

Complex Manifestations of Gender Disparity in Academic Medicine

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Abstract: *Context:* More and more women are entering medical field and are becoming an integral part of academic medicine. However, they have yet to reach gender equality in terms of compensation, scholarship, and leadership, and most struggle to find the balance between work and home. We performed a systematic review of the literature to ascertain the obstacles women face in academic medicine and how best to overcome these hurdles and attain gender equity.

Data Sources and Data Synthesis: A comprehensive literature search was performed using Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) (1996 to Present); the terms "physicians, women" and "academic medicine" retrieved 751 results. Key articles were hand searched for relevant references. A combination of original research articles, commentaries, and editorials were reviewed. The articles were categorized into one of the following seven categories:

The Prevalence of Gender Discrimination in Medical Schools

Compensation in Academic Medicine

Research funding and Authorship in peer-reviewed journals

Advancement of Women to Leadership Positions

Mentoring

Targeted Intervention and Other Success Stories- how best to promote the development and retention of women faculty

Conclusions: Gender disparity is extremely prevalent in academic medicine. Women lag behind men in several measures such as leadership, authorship, scholarship, advancement, and compensation. As the number of women entering medical school has increased, there is an urgent need to develop policies and programs targeted at the recruitment, retention, and advancement of women faculty in academic medicine. Several recent programs, such as the IMERGE program at Emory University and the Claflin Distinguished Scholar Awards program at Massachusetts General Hospital, have proven successful in attaining some short-term degree of equality and fairness. If other institutions could establish similar programs, great strides would be made in reducing sex disparities in academic medicine. By altering the structure of academic medicine, to allow flexibility, women **can succeed** without sacrificing family time and can find a balance between work and home life without sacrificing career goals.

INTRODUCTION

For some time, the lack of equality of women in academic medicine has come under scrutiny. Although women now comprise almost half of all medical students, only 16% of professors and 11% of medical school deans are women (2006 AAMC statistics). The fact that the broad base of participation of women who enter into science and medicine has not created more equality at the top has been difficult to explain in terms of causes and effects. The problem is multifaceted starting from the cultural norms related to gender roles pertaining to child rearing and work-life balance to absence of suitable mentors, lack of infrastructure to

promote women into leadership roles, and inequality in compensation, authorship and scholarship [1-5].

Career progression and success to women often come at the price of numerous sacrifices. Even the seemingly successful women run into a glass ceiling closely entwined with discrimination practices making advancement to senior faculty positions and leadership positions daunting and unattainable. If the structure of academic medicine is not altered to create flexibility and a more welcoming environment, many women will continue to struggle as working moms and likely need to sacrifice family time to succeed at work. We reviewed the existing literature to ascertain why it is such a struggle for women to survive and achieve high ranking positions in academic medicine and how these barriers can be broken down to allow for a more even playing field.

Data Sources and Data Synthesis

A comprehensive literature search was performed using Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) (1950 to Present) using search

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terms “women, gender, mentoring, authorship, academic medicine, and science, in varying combinations. Key articles were hand searched for relevant references. A combination of original research articles, commentaries, and editorials were reviewed. The articles were categorized in to one of six following categories:

Inequality in Compensation in Academic Medicine

Research funding and Authorship in peer-reviewed journals

Advancement of Women to Leadership Positions

Mentoring

Work life balance

Targeted Interventions and Other Success Stories

Inequality in Compensation in Academic Medicine

Gender is a significant salary predictor among those in academic medicine, even after controlling for gender-associated independent variables. In a cross sectional survey of full time faculty at 24 US medical schools, female physicians earned an average of \$12,000 less than male physicians; this disparity increased with seniority [6]. Female Board Certified Internists were surveyed in the state of Pennsylvania 10-30 years after their medical school graduation and were noted to work in low-earning specialties, take extended time off or work part time to care for children, be in solo practice, and not have an academic affiliation [7]. Women holding an MD or DO degree and practicing rehabilitation medicine full time reported earning 75% of what male physicians earned, irrespective of their practice setting or academic rank [8]. This is consistent across the continents, with women physicians in Canada, England, and Australia without fail reporting less earnings than their male counterparts [9].

In order for women to be at the forefront of academic medicine, they need to be compensated comparatively with their male colleagues. Without equal compensation, it seems as if their work is less important and as a result they will receive less respect. Achieving the goal of equitable salary requires standardized guidelines for advancement and salary determinants. Deans and department heads must work together to reach this point of equality.

Research Funding and Authorship in Peer-Reviewed Journals

Among the most important factors in career development for academic medical faculty is to develop research niche and publish original work in peer-reviewed journals. Many women find it a challenge to receive funding for their research, making career progression difficult. In 2005, the National Institutes of Health began the prestigious Clinical and Translational Science Award (CTSA), in which one principal investigator (PI) was appointed to coordinate all the research at each academic health center chosen for the award. The conditions established for funding and development of the program overwhelmingly resulted in the selection of men over women for the available positions. Perhaps it is the difference in the leadership style women project. Stereotypical leadership attributes, such as assertiveness and dominance, make men seem more competent. However, previous studies have shown that transformational leaders (compared to

transactional leaders) should be the more effective and ideal for PI role because they move their followers towards a common, shared goal and are best able to enact changes. It is also known that women are more likely to exhibit transformational leadership skills and therefore be more effective. In order to reduce gender bias and enhance the selection pool of potential leaders, there needs to be fairer policies promoting the equal selection of a man or woman principal investigator [10].

Publishing in peer reviewed journals is often used as a measure of success in academic medicine. One study evaluated the genders of first and senior authors for all articles published in 1970, 1980, 1990, 2000, and 2004 in six prominent medical journals (the *New England Journal of Medicine*, the *Journal of the American Medical Association*, the *Annals of Internal Medicine*, the *Annals of Surgery*, *Obstetrics & Gynecology*, and the *Journal of Pediatrics*) to see if a “gender gap” exists. Even in year 2004 only 29.3% of first authors and 19.3% of senior authors in these major medical journals were women. However, there was a positive trend as noted by an increase in the number of women first authors from 5.9% to 29.3% and women senior authors from 3.7% to 19.3%. This increase was seen most drastically in *Obstetrics & Gynecology* and the *Journal of Pediatrics* with the smallest increase in the *Annals of Surgery* [11].

More recently Jagsi *et al.* examined the distribution of women on editorial review boards as well as editors-in-chief of 16 major medical journals from 1970 to 2005. Female editorial board members rose from 1.4% to 16.0% over the 35 years, but women still remained in the minority on all the boards in all the journals. Only 8 editors-in-chief in this study were female [12].

Career Advancement and Attainment of Leadership Positions

Women in academic medicine consistently encounter barriers to career advancement. After medical school graduation, women are significantly more likely than men to be appointed as faculty members. However, fewer than expected are promoted to senior ranks [6, 13]. In Canada, only 9% of medical school department chairs and 12% of full-time faculty are women despite the fact that 28% of Canadian physicians are women [9]. A cross-sectional, cohort study found that women generally held lower academic ranks than men; only 56.3 percent reported aspiring to become full professors [8]. Women held significantly fewer leadership and directorship positions, received fewer research awards, and participated in and led fewer committees.

Dacre argued that despite the high percentage of women entering medical school, their numbers across the workforce have yet to reflect this trend. [14] The mismatch between educational and workforce participation has an especially prominent effect within academic medicine where “the proportion of women decreases with increasing academic grade” due to lack of role models, lack of flexibility of duty rotations, and low acceptance of career breaks and part time working. The best and brightest women are often lost to the pharmaceutical world or private practice.

Ben Barres refutes the Harvard hypothesis that the lack of advancement of women in academic medicine is because of differences in skill levels and argues instead that it is due

to discrimination. There is a widespread assumption that women are less capable than men, but a study of 20,000 math test scores of children ages 4 to 18 showed little difference between the genders [15]. If women are consistently led to believe that they are inferior, then eventually they will lose ambition in their work.

In 2008, the *British Medical Journal* provoked a gender debate by asking if there are too many women among medical school graduates. Brian McKinstry argued that the end result of the feminization of medicine in the British system will be evident in the near future. Women concentrate in few "family friendly" specialties which will be hindered by an abundance of part time workers and career breaks for maternity leave or FMLA. It is also known that female doctors see fewer patients and are 30% more likely to refer their patients to the hospital [16]. On the other hand, Women are more likely to have better communication skills and develop superior relationships with patients and less likely to be sued. [17]. Male doctors in the United States were three times more likely to have a malpractice claim against them due to behaviors such as impulsivity and egoism. Welcoming women into the workforce will promote a balanced and quality approach to patient care.

Gender Disparity by Specialty

Different specialties have different traditions, work schedules and differ in the ways how they treat and value their women faculty. Academic Surgical specialties are considered particularly rigid and family churlish. There are far fewer women among surgical specialties and they tend to focus on clinical practice than academics. A survey of 270 female surgeons found that 70% devoted more than half of their time to patient care, indicating why women are underrepresented in leadership positions. The percentage of women who reported that their careers focused on research (5%) was almost equal to the percentage of women who identified themselves as full professors (4%) [18].

A survey of 4,659 residents and 811 fellows in obstetrics and gynecology found that as trainees advance through residency they lose interest in academic academic careers. Female trainees believed that their male colleagues were more actively recruited for faculty positions and more likely to receive helpful career advice [19]. This is unsettling because the majority of residents in obstetrics and gynecology are women.

McPhillips *et al.* [20] sought to determine how family friendly pediatric residency programs are towards working mothers. Using the Task Force on Women in Pediatrics three areas of need were determined (a family friendly environment; scheduling and career path flexibility; and addressing of issues specific to working women and how to attain success) and recommendations were provided. Fifty nine percent of the department chairs reported providing child care facilities, but the demand was much greater than the availability, and only 61% accepted children as early as two months of age, when many maternity leaves are up. Most programs did not have clearly written maternity and paternity leave policies. Residents were usually allowed a maximum of three weeks leave without having to make up time. Furthermore, most departments provided no work flexibility

and only 40% of department chairs mentored their residents on balancing work and home.

Strategies for Gender Parity

Identifying what is most important to women faculty can provide institutions the basis for program development geared towards faculty retention and advancement.

A survey of 163 women faculty at Stanford School of Medicine was carried out to see how the medical community can attract, retain, and advance women in academic medicine [21]. Most respondents listed a "flexible work environment without negative consequences as most important (53 ranked "most important" with a mean importance of 4.37 out of 5) while the ability to receive mentorship (4.13 out of 5), provision of administrative and secretarial support for their research (4.11 out of 5), and eligibility for a three month sabbatical to write papers and grants (4.15 out of 5) were listed as very important. A retrospective analysis of 133 academic emergency medicine departments found that if a department had a female chairperson, there was a significantly higher proportion of female faculty and a greater likelihood of having a female residency program director [22].

THE IMPORTANCE OF MENTORING

One of the many challenges that women face in academic medicine is the unavailability of a positive role model. Traditionally, a one-on-one mentorship occurs between a junior and senior faculty member which has been shown to have a positive outcome on ones career. The mentee is more likely to follow their career aspirations, make more money, receive more research grants and better funding while their mentor can help with grant and manuscript writing and compose letters of recommendation. However, a hierarchical relationship may occur and women and minorities may experience difficulty finding suitable mentors [23]. The association between the male mentor and female mentee is often frowned upon and women have to give up either personal dignity to get ahead or their personal happiness to deal with the hostility, and hatred; this situation is unlikely to happen with mentors of the same gender. In the much quoted survey from Penn State University, male mentors were reported both by male and female mentees to provide more leadership opportunities, feedback, coaching advice, networking and career advancement opportunities. One important limitation to the survey is that it only addressed factors directly related to career success but not the personal sacrifices in terms of happiness and disturbed family life mentees have to forgo to be successful. An additional factor for the perceived success of male mentors may be that women mentees drop out of the race after seeing the hardship their women mentors go through and the sacrifices they make to climb the ladder.

Alternative Strategies for Mentoring

The most effective way to mentor women may not be by traditional mentoring standards, which challenge the mentee. The *multiple mentoring model*, in which the mentee seeks out a community of mentors, allows women to be encompassed by a powerful network consisting of both junior and senior faculty members providing a collaborative and hierarchical relationship. The peer mentoring model involves the foundation of a mentoring community without establishment of a hierarchy. Participants benefit from mutual support and

learning while developing friendships with co-workers of the same age and rank. However, there is little experience if no senior mentor is chosen and there can be competition among members [24].

The Internal Medicine Research Group at Emory (IMeRGE) is yet another alternative model for mentoring. IMeRGE is composed of five men and two women faculty between one and five years experience with a goal "to foster a collaborative atmosphere among junior General Medicine faculty at Emory University, while simultaneously acquiring experience through an advanced faculty development program in three focal areas: of research, advanced teaching skills, and professional development." The group holds weekly meetings, assigns projects with foreseeable endpoints, establishes rules to prevent competition, and appoints their division chief as senior advisor. All members are held accountable for the mentoring process. The program is an alternative to a traditional mentoring relationship and, thus far, has proven successful [23].

WORK LIFE BALANCE

Women with children tend to perceive a less positive climate in academic medicine than women without children. [21]. Geri Fox [1] eloquently acknowledged and shared her struggles as a working mom: the sacrifice of countless hours and numerous memories in order to pursue and succeed at a job she loves. Those who decide to confront the struggles will run into barriers and hurdles that make attainment of senior faculty positions seem daunting and unattainable. The struggles of a working mom are enhanced when one's employer does not provide flexibility in balancing family and career. Gliese Verlander, a single mother of four and a practicing psychiatrist, succinctly described the goal of most women physicians raising children: "to find a personal balance that works well for herself and her family and leaves the physician-mother with a sense of fulfillment and contentment with the choices she made" [25].

Not finding the balance between work and personal life can hamper one's ability for career advancement. Proper mentorship and collaborative work helps physicians find the balance that can enable them to have successful careers without sacrificing a happy family. Women who decide to hire outside help may strain their relationship with their children, but working part time may damage their career [26]. No one can do it all, especially all at once. The challenge is finding the balance that makes one happy. Young residents should be taught the intricacies of balancing so that it becomes a skill they will have mastered upon becoming full time faculty [27].

In 2001 the American Association of University Professors drafted and revised an updated Statement of Principles on Family Responsibilities and Academic Work to accommodate and support the numerous men and women balancing work and family [28]. The paper included pregnancy, child care, and eldercare restrictions including guidelines on how to modify one's responsibilities or stop the tenure clock. The AAUP recommends providing on-site quality childcare which "has led to stronger and more contented families and increased productivity."

The Clinical Scholars program of the Robert Wood Johnson Foundation is designed to train young physicians to be-

come leaders in scholarly research for health services and policy. In 2003, Kalet *et al.* [29] surveyed the 36 female graduates of the program from 1984-1989 who found through the program that personal satisfaction is finding a work-life balance. Their drive to lead and mentor others as well as seek mentorship for themselves, while keeping their "eye on the prize" and balancing personal and professional life has characterized these women as a rare breed of success in academic medicine.

Creation of Part-Time Faculty Positions

Women mostly opt for part time positions in order to achieve work/family balance and are therefore, less likely than men to advance along the tenure track. Those that chose tenure worked full time in order to achieve it; many would have benefited from a flexible prorated tenure track [30]. Unless there is a policy change, faculty members focused on achieving a work-life balance will be underrepresented in the upper ranks of academic medicine.

Medical institutions must be challenged to create more welcoming environments for women [31]. Flexibility of the institution and strong leadership by the dean and department chair are the first steps in allowing this to happen. Women should be encouraged to develop a different organization structure to accommodate for the strengths of both men and women [32].

The part-time residency is an option for those seeking to find a work/life balance early on. A 2005 study showed 12% of pediatric residency programs had a part-time option and 91% of those taking advantage of the option were women [33]. Both men and women working part time cited child care as the main reason. Eight percent of pediatric residents at the University of California, San Francisco worked part time and 40% of them would have had to request a leave of absence had part time not been an option. This flexibility allows programs to retain individuals who might have to otherwise conclude their training or take a leave of absence. Unfortunately, part-time residencies are hard to come by in some specialties [34]. There are few guidelines and even less information available for those considering one. Women are more likely to work part time or seek part time residency programs, but the total hours worked per week when factoring in childcare and household duties greatly surpasses men [9]. These are numerous aspects where programs can be enhanced to allow a better balance for their residents.

TARGETED INTERVENTION AND OTHER SUCCESS STORIES

Clafin Distinguished Scholar Awards

The Clafin Distinguished Scholar Awards presented by Massachusetts General Hospital provided \$30,000 in start up funding per year for up to two years to junior faculty with child raising responsibilities [35]. At the time of the publication, award recipients had a 90% retention rate including 25 promotions. Since obtaining their awards, the recipients had been awarded grants exceeding the cost put forward by the institution. The benefits of the award have been recognized by the recipients who were able to advance their career while recognizing the institution's commitment to women scientists.

The success of the program is due to several factors. First, the funding was flexible and could be used in almost any way the recipient saw fit. The recipients' confidence increased and they used their changed perceptions of the institutions to influence other junior faculty. Additionally, the award helped to remove any sex-related disparities that may have been present in the start up packages of the junior faculty [36]. Making programs like this more widespread can help women balance personal and professional life while being able to progress their career and contribute to the scientific community.

Executive Leadership in Academic Medicine

The Executive Leadership in Academic Medicine (ELAM) program at Drexel University College of Medicine provides leadership training, networking, and mentoring to women faculty to facilitate their advancement to senior leadership positions. The successes of the program can be seen in its graduates, 75% of whom have gone on to senior leadership positions. A follow up study by Dannels *et al.* compared participants from two different cohorts with applicants not accepted to the program and women on the AAMC's faculty roster to determine if participation in the program enhanced leadership and career development. A 2006 follow up survey was compared with baseline data from 2002 and showed that ELAM participants were more likely to hold or aspire to a higher leadership position inside an academic health center and ELAM participants demonstrated more knowledge about leadership than the other groups [37]. Participants reported enhanced leadership capabilities in all ten categories evaluated over an 18-month period resulting in superior skills that will be of use throughout their career [38].

Gender Parity Program at Hopkins

In 1990, Fried *et al.* [39] identified gender based obstacles women were experiencing at Johns Hopkins University School of Medicine. Through an anonymous survey it was found that a significant number of women felt held back by the lack of quality mentors, unfair institutional policies, and feelings of isolation. An intervention program was developed targeted to leadership advancement with defined short and long-term goals. The program started with education about the nature and prevalence of gender discrimination and campaigned for change in institutional policies, such as holding meetings and grand rounds during awkward hours and advocated establishment of promotions committees, mentoring, and a career development program through identification of women whose careers were not progressing satisfactorily. All women whose salaries were identified as below scale received an increase and women ready for promotion were identified. A task force reported regularly to the department chairs with future goals and methods to help correct gender bias. In a follow-up survey after 3 yrs, over one half of women had noticed improvements in salary equity, timeliness of promotion, and decline in isolation; there was 110% increase in the proportion of faculty with mentors including a 39% increase in women noting that their careers were enhanced by their mentors. Furthermore, there was a 66% increase in women expecting to be promoted with a similar decline in those expecting to leave academic medicine. The biggest improvement was seen in the 550% increase in women at the associate professor rank from 1990-1995. As the institution acknowledged the problems they were experi-

encing and began to fix them, women began to feel more appreciated.

A before and after survey was used to determine the benefits of an intervention program on closing the salary gender gap [40]. A three part intervention series included data collection on faculty rank and salary, analyses of the salaries by department, gender, and leadership positions compared to the national average, and identification of women making less than men comparable in rank, track, specialty, and years at the rank. Finally, an evaluation meeting was arranged between the Dean and each department head to discuss departmental progress in education, research, service areas, and the salary data. The data was recollected in 2004 and showed that the salary differences between women and men were no longer statistically significant proving that the gender gap in salary can be reduced by collecting accurate data on compensation, identifying disparities, and holding the leadership accountable [40].

Wagner worked at over 100 academic health centers and provided following recommendations to promote the advancement of women in academic medicine ([8]. First, there needs to be an updated approach to faculty and leadership development and mentoring. Second, faculty structuring needs to have more flexibility in order to enable women to continue to advance professionally without neglecting their personal lives and home responsibilities. Finally, department heads and chairs need to be held accountable for the advancement of women junior faculty. In order for the field of medicine to progress, the talents and capabilities of women physicians need to be recognized and promoted without punishment of those trying to balance work with family.

With women comprising almost half of medical students, the Increasing Women's Leadership Project Implementation Committee concluded that women should comprise more than 14% of tenured faculty and 12% of full professors. Official data from 1995-2001 looked at the advancement of women over a four year period [41]. Based on the results, the committee suggested that faculty diversity be emphasized, men should be assisted in becoming better mentors for women, and financial support should be given to the Women in Medicine programs and the AAMC Women Liaison officers. Implementation of these programs requires an ongoing, joint cooperation between the dean, department chairs, and other senior leaders at the institution but is possible and critical for the long-term success and development of women leaders at academic health centers.

Institutions should promote teamwork over independence while valuing "soft science" as much as "hard science." The idea that work and home are separate entities should be changed. By allowing more flexibility in scheduling, faculty will be able to balance personal and professional life without sacrificing one for the other. By first identifying the absence of women in leadership positions as a problem, the next step is to design and test theories improving the promotion of women in academic medicine. The goal is that by changing institutional policies to be a more welcoming environment for women raising children, in time, institutional cultures will be revised and be more tolerant of women advancing through the disciplines of academic medicine. The ever-changing field of medicine is becoming more and more gender equitable. It is important to address issues related to

women physicians since increasing numbers of female patients are requesting female physicians. Female physicians are also more likely to practice in the less sought-after primary care fields and work in underserved areas. Many women struggle as working moms and medical institutions need to be encouraged to create a more welcoming environment for women by creating flexibility and strong leadership. As the number of women in academic medicine increases, one can hope that policies and opinions will begin to change to ease the burden of balancing work and home.

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