstrate substantial inter-rater reliability, and content and face validity.⁴³ All 27 studies were assessed using

QUADS by EB. A subset of studies (n=4) was assessed independently by two other authors (IMGT and CD). Discrepancies were resolved through discussion.

RESULTS

The search of electronic databases yielded 1747 studies. A further 62 were identified through handsearching. Following removal of duplicates, 764 articles were screened for eligibility, and 199 full-text articles were screened. Of these, 27 met the inclusion criteria (table 1).

Characteristics of included studies

Studies were published between 2008 and 2022. One study took place both before and during the COVID-19 pandemic,⁴⁴ with the remaining studies all taking place before the pandemic. Three took place in the UK,^{45–47} one took place in both the USA and Ethiopia,⁴⁸ and the remainder took place in the USA. Sample sizes ranged from 4 participants⁴⁹ to 3268 participants.⁵⁰

11 interventions were aimed at all or multiple levels of academic rank,^{44 45 47 51–58} seven were aimed at mid-career and/or senior faculty (assistant professor to full professor),^{50 59–64} four were aimed at early and mid-career faculty (instructor to assistant professor),^{48 65–67} three were aimed at assistant professor level only^{68–70} and two were aimed at junior faculty (instructor, senior lecturer and lower)^{46 49} (online supplemental file 3).

Interventions

The most commonly reported intervention (10/27 papers) consisted of career development programmes (CDPs) and leadership skills programmes^{48 50 54 55 59–64} with two interventions aimed at developing specific skills for career advancement, for example, curriculum vitae (CV) preparation.^{69 70} Five of the papers were written about three national CDPs for women in academic medicine in the USA: the Association of American Medical Colleges' Early and Mid-Career Women in Medicine Programmes and Drexel University's Hedwig van Ameringen Executive Leadership in Academic Medicine programme.^{50 60–62 64} Two papers describe findings at 1 and 5 years from a leadership development programme for women in radiology (LIFT-OFF) at Vanderbilt University Medical Centre, Nashville, Tennessee.^{44 55}

Interventions aimed at more junior faculty tended to take the form of mentoring programmes.^{46 49 65–67} Mentoring took the form of facilitated peer mentoring in three studies^{49 65 66}; two of these studies report on the same mentorship programme after the pilot phase and longer term follow-up over approximately 4 years.⁶⁵ Other mentoring programmes followed a more traditional dyadic approach with a senior faculty member matched to a junior member.^{46 67}

Five interventions were multifaceted and included activities such as CDPs combined with departmental task forces, a review of current hiring strategies and provision of research funding for assistant professors.^{44 45 47 58 68}

Two interventions involved the development of women-focussed groups and organisations^{51 53} and one intervention consisted of an educational campaign to raise awareness and acceptance of family-friendly policies.⁵⁶ Two interventions comprised diversity or implicit bias training for faculty and faculty search committees.^{52 57} Interventions varied in their duration from 'brief' (15–30 min) to years-long^{44 45 47 51 53 58 68} (online supplemental file 3).

Only one paper described an intervention that ran during the COVID-19 pandemic.⁴⁴ No studies described interventions specifically designed to mitigate the effects of the pandemic on women's academic productivity.

Morahan framework

Most of the interventions (24/27) sought to 'equip the women', enhancing their knowledge and skills to enable them to advance their careers in academic medicine.^{44–51 53–55 58–70}

Seven interventions sought to 'create equal opportunities for women', for example, through developing departmental-level initiatives to improve female faculty's career advancement.^{45 47 53 57 58 67 68} Eight interventions sought to 'value relational skills and increase visibility', for example, through creating networking opportunities.^{44 45 47 53–55 58 63} 10 interventions sought to assess and revise workplace culture, for example, training interventions to reduce implicit bias^{44 45 47 48 52 53 56–58 68} (online supplemental file 3).

TIDieR framework

None of the papers provided sufficient detail to fulfil all 12 items on the TIDieR checklist. Few reported on tailoring (if the intervention was planned to be personalised, titrated or adapted), modifications, intervention adherence or fidelity, or the extent to which the intervention was delivered as planned. Only one cited specific theories which informed the intervention design (Resonant Leadership, Social Cognitive Theory and Social Network Theory).⁵⁴

Intervention providers were senior faculty in seven papers.^{46 48 51 52 67–69} Five of the interventions, predominantly mentorship programmes, relied on female faculty for their delivery.^{49 53 65 66 70} Five interventions used internal and/or external expertise in their delivery.^{44 55 57 59 63} Two papers describe the Athena Swan programme which involves faculty at all levels.^{45 47} One multifaceted intervention relied on senior faculty, local and national experts and institutional leadership.⁵⁸ The remaining seven studies did not specifically describe the intervention providers.^{50 54 56 60–62 64}

Modes of delivery of the intervention were highly variable and included 1:1 or 1:2 face-to-face sessions,^{46 67 70} small group sessions with interactive workshops, case-based discussions, book clubs and paired discussions,^{51 54 57 58} annual summits and lectureships,^{44 68} and online modules.⁴⁴



A detailed description of each intervention and the TIDieR Framework is provided in online supplemental file 4.

Reported outcomes

The most frequently used approach to data collection (n=18) was feedback from faculty or participants either via a survey or interviews/focus groups.^{45 46 48 49 51–55 59–63 65–67 70}

Three studies reported on data gathered from faculty rosters and databases,^{47 50 64} one study reported on publication data gathered from CVs and search engines (PubMed and Ovid), and five combined data from surveys with other sources, for example, publications hiring outcomes.^{44 56–58 68}

The 12 papers reporting CDPs, leadership or academic skills development programmes generally reported positive findings. Of these, nine studies reported subjective findings such as self-reported increase in knowledge and competencies.^{48 54 55 59–63 70} Two of the remaining studies compared retention and promotion rates among women who participated in CDPs with female non-participants and male faculty^{50 64} and produced statistically significant results. The final study, describing a writing group for women, reported an increased publication rate after the intervention compared with before.⁶⁹

Of the five mentorship programmes, four reported positive findings based on subjective measures such as self-reported increase in skills and participant feedback,^{49 65–67} with some also noting academic output. The two papers reporting on women-focussed professional organisations relied primarily on feedback from participants, which was generally positive.^{51 53} The remaining mentorship study reported statistically significant improvements in measures for job-related anxiety-contentment, self-esteem and self-efficacy.⁴⁶

Of the five multifaceted interventions, four reported objective measures including employment data and academic productivity with a comparator group, or a combination of objective data with participant feedback.^{44 47 66 68} Findings from these studies tended to be more mixed, with two reporting improvements in staff satisfaction and female representation,^{44 66} and the remaining two reporting no statistically significant improvement in female clinical academic employment,⁴⁷ or other key measures including academic productivity.⁶⁸ The final paper describing a multifaceted intervention (Athena Swan) was a qualitative study which reported positive impacts but also noted potential negative effects such as the disproportionate allocation of Athena SWAN-related work to female faculty, potential reinforcement of gender-based stereotypes and a failure to challenge the underlying societal issues such as gendered divisions of labour.⁴⁵

The two papers describing diversity or implicit bias training also reported positive findings: one reported a statistically significant decrease in implicit bias associating men with leadership.⁵² Another study looking at the effects of diversity training for faculty search committees

reported statistically significant increases in hiring women faculty among participating departments.⁵⁷ Lastly, the paper describing an educational campaign to raise awareness of family-friendly policies reported an increased awareness of the policies but no improvement in the hiring or advancement of female academics⁵⁶ (online supplemental file 3).

Study quality

Studies scored an average of 20.19 out of a maximum possible score of 39 using the QUADS tool.⁴³ Studies scored well on describing the study population and research setting, using appropriate data collection tools and analytic methods, but scored poorly on providing evidence that research stakeholders were consulted in research design and conduct, in providing a justification for the choice of analytical methods, and in describing the sampling approach in adequate detail. A full description of the QUADS score for each study is provided in online supplemental file 5.

DISCUSSION

Gender inequality in academic medicine has been recognised for decades,¹ but progress is slow^{7 30} and has been set back even further by COVID,^{21–27 71} with the time to reach gender parity increasing by nearly 40 years since the pandemic.⁷² We report on findings from 27 studies describing interventions to improve gender equality and equity in academic medicine published between 2008 and 2023.

We found that the evidence supporting such initiatives in academic medicine is scant, with few examples of unequivocal success. CDPs and leadership programmes for women, mentorship programmes and women's support groups are popular and tended to report positive findings, but many of these studies relied on subjective measures^{48 49 51 53–55 59–63 65–67 70} and often lacked a comparator group. Multifaceted interventions provided more objective evidence, but only two of the five studies reported statistically significant improvements in the representation of women faculty.^{44 58} Overall, as other reviews found,^{33 34} the quality of the studies included was low to moderate, with only 4 scoring >66% using the QUADS tool.^{47 52 60 68} None of the studies fulfilled all 12 items on the TIDieR checklist.

Factors affecting the impact of gender equity interventions

There may be several reasons why gender equity interventions in academic medicine have not achieved their desired impact. First, medical professionals have recently been shown to overestimate women's true representation in different fields and at different ranks. This overestimation can be associated with reduced support for gender-based initiatives, especially among male medical professionals.⁷³ These findings may be part of a concerning trend occurring more broadly: 46% of >20000 adults surveyed across 30 countries agreed that we have gone so far in promoting women's equality that we are discriminating against men.⁷⁴ Relations between

majority and minority groups tend to be viewed as a zero-sum game. The perception that bias against women is reducing, and their success is rising can be interpreted as evidence that bias against men is rising and their success declining. This perception threatens men's self-interest and can give the impression that an organisation's practices violate meritocratic principles.⁷⁵ Individuals are unlikely to support interventions that they perceive as being disadvantageous to them and fundamentally unjust.

Gender equity can be seen as a 'women's issue', and the responsibility of solving the issue is left to women,³⁶ creating an effect similar to minority tax experienced by those who are under-represented in medicine (URiM).⁷⁶ The majority of interventions described above not only relied on women to implement and participate in, but also aimed to 'equip the women'.^{44-51 53-55 58-70} Sending the message that women need help to achieve high levels of career success suggests that they inherently lack competence and can result in increased discrimination.⁷⁵ Moreover, interventions aimed at equipping women may fail to address the organisational and systemic factors that underpin inequality.

Creating 'institutional housekeeping' by leaving the work of solving gender inequality to women faculty is not desirable, but interventions implemented from the top down, that is, from organisational levels or external bodies, can also have unforeseen consequences. Organisations can engage in a type of 'window dressing'. This involves creating an air of change but without taking action to produce true change, such as including the voices of minoritised staff in developing diversity initiatives.⁷⁷ The imposition of external rewards or threats for achieving equity may reduce faculty's intrinsic motivation to engage in diversity-improving initiatives.^{75 78} Ultimately, practices aimed at enhancing equality cannot succeed when they coexist with practices which undo equality. For example, training faculty search committees to identify more women candidates is futile if discriminatory practices exist at the hiring stage.⁷⁷ Failure to consider unintended consequences and organisational practices which could undo equality initiatives, along with limited engagement with stakeholders, could explain some of the mixed outcomes reported even for large multifaceted interventions.

Societal factors need to be considered too—in most countries, caring responsibilities still predominantly fall to women regardless of their occupation, and as seen during COVID, increased caring responsibilities translate to a significant barrier to women's participation in the workplace on an equal footing to men.^{72 79} During the pandemic, this was shown to be particularly acute for women who occupy other groups who are URiM.²⁶ Societal change, for example, improved access to formal care services and more equitable distribution of caring responsibilities between men and women is needed alongside organisational change to facilitate gender equity in the workplace.

The lack of studies from the COVID-19 period may be due to publication delays. An alternative explanation is that interventions did not run during the pandemic, or people could not engage with them, and new interventions were not

implemented. During the pandemic, physicians, especially those on the front line, experienced significant impacts on their psychological and physical health, and women were more likely than men to report emotional exhaustion and physical symptoms.⁸⁰ Of the 27 papers included in this review, only 5 describe interventions which did not rely almost entirely on women faculty for either delivery, participation or both.^{52 56-58 68} During the pandemic, women faculty may not have the capacity to engage with initiatives to enhance gender equity, highlighting one of the problems with relying on women to solve the gender equity problem.

Limitations

Although an exhaustive search was conducted, some studies might have been missed, particularly those published in languages other than English, possibly explaining the predominance of interventions from the USA.

Publication bias could also be an issue, and most of our studies reported positive findings. Another consideration is that our search was focused on healthcare literature, and we excluded studies which described interventions aimed at groups other than physicians, so potentially successful interventions which included other groups are not reflected here. Quality assessment may have been stronger had it been conducted by two authors on all papers. Although two other authors reviewed a subset of studies and compared findings for consistency, future reviews may benefit from dual review of all papers. Lastly, we did not consider other groups who are traditionally URiM, and therefore, intersectionality is not considered in this review.

Recommendations and future research

A different approach is needed if we are to reinvigorate the goal of gender equity in academic medicine and apply the lessons learnt during COVID. We suggest that organisations take a more holistic view of integrating equity practices. Context is important, and unintended consequences need to be carefully considered. Interventions that rely on women for their implementation or seek to 'fix the women' should be balanced by organisational interventions and policy change, taking an evidence-based approach. A rigorous study might be one where the focus is on the organisational and systemic practices that enhance equity—and those that undo it. Engaging with stakeholders and in particular, minoritised groups, from planning through to evaluation is critical. Researchers might draw on theoretical frameworks, for example, those which conceptualise organisational change and facilitate a structured approach, such as Lewin's Change Theory⁸¹ or Kotter's Eight-Step Model.⁸² When practices work well, we suggest that they are shared in sufficient detail that will allow other organisations to modify and implement them; authors could consider the use of a reporting framework such as TIDieR.⁴² Differences in the barriers experienced by women in academic medicine who also undertake clinical practice and those who do not undertake clinical practice also need further exploration. Additionally, investigation is needed into how female clinical academics navigate



the professional hierarchies of both academic and clinical institutions, as well as the dual identity of clinician and academic.

Sending a strong signal that diversity benefits all and a true meritocracy addresses inequity will be key to garnering continued support. Research that builds on the evidence for the benefits of diversity and equity, considers intersectionality, explores the perspectives of minoritised faculty and highlights the kinds of organisational practices that undo equity will be needed if we are to finally achieve gender parity.

Contributors EB made substantial contributions to the study conception, study design, data acquisition, analysis and interpretation and drafted the manuscript. CD, CK, IMGT, NS and MH made substantial contributions to the study conception, study design, data acquisition, analysis and interpretation and revised the manuscript. DM made substantial contributions to the study conception, study design and data acquisition. All authors have approved the submitted version and agree to be personally accountable for the author's own contributions and to ensure that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and the resolution documented in the literature. EB is the guarantor for this paper.

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