

Supplemental Digital Appendix 1

Survey From a Cross-Sectional Study of Gender-Based Discrimination and Bias During Residency Training, Massachusetts General Hospital and Brigham and Women’s Hospital, 2017

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Confidential

A cross-sectional study of gender-based discrimination and bias during residency training

Many studies have shown that both residents and attending physicians are unhappy in their work. One possible explanation for resident physician unhappiness is a suboptimal learning and working environment. We are attempting to better understand the learning and working environment for resident physicians within the Partners system. As a resident physician, you are invited to complete the following survey on your workplace experiences including gender-based discrimination or bias.

Your participation is voluntary, and we are committed to the confidentiality of your responses. Surveys will be administered via the secure Partners REDCap platform and all participants will be assigned a randomly generated study ID that will be used for all data extraction and analysis. The only individual who will have access to identifiable data (e.g., email address) is a PhD educator who has no supervisory role over resident physicians. Other members of the research team will only see de-identified or coded results. No physician, including your program director or department chair, will have access to identifiable data.

This survey will take you approximately 5-15 minutes to complete. Completing the survey acknowledges your consent to participate in this study.

If you complete the survey, you will receive a \$10 gift card to [COFFEE CENTRAL]. Additionally, your residency program will receive a \$300 bonus to spend on a resident event if the program participation rate exceeds 75%. Please contact the study PI, Dr. Roy Phitayakorn (rphitayakorn@mgh.harvard.edu, 617-643-7935) or the person in charge of study data, Dr. Emil Petrusa (epetrusa@mgh.harvard.edu) if you have questions or concerns about this research. If you'd like to speak to someone not involved in this research about your rights as a research subject, or any concerns or complaints you may have about the research, contact the Partners Human Research Committee at 857-282-1900.

ELECTRONIC CONSENT: Please select your choice below.

Clicking on the "I agree" button below indicates that:

- you have read the above information
- you voluntarily agree to participate
- you are at least 18 years of age

If you do not wish to participate in the research study, please decline participation by clicking on the "I decline" button.

I agree

I decline

Confidential

We will begin by asking you some questions about yourself.

What is your current PGY level? For residents who are on a research year, please indicate the highest completed PGY clinical year.

PGY1/intern

PGY2

PGY3

PGY4

PGY5

PGY6

PGY7

PGY8

PGY9

What is your age in years?

What is your gender?

Female

Male

Other

Are you Hispanic or Latino in origin or descent?

Yes, Hispanic or Latino

No, Not Hispanic or Latino

Please indicate your race. You may choose more than one.

White
Black/African-American
Asian
Native Hawaiian or other Pacific Islander
American Indian or Alaska Native
Other

Please answer each statement below by selecting the radio button that best reflects how often you feel what each statement describes. There are no right or wrong answers.

I feel burned out from my work: *Never / A few times a year or less / Once a month or less / A few times a month / A few times a week / Every day*
I have become more callous: *Never / A few times a year or less / Once a month or less / A few times a month / A few times a week / Every day*
toward people since I took this job: *Never / A few times a year or less / Once a month or less / A few times a month / A few times a week / Every day*

Please select the radio button that best reflects how often you have experienced the listed behaviors in the last six (6) months.

Public humiliation: *Never / 1-2 times / 3-4 times / 5 or more times*
Others taking credit for your work: *Never / 1-2 times / 3-4 times / 5 or more times*
Being assigned tasks as a form of punishment: *Never / 1-2 times / 3-4 times / 5 or more times*
Being slapped, pushed, kicked or hit: *Never / 1-2 times / 3-4 times / 5 or more times*
Threats to career or reputation: *Never / 1-2 times / 3-4 times / 5 or more times*
Harassment or discrimination based on gender: *Never / 1-2 times / 3-4 times / 5 or more times*
Harassment or discrimination based on race/ethnicity: *Never / 1-2 times / 3-4 times / 5 or more times*
Harassment or discrimination based on religion: *Never / 1-2 times / 3-4 times / 5 or more times*

Regarding your experiences of public humiliation, please indicate the source of behavior. Check all that apply.

Medical students
Residents at same or lower level
Residents/fellows at higher level
Attending physicians
Nursing staff
Patients

Additional comments regarding your experiences of public humiliation.

Regarding your experiences of others taking credit for your work, please indicate the source of behavior. Check all that apply.

- Medical students
- Residents at same or lower level
- Residents/fellows at higher level
- Attending physicians
- Nursing staff
- Patients

Additional comments regarding your experiences of others taking credit for your work.

Regarding your experiences of being assigned tasks as a form of punishment, please indicate the source of behavior. Check all that apply.

- Medical students
- Residents at same or lower level
- Residents/fellows at higher level
- Attending physicians
- Nursing staff
- Patients

Additional comments regarding your experiences of being assigned tasks as a form of punishment.

Regarding your experiences of being slapped, pushed, kicked or hit, please indicate the source of behavior. Check all that apply.

- Medical students
- Residents at same or lower level
- Residents/fellows at higher level
- Attending physicians
- Nursing staff
- Patients

Additional comments regarding your experiences of being slapped, pushed, kicked, or hit.

Regarding your experiences of threats to your career or reputation, please indicate the source of behavior. Check all that apply.

- Medical students
- Residents at same or lower level
- Residents/fellows at higher level
- Attending physicians
- Nursing staff
- Patients

Additional comments regarding your experiences of threats to career or reputation.

Regarding your experiences of harassment or discrimination based on gender, please indicate the source of behavior. Check all that apply.

- Medical students
- Residents at same or lower level
- Residents/fellows at higher level
- Attending physicians
- Nursing staff
- Patients

Additional comments regarding your experiences of harassment based on gender.

Regarding your experiences of harassment based on race/ethnicity, please indicate the source of behavior. Check all that apply.

- Medical students
- Residents at same or lower level
- Residents/fellows at higher level
- Attending physicians
- Nursing staff
- Patients

Additional comments regarding your experiences of harassment based on race/ethnicity.

Regarding your experiences of harassment based on religion, please indicate the source of behavior. Check all that apply.

Medical students
Residents at same or lower level
Residents/fellows at higher level
Attending physicians
Nursing staff
Patients

Additional comments regarding your experiences of harassment based on religion.

The following questions are about gender-based discrimination or bias in residency training.

To what degree do you feel that you have personally experienced gender-based discrimination or bias during residency training?

0 = No experience

5 = Some experience

10 = Very frequent experience

0 1 2 3 4 5 6 7 8 9 10 I decline to answer

Who was the source of your personal experience with gender-based discrimination or bias during residency training? (i.e. Who was the person discriminating or demonstrating bias against you on the basis of gender?)

Administrative staff: *Male / Female / Both / Not applicable*

Attending physician: *Male / Female / Both / Not applicable*

EMT/ambulance staff: *Male / Female / Both / Not applicable*

Medical student: *Male / Female / Both / Not applicable*

More junior resident: *Male / Female / Both / Not applicable*

More senior resident/fellow: *Male / Female / Both / Not applicable*

Resident at same level: *Male / Female / Both / Not applicable*

Nursing staff: *Male / Female / Both / Not applicable*

Patient: *Male / Female / Both / Not applicable*

Patient family/visitors: *Male / Female / Both / Not applicable*

Other sources of your personal experience with gender-based discrimination or bias during residency training (please specify):

If you have personally experienced gender-based discrimination or bias during your medical training or within your work setting, how often have you experienced the following types of discrimination?

Please select "No experience" if you have not experienced that type of discrimination or bias.

Receiving decreased responsibility from superiors based on gender: *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

Receiving less trust from patients or patient families based on gender: *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

Receiving less trust from other health care providers based on gender: *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

Negative or inappropriate verbal exchange specific to your gender: *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

Bias against pregnancy: *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

Being expected to perform non-medical tasks compared to colleagues of the opposite gender: *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

Sexual harassment: *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

Other types of personal experience with gender-based discrimination or bias during residency training (please specify):

If you have personally experienced gender-based discrimination or bias during your medical training or within your work setting, in what healthcare setting did it occur? Please select "No experience" if you have not personally experienced discrimination or bias in a particular setting.

Clinic: *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

ICU: *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

Operating Room: *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

Pre-operative area (CPC): *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

Post-operative care area (PACU): *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

Emergency Department: *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

Inpatient floor/wards: *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

Resident lounge: *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

Patient Room: *No experience / Annual experience / Monthly experience / Weekly experience / Daily experience*

Other settings where you have personally experienced gender-based discrimination or bias during residency training (please specify):

To what degree do you feel that you have WITNESSED (i.e. occurring to someone else) gender-based discrimination or bias during residency training?

0 = No experience

5 = Some experience

10 = Very frequent experience

0 1 2 3 4 5 6 7 8 9 10 I decline to answer

Who was the source of the gender-based discrimination or bias you WITNESSED during residency training? (i.e. Who was the person discriminating or demonstrating bias against someone else on the basis of gender?)

Administrative staff: *Male / Female / Both / Not applicable*

Attending physician: *Male / Female / Both / Not applicable*

EMT/ambulance staff: *Male / Female / Both / Not applicable*

Medical student: *Male / Female / Both / Not applicable*

More junior resident: *Male / Female / Both / Not applicable*

More senior resident/fellow: *Male / Female / Both / Not applicable*

Resident at the same level: *Male / Female / Both / Not applicable*

Nursing staff: *Male / Female / Both / Not applicable*

Patient: *Male / Female / Both / Not applicable*

Patient family/visitors: *Male / Female / Both / Not applicable*

Other sources of gender-based discrimination or bias you WITNESSED during residency training (please specify):

Who was the recipient of the gender-based discrimination or bias you WITNESSED during residency training?

Administrative staff: *Male / Female / Both / Not applicable*

Attending physician: *Male / Female / Both / Not applicable*

EMT/ambulance staff: *Male / Female / Both / Not applicable*

Medical student: *Male / Female / Both / Not applicable*

More junior resident: *Male / Female / Both / Not applicable*

More senior resident/fellow: *Male / Female / Both / Not applicable*

Resident at the same level: *Male / Female / Both / Not applicable*

Nursing staff: *Male / Female / Both / Not applicable*

Patient: *Male / Female / Both / Not applicable*

Patient family/visitors: *Male / Female / Both / Not applicable*

Other sources of gender-based discrimination or bias you WITNESSED during residency training (please specify):

If you have WITNESSED gender- based discrimination or bias during your residency training, how often have you WITNESSED the following types of discrimination? Please select "No observation" if you have not witnessed that type of discrimination or bias.

- Receiving decreased responsibility from superiors based on gender: *No observation / Annual observation / Monthly Observation / Weekly observation / Daily observation*
- Receiving less trust from patients or patient families based on gender: *No observation / Annual observation / Monthly Observation / Weekly observation / Daily observation*
- Receiving less trust from other health care providers based on gender: *No observation / Annual observation / Monthly Observation / Weekly observation / Daily observation*
- Negative or inappropriate verbal exchange specific to gender: *No observation / Annual observation / Monthly Observation / Weekly observation / Daily observation*
- Bias against pregnancy
- Being expected to perform non-medical tasks compared to colleagues of the opposite gender: *No observation / Annual observation / Monthly Observation / Weekly observation / Daily observation*
- Sexual harassment: *No observation / Annual observation / Monthly Observation / Weekly observation / Daily observation*

Other types of witnessed gender-based discrimination or bias during residency training (please specify):

If you have WITNESSED gender-based discrimination or bias during your medical training or within your work setting, in what healthcare setting did it occur? Please select "No observation" if you have not witnessed gender discrimination or bias in a particular setting.

- Clinic: *No observation / Annual observation / Monthly observation / Weekly observation / Daily observation*
- ICU: *No observation / Annual observation / Monthly observation / Weekly observation / Daily observation*
- Operating Room: *No observation / Annual observation / Monthly observation / Weekly observation / Daily observation*
- Pre-operative area (CPC): *No observation / Annual observation / Monthly observation / Weekly observation / Daily observation*
- Post-operative area (PACU): *No observation / Annual observation / Monthly observation / Weekly observation / Daily observation*
- Emergency department: *No observation / Annual observation / Monthly observation / Weekly observation / Daily observation*
- Inpatient floor/wards: *No observation / Annual observation / Monthly observation / Weekly observation / Daily observation*
- Resident lounge: *No observation / Annual observation / Monthly observation / Weekly observation / Daily observation*
- Patient Room: *No observation / Annual observation / Monthly observation / Weekly observation / Daily observation*

Other settings where you have witnessed gender-based discrimination or bias during residency training (please specify):

Have you ever shared your witnessed or personal gender-discrimination or bias experiences with another person informally?

Yes No I decline to answer

With whom did you share your witnessed or personal gender-based discrimination or bias experiences? Please check all that apply.

Medical student
More junior resident
Resident at same level
More senior resident/fellow
Attending physician
Nursing staff
Hospital administrator
Family member or partner outside of the hospital
Friend outside of the hospital
Other:

Have you ever chosen to formally report gender-based discrimination or bias during your residency training?

Yes - I have formally reported gender-based discrimination or bias during my residency training
No - I have not formally reported gender-based discrimination or bias during my residency training
I decline to answer

Was anything done as a result of your report?

Yes, I reported it and something was done
No, I reported it and nothing was done
I reported it and I do not know if anything was done

Why did you choose not to formally report gender-based discrimination or bias? You may select more than one response.

I was too busy
I didn't know how
I didn't think anything would happen as a result of the report
I had fear of retribution
I had fear of negative personal or professional consequences

Other reasons you did not formally report gender-based discrimination or bias during residency training:

Have you ever chosen NOT to report gender-based discrimination or bias?

Yes, there have been times I have chosen not to formally report gender-based discrimination or bias
No, I always formally report gender-based discrimination or bias

Why did you choose not to formally report gender-based discrimination or bias? You may select more than one response.

I was too busy

I didn't know how

I didn't think anything would happen as a result of the report

I had fear of retribution

I had fear of negative personal or professional consequences

Other reasons you did not formally report gender-based discrimination or bias during residency training:

Please indicate how you believe that the following factors have been affected by your personal experiences or observations with gender-based discrimination or bias during your residency training.

Job satisfaction: *Not at all affected / Slightly affected / Somewhat affected / Very affected / Extremely affected*

Quality of patient care: *Not at all affected / Slightly affected / Somewhat affected / Very affected / Extremely affected*

Personal well-being: *Not at all affected / Slightly affected / Somewhat affected / Very affected / Extremely affected*

Personal risk of burn-out: *Not at all affected / Slightly affected / Somewhat affected / Very affected / Extremely affected*

Relationship with nursing staff: *Not at all affected / Slightly affected / Somewhat affected / Very affected / Extremely affected*

Relationship with other residents: *Not at all affected / Slightly affected / Somewhat affected / Very affected / Extremely affected*

Relationship with attending physicians: *Not at all affected / Slightly affected / Somewhat affected / Very affected / Extremely affected*

Other consequences or effects of personally experienced or witnessed gender-based discrimination or bias during residency training (please specify):

You may use this space to share examples or stories of personally experienced or observed gender-based discrimination or bias from your residency training. What were the effects or consequences of these experiences/observations on you, on other members of the healthcare team, or on patients? Please note that any identifiers you include will not be automatically removed from your response.

Please enter your email address if you would be willing to be confidentially contacted by research staff about the workplace experiences you described during the course of this survey. Providing your email is OPTIONAL and is NOT required to receive your gift card.

If you wish to edit prior responses, please do so now. Your answers will be finalized upon clicking "Submit" below.

Supplemental Digital Appendix 2

Perceived sources of gender-based discrimination

| Specialty/gender | | Administrators | Attending physicians | Emergency medicine personnel | Medical students | More junior residents | More senior residents | Residents at same level | Nursing staff | Patients | Patient family/visitors |
|------------------------------|--------------------|----------------|----------------------|------------------------------|------------------|-----------------------|-----------------------|-------------------------|---------------|----------|-------------------------|
| All specialties, all genders | Male (n) | 7 | 74 | 7 | 28 | 39 | 54 | 38 | 4 | 52 | 23 |
| | Female (n) | 23 | 7 | 1 | 0 | 1 | 9 | 6 | 119 | 11 | 3 |
| | Both (n) | 41 | 41 | 15 | 5 | 12 | 24 | 16 | 59 | 125 | 135 |
| | Not applicable (n) | 137 | 88 | 183 | 172 | 157 | 121 | 146 | 39 | 33 | 55 |
| | Total (n) | 208 | 210 | 206 | 205 | 209 | 208 | 206 | 221 | 221 | 216 |
| All specialties, women | Male (n) | 6 | 65 | 7 | 28 | 36 | 51 | 36 | 3 | 48 | 21 |
| | Female (n) | 20 | 3 | 1 | 0 | 1 | 4 | 2 | 106 | 4 | 2 |
| | Both (n) | 40 | 37 | 13 | 4 | 11 | 22 | 15 | 55 | 120 | 127 |
| | Not applicable (n) | 103 | 66 | 148 | 135 | 123 | 92 | 116 | 17 | 9 | 27 |
| | Total (n) | 169 | 171 | 169 | 167 | 171 | 169 | 169 | 181 | 181 | 177 |
| All specialties, men | Male (n) | 1 | 9 | 0 | 0 | 2 | 2 | 1 | 1 | 3 | 2 |
| | Female (n) | 3 | 4 | 0 | 0 | 0 | 5 | 4 | 12 | 7 | 1 |
| | Both (n) | 1 | 3 | 2 | 1 | 1 | 2 | 1 | 4 | 5 | 8 |
| | Not applicable (n) | 32 | 21 | 33 | 35 | 33 | 28 | 29 | 21 | 23 | 26 |
| | Total (n) | 37 | 37 | 35 | 36 | 36 | 37 | 35 | 38 | 38 | 37 |

Survey participants were given the opportunity to identify the gender of individuals from whom they experienced gender-based bias or discrimination. Participants could select “male,” “female,” “both,” “not applicable”, or leave the question blank. For women participants, there is no effect of specialty on identifying a particular group as a source of gender discrimination other than for attendings ($p=0.005$). Pairwise comparison shows women residents in surgery are more likely to identify attendings as a source of GBD compared to women residents in internal medicine (72% vs 48% OR=2.8, 95CI: 1.42-5.6, $p=0.003$). There was no significant difference between anesthesia and medicine and surgery and anesthesia. For men, there is no effect of specialty on identifying a particular group as a source of gender discrimination.

Supplemental Digital Appendix 3

Perceived forms of gender-based discrimination

| Specialty/gender | | Less responsibility | Less trust from patients | Less trust from other providers | Inappropriate verbal exchange | Pregnancy bias | Nonmedical tasks | Sexual harassment |
|------------------------------|--------------|---------------------|--------------------------|---------------------------------|-------------------------------|----------------|------------------|-------------------|
| All specialties, all genders | Never (n) | 154 | 43 | 77 | 69 | 192 | 99 | 151 |
| | Annually (n) | 43 | 54 | 52 | 52 | 15 | 27 | 49 |
| | Monthly (n) | 23 | 76 | 53 | 59 | 8 | 51 | 23 |
| | Weekly (n) | 6 | 44 | 34 | 41 | 8 | 33 | 4 |
| | Daily (n) | 1 | 10 | 11 | 6 | 4 | 16 | 0 |
| | Total (n) | 227 | 227 | 227 | 227 | 227 | 226 | 227 |
| All specialties, women | Never (n) | 115 | 14 | 42 | 36 | 152 | 60 | 116 |
| | Annually (n) | 39 | 44 | 47 | 45 | 13 | 26 | 41 |
| | Monthly (n) | 22 | 72 | 49 | 56 | 6 | 48 | 22 |
| | Weekly (n) | 6 | 43 | 34 | 41 | 8 | 32 | 4 |
| | Daily (n) | 1 | 10 | 11 | 5 | 4 | 16 | 0 |
| | Total (n) | 183 | 183 | 183 | 183 | 183 | 182 | 183 |
| All specialties, men | Never (n) | 36 | 28 | 34 | 37 | 37 | 38 | 33 |
| | Annually (n) | 4 | 10 | 5 | 2 | 2 | 1 | 7 |
| | Monthly (n) | 1 | 3 | 2 | 2 | 2 | 2 | 1 |
| | Weekly (n) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Daily (n) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total (n) | 41 | 41 | 41 | 41 | 41 | 41 | 41 |

Women report personally experiencing GBD more frequently across all forms of GBD. While 31.3% of women identified at least one form of GBD that they experience on a weekly or daily basis, none of the men who indicated personal experience of GBD identified a form of GBD that they experienced more than monthly ($p<0.001$).

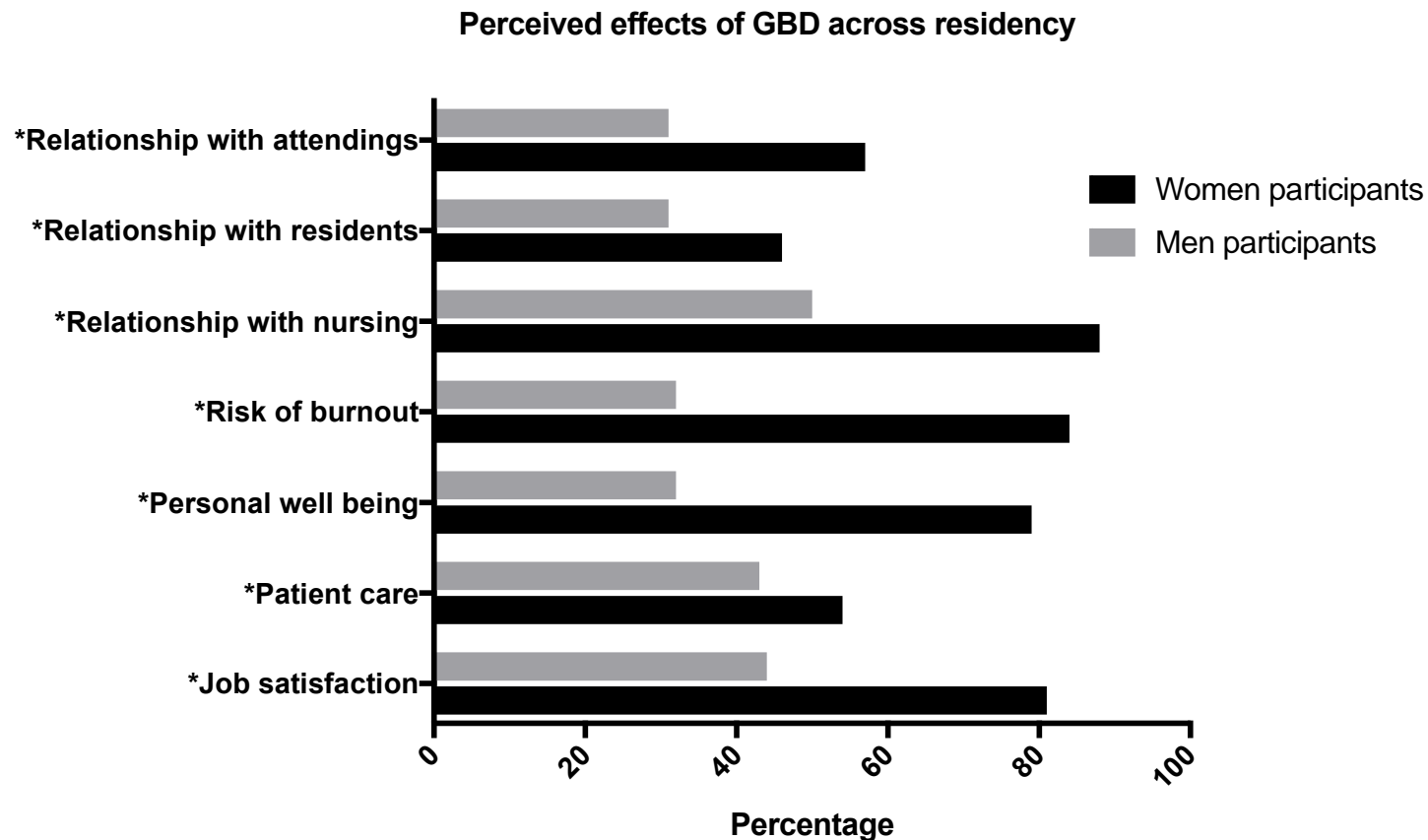
Supplemental Digital Appendix 4

Hospital location of perceived gender-based discrimination

| Specialty/gender | Clinic (n/total responses) | Intensive Care Unit | Operating Room | Preoperative area | Post- operative area | Emergency Department | Inpatient Ward/ Floor | Resident lounge | Patient room |
|-----------------------------------|----------------------------------|------------------------|-------------------|----------------------|----------------------------|-------------------------|--------------------------|--------------------|-----------------|
| All specialties, All genders | 83/224 | 112/223 | 100/224 | 68/222 | 79/223 | 93/218 | 167/223 | 32/221 | 169/223 |
| Women | 75/180 | 107/179 | 89/180 | 62/178 | 73/179 | 86/174 | 151/179 | 28/177 | 159/179 |
| Men | 9/41 | 3/41 | 9/41 | 4/41 | 4/41 | 6/41 | 14/41 | 4/41 | 8/41 |
| Anesthesia, all genders | 6/50 | 25/50 | 44/51 | 32/50 | 37/50 | 7/49 | 23/50 | 3/49 | 29/50 |
| Anesthesia, women | 5/41 | 23/41 | 39/42 | 29/41 | 34/41 | 7/40 | 18/41 | 3/40 | 27/41 |
| Anesthesia, men | 1/8 | 1/8 | 4/8 | 2/8 | 2/8 | 0/40 | 4/8 | 0/8 | 1/8 |
| Internal Medicine, all genders | 53/116 | 61/114 | 13/102 | 9/115 | 9/115 | 54/113 | 98/114 | 10/114 | 100/115 |
| Internal Medicine, women | 46/97 | 60/95 | 12/84 | 8/96 | 8/96 | 50/94 | 91/95 | 8/95 | 94/96 |
| Internal Medicine, men | 7/18 | 1/18 | 1/18 | 1/17 | 1/18 | 4/18 | 7/18 | 2/18 | 6/18 |
| Surgery all genders | 24/58 | 26/59 | 43/58 | 27/57 | 23/58 | 32/56 | 46/59 | 19/58 | 40/58 |
| Surgery, women | 23/42 | 24/43 | 38/42 | 25/41 | 34/42 | 29/40 | 42/43 | 17/42 | 38/42 |
| Surgery, men | 1/15 | 1/15 | 4/15 | 1/15 | 1/15 | 2/15 | 3/15 | 2/15 | 1/15 |

Participants who endorsed personal experience of GBD were asked to identify the hospital location(s) where it occurred. GBD was reported to occur across hospital settings. In general, residents report experiencing GBD in locations that reflect their workflow, with a high proportion of residents reporting personal experience of GBD in patient rooms.

Supplemental Digital Appendix 5



Survey respondents who indicated personal experience and/or observation of were asked to identify work domains affected by gender-based discrimination (GBD); female respondents were significantly more likely to note the perceived effects of GBD across all seven domains studied in the survey denoted by * ($p < 0.05$).