Women in Medicine and Biomedical Research

Health Research Alliance 3-31-16

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Overview

- What the data show
- Causal factors
- NIH-TAC Trial
- Pathways Program for STEM faculty
- Discussion
“We just need to wait for all the women in the pipeline to advance”

Longitudinal studies show...

It’s not a “waiting” problem
It’s an advancement problem

- Tesch B. Promotion of women physicians in academic medicine JAMA 1995
- Nonnemaker L. Women physicians in academic medicine: new insights from cohort studies. NEJM 2000
Sex differences in academic rank in US medical schools in 2014 (Jena, JAMA, 2015)

- Database of 91,073
- Full professors:
  - 11.9% of women
  - 28.6% of men
- Women less likely to be full professors (absolute adjusted ~ 4%) after accounting for age, experience, specialty, and measures of research productivity
- Sex differences across all specialties
- Did not vary by school research funding ranking
Sex differences in institutional support for junior biomedical researchers  (Sege, JAMA, 2015)

| Table 2. Institutional Start-up Support for Men and Women Applying for Early Career Awards* |
|---------------------------------|-----------------|-----------------|------------------|
|   | Start-up Support, Median (IQR), in 1000s of US$ | Total | Men   | Women  |
| No. of applicants | 678 (216-1100) | 889 (283-1250) | 350 (180-775) | .001 |
| Type of degree |     |     |     |     |     |
| MD | 528 (150-900) | 596 (50-1123) | 474 (200-800) | .95  |
| PhD | 717 (240-1100) | 936 (475-1250) | 348 (180-750) | .001 |
| MD, PhD | 800 (267-1393) | 961 (271-1447) | 500 (0-850) | .23  |
| Type of research |     |     |     |     |     |
| Basic | 811 (350-1200) | 980 (504-1290) | 585 (225-882) | .001 |
| Clinical | 210 (89-350) | 162 (0-435) | 213 (101-350) | .25  |
| NIH funding to institution by quartile |     |     |     |     |     |
| 1° | 830 (263-1300) | 1040 (409-1500) | 368 (169-800) | .001 |
| 2 | 600 (221-950) | 725 (275-970) | 388 (186-922) | .16  |
| 3 | 581 (216-750) | 660 (331-1100) | 541 (204-750) | .17  |
| 4 | 376 (150-1050) | 537 (169-1160) | 184 (117-600) | .16  |
| Institutions with >10 applicants | 575 (210-1000) | 850 (158-1300) | 483 (203-750) | .03  |

* Not explained by degree, years of experience, or institutional characteristics
A thousand pounds of feathers

- Unconscious bias
  - Cost of assertiveness
- Salary discrepancies
- Mentorship
- Balancing work & life
- Culture
Unconscious bias

- Gender Schemas
  - Deeply embedded generalizations
  - Most people believe they are objective

- *Both men and women* give lower ratings when work is thought to be a woman’s
  - grant proposals, CVs, works of art

  -- Moss-Racusin, *PNAS,* 2012
Science faculty’s gender biases

- Randomized, double-blind
- 127 professors at 6 research universities
- Rate applications for lab manager
- Sent identical resumes... ½ male, ½ female

Moss-Racusin, PNAS, 2012
Bias against assertiveness in women

- The qualities required of leaders and those required of femininity are at odds

- Women are penalized for adopting a highly assertive style – incongruent with societal norms

- Narrow band of behavior is acceptable
  - Butler & Geis (1990) J Person & Social Psychol
Gender differences in salary

- Salary discrepancies exist after adjustment for specialty, hours worked and other variables
  - Wright AL et al. Acad Med. 2003;78:500-508
  - Jagsi R et al. JAMA, 2012; 307:2410-2417
Salary: early career MD researchers

- Survey to 1275 recipients of NIH K08 & K23 awards in 2010-11
- 75% response rate
- Mean salary
  - Men $172,164
  - Women $141,325
- Adjusted for covariates: age, race, marital status, parental status, degrees, specialty, rank, years on faculty, institution type, region, work hours, research time
- $10,921 after adjustment

- Jagsi et al; Acad Med; 2013
Mentoring

- Faculty cite mentoring as critical to success
- Women *slightly* less satisfied with mentoring
- Mentorship gaps:
  - Negotiation skills
  - Work–life balance
    - Files et al. J Women's Health; 2008
    - Blood et al. J Women's Health; 2012
    - De Castro R et al. Acad Med; 2014
- Mentor gender, gender concordance, and # of mentors not assoc with satisfaction
  - De Castro et al. Acad Med; 2014
“Work-Life balance”...
Meeting goals at work and in life

- Long work hours
  - Key predictor of work-family conflict (Jacobs, 2008)
  - Odds of burnout by women increase by 15% for each additional 5 hrs/wk >40 hrs
    (McMurray, 2000)
- Technology blurring work-life boundaries…making jobs 24/7
- Women disproportionately in caregiving role
  - Continues in most recent study of young K08/K23 awardees (Jolly, 2014)
  - Increasing need for elder care
Dual career couples/partners

- K08 or K23 awardees between 2006-9
  - 1049 academic physicians
  - Mean age=40 yrs
  - Spouses/partners employed *full time*
    - 86% of women
    - 45% of men
A thousand pounds of feathers

- Unconscious bias
  - Cost of assertiveness
- Salary discrepancies
- Mentorship
- Balancing work & life
- Culture
The NIH-TAC Trial
Transforming Academic Culture

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NIH-TAC Trial

- **Major hypothesis**
  - Among women assistant professors, a multi-faceted intervention will:
    - Improve academic productivity (publications, grants)
    - Improve self-efficacy & improve culture
    - Decrease work-family conflict

- **Long term goal**
  - To create an environment where women can succeed fully in their careers, maximizing their contributions to academic medicine and improving workplace for all faculty
Culture Conducive to Women’s Academic Success

Final Measure
- Demonstrated reliability & validity
- Four dimensions of culture
Results: Culture Conducive to Women’s Academic Success

- Culture **mitigated** the impact of long work hours on work-family conflict

NIH-TAC Results: Academic Productivity

- No differences between intervention vs control
  - *EXCEPT* in PhDs: 2.3x more first-author peer reviewed pubs

- However, both groups (combined) improved significantly:
  - Total # of peer reviewed publications increased by 46% (p<0.001)
  - Grant status* improved for 50% of faculty (p <0.001)

*Improvement in grant status defined by one or more of the following criteria:
  - Increase in total number of grants
  - Increase in federally funded grants
  - Increase in the number of grants for which participant was principal investigator
NIH-TAC Additional Results:
Intervention vs Control

- Intervention & control groups improved equally in:
  - work-family conflict scores (-6.8%, p = 0.006)
  - work self-efficacy scores (5.4%, p = 0.001)
  - department culture scores (5%, p = 0.02)

- Greater decline in work hours in intervention group
  - Intervention group: -3.8 hours
  - Control group: -1.4 hours
  - p-value = 0.006
Summary: NIH-TAC Trial Results

1. Culture matters

2. PhDs increased academic productivity
   • Interventions may need to be customized to specific faculty groups

3. Intervention faculty decreased work hours while sustaining academic productivity

4. Task Forces can develop and implement creative “local” initiatives that appear to benefit all faculty
Limitations

- Did the trial have an impact across the entire school?
  - Contamination and co-intervention
    • Other professional development activities (65% of controls)
- No release time for intervention faculty
- Academic productivity may not be the most meaningful outcome
- Need more f/u time → only 2 months
Penn Faculty Pathways Program

A Career Leadership Program for STEM Assistant Professors

Curriculum

Year 1
Eight Sessions
1. Inside Leadership
2. Total Leadership Part 1
3. Total Leadership Part 2
4. Total Leadership Part 3
5. Promotion Strategies
6. Time Management
7. Effective Communication
8. Career Mapping

Year 2 (optional)
Four Sessions
- Stress Management
- Leadership Styles
- Negotiation Strategies
- Refreshing Career Map

GOALS
Maximize Faculty Potential
Leadership Skills: Personal/Professional
Build Cohort Community

Demographics
- Five Schools
- Each Cohort: 18 faculty
- 3 years: 52 faculty total

Principles for Adaptation
- Obtain budget
- Identify faculty participants
- Identify course leaders
- Survey participants
- Develop curriculum
- Evaluate impact

Evaluation
- 25% in confidence in leadership
- 30% in confidence in negotiation
- 25% in planning career goals
Thank you

www.focusprogram.org