

Breaking the Bias-Habit: A Workshop to Help Internal Medicine Residents Reduce the Impact of Implicit Bias

Tyson Pankey, MPH

TEAM Science scholar at the Center for Women's Health Research at the University of Wisconsin-Madison School of Medicine and Public Health, and doctoral student in the Department of Counseling Psychology at the University of Wisconsin-Madison.

Molly Carnes, MD, MS

Professor, Departments of Medicine, Psychiatry, and Industrial and Systems Engineering, Director of the Center for Women's Health Research, and Co-director of Women in Science and Engineering Leadership Institute (WISELI) at the University of Wisconsin-Madison.

Anna Kaatz, PhD, MPH

Associate Scientist and Director of Computational Sciences at the Center for Women's Health Research at the University of Wisconsin-Madison School of Medicine and Public Health.

Lacey Alexander, MS, RN

Doctoral Candidate in Nursing at the University of Wisconsin-Madison School of Nursing, Jonas Scholar 2016-2018

Amarette Filut, BS

Research Assistant at the Center for Women's Health Research at the University of Wisconsin-Madison School of Medicine and Public Health, and doctoral student in Clinical Investigation at the University of Wisconsin-Madison

Youhung Her-Xiong, MSW, APSW

TEAM Science scholar at the Center for Women's Health Research and Doctoral student at the University of Wisconsin – Madison School of Social Work

Anne Stahr, MS

Education Director of the Advanced Fellowship in Women's Health VA National Coordinating Center, and doctoral student in the Department of Education Leadership and Policy Analysis at the University of Wisconsin-Madison.

Christine Kolemmainen, MD, MS

Clinical Adjunct Associate Professor and core faculty member of internal medicine residency at the University of Wisconsin-Madison School of Medicine and Public Health, internist and medical director of women's health at the William S. Middleton Madison Veteran's hospital, and director of the Advanced Fellowship in Women's Health VA National Coordinating Center.

Acknowledgements: The authors thank the University of Wisconsin-Madison Internal Medicine Residency Program, Dr. Stephen Johnson, Dr. Christine Pribbenow, Dr. Will TL. Cox, the staff of the LEAD Center at the University of Wisconsin-Madison, and the Department of Medicine's Education Committee at the University of Wisconsin-Madison School of Medicine and Public Health for their contributions to the development of the Breaking the Bias Habit workshop.

Research reported in this publication was supported by the National Institutes of General Medical Sciences of the National Institutes of Health under award number R25GM083252. Additional support for the development and operation of the Breaking the Bias Habit workshop came from the Department of Medicine Education Innovation Grant, and the National Institutes of Health under award numbers R01GM088477, R35GM122557, R01GM111002, UL1TR000427 and TL1TR000429. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Ethical approval: The Health Sciences Institutional Review Board at the University of Wisconsin-Madison granted approval of this research

Prior poster or abstract presentation:

Pankey T, Stahr A, Kaatz A, Carnes M, Kolehmainen C. Breaking the Bias-Habit: A workshop to help internal medicine residents reduce implicit bias. 2017 Understanding Interventions Conference. San Antonio, TX. March 2017.

Stahr A, Kaatz A, Alexander L, Filut A, Her Y, Pankey T, Carnes M, Kolehmainen C. Evaluation of a workshop intervention to reduce racial bias in internal medicine residents' clinical decision-making. Society of General Internal Medicine: Washington, DC. April 2017.

Abstract

Physicians may develop habituated responses in interpersonal interactions based on cultural stereotypes (implicit biases). With growing awareness of the impact of implicit bias on judgment and decision making, “implicit bias training” is being widely recommended and implemented in medical training. We developed and evaluated a workshop intended to help internal medical residents – physicians-in-training who provide direct patient care - identify the potential for implicit bias in their clinical and professional interactions and provide them with cognitive behavioral strategies that have been shown to “break the bias habit.” The workshop content (1) demonstrated how implicit bias functions as a habit of mind, (2) promoted bias literacy among participants, (3) and translated evidence-based strategies to reduce the influence of bias into the realm of residents’ clinical and professional experiences. Post-workshop surveys and focus groups assessed residents’ reactions to workshop content and preparedness to implement bias-reducing strategies. Data were aggregated and analyzed for major themes and findings. Most residents felt implicit bias was important to their personal learning and were motivated to change their interpersonal behaviors. Over half our participants felt prepared to immediately implement bias-reducing strategies. Internal medicine residents will become practicing physicians, researchers, educators, and academic leaders in primary care and medical subspecialties (e.g. cardiology) in the largest physician specialty. We do not know the long-term impact of this workshop, but preliminary feedback suggests it was effective in increasing residents’ awareness of implicit bias, as well as motivation and self-efficacy to practice bias habit-reducing behaviors in clinical and professional interactions.

Introduction

Lingering institutional and cultural biases continue to influence how physicians learn and practice medicine and the professional environment in which physicians function. Research shows that contemporary approaches to teaching “cultural competence” to physicians in training are generally ineffective and may undermine their learning objectives (Zescott, 2016). Even well-intended physicians develop habituated responses in interpersonal interactions based on cultural stereotypes (implicit biases) to the same degree as the general population (Blair et al., 2013). These implicit bias habits can contribute to health inequities both through their influence on physicians’ clinical decision-making, patient-physician interactions (Chapman, Kaatz, & Carnes, 2013; Hall et al., 2015; Maina, Belton, Ginzberg, Singh, & Johnson, 2018; Zescott, 2016) and by preventing individuals from historically underrepresented groups from entering and advancing in medical careers (L. Pololi, Cooper, & Carr, 2010; Smedley, 2004; Sullivan, 2004).

As an example of implicit *gender* bias in a clinical context, male patients were more likely than female patients to be referred for knee replacement surgery, despite similar complaints of arthritic pain—a discrepancy that may exist, in part, due to biases that attribute women’s physical symptoms to underlying emotional distress (Borkhoff et al., 2008). As an example of implicit *racial* bias in a clinical context, physicians prescribed less pain medication to Black than to White patients reporting equal levels of pain, with stereotypes that substance abuse is higher among Blacks having influenced physicians’ decisions (Todd, Deaton, D’Adamo, & Goe, 2000). A large body of research demonstrates the ubiquity of race and gender stereotypes in professional interactions and evaluations, and how these conspire in multiple ways to impede career advancement of racial/ethnic minorities and women (Bartels, Goetz, Ward, & Carnes,

2008; Boatright, Ross, O'Connor, Moore, & Nunez-Smith, 2017; Kolehmainen, Brennan, Filut, Isaac, & Carnes, 2014; Madsen et al., 2017; Nunez-Smith et al., 2007; L. Pololi et al., 2010; L. H. Pololi & Jones, 2010; Ross et al., 2017; Samuels et al., 2017). As an example of how implicit bias influences behavior in professional interactions, female physicians in positions of authority felt penalized for exhibiting stereotypically male behaviors during medical emergency management procedures (Kolehmainen, Brennan, Filut, Isaac, & Carnes, 2014). Faculty in academic medical centers who identify as members of racial/ethnic minority groups describe multiple episodes of negative interactions based on implicit stereotype-based assumptions (Nunez-Smith et al., 2007; L. Pololi et al., 2010).

An in-depth review of studies documenting the existence of implicit bias among healthcare providers and its negative impact on patient-provider communication concluded that there is a need for strategies aimed at reducing implicit bias among healthcare providers (Maina et al., 2018). Internal medicine is the largest medical specialty accounting for over 25 percent of all physicians (AAMC, 2017). Internal medicine residents are physicians who have completed medical school and are directly responsible for patient care for the first time in their training. Residency is a time when physicians form practice habits that can last throughout their career (Cox, Smith, & Bartell, 2005). We reasoned that this would be an ideal time to expose physicians to concepts of implicit bias and provide evidence-based strategies to practice in their day-to-day interactions with patients and colleagues as they continued in their training in internal medicine or one of its subspecialties (e.g. cardiology, gastroenterology, endocrinology).

We developed and evaluated a workshop that facilitated resident learning and behavior change related to stereotype-based implicit bias. Behavior change theory (Bandura, 1977; Prochaska & Velicer, 1997) postulates that changing an unwanted behavior requires awareness of a problem behavior, motivation to overcome the behavior, self-efficacy to engage in a more desirable behavior, and intentional practice of a new behavior (Bandura, 1977, 1991). Carnes and colleagues (Carnes et al., 2015) applied these tenets to a workshop to reduce gender bias among medicine, science, and engineering faculty at the University of Wisconsin-Madison (UW-Madison). Compared to 46 control departments, faculty in 46 departments receiving the workshop showed significant increases in personal bias awareness, motivation, self-efficacy, and self-reported action to promote gender equity. Both male and female faculty also reported a more positive department climate (Carnes et al., 2015), and three years later departments that received the workshop had a significantly greater percentage of women among new hires compared to control departments as well as greater retention of male faculty (Devine et al., 2017). In addition to focusing only on gender bias, the original workshop targeted faculty in academic medicine, science, and engineering, rather than residents. These limitations on the generalizability of our approach are tempered by the fact that this workshop remains one of the few pro-diversity interventions that has been tested in a controlled study within a real world academic environment and been found to have long-term individual and institutional benefits (Carnes et al., 2015; Devine et al., 2017).

Methods

Workshop Design

We maintained the same conceptual framework and modular format of Carnes et al.'s original workshop, but tailored the content to encompass bias categories beyond gender, include discipline-specific examples, and fit their level of training (Carnes et al., 2012). Content development began with a review of relevant research assisted by a health sciences librarian. Through this process, workshop presenters gained content expertise in health disparities and implicit bias within clinical and professional contexts. The workshop incorporated quotes from qualitative studies that highlighted experiences of patients and physicians from historically marginalized groups (a) to demonstrate the existence and impact of bias (Kolehmainen, 2014; Borkhoff et al., 2008; Huizinga, Bleich, Beach, Clark, & Cooper, 2010; Kolehmainen et al., 2014; Nunez-Smith et al., 2007; Todd et al., 2000), and (b) from randomized controlled studies, to demonstrate the existence of implicit bias and present evidence-based bias-reducing strategies (Duguid & Thomas-Hunt, 2015; Er-rafiy & Brauer, 2013; Kaiser et al., 2013; Legault, Gutsell, & Inzlicht, 2011; Uhlmann & Cohen, 2007; Walton, Logel, Peach, Spencer, & Zanna, 2015). We entitled the three-hour workshop “Breaking the Bias Habit for Medical Residents” and organized content into three modules:

Module one: “Living in a Bias-sphere: Implicit Bias as a Habit”

Module two: “Identifying Types of Implicit Bias in Healthcare: Becoming Bias Literate”

Module three: “Strategies that Reduce the Influence of Implicit Bias”

In module one, we define implicit bias and explain how it emerges as a “habit of mind” (Carnes et al., 2012). We demonstrate how habits of mind can lead to perceptual errors with an optical illusion and unintended behaviors by having participants perform the Stroop Color Naming task

as a group (Stroop, 1935). We then demonstrate how these same types of habits of mind can lead to errors in perception, interpretation, and judgments in interactions with people. To make this point, we use a study in which students listened to a pre-recorded passage spoken in Standard American English, but perceived more accented English when they thought the speaker was Asian than when they thought the speaker was White (Rubin, 1992). Module one introduces implicit bias as a habit that can be made—and broken—so participants can approach the concept with less stigma.

In module two, we promote “bias literacy” (Sevo & Chubin, 2010) by describing and labeling several implicit bias concepts (e.g., homophily, microaggressions, stereotype threat). Physicians are familiar with the importance of identifying and naming a disease process when confronted with a cluster of clinical findings. Drawing parallels, we hope that increasing their bias literacy will help residents “diagnose” manifestations of implicit bias that commonly occur within patient and professional interactions—a fundamental step to treating any condition.

Module three provides evidence-based strategies residents can practice to reduce the influence of stereotype-based bias within clinical and professional encounters. Each module includes active learning components that encourage residents to apply the material and specify how they will implement what they have learned. For example, to foster behavioral change, residents write a “Commitment to Action” in which they specify how they will incorporate bias habit-reducing strategies into their professional practice (Lockyer et al., 2001; Zescott, 2016).

Resident Piloting & Evaluation

The Internal Medicine (IM) residency program director at the University of Wisconsin-Madison (UW-Madison) School of Medicine and Public Health allotted time in the second-year resident (PGY-2) curriculum for our workshop. A coordinator assigned each PGY-2 resident to one of two pilot workshops in 2016. Three authors were involved in workshop development and presentation: an IM physician and professor with experience developing, presenting, and testing the original workshop on which this one was based; an IM physician with a master's degree in education who is core faculty in the IM residency program; and a master's qualified medical educator trained in adult education and group facilitation. Presenters delivered the workshop to nine residents in February and 11 residents in March. Five residents out of 25 PGY-2 (20%) did not participate due to scheduling conflicts.¹

Using education and professional development frameworks from program evaluation (Kirkpatrick & Kirkpatrick, 2006);(Birman, Desimone, Porter, & Garet, 2000) the external evaluation team administered self-report surveys and held focus groups to evaluate our workshop (see **Appendices A and B**). Paper surveys assessed general workshop reactions including perceived importance of the topic, learning and comprehension of workshop content, and perceived likelihood of implementing bias-reducing strategies. Focus groups assessed perceptions of content clarity, learning activities, and factors affecting the understanding and implementation of bias-reducing strategies within the workplace. Content analysis of transcribed focus groups was aided by QRS International's NVivo 11 Qualitative Data Analysis Software (2012).

¹The UW-Madison Health Sciences Institutional Review Board approved all data collection and consent procedures. Professional evaluators external to the study team conducted all evaluation activities. Participating residents provided informed consent.

Results

Sixteen (80%) out of 20 residents agreed to complete evaluation measures. Most residents (93.8%; N=15) indicated implicit bias was important, very important, or extremely important to their personal learning. Seventy-five percent (N=12) expressed motivation to change their behavior due to the workshop, and more than half (56.3%; N=9) felt efficacious enough to immediately implement bias-reducing strategies in the workplace.

Focus group data suggested that residents perceived the workshop as well organized, professionally relevant, and engaging. Residents valued the use of diverse teaching modalities throughout the workshop, particularly interactive learning activities and small group discussions. They also appreciated inclusion of research demonstrating the influence of implicit bias in healthcare. Several residents reported that exposure to empirical evidence increased personal awareness and motivation to change. One resident stated:

“I think that having specific things that you know, or outcomes they’ve seen, like the pain-control for Black versus White people, is something I can go forward with and think, this patient is Black and I need to be aware of this and think about what I’m giving them.”

Regarding content, residents largely expressed dissatisfaction with the detail of the case studies, for example:

“I felt the cases were a little over the top...it would have been more of a challenge, but more useful to make the statements a little more subtle.”

Residents discussed experiencing bias from patients while discussing factors affecting their ability to reduce bias in the workplace. Two residents remarked:

“I actually had a patient say to me, ‘I usually don’t like women doctors because I think they’re bitchy, but I don’t mind you’. I was like, ‘Okay, how many of my patients are thinking. . .”

“I feel like we get that from so many angles. Being women, looking young, all of that. You know... I can’t imagine what[a] young, Black, woman doctor would get. It would be the hardest.”

Residents also perceived a lack of emphasis placed on reducing implicit bias from clinical supervisors or within the training curriculum. Residents felt that without regular attention given to implicit bias, a supportive institutional environment, or effective modeling from supervisors, long-term behavior change seemed unlikely. Some residents felt particularly ill-prepared to address bias observed among colleagues. One resident reflected:

“I don’t think that there is a way to stop it if you see it happening...you can’t say that, ‘Hey, I think you’re biased against the patient.’ If it’s within colleagues, I think it would be hard in the setting. I have no idea how you would do it. It would be very difficult.”

Discussion and Conclusion

We described the development and evaluation of a theoretically grounded workshop that incorporates principles of behavior change, promotes bias literacy, and provides specific cognitive behavioral strategies to help IM residents “break the bias habit” in their interactions with patients and colleagues. Evaluative feedback suggests that a bias habit-reducing workshop

increases residents' awareness of bias, as well as their motivation and self-efficacy to reduce bias behaviors. This small sample of residents was interested in discussing implicit bias and was particularly receptive to empirical evidence of its influence within healthcare. Residents perceived that the current institutional climate and lack of faculty role-modeling to reinforce bias habit-reducing strategies could be barriers to successful long-term behavior change. This observation underscores the need to engage faculty in bias-reducing strategies. The consensus is that implicit bias training of some kind is essential for all physicians (Butkus et al. 2018). However, the most effective approach and content of such training requires further study. Training that focuses solely on increasing awareness of participants can backfire (Duguid & Thomas-Hunt, 2015) (Carnes 2018). Several reviews of studies that have measured implicit bias in physicians have found no impact on clinical decision-making when dealing with patients who have conditions confirmed by objective data such as urinary tract infections or hypertension, and variable outcomes in dealing with patients with more subjective symptoms such as pain or depression (Hall et al. 2015; Maina et al.2018; Zescott et al. 2016). These reviews have uniformly concluded that there are currently no reliable ways to measure whether any other intervention intended to reduce physician's implicit bias has clinically meaningful outcomes. Thus, even if our workshop does reduce the impact of implicit bias on internal medicine residents, we will not be able to determine its clinical impact.

Although we cannot yet assess clinical outcomes, the positive evaluations the breaking the bias habit workshop prompted its integration into the second year of the standard resident curricula at the University of Wisconsin. To make meaningful institutional change, we are developing a breaking the bias habit workshop aimed at faculty in the Department of Medicine that is being

rolled out over the next two years. Continued research is critically needed on the effectiveness of interventions aimed at reducing physicians' implicit bias and the impact of such interventions on both patient outcomes and career outcomes of physicians from stereotyped groups. At this point, we can only be cautiously optimistic that by approaching implicit bias as a habit and mobilizing strategies to help internal medicine residents break the bias habit, we are working toward our ultimate goal of achieving a fully diverse physician workforce that is providing equitable patient care to a variety of stereotyped populations.

References

- Association of American Medical Colleges. (2017). *The state of women in academic medicine: the pipeline and pathway to leadership*. Retrieved from www.aamc.org/members/gwims/statistics
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-215.
- Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes*, 50(2), 248-287. doi:[http://dx.doi.org/10.1016/0749-5978\(91\)90022-L](http://dx.doi.org/10.1016/0749-5978(91)90022-L)
- Bartels, C., Goetz, S., Ward, E., & Carnes, M. (2008). Internal medicine residents' perceived ability to direct patient care: impact of gender and experience. *Journal of Womens Health*, 17(10), 1615-1621.
- Birman, B., Desimone, L., Porter, A., & Garet, M. (2000). Designing professional development that works. *Educational Leadership*, 57(8), 28-33.
- Blair, I. V., Steiner, J. F., Fairclough, D. L., Hanratty, R., Price, D. W., Hirsh, H. K., ... & Havranek, E. P. (2013). Clinicians' implicit ethnic/racial bias and perceptions of care among Black and Latino patients. *The Annals of Family Medicine*, 11(1), 43-52. doi:10.1370/afm.1442
- Boatright, D., Ross, D., O'Connor, P., Moore, E., & Nunez-Smith, M. (2017). Racial disparities in medical student membership in the Alpha Omega Alpha Honor Society. *JAMA internal medicine*, 177(5), 659-665. doi:10.1001/jamainternmed.2016.9623
- Borkhoff, C. M., Hawker, G. A., Kreder, H. J., Glazier, R. H., Mahomed, N. N., & Wright, J. G. (2008). The effect of patients' sex on physicians' recommendations for total knee arthroplasty. *Canadian Medical Association Journal*, 178(6), 681-687. doi:10.1503/cmaj.071168
- Bristow, L. R., Butler, A. S., & Smedley, B. D. (Eds.). (2004). In the nation's compelling interest: Ensuring diversity in the health-care workforce. National Academies Press.
- Butkus, R., J. Serchen, D. V. Moyer, S. S. Bornstein, S. T. Hingle, Health, and Physicians Public Policy Committee of the American College of. 2018. 'Achieving gender equity in physician compensation and career advancement: A position paper of the American College of Physicians', *Ann Intern Med*, 168: 721-23.
- Carnes, M., Devine, P. G., Baier Manwell, L., Byars-Winston, A., Fine, E., Ford, C. E., . . . Sheridan, J. (2015). The effect of an intervention to break the gender bias habit for faculty at one institution: a cluster randomized, controlled trial. *Academic Medicine*, 90(2), 221-230. doi:10.1097/acm.0000000000000552
- Carnes, M., Devine, P. G., Isaac, C., Manwell, L. B., Ford, C. E., Byars-Winston, A., ... & Sheridan, J. (2012). Promoting institutional change through bias literacy. *Journal of Diversity in Higher Education*, 5(2), 63. doi:10.1037/a0028128
- Carnes, M. 2018. 'The American College of Physicians is working hard to achieve gender equity, and everyone will benefit', *Ann Intern Med*, 168: 741-43.
- Chapman, E. N., Kaatz, A., & Carnes, M. (2013). Physicians and implicit bias: how doctors may unwittingly perpetuate health care disparities. *Journal of General Internal Medicine*, 28(11), 1504-1510. doi:10.1007/s11606-013-2441-1

- Cox, E. D., Smith, M. A., & Bartell, J. M. (2005). Managing febrile infants: impact of literature recommendations published during a physician's residency. *Evaluation & the Health Professions, 28*(3), 328-348. doi:10.1177/0163278705278280
- Devine, P. G., Forscher, P. S., Cox, W. T. L., Kaatz, A., Sheridan, J., & Carnes, M. (2017). A gender bias habit-breaking intervention led to increased hiring of female faculty in STEM departments. *Journal of Experimental Social Psychology, 73*, 211-215. doi:10.1016/j.jesp.2017.07.002
- Duguid, M. M., & Thomas-Hunt, M. C. (2015). Condoning stereotyping? How awareness of stereotyping prevalence impacts expression of stereotypes. *Journal of Applied Psychology, 100*(2), 343-359. doi:http://dx.doi.org/10.1037/a0037908
- Er-rafiy, A., & Brauer, M. (2013). Modifying perceived variability: four laboratory and field experiments show the effectiveness of a ready-to-be-used prejudice intervention. *Journal of Applied Social Psychology, 43*(4), 840-853.
- Hall, W. J., Chapman, M. V., Lee, K. M., Merino, Y. M., Thomas, T. W., Payne, B. K., ... & Coyne-Beasley, T. (2015). Implicit racial/ethnic bias among health care professionals and its influence on health care outcomes: a systematic review. *American Journal of Public Health, 105*(12), e60-e76. doi:10.2105/AJPH.2015.302903
- Huizinga, M. M., Bleich, S. N., Beach, M. C., Clark, J. M., & Cooper, L. A. (2010). Disparity in physician perception of patients' adherence to medications by obesity status. *Obesity, 18*(10), 1932-1937. doi:10.1038/oby.2010.35
- Kaiser, C. R., Major, B., Jurcevic, I., Dover, T. L., Brady, L. M., & Shapiro, J. R. (2013). Presumed fair: Ironic effects of organizational diversity structures. *Journal of Personality and Social Psychology, 104*(3), 504-519. doi:http://dx.doi.org/10.1037/a0030838
- Kirkpatrick, D., & Kirkpatrick, J. (2006). *Evaluating training programs: The four levels* (3rd ed.). San Francisco, CA: Berrett-Koehler Publishers.
- Kolehmainen, Brennan, Filut, Isaac, & Carnes. (2014). Afraid of being" witchy with a'b": a qualitative study of how gender influences residents' experiences leading cardiopulmonary resuscitation. *Academic Medicine, 89*(9), 1276-1281.
- Legault, L., Gutsell, J. N., & Inzlicht, M. (2011). Ironic effects of antiprejudice messages: How motivational interventions can reduce (but also increase) prejudice. *Psychological Science, 22*(12), 1472-1477. doi:http://dx.doi.org/10.1177/0956797611427918
- Lockyer, J. M., Fidler, H., Ward, R., Basson, R. J., Elliott, S., & Toews, J. (2001). Commitment to change statements: A way of understanding how participants use information and skills taught in an educational session. *The Journal of Continuing Education in the Health Professions, 21*, 82-89.
- Madsen, T. E., Linden, J. A., Rounds, K., Hsieh, Y. H., Lopez, B. L., Boatright, D., ... & Lall, M. D. (2017). Current status of gender and racial/ethnic disparities among academic emergency medicine physicians. *Academic Emergency Medicine, 24*(10), 1182-1192. doi:10.1111/acem.13269
- Maina, I. W., Belton, T. D., Ginzberg, S., Singh, A., & Johnson, T. J. (2018). A decade of studying implicit racial/ethnic bias in healthcare providers using the implicit association test. *Social Science & Medicine, 199*, 219-229. doi:10.1016/j.socscimed.2017.05.009
- Nunez-Smith, M., Curry, L. A., Bigby, J., Berg, D., Krumholz, H. M., & Bradley, E. H. (2007). Impact of race on the professional lives of physicians of African descent. *Annals of Internal Medicine, 146*(1), 45-51.

- Pololi, L., Cooper, L. A., & Carr, P. (2010). Race, disadvantage and faculty experiences in academic medicine. *Journal of General Internal Medicine*, 25(12), 1363-1369. doi:10.1007/s11606-010-1478-7
- Pololi, L. H., & Jones, S. J. (2010). Women faculty: an analysis of their experiences in academic medicine and their coping strategies. *Gender medicine*, 7(5), 438-450.
- Prochaska, J. O., & Velicer, W. F. (1997). The transtheoretical model of health behavior change. *American journal of health promotion*, 12(1), 38-48.
- QSR International Pty Ltd. (2012). NVivo qualitative data analysis software. *Version 10*.
- Ross, D. A., Boatright, D., Nunez-Smith, M., Jordan, A., Chekroud, A., & Moore, E. Z. (2017). Differences in words used to describe racial and gender groups in Medical Student Performance Evaluations. *PLoS One*, 12(8), e0181659. doi:10.1371/journal.pone.0181659
- Rubin, D. L. (1992). Nonlanguage factors affecting undergraduates' judgments of nonnative English-speaking teaching assistants. *Research in Higher Education*, 33(4), 511-531.
- Samuels, E. A., Boatright, D., Sanchez, L. D., Heron, S. L., Liferidge, A. T., Wilson, T., ... & Moll, J. (2017). Clinical Vignettes Inadequate to Assess Impact of Implicit Bias: Concerning Limitations of a Systematic Review. *Academic Emergency Medicine*, 24(12), 1531-1532. doi:10.1111/acem.13317
- Sevo, R., & Chubin, D. E. (2010). Bias literacy: A review of concepts in research on gender discrimination and the US context. In *Women in Engineering, Science and Technology: Education and Career Challenges* (pp. 21-54). IGI Global.
- Stroop, J. R. (1935). Studies of interference in serial verbal reactions. *Journal of Experimental Psychology*, 18(6), 643-662.
- Sullivan, L. (2004). *Missing Persons: Minorities in the Health Professions, A Report of the Sullivan Commission on Diversity in the Healthcare Workforce*. Retrieved from <http://www.aacn.nche.edu/media-relations/SullivanReport.pdf>
- Todd, K. H., Deaton, C., D'Adamo, A. P., & Goe, L. (2000). Ethnicity and analgesic practice. *Annals of emergency medicine*, 35(1), 11-16.
- Uhlmann, E. L., & Cohen, G. L. (2007). "I think it, therefore it's true": Effects of self-perceived objectivity on hiring discrimination. *Organizational Behavior and Human Decision Processes*, 104(2), 207-223. doi:http://dx.doi.org/10.1016/j.obhdp.2007.07.001
- Walton, G. M., Logel, C., Peach, J. M., Spencer, S. J., & Zanna, M. P. (2015). Two brief interventions to mitigate a "chilly climate" transform women's experience, relationships, and achievement in engineering. *Journal of Educational Psychology*, 107(2), 468-485. doi:http://dx.doi.org/10.1037/a0037461
- Zescott, C. A., Blair IV, Stone J. (2016). Examining the presence, consequences, and reduction of implicit bias in health care: a narrative review. *Group Processes & Intergroup Relations*, 19(4), 528-542.

Appendix A.

Survey

Thank you for participating in the evaluation of the Breaking the Bias Habit Workshop. Please answer the following questions and return this survey to Dr. Sara Kraemer.

1. Reaction to Workshop

How do you rate ...	Extremely important	Very important	Important	Somewhat important	Not important at all
a. ... the topic of implicit bias in terms of your own personal interest or learning goals?					
b. ...the topic of implicit bias in terms of being beneficial to others?					
c. What would have improved the workshop?	Comments:				

2. Learnings from Workshop

For the following examples, please choose one of the following terms that best fits the following examples:

- Expectancy Bias
- Homophily

- Stereotype threat
- Microaggressions

Examples	Terms
You see in the medical record that your next patient is Black and hypertensive and you assume they don't take their medications.	
Your look forward to taking care of your 20-something nursing student patient and spend extra time talking about what it's like to work in health care at her appointments.	
In a grant application for a QI project, you are asked to identify your race and gender at the top.	
You are the only Black patient in the waiting room and aren't offered coffee.	

•

Learnings from Workshop, continued:

Questions	Written responses
What are some strategies to reduce implicit bias that <i>work</i> ?	
What are some strategies to reduce implicit bias that <i>do not work</i> ?	

3. Understanding and Implementing Habit-Reducing Strategies

The next set of questions asks you about your awareness of implicit bias and your desire to practice (or not practice) habit-reducing strategies *after participating in this workshop on implicit bias*.

Please check the box that is the most appropriate response for each statement:

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
a. I am more aware of how personal implicit bias may impact clinical judgment and/or decision making.					
b. I am concerned about implicit bias in clinical and workplace settings.					
c. The material presented was relevant to my job.					
d. I will be able to apply much of the material to my job.					
e. I don't feel ready to implement EPIC strategies in my workplace.					
f. The workshop prepared me to immediately implement EPIC strategies in my workplace.					
g. My knowledge and understanding of implicit bias and bias-reducing strategies was enhanced because of this workshop.					
h. I feel confident that I understand implicit bias and can change my behavior.					
i. I am eager to change my behavior as a result of participating in this workshop.					
j. The case studies engaged me and helped me learn about implicit bias in real contexts.					

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
k. I am vulnerable to unknowingly discriminating based on gender or race.					
l. Decreasing automatic stereotypic associations benefits society.					
m. Decreasing automatic stereotypic associations is a valuable goal.					
n. I am not confident that I could challenge a personnel decision if I think it has been influenced by stereotypes.					

Additional comments:

Appendix B. Focus Group Guide

1. In your experience attending the workshop, did you feel that the content, presentation style, and delivery of information was clear and understandable?
 - a. Probe for:
 - i. Was it the right level of engagement?
 - ii. Were the active learning exercises engaging?
 - iii. What worked well? Examples?
 - iv. What did not work well? Examples?
 - v. Did you feel “ready” after the workshop to try bias-reducing strategies?
2. When translating this workshop to clinical and workplace settings, what are some of the opportunities and challenges to implementing bias-reducing strategies?
 - a. Probe for:
 - i. Understanding of content.
 - ii. Context and culture of work/clinic
 - iii. Personal viewpoint(s).
3. Given your understanding of the issues involving implicit bias in clinical and workplace settings, what do you feel are the most important issues for medical residents?
 - a. Probe for:
 - i. Support of supervisors.
 - ii. Retention of knowledge (about implicit bias and the strategies).
 - iii. Opportunities to practice strategies.
 - iv. Needs for future professional learning.
 - v. Other?