

Tackling discrimination in medicine head on: the impact of Bystander Intervention Training

Journal:	<i>Medical Teacher</i>
Manuscript ID	CMTE-2023-1296.R1
Manuscript Categories:	Articles
Date Submitted by the Author:	30-Jan-2024
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SDG:	
Keywords (user):	Bystander Intervention Training, Discrimination, Racism
Keywords:	Medicine < Profession, Simulation < Teaching & Learning, Small group < Teaching & Learning, Communication skills < Learning outcomes, Education environment < Curriculum

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Tackling discrimination in medicine head on: the impact of Bystander Intervention Training

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Tackling discrimination in medicine head on: the impact of Bystander Intervention Training

Abstract

Purpose

A mixed-methods study to evaluate *Bystander Intervention Training*, a simulation-based small-group training programme designed to teach skills to tackle discrimination.

Materials and Methods

Norwich Medical School delivered the intervention online between January 2020 and June 2023 to medical students, physician associate trainees, and qualified doctors. A sample of 569 participants was used in the main analysis. Participants completed pre-and post-training and follow-up evaluations.

Results

Paired post-training scores were significantly different (all $p < 0.001$) from the pre-training scores for all 12 questions, in favour of the post-training scores. Of the 159 participants who completed follow-up questionnaires, 27 (17.9%) reported having the opportunity to be an active bystander; of those, 23 (85%) intervened. Scores in the follow-up questionnaire were significantly higher than those in the pre-training survey and significantly lower than those in the post-training questionnaire ($p < 0.001$). Participants had an increased sense of responsibility to be an active bystander and were empowered to challenge discrimination. Participants from marginalised groups expressed positive views about the training.

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6 **Conclusions**
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8 Interventions that allow open discussion and carefully supported personal disclosure in safe spaces,
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10 where difficult and uncomfortable discussions can occur, with an opportunity to change behaviour,
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12 must be developed to tackle discrimination.
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For Peer-Review Only

Introduction

The importance of addressing discrimination and providing a safe inclusive environment within medical education cannot be overstated. The demographics of the medical field are (slowly) increasing in diversity but there is clear and sustained evidence that minoritized groups experience harassment, discrimination, and bias in medical education [1-4] leading to higher rates of burnout [5] despite widened access [6]. There is clear evidence of a significant and sustained attainment gap for students from Black, Asian, and minority ethnic (BAME¹) backgrounds in higher education, and in medicine specifically [7].

A broad diversity of people contribute to the work of the NHS, including people of different genders, ethnicities, disabilities, religions, sexual orientations, ages and other personal characteristics. Benefits of a diverse workforce include improved quality of care for patients and increased efficacy of services [8]. However, it is evident within the NHS that there are instances of harassment and discrimination against staff who possess these characteristics. In the recent General Medical Council national training survey, 27% of trainees reported that they have experienced micro-aggressions and negative comments from colleagues and 28% reported hearing insults, stereotyping and jokes on the grounds of someone's protected characteristics [9]. In a report by the NHS, ethnicity was the most common characteristic associated with harassment and discrimination in primary care, above gender, age, religion and disability, which led some to feel that they worked in a *'hostile environment'* or an unsupportive culture, where negative attitudes were part of *'business as usual'* and often not openly challenged [10]. Whilst NHS trusts are

¹ BAME is used with intent where it describes a wide range of ethnicities. It is not used where the focus is on a particular ethnic group e.g. Black students.

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3 striving to increase the diversity and inclusion of their workforce, addressing harassment and
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5 discrimination based on personal characteristics is essential to creating a safe and supportive
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7 working environment. Medical schools have the responsibility to protect students and staff from
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9 feeling unsafe, unwelcome, and inferior and therefore discrimination or harassment should not be
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11 part of their experience. Medical education placements within the NHS in primary and secondary
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13 care are a key context within which students experience discrimination [11]. Any efforts to tackle
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15 discrimination need to be effective across campus and placement settings, and medical schools
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17 need to be driving this change [12].
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23 Whilst there have been many different approaches to addressing racism, as well as homophobia
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25 and sexism, these have often been tokenistic, frequently single-identity focused and may even
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27 cause harm [13]. Classroom-based training that raises awareness and remains theoretical about
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29 what to do in the future such as the widely-adopted, implicit bias training programmes, have
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31 demonstrated limited effectiveness [14-16]. Interventions that challenge discrimination from an
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33 intersectional perspective address the cumulative disadvantage experienced by people with
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35 multiple minoritized characteristics [17], and that take a systems-level approach, are more
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37 effective. Targeted interventions that aim to change behaviour through meaningful engagement
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39 with challenging material and that draw directly on evidence whilst also being grounded in theory
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41 are going to be more effective at tackling systemic institutional change and actually changing
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43 behaviour [18]. Research has shown that bystander intervention training, with an evidence base
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45 primarily located in addressing sexual harassment in Higher Education settings [19], is a useful
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47 technique for reducing power-based discrimination and behaviour [20, 21]. The aim of the training
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49 is that the individual becomes an active bystander in discriminative or emergency situations by
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51 recognising the situation as potentially harmful and intervening in a way that could improve
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3 outcomes [22]. The purpose of bystander intervention training is to equip individuals with the
4 knowledge and skills they need to become active bystanders and feel confident in speaking up and
5 helping others. Evidence shows that the training demonstrates positive changes in behaviour,
6 attitudes and cognition [23]. Training is also effective for academic staff, providing a variety of
7 new skills including new vocabulary to facilitate sensitive conversations, increased awareness
8 regarding best practices for intervention, and practical tools to apply when intervening [24]. Whilst
9 effective, little or no research has evaluated the effectiveness of bystander intervention training
10 addressing other protected characteristics other than gender and the issue of sexual violence [25].
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22 This study reports on a mixed method evaluation of a bystander intervention training programme
23 (BiT) provided to trainees and qualified doctors and physician associate trainees within Norwich
24 Medical School between January 2020 and June 2023.
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33 **Materials and Methods**

34 **Study population**

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37 This mixed methods evaluation study was conducted at the University of East Anglia (Norwich,
38 UK). The intervention was delivered to second-year and fourth-year medical students as part of
39 their curriculum, MSc Physician Associate postgraduate students and qualified doctors. The
40 intervention was delivered online using the video-conferencing application 'Zoom' (Zoom Video
41 Communications Inc, Version: 5.0.3) to groups of a maximum of 10 participants. BiT was piloted
42 in both November 2020 and January 2021. Then after amendment delivered between 16th October
43 2021 and 13th June 2023. The study was approved by the University of East Anglia Faculty of
44 Medicine and Health Sciences Research Ethics Committee (Reference: ETH2021/22-112).
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The intervention

BiT was developed in Norwich Medical School by staff and students and aimed to empower individuals to take an active stand against discrimination, across protected characteristics such as gender, sexuality, and ethnicity. The training raises participants' awareness of being an active bystander in situations where they witness discrimination or harassment and allows them to discuss and practise speaking up on behalf of others. We developed the training programme to be centred around providing participants with opportunities to have safe, observed practice in bystander intervention with an actor, enabling them to explore common issues surrounding diversity and equality with an intersectional lens.

Based on principles drawn from behaviour change theory, the programme addresses Latane and Darley's [26] five-step decision model by raising awareness that students should be active bystanders in situations where they witness discrimination and harassment. Participants work in an active, live simulation with an actor effectively providing a behavioural intervention, taking the onus away from the *'victim'* in the situation moving it to the bystander. Along with facilitator-led *'safe space'* discussion and experience sharing, the training is designed to create a *'stepping-off-the-cliff'* moment of being an active bystander. An important focus is placed within this training on using one's own privilege to act as an ally [27, 28]. BiT is designed to work in any setting with participants from any sector and seniority. The inclusion of an actor in small-group training is a fully immersive simulation experience that allows participants to witness the experiences of received and challenged, discriminatory behaviour. Role play has been shown to be an effective means of learning communication skills [29] and promotes reflection and insight not only for the students engaged in role play, but also for peers observing the session [30]. Research shows that learning through role play is strongly linked to improved self-efficacy [30] which is linked to more

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3 effective learning [18]. In BiT, role play was acted out by the facilitator, the actor, and a
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5 volunteering participant. The discriminatory ‘trigger line’ was always given by the actor who was
6
7 unknown to the participants. The scenarios used in the training, depicting various forms of
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9 discrimination from microaggressions to overt outbursts, were developed by medical students from
10
11 a range of backgrounds and provide a powerful representation of the lived experiences of students
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13 on campus, and on placement.
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17 To accompany the in-person session, we developed a Bystander Intervention Training Handbook
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19 and educational videos. The handbook gave a brief overview of bystander intervention, including
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21 an introduction to the 5Ds (distract, delegate, document, delay, and direct) [31] and the role play
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23 scenarios later covered in the training sessions. The 5Ds were taught to participants to allow them
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25 to practice applying this framework to the example role play scenarios (*Supplemental File 1*).
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33 **Evaluation**

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35 Participants were asked to complete pre-and post-training evaluation surveys immediately before
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37 and after the delivery of the training session. A follow-up survey was sent to all medical students
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39 in June 2023 (mostly 9-18 months post-completion of training with a few two months post-
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41 completion). Questionnaires collected demographic data (e.g., ethnicity, sexual orientation,
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43 disability, and religion). Surveys included 12 questions, with responses on a five-point Likert scale.
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45 Answers were scored from 1 (*‘Strongly Disagree’*) to 5 (*‘Strongly Agree’*). Surveys assessed
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47 participant knowledge and understanding of diversity and being an active bystander, as well as
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49 evaluation questions about the training itself. Free-text fields were used for the collection of
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51 qualitative data. Questions included: *‘Which part of the training did you feel was the best?’* and
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3 *'Is there anything about the training which you would change?'*. Participants provided an
4 anonymous code, used to match pre-and post-evaluation questionnaires. The follow-up survey
5 included additional questions about the opportunity to act as a bystander post-training. We were
6 unable to match follow-up questionnaires to those from the initial evaluations as we deleted the
7 anonymous codes after matching, as specified to the participants.
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14 15 16 17 18 **Statistical analysis** 19

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21 The measured demographic characteristics (group [second-year and fourth-year medical students,
22 PG students or qualified doctors], sex, ethnicity, gender identification changed from that assigned
23 at birth, sexual orientation, disability and religion) were compared for participants who completed
24 both pre-and post-training questionnaires and for those who completed an unmatched pre-training
25 questionnaire only. The latter unavoidably includes participants who completed a post-training
26 questionnaire that we were unable to match with their pre-training questionnaire. The matched and
27 unmatched groups were compared using a standard χ^2 test, except where any expected values were
28 fewer than five, in which case Fisher's exact test was used.
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40 For those who completed both pre-and post-training questionnaires, histograms of the distribution
41 of the responses were produced. Mean and standard deviations were calculated for each question
42 for both questionnaires. It would be more usual to present the median and interquartile range for
43 such data, but these were less informative here as so many of the ratings were 4 or 5. Paired pre-
44 and post-training scores were compared for each question using the signed rank test.
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52 The structure of the response data was investigated using principal components analysis (PCA)
53 and item-rest correlations (both based on polychoric correlations) for the pre-and post-training
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3 questionnaires, for those who completed both. The results of these led us to use the total scores
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5 on the two questionnaires as summary measures. Means and standard deviations were calculated
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7 for the total score for both questionnaires and for the difference in total scores, for those who
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9 completed both questionnaires. This was done for the whole paired sample and for a series of
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11 binary comparison groups. The comparative groups were created to examine the effect of protected
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13 and other characteristics: male/female, white/BAME, heterosexual/LGBO, student/qualified
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15 doctor, disabled/doesn't define self as disabled and gender identity same as assigned at
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17 birth/different. Religion does not lend itself to a binary comparison. People who gave '*Prefer not*
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19 *to say*' for a question were excluded from this analysis. Whether there were differences in the
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21 mean pre-training total scores between each of the binary groups was tested using a two-sample t-
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23 test. The total mean scores pre-and post-training were compared for the whole sample using a
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25 paired t-test. For each of the binary groups separately, we also carried out an ANCOVA, regressing
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27 the total post-training score on the total pre-training score, the binary group variable and the
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29 interaction between the two.
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36 For the follow-up data, we compared medical students who had completed both pre-and post-
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38 training questionnaires to those who completed the follow-up questionnaire. The two groups were
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40 compared for the measured demographic characteristics using a standard χ^2 test, except where any
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42 expected values were fewer than five, in which case Fisher's exact test was used.
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46 Owing to the nature of the study design, we could not match the follow-up questionnaires to the
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48 two initial questionnaires. We compared pre-training and follow-up scores for each question using
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50 the Mann-Whitney test. We also compared post-training and follow-up scores for each question
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52 using the Mann-Whitney test.
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3 All statistical analyses were carried out in Stata (Stata LP, College Station, Texas, USA, Version:
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11 **Qualitative analysis**

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14 Responses to open ended questions were transcribed and coded iteratively using an inductive,
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16 thematic approach [32] and arranged into themes reflecting participants' experiences.
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22 **Results**

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26 Participant characteristics for the 569 participants who completed both the pre-and post-training
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28 questionnaires and 106 participants who completed only the pre-training are presented in *Table 1*.

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31 Those for whom we have paired questionnaires were not significantly different from those who
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33 completed only the pre-training questionnaire, except that a much lower proportion of qualified
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35 doctors, especially, completed both questionnaires, compared to the other groups.
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42 **Quantitative results**

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45 Pre-and post-training scores by question are compared in *Figure 1*. For all questions, the paired
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47 post-training scores were highly significantly different from the pre-training scores ($p < 0.001$,
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49 signed rank test), in favour of the post-training scores. The pre-training question means ranged
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51 from 3.4 to 4.2 and the post-training means from 4.5 to 4.7.
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Post-training questionnaire

On a scale of 0 to 10 (0 = 'Not at all likely' and 10 = 'Extremely likely'), 72% (N=410) of participants rated the likelihood of their recommending the programme to a colleague as eight or higher. The overall mean score was 8.2.

The majority of participants reported that the training session overall was 'Really Useful' (58%) or 'Quite Useful' (37%) and said they 'Strongly Agree' (45%) or 'Agree' (44%) that their communication skills had improved following the training.

Total score analysis

In the PCA, the first principal components explained 87% of the variation in the pre-training questions and 90% in the post-training questions. For both pre-and post-training data, the first principal component loadings were all positive and of a similar magnitude for each of the questions. Item-rest correlations were fairly high for all questions (ranging from 0.50 to 0.85 for pre-training questions and from 0.72 to 0.89 for post-training). We therefore felt justified in working with the total scores pre-and post-training as summary measures, to avoid type I errors and enable more complex modelling.

Figure 2 and *Supplemental File 2* illustrate the pre-and post-training total scores by the selected binary groups. The effect of the training was large in comparison to any group effects. The overall mean total score increased from 45.0 (SD 7.0) pre-training to 54.2 (SD 5.6) post-training ($p < 0.001$). The mean total pre-training score was significantly higher in BAME participants (mean

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3 45.6, SD 7.0) compared to white participants (mean 44.4, SD 6.9) ($p=0.047$), though the difference
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5 was fairly small, and in student participants (mean 45.1, SD 6.9) compared to medically qualified
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7 participants (mean 39.9, SD 6.7) ($p=0.001$). There were no significant differences in mean total
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9 pre-training scores between the binary sex ($p=0.37$), ethnicity ($p=0.06$) disability ($p=0.74$) and
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11 gender identity ($p=0.50$) groups. For each of the binary groups separately (except gender identity
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13 because of small numbers), we carried out the ANCOVAs. The constant and the coefficient for
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15 the pre-training total score were both significantly different from zero (all $p<0.001$) but none of
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17 the group effects or interactions were significant for any of the binary groups. While there is strong
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19 evidence of the effectiveness of the training overall, there is no evidence of a differential effect of
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21 the training between the binary groups. We may, however, have lacked power for some of the
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23 smaller groups.
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32 **Follow-up evaluation**

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35 The characteristics of the medical students completing both pre-and post-training questionnaires
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37 and those completing the follow-up questionnaire ($N=159$) are shown in *Supplemental File 3*. The
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39 only differences were that fourth-year students were more likely to complete the follow-up
40
41 questionnaire than second-year students and there were differences in the distributions of religions.
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43 Follow-up scores were significantly higher than pre-training scores and significantly lower than
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45 post-training scores for all questions (*Supplemental File 4*). The follow up means are generally
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47 closer to the post-training means than the pre-training means (*Figure 3*).
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3 Twenty-seven (17.9%) of participants who completed the follow-up questionnaire reported that
4 they had had the opportunity to be an active bystander; of those, 23 (85%) participants intervened
5 and four reported that they did not feel able to act. Participants reported they were “*too scared to*
6 *call out*” racism and believed as medical students that their “*words mean nothing*” and that they
7 “*wouldn’t gain anything from bringing it up*”. Getting the chance to practice being an active
8 bystander was rated as ‘*Really Useful*’ (24.7%) or ‘*Quite Useful*’ (42.1%) and having the
9 opportunity to work with an actor to role play was rated ‘*Really Useful*’ (28.9%) or ‘*Quite Useful*’
10 (38.4%) by the participants. Most of the participants felt that the discussions and disclosures in the
11 session were ‘*Really Useful*’ (28.9%) and ‘*Quite Useful*’ (44.0%).
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27 **Qualitative results**

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30 Facilitators actively created a “*safe space*” and a “*comfortable environment*”, which allowed
31 participants to open-up and share personal experiences of discrimination. Some, particularly those
32 who had not faced discrimination themselves, were made more aware of what was happening in
33 their workplace:
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40 “*It was also interesting and a bit shocking to hear about some of my colleagues’*
41 *experiences, but this had highlighted to me how important it is for me to intervene*”
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45 Participants were able to learn from each other by seeing peers performing the role plays. Group
46 discussion between role plays allowed participants to discuss what they did well and how they
47 could deal with future situations:
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3 *“Getting the opportunity to hear how different colleagues handle the situations allows one*
4 *to take notes of things that worked will so as to use it in the future if we are faced with*
5 *these kinds of scenarios”*
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9
10 After the training, participants reported an increased sense of responsibility to be active bystanders
11 and being empowered to challenge discriminatory behaviours. Before the training, some admitted
12 that they would have done nothing if they witnessed such behaviours. Those who had been the
13 victims of these behaviours previously felt that as professionals it was just to be endured and there
14 was nothing that they could do:
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22 *“...I feel empowered now to speak up for myself and my colleagues when I witness*
23 *discrimination, whereas before I assumed that as professionals, we have to silently accept*
24 *discrimination”*
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30 The training did throw up some challenges for the participants. For instance, although they
31 expected them to be, participants found some of the role play scenarios uncomfortable and
32 challenging.
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37 *“It was challenging to be exposed to the characters portrayed by the actor, but it was*
38 *good to take me out of my comfort zone in a safe way”*
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43 Some participants expressed their nervousness in having to perform the role play in front of their
44 peers, but they thought, after the training, that they were more confident that they could now
45 handle these situations and, moreover, knew how to do it appropriately.
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50 *“I feel much more confident and although I was nervous to practice with the patient at*
51 *first it was really valuable, and I feel much more confident now”*
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3 Although they felt apprehensive, role play with an actor was recognised repeatedly as an
4
5 invaluable opportunity to practice their own, active, voice.
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8 *“The fact that we could see the scenarios with an actor, which made them feel more real*
9
10 *and showed me how I would feel more realistically in that situation”*
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13 Participants from minoritized groups or those who had experienced discrimination in the past
14 expressed positive views about the training was. They believed that their experiences were being
15 validated and the discrimination that they had faced was real especially as they were able to hear
16 from others with shared experiences:
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22 *“It was helpful to know that a lot of people go through similar scenarios and that training*
23 *is being provided to help”*
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26 *“I think it just reiterated some of the situations I have already faced as a brown woman.*
27
28 *It was helpful to see the sort of situations that others have been in and empathise with*
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30 *them”*
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36 However, some students observed that there was a difference in being an active bystander when
37 being a member of a marginalised group. For instance, this student felt that lacking lived
38 experience of discrimination may serve as a barrier to recognising the nuance of
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46 *“I think the training is a very good start in the right direction. However, I think it goes on*
47
48 *the assumption that medical students themselves are without bias and I think the*
49
50 *scenarios presented were situations which to me were quite obvious what the bias was. I*
51
52 *think there should be more scenarios which tackle the more nuanced things that certain*
53
54 *medical students may not be aware of and scenarios that help them to question their own*
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3 *biases they may have. I'm not sure how it would be possible to achieve it but I would say*
4
5 *I've had more scenarios where the bias was so very subtle and wouldn't necessarily be*
6
7 *picked up by someone else who has never had to be aware of those biases."*
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10 From watching their colleagues perform the role plays, they reported they now knew how they
11 would intervene, and they went away feeling safer, knowing they had someone to speak-up on
12 their behalf:
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18 *"...now we have had training, now we can expect our colleagues to intervene and stand-*
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20 *up"*
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23 A visual summary of the qualitative findings is shown in *Supplemental File 5*.
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30 **Discussion**

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34 This evaluation demonstrated that BiT was an effective and well-received training programme
35 addressing active bystander behaviour change through a comprehensive training programme using
36 real-life scenarios, across a range of discriminatory experiences developed by medical students
37 with protected characteristics, through role play with an actor. Existing evaluations of bystander
38 intervention training have focused on sexual harassment [33] and the one study that used a pre-
39 and post-intervention design evaluation with simulation for bystander intervention training, used
40 not an actor but a participant to play the role of perpetrator [34].
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50 By adopting a pre-and post-intervention design, we were able to demonstrate that BiT increases
51 knowledge of issues surrounding diversity and equality in clinical practice, creates increased
52 confidence in intervening when witnessing something racist homophobic, transphobic, and sexist,
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3 and increases skills and knowledge on how to intervene and speak up on behalf of someone else
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5 and that these improvements remained some months after the intervention. By collecting detailed
6
7 demographic information about our participants, we can see that the training benefits all, regardless
8
9 of their identity (e.g., group, gender, ethnicity, sexual orientation, disability, and religion).
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13 Some limitations need to be considered. Although evaluation was made integral within the session
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15 with time allowed to complete, not all participants completed the evaluations and respondents did
16
17 not always complete both the pre-and post-training questionnaires; this may have led to an
18
19 unrepresentative sample. Nevertheless, the extent of non-completion was small, and participants
20
21 who completed pre-training questionnaires only were not significantly different from those who
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23 completed both questionnaires on most demographic variables, except for group. Numbers were
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25 small, however, in some of the demographic categories.
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30 Furthermore, follow-up responses were possible only for medical students and could not be
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32 matched with the original questionnaires. Only a small number of qualified doctors and
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34 postgraduate students received the training, and so our results may be less robust for these groups.
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40 **Development of BiT**

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43 From feedback, additional scenarios should be developed for other protected characteristics,
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45 including faith-based discrimination, body-shaming, disability and mental health. New scenarios
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47 could also address complexities around hierarchy e.g., perpetrator being a person of higher
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49 seniority. Developing new scenarios could be an iterative process, with attendees helping to
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51 generate new scenarios, which would then reflect real-life situations.
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Future research

Although we were able to conclude that the intervention was effective in increasing participants' skills and knowledge of being an active bystander, and that the effects of the training remained at follow-up, we could not establish if the training actually increased the likelihood of someone intervening when witnessing something discriminatory. Future research could look at this using a matched follow-up design and including a longer-term follow up.

Additional questions could be added from scales looking at empathy (e.g., Interpersonal Reactivity Index [35] and willingness to intervene (e.g., amended versions of the Positive Attitude Towards Bullying Scale and Willingness to Intervene Scale [36], to see how effective the intervention is on these measures. Additional qualitative research using interviews or focus groups could be conducted to explore barriers to action.

Implications

Findings show that BiT is effective for students and qualified professionals and with a range of protected characteristics.. With the flexibility BiT permits and with new cases and settings, it is possible to extend the delivery of the training to wider groups of recipients. With interest and attention growing, new bystander training programmes are being developed; we have included recommendations that could be used to increase quality and effectiveness (*Figure 4*).

Whilst interventions such as BiT are important and clearly useful, other improvements to tackle discrimination should be made, such as ensuring fit-for-purpose reporting processes are in place

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3 on campus and placement, to ensure that staff and students can report an issue and that it can be
4 dealt with accordingly. To tackle prejudice in medicine, we need to ensure we have a workforce
5 that is educated and reflective about the detrimental effects of racism, homophobia, sexism and
6 other forms of discrimination [37].
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16 **Conclusion**

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19 The importance of addressing discrimination with bold, innovative interventions cannot be
20 overstated. It is essential that healthcare organisations across the UK have a zero-tolerance
21 approach to abuse, discrimination, bullying, and harassment [9]. Interventions that allow open
22 discussion and carefully supported personal disclosure in safe spaces where difficult and
23 uncomfortable discussions can take place and opportunities actually to change behaviour are
24 maximized must be developed to make a difference.
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38 **Acknowledgments**

39
40 The authors would like to acknowledge the Norwich Medical School Diversity in Medicine Team
41 and Norwich Medical School BAME Working Group for their work in helping design and deliver
42 the BiT programme.
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51 **Declaration of Interest Statement**

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55 The authors declare no conflict of interest.
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Funding

None.

Data Sharing Statement

The data from this study is available to other researchers on request.

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Table

Table 1 Characteristics of participants completing both pre-and post-training questionnaires and participants completing only pre-training questionnaire¹

		Completed pre-and post-questionnaires		Completed pre-questionnaire only		p-value ²
		n=569		n=106		
		n	(%)	n	(%)	
Group	Second-year medical student	288	(50.6)	40	(37.7)	0.004
	Fourth-year medical student	196	(34.5)	40	(37.7)	
	Postgraduate student	63	(11.1)	14	(13.2)	
	Qualified doctor	22	(3.9)	12	(11.3)	
Sex	Female	370	(65.0)	65	(61.3)	0.60
	Male	197	(34.6)	41	(38.7)	
	Prefer not to say	2	(0.4)	0	(0.0)	
Ethnicity	White	306	(53.8)	48	(45.3)	0.22
	Mixed/multiple ethnic groups	35	(6.2)	5	(4.7)	
	Asian/Asian British	158	(27.8)	40	(37.7)	
	Black/African/Caribbean/Black British	43	(7.6)	11	(10.4)	
	Other ethnic group	25	(4.4)	2	(1.9)	
	Prefer not to say	2	(0.4)	0	(0.0)	
Gender ID same as assigned at	Yes	562	(98.8)	106	(100.0)	>0.99
	No	4	(0.7)	0	(0.0)	

birth	Prefer not to say	3	(0.5)	0	(0.0)	
Sexual orientation	Heterosexual/straight	457	(80.3)	96	(90.6)	0.20
	Gay/lesbian	31	(5.5)	2	(1.9)	
	Bisexual	58	(10.2)	6	(5.7)	
	Other	5	(0.9)	0	(0.0)	
	Prefer not to say	18	(3.2)	2	(1.9)	
Defines self as disabled	No	546	(96.0)	104	(98.1)	0.59
	Yes	17	(3.0)	1	(0.9)	
	Prefer not to say	6	(1.1)	1	(0.9)	
Religion	No religion	246	(43.2)	39	(36.8)	0.28
	Christian	167	(29.4)	29	(27.4)	
	Muslim	68	(12.0)	13	(12.3)	
	Hindu or Sikh	52	(9.1)	18	(17.0)	
	Other	18	(3.2)	3	(2.8)	
	Prefer not to say	18	(3.2)	4	(3.8)	

1 Includes participants who filled in a post-training questionnaire whom we were unable to match

2 Fisher's exact test, except for group, which was a standard χ^2 test

Figures

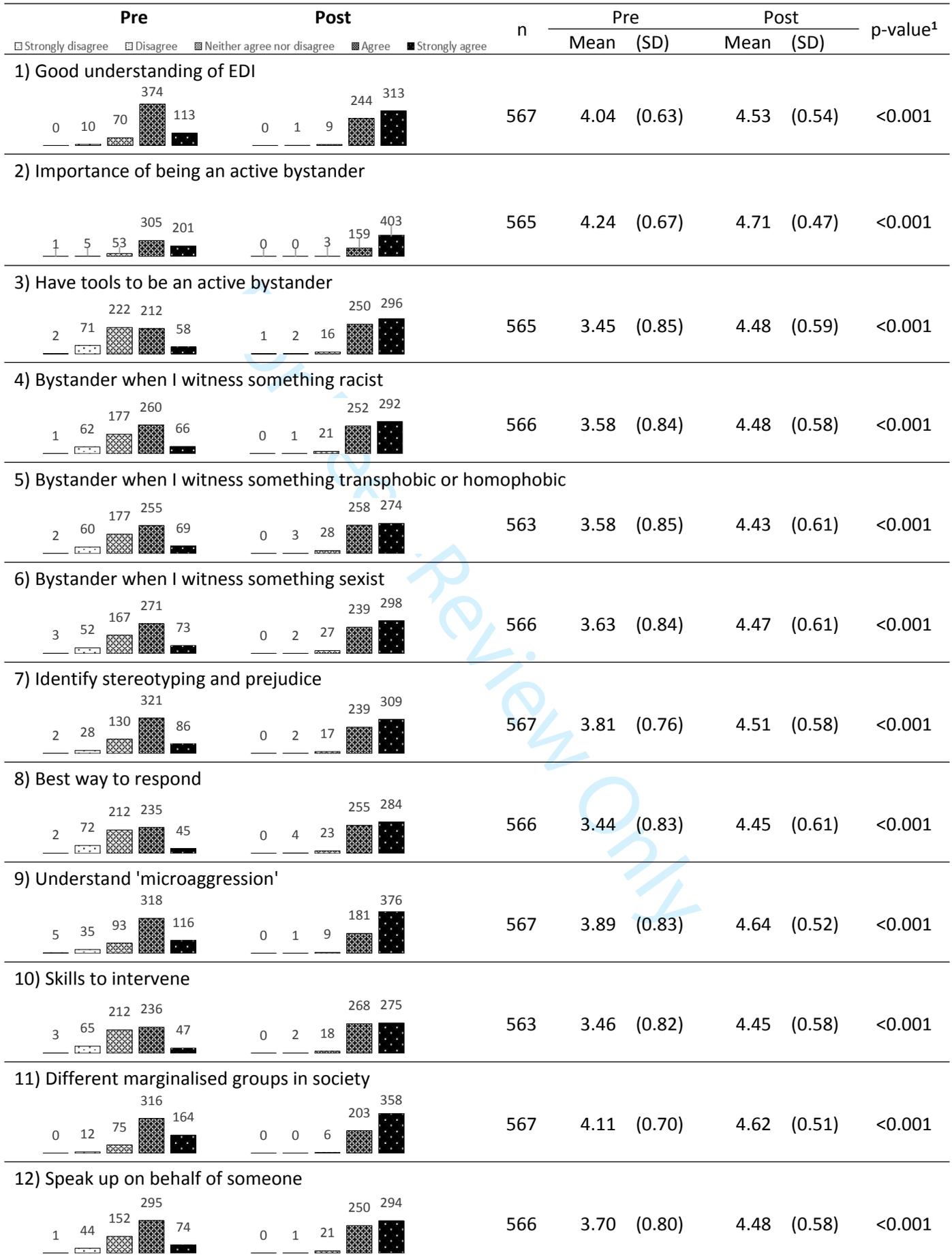
Figure 1 *Comparison of pre-and post-training scores by question*

Figure 2 *Mean total score pre-training and post-training by binary participant characteristics*

Figure 3 *Mean pre-training, post-training, and follow-up scores by question (medical students only)*

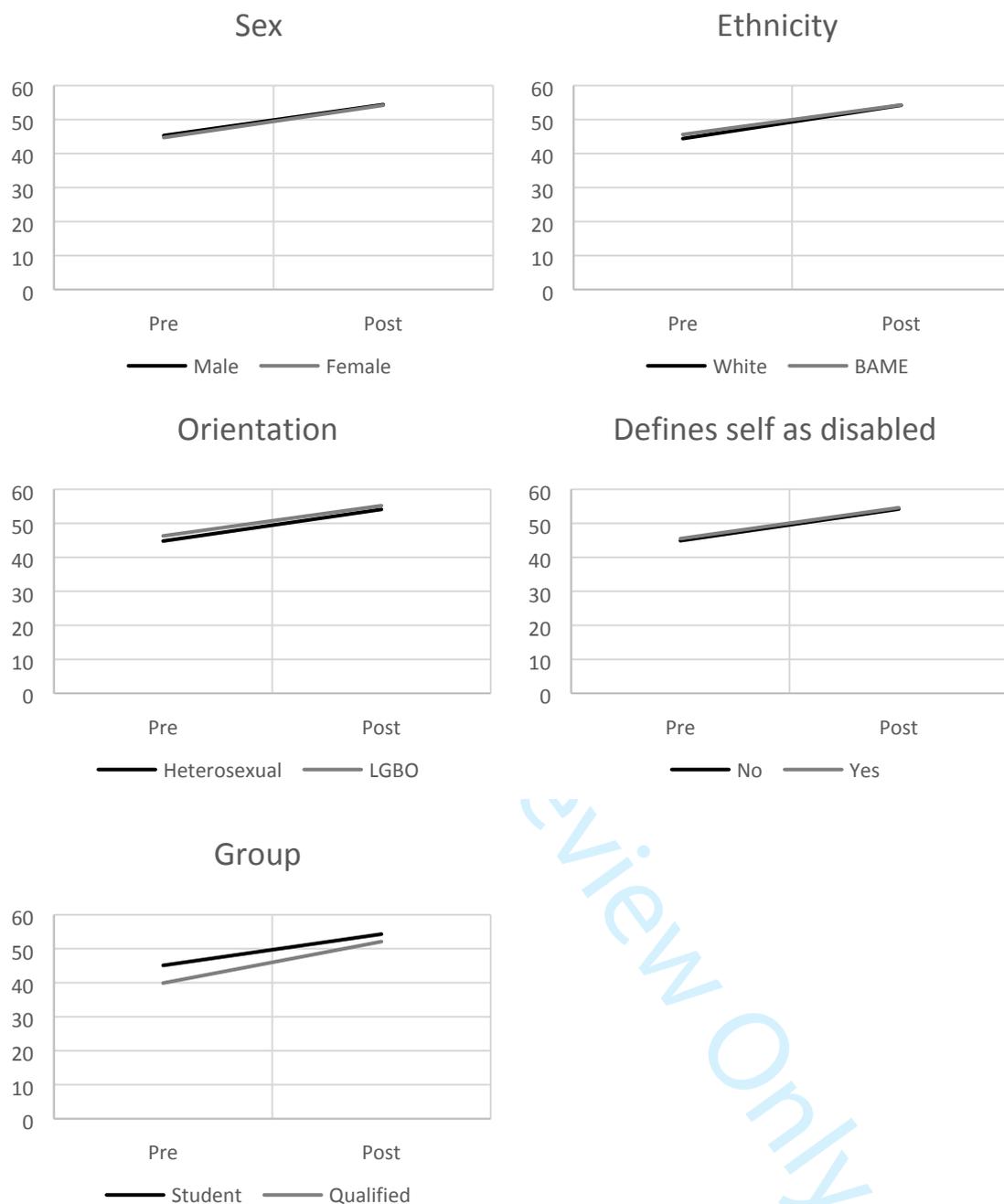
Figure 4 *Recommendations for intervention*

Figure 1 Comparison of pre- and post-training scores by question



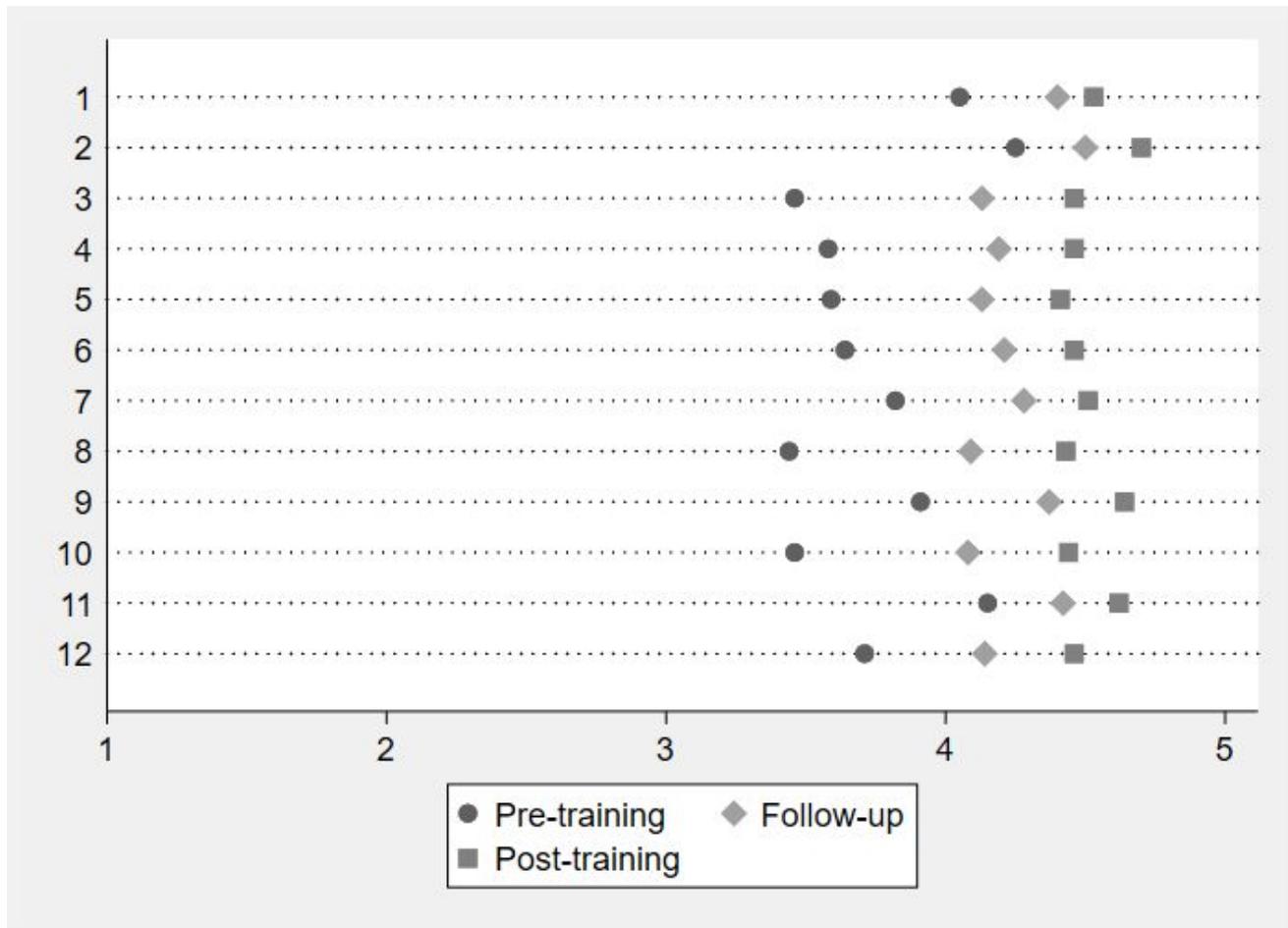
¹ Paired pre- and post-training scores compared using the signed rank test

Figure 2 Mean total score pre-training and post-training by binary participant characteristics



Review Only

Figure 3 Mean pre-training, post-training and follow-up scores by question (medical students only)



Peer Review Only

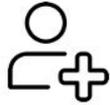
Figure 4 Recommendations for Interventions

Recommendations for Interventions

<p>1</p> <p>Theoretical Basis for Intervention</p> <p>Interventions should be developed with a theoretical basis. This addresses quality</p>	<p>10</p> <p>Paid Actors</p> <p>The inclusion of an actor allows for a fully immersive simulation experience and allows participants to witness and observe the experiences of received and challenged, discriminatory behaviour. A paid actor who was unknown to the participant always delivered the</p>
<p>2</p> <p>Change Behaviour as Well as Attitudes</p> <p>This required interventions which</p>	<p>11</p> <p>Intersectional Perspectives</p> <p>Working with scenarios that cover a range of protected characteristics (e.g., gender, sexuality, and ethnicity) enables participants to explore common issues</p>
<p>3</p> <p>Create a Safe and Supportive</p> <p>Allows participants to open-up and share personal experiences of dissemination. Can be the most impactful aspect of the</p>	<p>12</p> <p>Simulation/Role Play</p> <p>Role play creates the 'stepping off the cliff' moment moving into the simulated practice from the imagined version. It allows participants to build confidence in their ability to intervene before facing these situations in real life. It also</p>
<p>4</p> <p>Peer Learning: Learn from Others</p> <p>From watching others perform the role plays, participant will know how someone would act on their behalf if they needed</p>	<p>13</p> <p>Evaluation</p> <p>Evaluation ensures careful design of the intervention and attention to learning outcomes. Using mixed methods and in particular pre-post designs allow researchers to determine the effectiveness</p>
<p>5</p> <p>Small Groups</p> <p>Ensures that all participants can participate in a role play scenario. May also make participants feel more</p>	<p>14</p> <p>Iterative Development</p> <p>Development should be an iterative process, whereby those attending the training can help to generate new scenarios. Feedback from participants on how the training can be further developed</p>
<p>6</p> <p>Skilled Facilitators</p> <p>Create a safe and supportive environment for participants. They also play the role of the victim of the discrimination in the role play, as it is</p>	<p>15</p> <p>Supplementary Material</p> <p>Illustrative pre-reading materials can be useful to consolidate learning, as well as take home materials. For example,</p>
<p>7</p> <p>Allow for Group Discussion and</p> <p>Allows participants to feedback about what they did well or make suggestions on how they could handle the situation</p>	<p>16</p> <p>Collaborative</p> <p>Should be developed by a group of</p>
<p>8</p> <p>Emotional Labour: Debrief and Support</p> <p>Ensure there is an opportunity to debrief at the end of the session for participants,</p>	
<p>9</p> <p>Real Life Scenarios</p> <p>Having input from individuals from a range of backgrounds ensures that scenarios are a portrayal of real situations that are faced in real life.</p>	

Supplemental Digital Appendix 1 Example Scenario - Racism

Scenario 1: Racism

Patient
Details

Margaret Russell (68 years)

Setting



You are a second year medical student on Docking ward. You and your colleague, who is a second generation Korean, have been asked to perform a vascular examination on Mrs Russell. When your colleague is about to take the patient's blood pressure, the patient says, "*Your English is very good! When did you arrive here then dear?*". Your colleague looks uncomfortable and unsure as to how to respond.

Task



Intervene in the situation appropriately and address the comment made by the patient.

Trainer to ask for a volunteer (student to play the intervening second year medical student). Before the role play, the trainer can consider with the intervening student what their intervention will be or explore that 'in the moment'.

Group
Discussion

Do you think an intervention is needed in this situation? If not/if so – why?
 What might prevent bystanders from intervening in the situation?
 What do we mean by the term "microaggression" and why does it matter that we are aware of them?

Supplemental Digital Appendix 2 *Total score pre-training, post-training and difference in total score by binary participant characteristics*

	n	Pre-training			Post-training		Difference	
		Mean	(SD)	p-value ¹	Mean	(SD)	Mean	(SD)
Sex								
Male	191	45.3	(7.1)	0.37	54.4	(5.8)	9.0	(6.5)
Female	357	44.7	(6.9)		54.2	(5.4)	9.4	(5.9)
Ethnicity								
White	297	44.4	(6.9)	0.047	54.2	(5.6)	9.8	(6.2)
BAME	251	45.6	(7.0)		54.3	(5.6)	8.7	(5.9)
Orientation								
Heterosexual	442	44.8	(7.1)	0.06	54.1	(5.7)	9.4	(6.1)
LGBO	92	46.3	(6.4)		55.2	(5.0)	8.9	(6.0)
Status								
Student	531	45.1	(6.9)	<0.001	54.3	(5.6)	9.2	(6.1)
Qualified	19	39.9	(6.7)		52.1	(5.9)	12.2	(7.1)
Defines self as disabled								
No	528	44.9	(7.0)	0.74	54.2	(5.6)	9.3	(6.1)
Yes	17	45.5	(6.2)		54.6	(5.1)	9.1	(6.7)
Gender identity same as assigned at birth								
Yes	544	44.9	(7.0)	0.50	54.2	(5.6)	9.3	(6.1)
No	3	47.7	(5.8)		60.0	(0.0)	12.3	(5.8)
All	550	45.0	(7.0)		54.2	(5.6)	9.3	(6.1)

¹ Total pre-training scores compared using the two-sample t-test

Supplemental Digital Appendix 3 *Characteristics of medical students completing both pre- and post-training questionnaires and medical students completing follow-up*

Group		Completed pre- and post-questionnaires		Completed follow-up		p-value ¹
		n=484		n=159		
		n	(%)	n	(%)	
Group	Second year medical student	288	(59.5%)	75	(47.2%)	0.006
	Fourth year medical student	196	(40.5%)	84	(52.8%)	
Sex	Female	308	(63.6%)	106	(66.7%)	0.13
	Male	174	(36.0%)	50	(31.4%)	
	Other	0	(0.0%)	1	(0.6%)	
	Prefer not to say	2	(0.4%)	2	(1.3%)	
Ethnicity	White	266	(55.0%)	83	(52.2%)	0.22
	Mixed/multiple ethnic groups	30	(6.2%)	7	(4.4%)	
	Asian/Asian British	132	(27.3%)	53	(33.3%)	
	Black/African/Caribbean/Black British	35	(7.2%)	10	(6.3%)	
	Other ethnic group	19	(3.9%)	3	(1.9%)	
	Prefer not to say	2	(0.4%)	3	(1.9%)	
Gender ID same as assigned at birth	Yes	480	(99.2%)	156	(98.1%)	0.06
	No	3	(0.6%)	0	(0.0%)	
	Prefer not to say	1	(0.2%)	3	(1.9%)	
Sexual orientation	Heterosexual/straight	385	(79.5%)	129	(81.1%)	0.60
	Gay/lesbian	30	(6.2%)	8	(5.0%)	
	Bisexual	48	(9.9%)	12	(7.5%)	
	Other	5	(1.0%)	1	(0.6%)	
	Prefer not to say	16	(3.3%)	9	(5.7%)	
Defines self as disabled	No	465	(96.1%)	152	(95.6%)	0.32
	Yes	14	(2.9%)	3	(1.9%)	
	Prefer not to say	5	(1.0%)	4	(2.5%)	
Religion	No religion	216	(44.6%)	65	(40.9%)	0.005
	Christian	135	(27.9%)	41	(25.8%)	
	Muslim	58	(12.0%)	14	(8.8%)	
	Hindu or Sikh	43	(8.9%)	20	(12.6%)	
	Other	14	(2.9%)	1	(0.6%)	
	Prefer not to say	18	(3.7%)	18	(11.3%)	

¹ Fisher's exact test, except for group, which was a standard χ^2 test

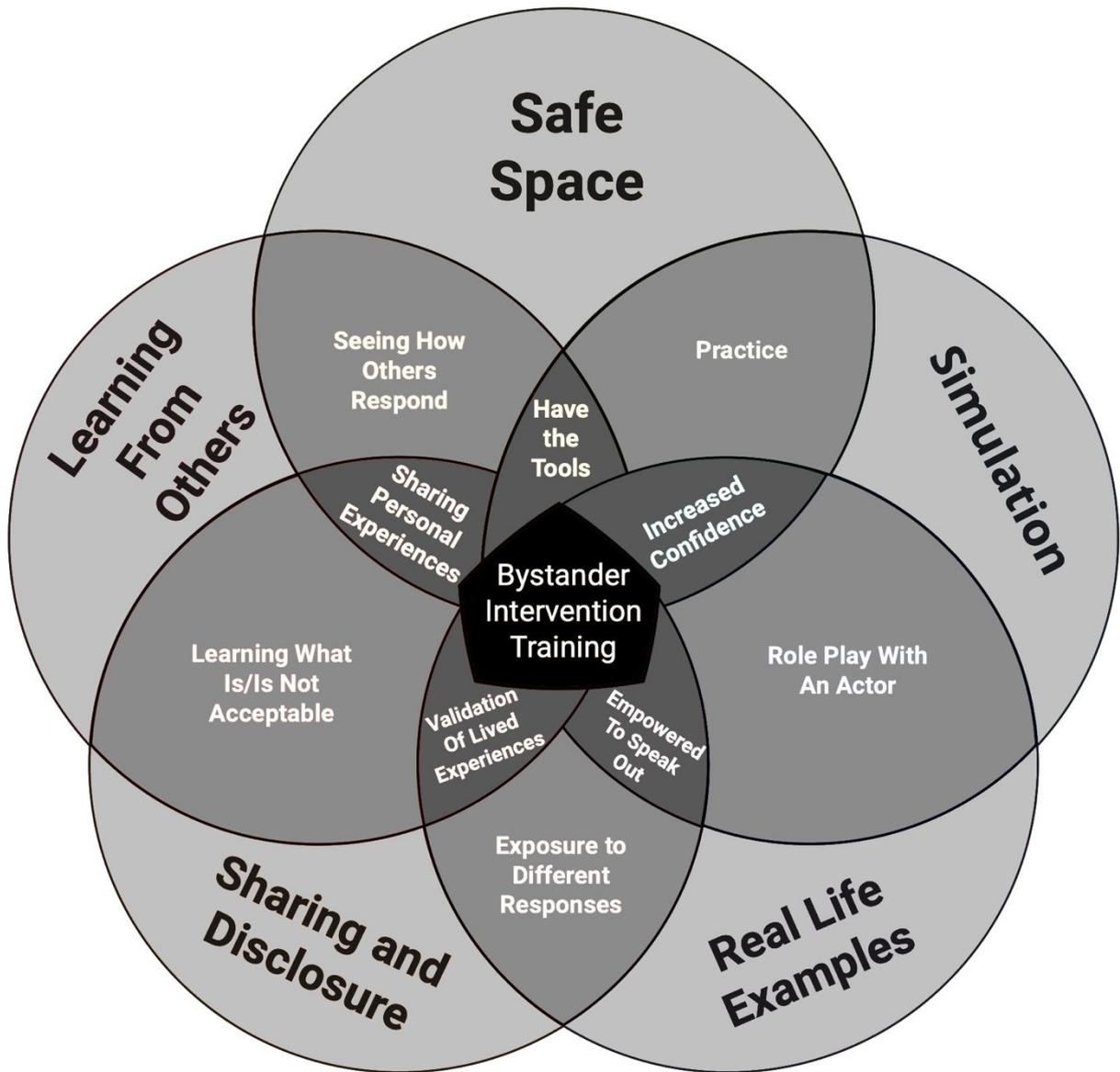
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For Peer-Review Only

Supplemental Digital Appendix 4 Comparison of pre-training, post-training and follow-up scores
(medical students only)

Question	Pre			Post			Follow-up (FU)			p Pre vs FU ¹	p Post vs FU ¹
	n	Mean	(SD)	n	Mean	(SD)	n	Mean	(SD)		
1)	482	4.05	(0.62)	484	4.53	(0.54)	159	4.40	(0.55)	<0.001	0.01
2)	480	4.25	(0.66)	484	4.70	(0.47)	159	4.50	(0.57)	<0.001	<0.001
3)	481	3.46	(0.84)	484	4.46	(0.60)	159	4.13	(0.76)	<0.001	<0.001
4)	481	3.58	(0.85)	484	4.46	(0.58)	159	4.19	(0.75)	<0.001	<0.001
5)	480	3.59	(0.84)	483	4.41	(0.62)	159	4.13	(0.73)	<0.001	<0.001
6)	481	3.64	(0.84)	484	4.46	(0.60)	159	4.21	(0.72)	<0.001	<0.001
7)	482	3.82	(0.76)	484	4.51	(0.57)	159	4.28	(0.65)	<0.001	<0.001
8)	481	3.44	(0.84)	484	4.43	(0.62)	159	4.09	(0.74)	<0.001	<0.001
9)	482	3.91	(0.84)	484	4.64	(0.51)	159	4.37	(0.69)	<0.001	<0.001
10)	481	3.46	(0.85)	484	4.44	(0.58)	159	4.08	(0.78)	<0.001	<0.001
11)	482	4.15	(0.69)	484	4.62	(0.51)	159	4.42	(0.60)	<0.001	<0.001
12)	481	3.71	(0.80)	484	4.46	(0.58)	159	4.14	(0.74)	<0.001	<0.001

Supplemental Digital Appendix 5 Visual Summary of Qualitative Findings



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Practice points

- The study adds to the growing body of knowledge about Bystander Intervention Training in clinical settings.
- The training design provided an intersectional approach to tackling discrimination.
- The findings increase our knowledge about what works well in Bystander Intervention Training and provides recommendations for the design and delivery of future training.

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Conceptualisation JSe, BH, BJ and KO. Study design and guarantor JSe. Qualitative analysis and qualitative interpretation JSe and LT. Statistical analysis and statistical interpretation JSk. All authors drafted and critically revised the manuscript for important intellectual content