Using Simulation-Based Learning with Standardized Patients (SP) in an Implicit Bias Mitigation Clinician Training Program

Jennifer Tjia¹, Michele Pugnaire², Joanne Calista², Ethan Eisdorfer², Janet Hale³, Jill Terrien³, Olga Valdman², Stacy Potts², Maria Garcia⁴, Majid Yazdani⁴, Geraldine Puerto¹, Miriam Okero³, Vennesa Duodu¹ and Janice Sabin⁵

¹Department of Population and Quantitative Health Sciences, UMass Chan Medical School, Worcester, MA, USA. ²Department of Family Medicine and Community Health, UMass Chan Medical School, Worcester, MA, USA. ³Tan Chingfen Graduate School of Nursing, UMass Chan Medical School, Worcester, MA, USA. ⁴Department of Medicine, UMass Chan Medical School, Worcester, MA, USA. ⁵Department of Biomedical Informatics and Medical Education, University of Washington School of Medicine, Seattle, WA, USA.

ABSTRACT

OBJECTIVES: To describe the development and refinement of an implicit bias recognition and management training program for clinical trainees.

METHODS: In the context of an NIH-funded clinical trial to address healthcare disparities in hypertension management, research and education faculty at an academic medical center used a participatory action research approach to engage local community members to develop and refine a “knowledge, awareness, and skill-building” bias recognition and mitigation program. The program targeted medical residents and Doctor of Nursing Practice students. The content of the two-session training included: didactics about healthcare disparities, racism and implicit bias; implicit association test (IAT) administration to raise awareness of personal implicit bias; skill building for bias-mitigating communication; and case scenarios for skill practice in simulation-based encounters with standardized patients (SPs) from the local community.

RESULTS: The initial trial year enrolled n = 65 interprofessional participants. Community partners and SPs who engaged throughout the design and implementation process reported overall positive experiences, but SPs expressed need for greater faculty support during in-person debriefings following simulation encounters to balance power dynamics. Initial year trainee participants reported discomfort with intensive sequencing of in-person didactics, IATs, and SP simulations in each of the two training sessions. In responses, authors refined the training program to separate didactic sessions from IAT administration and SP simulations, and to increase safe space, and trainee and SP empowerment. The final program includes more interactive discussions focused on identity, race and ethnicity, and strategies to address local health system challenges related to structural racism.

CONCLUSION: It is possible to develop and implement a bias awareness and mitigation skills training program that uses simulation-based learning with SPs, and to engage with local community members to tailor the content to address the experience of local patient populations. Further research is needed to measure the success and impact of replicating this approach elsewhere.

KEYWORDS: implicit bias, curriculum, clinician training, standardized patients, community engagement, bias mitigation

INTRODUCTION

A large and growing body of evidence demonstrates that clinician implicit biases contribute to adverse health outcomes of patients from marginalized communities.¹ Evidence indicates that clinicians, like others in society, hold negative implicit attitudes and stereotypes about certain stigmatized groups (eg persons of color, overweight individuals, those of lower socioeconomic class)² irrespective of clinician specialty, level of training or experience.¹,³ In response, the Centers for Disease Control and Prevention has declared that “becoming aware of one’s own biases may be a potentially lifesaving step for clinicians to undertake.”⁴

Trainings for clinicians in bias recognition, management, and mitigation have emerged at academic medical centers⁵–⁸ and professional organizations.⁹ Such programs target medical students⁵,⁶,¹⁰ residents,⁷ practicing nurses,¹¹ and practicing physicians.⁹ Common components include didactic presentations, Implicit Association Tests (IATs), group discussions, reflections, self-assessments, and strategy development to address implicit bias in practice.⁵,⁷–⁹ Training delivery modalities predominantly include self-paced, online programs. Few explicitly describe inclusion of case studies⁹ and, to our knowledge, none involve simulation experiences for...
communication and skill practice with standardized patients (SPs) or direct interaction with persons from marginalized communities.

This is a missed opportunity since the intergroup contact hypothesis from social psychology suggests that intergroup social contact can reduce stigmatizing attitudes and prejudice. At the individual level, intergroup contact theory proposes that members of one group, having incomplete or inaccurate ideas about members of another group, can positively change their beliefs and attitudes toward that group via contact, particularly when conducted with institutional support in a spirit of cooperation, commonality of goals, and with equal status among participants. While promising, this approach is largely unexplored in clinician training because of concerns about unintended consequences such as reinforcing destructive stereotypes, increasing personal and intergroup anxiety, and creating tension related to imbalanced power differentials.

Despite these challenges, our research group has used a community-engaged partnership to create and implement an in-person simulation-based training to mitigate the effects of implicit bias in clinician-patient encounters in a randomized clinical trial. The training program combined three core elements: 1. didactics to increase knowledge about social determinants of health, racism, implicit bias, and skills to mitigate bias; 2. self-administered IATs with feedback to increase bias awareness; and 3. clinical simulation encounters with racially and ethnically diverse SPs to facilitate skills practice.

The aim of this manuscript is to describe a participatory-action research approach to community-academic partnership in order to design a simulation-based, training intervention aimed at mitigating the negative impact of bias in clinician-patient encounters. We present lessons learned and strategies for successful community-engagement in designing and implementing a clinical bias mitigating intervention. We present baseline results of trainee participant IATs and the revised final version of our community-engaged bias mitigation training program.

**METHODS**

Details for the overall randomized trial, including full description of hypotheses and outcome measures, are published elsewhere. Briefly, between 2018 and 2022, we conducted a cluster randomized trial of a clinician training intervention to address implicit bias in healthcare encounters. The study setting was an academic medical center that serves a large low-income, publicly insured, person of color (POC) population in Central Massachusetts. The trial targeted interprofessional trainees (family medicine residents, internal medicine residents, and Doctor of Nursing Practice [DNP] students). The goal of the trial was to determine whether a community-engaged clinician training to raise bias awareness and provide bias mitigation skills can improve patient-centered communication and patient outcomes.

**Participatory action research (PAR) and community academic partnership**

The underlying methodology guiding development of the design and implementation of the training was PAR, a public health approach in which researchers and participants work together to promote positive change. PAR is based on iterative cycles of reflection, data collection, and action. Our effort formed partnerships with community, academic and educational stakeholders to develop and refine the training program. We highlight this development process because it is an innovative and emerging approach to clinical curriculum development that provides the advantage of tailoring curricular content to both trainees and local patient populations.

**Community stakeholders.** Community-academic partnership allowed us to integrate researchers’ theoretical and methodological expertise with community partners’ real-world knowledge and experiences. Community partners served two roles: 1. content development partners to design simulation case scenarios that authentically reflected local patient and community experiences; 2. SPs who participated in implementation of case simulation-based trainings. The partnership also sought to establish a “community-friendly” operational approach that minimized logistical barriers to program participation by community partners.

To build these partnerships, we contracted with a community-based organization (CBO) with deep ties and trust within the local community and a long history of academic collaboration. The CBO was compensated as a study partner to host meetings and lead recruitment of community members representative of the local population. We met weekly with the CBO and monthly with the community partners.

**Academic and curricular stakeholders.** We worked closely with educational faculty from the School of Medicine and Graduate School of Nursing at our study site in order to ensure that clinical and academic content appropriately targeted trainee curricular needs. We also partnered with a community-based diversity, equity, and inclusion (DEI) organization with extensive experience in design and implementation of frontline and executive-level staff bias training in-services in healthcare settings in our community.

**Program development.** Researchers and stakeholders worked together to design case simulation scenarios, a trainee performance evaluation checklist, and SP training protocols that were integrated into a cohesive, replicable training program. Community partners brought diverse cultural and lived experiences to the case scenario design process, and assisted with
recruiting other community members to work as SP’s in order to broaden the racial, ethnic, and economic diversity of the SP pool. SPs were hired and trained according to the standard protocols of the simulation center that include a series of foundational training as well as event/case-specific training before SPs engaged with trainees at an encounter. SPs attended an annual series of core competency development training sessions to refine their skills for case portrayal and evaluation of trainee performance.

Pilot testing of the training curriculum

We recruited faculty and representative trainees from the participating clinical training programs to conduct run throughs of the program at the end of the design process. We focused on examining performance of community partners as SPs who provided feedback to trainees (both in one-on-one simulations and group debriefs), IAT feedback and debriefings sessions, and timing of all training elements during the in-person sessions. After completing small scale run throughs, we conducted full-scale pilot testing with an entire initial cohort of eligible trainees who were assigned to participate in the training by their program leadership. Trainees could elect to allow use of their data for research purposes during the consent process. Pilot program evaluation involved both quantitative and qualitative data collection.

Inclusion and exclusion criteria

Participating training programs assigned their trainees to participate in the program over four academic years. By design, the initial program year included all second and third year medical trainees, and subsequent academic years included only second year trainees (ie those who joined the training program in the preceding year and had not been exposed to the bias mitigation program). First year trainees were excluded. These inclusion criteria and recruiting approach were designed to provide a total sample of at least 205 clinical trainees who practiced at eligible clinical sites over 3 academic years, which provided a greater than 90% power to detect a change in clinical outcomes (ie 3 mm Hg difference systolic blood pressure between control and post-training periods) of patients nested within trainees.17

Measurements

Demographics. Trainee participants self-reported age, gender, race/ethnicity, and training year.


Feedback. Research staff and training faculty also kept field notes to capture real-time observations and comments. Feedback was collected from all participating stakeholders, including community partners, faculty, and trainees. Following each training session, trainees were sent an online survey soliciting feedback about the overall program and each training component. (Online Figure 1) Informal debriefing sessions collected early feedback from community partners and faculty. Invitations for formal individualized feedback was extended to all program faculty, SPs, and trainees who completed the pilot program. Between June and July 2019, a Masters’ level educational curriculum specialist conducted all formal feedback sessions and took extensive fieldnotes to capture respondents’ responses in response to questions based on the trainee feedback survey.

Data analysis

Descriptive statistics (means, standard deviations, and frequencies) characterize the trainee population and baseline IATs. We report implicit bias scores using a standard IAT scoring algorithm.21 We calculate Cohen’s d, a standardized effect size measure to convey meaningful interpretation of IAT results when comparing implicit and explicit bias scores which are measured on different scales and to enable comparisons to IAT scores of other clinicians reported in the literature.23,24 Investigators with experience in qualitative methods (GP; JT) coded data for themes from field notes and interviews. To address rigor and reliability, emerging themes were presented and discussed with a selected group of community partners, faculty, and trainees to ensure that messages were accurately captured and presented. Trainees provided written informed consent to allow their data to be used for outcomes analysis. The study protocol was reviewed and approved by the UMass Chan Medical School Institutional Review Board.

RESULTS

Original training curriculum - structure, content and delivery

The training was designed as a two-session sequence to leverage a spaced learning design.25 The two three- to four-hour in-person sessions were spaced five weeks apart. Each in-person session included both individualized and group-based learning components (Online Figure 2). Four SP case scenarios for the simulation exercise reflected the racial, ethnic, and economic diversity of the study site’s local patient community (Figure 1). The SP cases were designed to subtly trigger stereotypes. The SPs represented a 55-year-old Latino male with poorly controlled hypertension, a 34-year-old Ghanaian man or woman with hypertensive urgency, a 70-year-old African American woman previously diagnosed hypertension, and a 50-year-old White woman receiving Medicaid with a history of hypertension. The four cases were imbued with some degree of non-adherence due to; medication side effects,
cultural beliefs about medication, an immigrant new to the US healthcare system and a Medicaid patient with social stressors, similar to what a clinician would encounter in their everyday practice.

**Evaluation of original training intervention**

**Quantitative results.** Trainee Participant Characteristics. By September 1, 2019, the initial group of medical resident and DNP student trainees were randomly assigned to one of five staggered start dates of the CONSULT training pilot program throughout the first academic year of the program. Of 125 trainees randomized, a total of 97 participants completed both sessions and 64 (51%) consented to enroll in the trial. Most consenting participants were internal medicine residents and 36% were DNP students, 40% were people of color, 33% foreign born, and 50% fluent in a second language. (Table 1)

Implicit Bias. IAT scores show a large Black-White Race bias effect (Cohen’s $d = 1.18; M = .39 (SD = 0.33)) and a moderate Black-White Medical Compliance stereotype effect (Cohen’s $d = 0.52; M = 0.24 (SD 0.46)). (Table 2) Smaller effect sizes were seen for Latino/Hispanic-White Ethnicity (Cohen’s $d = 0.31; M = 0.16 (SD.51)) and Latino/Hispanic-White Medical Compliance (Cohen’s $d = 0.39; M = 0.18 (SD 0.47)). (Table 2)

**Qualitative findings—trainees, community partners, and faculty feedback**

**Trainee feedback.** Challenges in Delivery Modality and IAT Feedback. Fieldnotes, feedback from trainees during the
onsite, group educational sessions and trainee informant interviews revealed several challenges. One challenge was that the use of an online platform for delivery of didactic knowledge content was suboptimal because trainees could easily choose not to engage with the material. For example, trainees who perceived themselves as having no implicit bias issues could easily click through the content. Furthermore, asking individuals to complete online modules in a group setting generated a perception of real-time peer pressure to speed through the online modules. In particular, trainees of color reflected that they felt “pressured” to rush through the online modules given that their non-POC peers were “racing through the content” and “calling it useless.” As a result, some POC trainees strongly expressed the need to create a “safe” setting in which to address implicit bias. Trainees also recommended changing the delivery modality of knowledge content, and particularly patient-centered communication skills, to an in-person, small group, interactive session to promote relational skill-building through direct interpersonal contact among group participants.

SP feedback. Debriefings and Facilitation. Community SPs reported that they benefited from formal training on how to provide feedback to trainees. Additionally, in group debriefing sessions, SPs reported feeling empowered when backed up by faculty facilitators, particularly when trainees are not accustomed to SPs providing discussion-based learning in an educational setting.

Faculty feedback. Facilitation Skills. Facilitation skills of the clinician-educators leading the IAT debriefings were variable,
particularly in their ability to effectively facilitate safe and meaningful discussions around race and bias. The most well-received facilitators were clinical psychologists who had training skills that promoted effective group-based processing and modeled openness in engaging with emotionally challenging content such as racism. Both trainees and facilitators recommended augmenting facilitators’ skills with a specific focus on creating a safe space, skills on how to support and not tokenize trainee POCs, and how to challenge defensiveness and white privilege.

Final training curriculum—structure, content, and delivery
We learned many lessons and highlight three key points. First, it is essential to create a safe environment for trainees. Second, it is equally important to convey and deliberately empower trainees and community partners. Third, the training content and approach needs to be tailored to the unique contextual challenges of the trainees’ clinical discipline and updated to reflect contemporary dialogue about race, racism, and disparities in society and the local healthcare context at the time of training delivery.

Within the iterative rubric of the PAR approach, we used the results and feedback from the initial year of the program to refine the training structure to implement with the successive cohorts of trainees. The resulting refinements simplified the program while preserving key programmatic elements including: knowledge building with interactive didactics, awareness building with IATs, skill building with social-contact-based SP simulation practice (Figure 2).

Revised Knowledge-building Didactic (Session One). We eliminated online self-teaching modules in favor of interactive, in-person, synchronous learning. We continued the spaced-learning design with two sessions over a five-week period. The first session was changed to focus on knowledge-building didactics that included slide presentations about healthcare disparities, implicit bias, and structural racism in healthcare. To enhance the experience, we included: video stories from community members; interactive discussions with breakout sessions for trainees to discuss race, ethnicity, and identity; a brief video about IATs (http://www.pbs.org/video/dependent-lens-implicit-bias-test/) with an option for an experiential IAT exercise (as time allows); and a case presentation of local examples of bias and structural racism in healthcare (with discussion, as time allows). The duration of this didactic session was reduced from 4 h to 2 h. The didactic structure was designed to generate discussion and buy-in among trainees, to promote reflection through “disruption” of beliefs, and to empower trainees to see how their actions could begin to address healthcare disparities (Figure 2).

To enhance the faculty facilitator skillset, we built a multi-disciplinary team and added DEI specialists well-versed in bias and racism education to deliver these sessions. Clinical content (ie hypertension management guidelines) was delivered either in-person by a clinician or via online learning at the discretion of each training program.

Revised Approach for Developing Awareness of Personal Bias. To retain the bias awareness experience while creating safety for trainees to process their results, we shifted the completion of the IATs from in-person, group learning sessions to completion on the trainee’s own time. We also reduced the number of IATs administered from 4 (black/white IAT; Latinx/white IAT; black/white compliance IAT; Latinx/white compliance IAT) to 1 randomly assigned compliance IAT (ie either the black/white compliance IAT or Latinx/white compliance IAT). Trainees were provided with their IAT results online which was followed-up with the standard Project Implicit IAT online debrief to help explain results and to learn more about implicit bias (implicit.harvard.edu/implicit/faqs.html). Training staff were made available to individually discuss IAT scores at the trainee’s discretion.

Revised Bias Mitigation Skill Training with Simulated Clinical Encounters (Session Two). The refined iteration of the training continued to focus on skill-building and a social-contact-based approach to skill practice in Session Two; this session lasted 3.5–4 h. Skill content was based on bias-mitigating approaches highlighted by the Institute of Healthcare Improvement, but we modified these to be anchored by a checklist approach proposed by Cooper—RELATE (Respect, Empathize, Listen, Ask, Talk, Engage)—which incorporates lessons from a tool called the Ladder of Inference, created by the organizational psychologists Chris Argyris and Peter Senge, which can help interrupt the unconscious processes linking observing things to making decisions. The skill-building presentation includes videos with discussion about ways to apply the RELATE checklist. Trainees complete two simulation cases with community SPs who provide 1:1 feedback regarding the patient-centeredness of the simulated encounter. A group debriefing between trainees and community SPs facilitated by a clinical psychologist followed. Clinical psychologists created a “safe space” to foster trainee trust and comfort to integrate and adapt to feedback, reflect on self-awareness, and progress toward empowerment. Formal evaluation of the program on patient outcomes is ongoing. Preliminary feedback reports high levels of acceptability and perceived importance among trainees.

DISCUSSION
Our clinician-facing, bias awareness raising and bias-mitigating skills intervention successfully leveraged a community-academic partnership to address difficult issues of healthcare disparities, implicit bias, and trust in clinical relationships. The aim of the intervention was not to change the biases individuals hold, but to increase understanding of the impact of implicit bias on healthcare disparities and to mitigate the effects of those biases on patient care and health outcomes.
We describe a feasible and acceptable model for implicit bias mitigation training that includes a social-contact-based approach (Figure 2). In response to solicited and unsolicited feedback from all stakeholders and measures of defensiveness, we were able to refine the intervention while maintaining fidelity to the original program. Below we describe how we addressed three key findings from participant feedback for others who may have an interest in using our training model.

Creating a safe environment

Despite agreement about the importance of creating a safe environment for learning about and discussing implicit bias and racial injustice,16,31 questions remained about how best to achieve such an environment. Our initial experiences with in-person, group IAT debriefing sessions revealed a number of challenges that we had to address that were also cited by other studies.32 These included: recognition that the topic of racial discrimination can be challenging and uncomfortable to discuss; awareness that the trainees targeted for participation are themselves likely to represent diverse racial, ethnic, cultural, socioeconomic backgrounds along with a variety of gender identities and sexual orientations; and acknowledgment that, despite shared professional experiences through training programs, trainees may differ in how they understand or experience racial injustice in their clinical work and “lived experiences” of racism, bias and discrimination.

We approached the creation of the learning environment as analogous to providing trauma-informed care.33 Within this framework, providers operate under the assumption that any given patient (or, in the case of this program, trainee) may have experienced traumatic events, and may not always feel comfortable disclosing those experiences to their healthcare providers. In recognition of this uncertainty, trauma-informed care encourages providers to adopt “universal trauma precautions,” including a clear, nonjudgmental and patient-centered approach to communication, respecting patient’s expertise about their own needs, developing a shared understanding of the effects of trauma on health, and awareness of and reflection upon provider’s own emotions and trauma histories when applicable.33 We replicated these elements within the IAT debriefing and the bias mitigation skills sessions through the engagement of expert facilitators. The importance of experienced, skilled facilitators who are comfortable with the content cannot be understated.

Empowerment of all stakeholders

Trainees can easily feel overwhelmed by the enormity and complexity of racism and bias in society and healthcare. It is easy for them to feel guilty about privilege and their role in racial injustice, and to feel an emotional burden from being asked or expected to fix the whole problem. It is crucial to accompany the message of the history of racism in medicine, evidence of bias, and social determinants of health with the positive message that they are empowered to enable change, however small, in addressing the pervasive societal forces of bias and inequity, through skills in bias mitigation in their clinical...
encounters with patients. Equally important is creating a level playing field for SPs who are tasked with providing feedback to trainees who are typically higher on the power hierarchy. To bridge these hierarchical imbalances, our facilitators modeled respect for community SPs by explicitly acknowledging their expertise and the value that their perspective brings to learning the skills of bias mitigation. Many trainees expressed that they will apply the skills and feedback received from SP’s as part of their ongoing care of patients.

Tailor to the trainee audience

Our experiences revealed insights about understanding the needs of trainees with different experiences and levels of engagement, and building skills at their learning edge. Overall, DNP students appeared to be highly engaged in the discussions, possibly reflecting their comfort and familiarity with the sensitivity of implicit bias training, building on prior curricular experiences in this area. For example, advanced practice nursing (APN) trainees often have years of “front-line” nursing experience. As such, they are more exposed to social determinants of health as part of their clinical practice and hence more receptive to learning practical skills to advance their skills in bias mitigation. Additionally, the nursing model of education places a strong emphasis on the social component of patients’ lives, with more extensive education related to social determinants of health integrated throughout their training as APNs. Similarly, our family medicine residents have more formal training in person-centered communication skills compared to our internal medicine residents, and so each had a different core skill set upon which to build bias-mitigating communication skills. Creating a “one size fits all” bias mitigation training runs the risk of wasting valuable time and alienating trainees.

Resource recommendations for local replication

For educators who which to replicate our training, we encourage tailoring and local adaptation of the core contents of our program (ie the slides for the 2 didactic sessions, the case summaries and content for standardized patient simulations) to enhance relevance and, ultimately, success. An overview of the steps and resources needed for local adaption are provided

<table>
<thead>
<tr>
<th>Step</th>
<th>Process</th>
<th>Process Goal</th>
<th>Recommended Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Review of content didactic (Session 1) regarding healthcare disparities, racism, and implicit bias</td>
<td>Recruit local educational leaders from targeted training programs to compare didactic content to local curricula</td>
<td>Alignment with local efforts, conversations, and policies addressing healthcare disparities, racism, and implicit bias</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Faculty time for program content review</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Open sessions for questions and answers</td>
</tr>
<tr>
<td>2.</td>
<td>Review of simulation case content (Session 2) for relevance to local patient communities</td>
<td>Recruit members of local patient communities to review and adapt case for increased relevance</td>
<td>Alignment of case content with the realities of the demographics and particularly clinical challenges of the local patient community</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Curricular design specialist</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Community-engagement expert</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Clinician educator</td>
</tr>
<tr>
<td>3.</td>
<td>Review of didactic and simulation content by target trainees</td>
<td>Recruit a few representative trainees to review the CONSULT training content</td>
<td>Increase relevance of content to local clinician challenges Align with prior related clinician training</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Brief time from a few representative trainees from the target clinician population</td>
</tr>
<tr>
<td>4.</td>
<td>Review of facilitator skill set</td>
<td>Recruit one or more facilitators who have skills in creating safe spaces for potentially challenging conversations about racism</td>
<td>Ensure facilitators have skills in:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>reflect and active listening</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>managing defensiveness</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>creating a safe space</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>empathy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diversity, equity and inclusion specialist</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Clinician educator</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Behavioral psychologist with clinician training background</td>
</tr>
<tr>
<td>5.</td>
<td>Standardized patient training</td>
<td>Case content training</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skill evaluation training</td>
<td>Ensure standardized patients: deliver case in accordance to local simulation center standards apply evaluation checklist in a reproducible and reliable manner</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Clinical simulation center trainers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mock sessions for review and revision</td>
</tr>
</tbody>
</table>
in Table 3. All training contents are available upon request to the study authors.

Limitations
We believe our model can be replicated in other settings, but acknowledge that the conditions in our setting were especially fertile for acceptance of the intervention. Our program was based in a single academic medical center that has been engaged with topics of implicit bias and racism throughout the undergraduate and graduate medical curriculum for at least a decade. The demographic characteristics of our trainees may have affected our results, which may have an impact on generalizability of the intervention. Our sample was 61% white, compared with national samples of DNP students (64% white), FM residents (49.1% white) and IM residents (34.4% white). Our sample was 33% non-US citizens, while nationally 13.2% of FM residents and 30.5% of IM residents are non-US citizens. We recognize that the time commitment of 4–5 h required for the entire program may preclude complete replication elsewhere, even though this time commitment is similar to other communications trainings such as the goals of care training at the VA. (https://www.ethics.va.gov/goalsofcaretraining/team.asp). To address this potential challenge, it is possible to eliminate the skill practice with SPs in the simulation lab and substitute role playing exercises between trainee participants. This may be a practical alternative since SP simulation is often costly and not possible for many clinical training programs without funds to pay for SPs. While this strategy precludes face-to-face contact between the clinical trainees and community members and SPs, the benefits of intergroup contact may be alternatively achieved through other interactive methods such as video documentaries. Finally, we note that the trainee feedback survey used to guide the refinement of the program was locally developed and did not use a validated or pilot-tested questionnaire.

Conclusion
In summary, we demonstrate that it is possible to develop, tailor and implement a training program for bias awareness and mitigation skills training program for clinical trainees that enhances awareness of bias, provides skills to mitigate bias, and provides interactions with the local community through simulation-based learning with SPs. We have provided lessons learned, guidance for success, and a summary of tools and approaches that can be used to address bias in other healthcare training programs.

Further research is needed to measure the success and impact of replicating this approach at other institutions.

Acknowledgements
The authors wish to extend gratitude to the community partners, standardized patients, and trainees for their generous contributions to this project, and to thank Lynley Rappaport MPH, MEEd, Nancy Esperza, MEEd, Valerie Zolezzi-Wyndham, JD, Germán Chiriboga, MPH, Elizabeth Dykhouse, PhD, Sylvia Stanhope, BA for their roles in data collection and to Jeroan Allison, MD, MS for his role in conceptu-alizing the study.

Ethical Approval
Ethical approval has been granted for studies involving human subjects by the UMass Chan Medical School Institutional Review Board (H00012160).

Disclaimers
The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

ORCID iD
Janet Hale https://orcid.org/0000-0002-9680-9909

Previous Presentations
Earlier versions of this material has been presented at the 2020 Annual Research Meeting, June 13–16, 2020 in Boston, MA and the 2021 National Organization of Nurse Practitioner Faculties. 47th Annual Conference, April 2021, Denver, CO. (Virtual).

Supplemental Material
Supplemental material for this article is available online.

REFERENCES
34. Fong THC, Mak WWS. The effects of internet-based storytelling programs (amazing adventure against stigma) in reducing mental illness stigma with mediation by interactivity and stigma content: randomized controlled trial. *J Med Internet Res.* 2022 Aug 12;24(8):e37973. doi:10.2196/37973