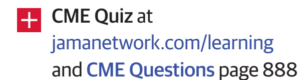
JAMA Surgery | Special Communication

Recognizing and Reacting to Microaggressions in Medicine and Surgery

Madeline B. Torres, MD; Arghavan Salles, MD, PhD; Amalia Cochran, MD

Diversity and inclusion in medicine, and in surgery in particular, still merit substantial attention in 2019. With each increase in academic rank there are fewer women, with only 24% of full professors in medicine being women. Underrepresented minorities face similar challenges, with only 3% of medical faculty being black and 4% of medical faculty being Hispanic or Latino; only 2% of full professors are Hispanic or Latino and only another 2% are black. Explicit discrimination unfortunately still does exist, but in many environments, more subtle forms of bias are more prevalent. Microaggressions, which are categorized as microassaults, microinsults, microinvalidations, and environmental microaggressions, are indirect expressions of prejudice that contribute to the maintenance of existing power structures and may limit the hiring, promotion, and retention of women and underrepresented minorities. The primary goal of this communication is to help readers understand microaggressions and their effect. We also provide suggestions for how recipients or bystanders may respond to microaggressions.

JAMA Surg. 2019;154(9):868-872. doi:10.1001/jamasurg.2019.1648
Published online July 10, 2019.


CME Quiz at jamanetwork.com/learning and CME Questions page 888

Author Affiliations: Author affiliations are listed at the end of this article.

Corresponding Author: Arghavan Salles, MD, PhD, Division of Minimally Invasive Surgery, Department of Surgery, Washington University in St Louis, 4901 S Euclid Ave, Ste 920, St Louis, MO 63108 (arghavan@alumni.stanford.edu).

"I did a case this morning and spoke to the family after the procedure while wearing my jacket with my name, MD, and 'Chair of Surgery.' Family tells the postanesthesia care unit they haven't talked to the surgeon so I was paged to come speak to them."— Female surgical department chair

Medical school marks the inception of a physician's career; it is humbling and exciting to join a profession dedicated to providing optimal care to patients regardless of gender, race, religion, sexual preference, or other characteristics. Unfortunately, the physician workforce does not reflect the demographics of the population of the United States. More women are matriculating into medical school and residency programs, yet the percentage of women faculty in medical schools remains low at 39%.[1,2] With each increase in rank there are fewer women, with only 24% of full professors being women.[3] The percentage of underrepresented minorities (URMs) in medicine is low as well and has not changed appreciably since at least 2012. Compared with 13% of the US population, only 3% of medical school faculty are black.[4,5] Similarly, while 18% of the US population identifies as Hispanic or Latino, only 4% of medical school faculty are Hispanic or Latino.[4,5] Like the data for women, there are fewer Hispanic, Latino, and black faculty at increasing ranks, with 2% of full professors identifying as Hispanic or Latino and another 2% identifying as black.[6] Data also suggest that opportunities for Native Americans may be shrinking, as applications from this group are decreasing. Only 0.1% of full-time faculty at medical schools are Native American or Alaskan natives.[4]

From the start of medical school, women and URMs in medicine experience verbal and nonverbal reminders of how they differ from the traditional image of the white male physician. Even the pictures on the walls constantly reinforce the message that women and minorities are not part of the "in" group. For example, women are less likely than men to be introduced by their titles.[7] In fields, such as obstetrics and gynecology and pediatrics, in which most of the workforce is women, the leadership is still mostly men.[8] There are similar challenges for URMs. The fact that there are fewer URMs in higher academic ranks (eg, full professor and associate professor) than in lower ranks (eg, assistant professor and instructor) suggests challenges to promotion.[9,10] This is consistent with prior data showing that faculty of color are promoted at lower rates and leave academic medicine at higher rates than white faculty.[11,12]

The discrimination experienced by women and URMs in medicine can vary in severity. Asking whether a student got into medical school because she was a minority woman, calling minority students by each other's names, or questioning women's commitment to their job if they have interest in having children, and the behaviors that reinforce these messages, are embedded into the culture of medicine. Women and URMs routinely experience these subtly hostile types of incidents. As blatant racism, sexism, and discrimination become less widespread, more insidious forms of discrimination, such as microaggressions, have become more noticeable. In this article, we define microaggressions, discuss their effects, and summarize the literature on how and when to respond to them.

Microaggressions: History and Definitions

The word *microaggression* was initially coined by Harvard psychiatrist Chester Pierce in 1970 and referred to minor yet damaging humiliations and indignities experienced specifically by African Americans.[13] The modern definition of microaggressions, created

© 2019 American Medical Association. All rights reserved.

Downloaded From: https://jamanetwork.com/ by a Penn State Milton S Hershey Med Ctr User on 04/05/2022

by Sue et al in 2007,[14] describes them as "subtle snubs, slights, and insults directed towards minorities, as well as to women and other historically stigmatized groups, that implicitly communicate or at least engender hostility." This definition extends beyond verbal abuse to include general disrespect, devaluation, and the exclusion of recipients. Microaggressions occur daily and are commonly delivered automatically with dismissive body language and tone of voice.

While there is increasing interest in microaggressions, it is important to note that the field is fledgling. There are some who have methodological concerns about initial studies of microaggressions, which have been done with small focus groups.[15,16] In addition, researchers have proposed an association of microaggressions with worsening mental health. However, microaggressions are associated with a negative emotional response, which may in and of itself be associated with worsening mental health.[15] Another criticism of microaggressions is that defining them based on the recipient's experience and perception makes them subjective.[15,17] What may be perceived as a microaggression to one person may not seem like one to another.[15] Although the precise science of microaggressions is still being understood, one thing that seems clear is that microaggressions have a negative effect on recipients. We focus here on describing the types of microaggressions and their proposed effect.

Unlike macroaggressions—or racism and misogyny—that occur at systematic and structural levels, microaggressions happen at a more interpersonal and private level.[18] As shown in the **Figure** and described later, there are 4 subtypes of microaggressions: microassaults, microinsults, microinvalidations, and environmental microaggressions.

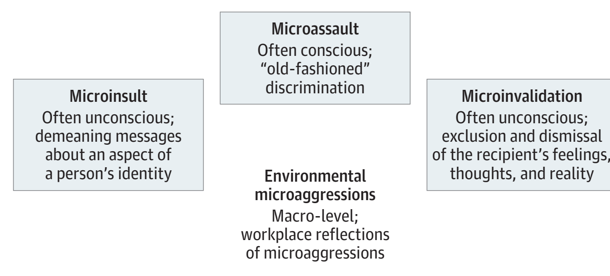
Microassaults

Microassaults are what one thinks of as "old-fashioned" discriminatory statements. These are often intentional and are the most blatant of microaggressions, characterized by verbal or nonverbal attacks clearly intended to offend the recipient.[14] Other forms of microassaults are name calling and overtly discriminatory actions. Examples include comments such as, "You people are all the same, claiming your minority status to take the spots that belong to someone else," or, "They are letting women be doctors now?" Microassaults differ from blatant racism and discrimination by focusing on an individual rather than a group, although racism may still be the motivation.[14,18] Additional examples include a refusal to work with a woman or URM team member, discouraging interracial relations, and suggesting that women and URMs are not competent physicians or surgeons.

Microinsults

Microinsults are subtle snubs or humiliations that convey a demeaning message to the recipient in a way that may be unintentional to the perpetrator. These behaviors and statements "convey rudeness and insensitivity and demean a person's racial heritage or identity."[14] In medicine, this happens when women or URM physicians are confused for the nurse, the janitor, an interpreter, or another nonmedical role because they do not fit the traditional image of a physician. A more recent example of a microinsult includes the experience of URMs and women physicians who answer the call for physicians in a flight and are questioned and sometimes excluded because they do not "look" like physicians.[19] Furthermore, microinsults pathologize a person's behavior, creating a notion that the recipient's behavior is "abnormal." Sometimes this may take the form of black physicians being called inarticulate or discouraged from wearing their natural hair style and Latinx physicians being told to "tone down their behavior." Additional examples are ignoring URM students in the operating room or during rounds and making comments that suggest that people obtained their current position because of affirmative action rather than their knowledge, skills, and abilities.

Figure. Summary of the 4 Types of Microaggressions



Microinvalidations

Microinvalidations are aimed to exclude, negate, and dismiss the personal thoughts, feelings, or experiential reality of a person. This can be achieved by a perpetrator's stated inability to see color and race ("I am color-blind"), further negating a minority group member's experience and leading them to question if a microaggression has occurred. Another example is denying concerns about fairness by insisting that the workplace is, indeed, a meritocracy. Microinvalidations are also reflected in the myth of meritocracy, which is the belief that hard work pays off and that race or sex play no role in determining a person's success.[14,20] Additional examples include invalidating a woman's or URM's experience of inequality by calling them oversensitive.

Environmental Microaggressions

Environmental microaggressions occur when microassaults, microinsults, and microinvalidations are reflected in the culture, processes, and climate of the workplace.[14,17,21] They commonly occur at a macro level and are constant reminders of the prejudice and bias that exist at a systemic level. Examples of environmental microaggressions include all hallways being decorated with pictures of white male surgeons and the inequitable application of promotion and tenure criteria resulting in an exceptionally qualified female or URM faculty member not being promoted on administrative grounds that have never been applied to a male colleague. Furthermore, the lack of diversity in leadership can lead to a homogenous culture that may be perceived as unwelcoming to women and URMs. The sense of being "other" from those in power may be heightened for URMs in an all-white medical school class or for women in all-male practice groups. More subtle forms of environmental microaggressions occur when medical schools and departments of surgery unintentionally exclude and minimize the identity of URMs and women by excluding accomplishments and portraits of members of some racial, ethnic, and cultural backgrounds. Lastly, the lack of child care and proper rooms for breastfeeding mothers at national conferences and within hospitals perpetuate an unwelcoming environment for families and in particular women physicians.

© 2019 American Medical Association. All rights reserved.

Downloaded From: https://jamanetwork.com/ by a Penn State Milton S Hershey Med Ctr User on 04/05/2022

Effect of Microaggressions

Using the term *microaggressions* may make these behaviors and statements seem less pernicious than those that are overtly discriminatory. However, microaggressions generate stresses equal to or worse than overt discrimination for URMs.[22] Recent research shows that regular exposure to perceived discrimination of any kind adversely affects the psychological and physical health of the recipients. Microaggressions contribute to lower self-esteem, and this effect is heightened in educational and workplace settings.[23] Repeated microaggressions have also been linked to depression, anxiety, and trauma responses, and an association has been identified between experiencing microaggressions, anxiety, and alcohol use in college students of color.[24-27] Furthermore, racial and ethnic discrimination is an identifiable stressor that may play a role in health disparities.[28] Studies have demonstrated that perceived discrimination is associated with hypertension, with the most clear effects described for black and Native American individuals.[29,30] Microaggressions extract a psychological and physical toll on those who experience them, with a societal price of harming the already fragile pipeline of women and minority physicians in academia.

How to Respond to Microaggressions

When people encounter microaggressions, their first reaction is often to question whether the microaggression occurred and if they heard it correctly.[20,23] In addition, it may not always be clear whether the slight was intended.[14] Ambiguity leaves recipients of microaggressions posing themselves a series of questions such as:

- Did this person intend to insult me?
- Should I respond?
- How should I respond?
- What would happen if I say something?
- Is it worth the trouble?
- Am I making a big deal about nothing?

Recipients of microaggressions may want to consider their personal or psychological safety, the other person's willingness to have further conversation, and whether they will regret remaining silent.[23] For example, focus groups of black women shared that when facing microaggressions, they would selectively address them depending on whether they could identify an appropriate strategy and felt they could influence the situation.[31] They shared several coping strategies that were based on voicing resistance and concern, relying on social networks for support, or developing self-protective mechanisms, such as desensitization.[31] For some, social networks consisted of colleagues who had a firsthand understanding of their work environment, but for others it was important to have a network outside of work to remind them of other aspects of their identity that they valued. Self-protective mechanisms may take the form of shrugging off microaggressions rather than acknowledging them, or they may take the form of repressing frustration in the moment and perhaps coping by eating or sleeping.[31]

Interviews with black women corporate managers identified additional coping strategies.[32] Some used religion and spirituality to help them forgive perpetrators and place the microaggressions into context. They also developed protective mechanisms by taking pride in themselves and their families. Women identified the importance of a social network, sponsorship and mentoring, and self-care to buffer themselves from the negative effect of microaggressions.[32] It is also important to note the compounded effect of intersectionality. Those who, like black women, hold more than 1 negatively stereotyped or underrepresented identity are particularly vulnerable to microaggressions and discrimination.[33] This is partially because, when faced with discriminatory behavior, it can be difficult to assess whether the issue is racism, sexism, or both.[33]

Three main frameworks have been proposed for how to structure a response to microaggressions and they can be used by the recipients of microaggressions as well as bystanders. The first, identified by Ganote et al,[34] is "Open The Front Door" ("Observe, Think, Feel, Desire"). The authors describe starting the conversation by stating what was observed, how the comment was interpreted, how it made the recipient feel, and what the desired outcome might be. One example might be, "When you said [microaggression], it made me think that you [negative opinion]. I feel concerned about this because [reason], and I would like us to discuss this further so we can come to an understanding."[34] This strategy is likely to have a more constructive outcome than responding with the more common reaction of anger and accusation.[14]

The second framework is ACTION,[35-37] which follows these steps:

- Ask clarifying questions.
- Come from curiosity, not judgment.
- Tell what you observed in a factual manner.
- Impact exploration—discuss what the impact of the statement was.
- Own your own thoughts and feelings around the situation.
- Next steps.

An example of using the ACTION framework would be to start by stating, "I am not sure that I understood what you meant when you said [microaggressive comment]. I want to better understand; can you explain that to me?" The recipient can then follow up with their observation of the facts of what happened, followed by a statement such as, "When I hear comments like that, it makes me feel like you think I am only here because I am a minority, not because I can do the work." The discussion can then close with actions items for follow-up by those involved in the dialogue.

The third framework, and perhaps the simplest, is XYZ.[37] This takes the form of, "I feel X when you say Y because Z." The primary similarity among these frameworks is the focus on what was observed (behaviors) and the recipient's resulting thoughts or feelings (use of "I" statements) to decrease the potential for defensiveness and encourage dialogue. There is no perfect framework, but any of these 3 can be used by those who are the recipients of microaggressions as well as those who are witnesses.

Lastly, the effect of allies cannot be underestimated. Because they are not the recipients of the microaggressions, bystanders are often in a more powerful position to intervene. There are several strategies bystanders may consider, including the ones already described, as well as shifting the conversation back to someone who was interrupted, giving credit to and amplifying the voice of the person who initially voiced an idea, and demonstrating support for those who have been targeted unfairly.[37] The ultimate goal should be to work toward a mutual understanding of why something can be perceived as a microaggression and its effect on the recipient.

© 2019 American Medical Association. All rights reserved.

Downloaded From: https://jamanetwork.com/ by a Penn State Milton S Hershey Med Ctr User on 04/05/2022

Conclusions

Microaggressions are deleterious for the health of women and URM physicians as well as the communities they serve. Patients in race-concordant relationships with physicians are more satisfied with their care.[38] Although all physicians should be qualified to provide culturally competent care, increasing the number of women and URM physicians may decrease disparities in health care and improve the outcomes of women and URMs.

As medical schools and residencies begin to value diversity and inclusion among trainees and the health care workforce at large, it is increasingly important to be aware of the obstacles to success for women and URMs.[39] Microaggressions, although subtle, have a significant effect on their recipients, threatening the future workforce in medicine and ultimately the health of patients. Given the current physician health crisis, we cannot afford to let these continue unhindered. Only by raising awareness, voicing concerns, and constructively confronting microaggressions through thoughtful dialogue can we change these behaviors and champion a more fully inclusive culture.

ARTICLE INFORMATION

Accepted for Publication: April 15, 2019.

Published Online: July 10, 2019. doi:10.1001/jamasurg.2019.1648

Author Affiliations: Surgical Oncology Program, Center for Cancer Research, National Cancer Institute, Bethesda, Maryland (Torres); Section of Minimally Invasive Surgery, Department of Surgery, Washington University in St Louis, St Louis, Missouri (Salles); Division of Trauma, Critical Care, and Burns, Department of Surgery, The Ohio State University, Columbus (Cochran).

Author Contributions: Drs Torres and Salles are co–first authors.

Conflict of Interest Disclosures: Dr Salles has received honoraria from Medtronic for speaking and consulting. Drs Torres, Salles, and Cochran are members of the Association of Women Surgeons (AWS) #HeForShe Taskforce; this work was produced under its auspices and endorsed by the AWS Executive Council.

Additional Contributions: We thank the individual quoted for granting permission to publish this information.

REFERENCES

1. Association of American Medical Colleges. Table 10: U.S. medical school faculty by sex and degree, 2017. https://www.aamc.org/download/486096/data/17table10.pdf. Accessed January 19, 2019.

2. Association of American Medical Colleges. Table 14: U.S. medical school faculty by sex, degree, and department, 2017. https://www.aamc.org/download/486104/data/17table14.pdf. Accessed January 19, 2019.

3. Association of American Medical Colleges. Table 9: U.S. medical school faculty by sex and rank, 2017. https://www.aamc.org/download/486130/data/17table9.pdf. Accessed January 19, 2019.

4. Association of American Medical Colleges. Current trends in medical education. http://www.aamcdiversityfactsandfigures2016.org/report-section/section-3/. Accessed January 19, 2019.

5. U.S. Census Bureau. Quick Facts: United States. https://www.census.gov/quickfacts/fact/table/US/PST045218. Accessed January 19, 2019.

6. Association of American Medical Colleges. Table 3: U.S. medical school faculty by rank and race/ethnicity, 2017. https://www.aamc.org/download/486118/data/17table3.pdf. Accessed January 19, 2019.

7. Files JA, Mayer AP, Ko MG, et al. Speaker introductions at internal medicine grand rounds: forms of address reveal gender bias. *J Womens Health (Larchmt)*. 2017;26(5):413-419. doi:10.1089/jwh.2016.6044

8. Silver JK, Ghalib R, Poorman JA, et al. Analysis of gender equity in leadership of physician-focused medical specialty societies, 2008-2017. *JAMA Intern Med*. 2019;179(3):433-435. doi:10.1001/jamainternmed.2018.5303

9. Xierali IM, Fair MA, Nivet MA. Faculty diversity in U.S. medical schools: progress and gaps coexist. https://www.aamc.org/download/474172/data/december2016facultydiversityinu.s.medicalschoolsprogressandgaps.pdf. Accessed January 19, 2019.

10. Fang D, Moy E, Colburn L, Hurley J. Racial and ethnic disparities in faculty promotion in academic medicine. *JAMA*. 2000;284(9):1085-1092. doi:10.1001/jama.284.9.1085

11. Liu CQ, Alexander H. Promotion rates for first-time assistant and associate professors appointed from 1967 to 1997. https://www.aamc.org/download/121130/data/aibvol9_no7.pdf. Accessed January 19, 2019.

12. Yamagata H. Trends in faculty attrition at U.S. medical schools, 1980-1999. https://www.aamc.org/download/102352/data/aibvol2no2.pdf. Accessed January 19, 2019.

13. Pierce CM. Black psychiatry one year after Miami. *J Natl Med Assoc*. 1970;62(6):471-473.

14. Sue DW, Capodilupo CM, Torino GC, et al. Racial microaggressions in everyday life: implications for clinical practice. *Am Psychol*. 2007;62(4):271-286. doi:10.1037/0003-066X.62.4.271

15. Lilienfeld SO. Microaggressions. *Perspect Psychol Sci*. 2017;12(1):138-169. doi:10.1177/1745691616659391

16. Lau MY, Williams CD. Microaggressions research: Methodological review and recommendations. In: Sue DW, ed. *Microaggressions and Marginality: Manifestation, Dynamics and Impact*. New York, NY: John Wiley & Sons; 2010:313-336.

17. Wong G, Derthick AO, David EJ, Saw A, Okazaki S. The *What*, the *Why*, and the *How*: A Review of Racial Microaggressions Research in Psychology. *Race Soc Probl*. 2014;6(2):181-200. doi:10.1007/s12552-013-9107-9

18. Osanloo AF, Boske C, Newcomb WS. Deconstructing macroaggressions, microaggressions, and structural racism in education: developing a conceptual model for the intersection of social justice practice and intercultural education. *Int J Organizational Theory Dev*. 2016;4(1):1-18. http://www.nationalforum.com/Electronic%20Journal%20Volumes/Osanloo,%20Azadeh%20Deconstructin%20Racism%20in%20Education%20IJOTD%20V4%20N1%202016.pdf. Accessed January 19, 2019.

19. Hauser C. "Are you actually an M.D.?": a black doctor is questioned as she intervenes on a Delta flight. https://www.nytimes.com/2018/11/02/us/delta-black-doctor-racial-profiling.html. Accessed January 19, 2019.

20. Sue DW, Capodilupo CM, Holder AMB. Racial microaggressions in the life experience of black Americans. *Prof Psychol Res Pr*. 2008;39(3):329-336. doi:10.1037/0735-7028.39.3.329

21. Hunter RL. *An Examination of Workplace Racial Microaggressions and Their Effect on Employee Performance* [master's thesis]. Spokane: Gonzaga University; 2011.

22. Solorzano D, Ceja M, Yosso T. Critical race theory, racial microaggressions, and campus racial climate: the experiences of African American college students. *J Negro Educ*. 2001;69(1/2):60-73. https://inclusion.uci.edu/wp-content/uploads/sites/13/2018/12/CRT_RacialMicros_Campus1.pdf. Accessed October 25, 2018.

23. Nadal KL, Wong Y, Griffin KE, Davidoff K, Sriken J. The adverse impact of racial microaggressions on college students' self-esteem. *J Coll Student Dev*. 2014;55(5):461-474. doi:10.1353/csd.2014.0051

24. Torres L, Driscoll MW, Burrow AL. Racial microaggressions and psychological functioning among highly achieving African-Americans: a mixed-methods approach. *J Soc Clin Psychol*. 2010;29(10):1074-1099. doi:10.1521/jscp.2010.29.10.1074

25. Blume AW, Lovato LV, Thyken BN, Denny N. The relationship of microaggressions with alcohol use and anxiety among ethnic minority college students in a historically White institution. *Cultur Divers Ethnic Minor Psychol*. 2012;18(1):45-54. doi:10.1037/a0025457

26. Reid E. *How Racial Microaggressions Impact the Mental Health of Black Women of Different Occupational Prestige* [honors thesis]. Boston: University of Massachusetts; 2017.

27. O'Keefe VM, Wingate LR, Cole AB, Hollingsworth DW, Tucker RP. Seemingly harmless racial communications are not so harmless: racial microaggressions lead to suicidal ideation by way of depression symptoms. *Suicide Life Threat Behav*. 2015;45(5):567-576. doi:10.1111/sltb.12150

28. Williams DR, Neighbors H. Racism, discrimination and hypertension: evidence and needed research. *Ethn Dis*. 2001;11(4):800-816.

29. Dolezsar CM, McGrath JJ, Herzig AJM, Miller SB. Perceived racial discrimination and

© 2019 American Medical Association. All rights reserved.

Downloaded From: https://jamanetwork.com/ by a Penn State Milton S Hershey Med Ctr User on 04/05/2022

hypertension: a comprehensive systematic review. *Health Psychol*. 2014;33(1):20-34. doi:10.1037/a0033718

30. Thayer ZM, Blair IV, Buchwald DS, Manson SM. Racial discrimination associated with higher diastolic blood pressure in a sample of American Indian adults. *Am J Phys Anthropol*. 2017;163(1):122-128. doi:10.1002/ajpa.23190

31. Lewis JA, Mendenhall R, Harwood SA, Browne Huntt M. Coping with gendered racial microaggressions among black women college students. *J Afr Am Stud*. 2013;17(1):51-73. doi:10.1007/s12111-012-9219-0

32. Holder AMB, Jackson MA, Ponterotto JG. Racial microaggression experiences and coping strategies of Black women in corporate leadership. *Qual Psychol*. 2015;2(2):164-180. doi:10.1037/qup0000024

33. Sanchez-Hucles JV, Davis DD. Women and women of color in leadership: complexity, identity, and intersectionality. *Am Psychol*. 2010;65(3):171-181. doi:10.1037/a0017459

34. Ganote C, Cheung F, Souza T. Don't remain silent!: strategies for supporting yourself and your colleagues via microresistances and ally development. http://www.pamelaroy.net/uploads/5/0/8/2/50825751/pod15dcwhitepaper.pdf. Accessed January 19, 2019.

35. Souza T. Responding to microaggressions in the classroom. https://www.facultyfocus.com/articles/effective-classroom-management/responding-to-microaggressions-in-the-classroom/. Accessed October 25, 2018.

36. The University of Nebraska Omaha Center for Faculty Excellence. Microaggressions handouts. https://www.unomaha.edu/faculty-support/teaching-excellence/microaggressions-handout.pdf. Accessed October 25, 2019.

37. Scully M, Rowe M. Bystander training within organizations. *J Int Ombudsman Assoc*. 2009;2(1):1-9. https://studentsuccess.unc.edu/files/2015/10/Scully-and-Rowe-2009.pdf. Accessed January 20, 2019.

38. Cooper-Patrick L, Gallo JJ, Gonzales JJ, et al. Race, gender, and partnership in the patient-physician relationship. *JAMA*. 1999;282(6):583-589. doi:10.1001/jama.282.6.583

39. Association of American Medical Colleges. AAMC results of the 2017 medical school enrollment survey. https://members.aamc.org/iweb/upload/Results_of_the_2017_Medical_School_Enrollment_Survey.pdf. Accessed January 19, 2019.

© 2019 American Medical Association. All rights reserved.

Downloaded From: https://jamanetwork.com/ by a Penn State Milton S Hershey Med Ctr User on 04/05/2022