

CRITICALLY APPRAISED TOPIC

FOCUSED CLINICAL QUESTION

In physical therapists practicing in outpatient orthopedic or pediatric settings, do educational interventions reduce implicit racial bias compared to workplace diversity?

AUTHOR

Prepared by	Bria Dunn, SPT	Date	11/22/2017
Email address	bria_dunn@med.unc.edu		

CLINICAL SCENARIO

This clinical question was derived from research I am conducting with fellow third year student, Jennell McIntosh, with the guidance of Dr. Dana McCarty, PT, DPT, PCS, C/NDT. Implicit biases reflect implicit attitudes or stereotypes toward individuals or groups based on characteristics, such as race, that unconsciously affect how we interact with others.¹ The available research about healthcare practitioners, mostly physicians and nurses, shows that implicit biases significantly impact patient-provider interactions, clinical decision-making and subsequent healthcare outcomes.^{2,3} While our research only seeks to determine the prevalence, if any, implicit racial biases among physical therapists practicing in outpatient orthopedic or pediatric settings, the findings for this clinical question can potentially inform interventions to reduce these biases in order to improve healthcare outcomes for patients who seek our services. This ultimately benefits not only patients but also providers and payers alike as the healthcare industry transitions toward value-based healthcare delivery.

SUMMARY OF SEARCH

A total of 3 articles were identified across 4 databases—CINAHL, PsycINFO, PubMed and Scopus—that met the established inclusion and exclusion criteria. One article was a systematic review of cohort studies and the two others were pre-test post-test designs with control and single groups respectively. Although the systematic review is a higher level of evidence and of greater methodological quality based on risk of bias assessments, the pre-test post-test designs were more relevant to the clinical question and therefore selected as best evidence for critical appraisal.

- Prior to intervention, implicit racial biases against African-Americans and negative attitudes towards them were common among healthcare practitioners and others who work in healthcare settings.
- Some structured educational interventions appear effective to reduce implicit racial biases against African-Americans and improve attitudes towards them while others do not.
- No research at present has examined the direct effects of workplace diversity on implicit racial biases among healthcare practitioners.

CLINICAL BOTTOM LINE

There is little available evidence at present to inform educational intervention(s) for the reduction of implicit racial biases among physical therapists. In fact, many are just beginning to acknowledge that healthcare practitioners harbor implicit biases, much like the general population, and the detrimental effect they have on patient care.^{2,3} The available evidence suggests that a systematic, multi-level cultural competency/diversity intervention can reduce implicit racial biases among hospital employees but it cannot be determined whether these reductions are statistically significant or clinically meaningful or which aspect of the complex intervention accounts for the greatest reductions. A shorter, targeted intervention did not induce statistically significant or clinically meaningful reductions in implicit racial bias in a group of occupational therapists, however, the strength of held attitude and beliefs may influence propensity to observable change on certain measures of implicit bias. Future research is indicated with sound methodological quality, especially larger sample sizes and consistent reporting of results, to determine the effects of educational intervention(s) on reducing implicit racial bias, in addition to research examining the role of workplace diversity. Ideally, future research would target physical therapists as the clinical question proposes, however, this topic is so grossly understudied that informing intervention(s) based on the conclusions from research about healthcare practitioners may have to suffice for the foreseeable future.

This critically appraised topic has been individually prepared as part of a course requirement and has been peer-reviewed by one other independent course instructor

SEARCH STRATEGY

Terms used to guide the search strategy			
Patient/Client Group	Intervention (or Assessment)	Comparison	Outcome(s)
"physical therap*" physiotherap* "rehabilitation therap*" orthopedic orthopaedic pediatric paediatric <i>The following terms were added to broaden the population after manipulating the initial search strategy yielded 0 results:</i> healthcare provider healthcare professional healthcare practitioner	education* "educational intervention*" training retraining	workplace job company office profession* diverse diversity	"implicit bias" "unconscious bias" race racial

Final search strategy (history):

Search	Query	Items found
#8	Search (#7 AND (#2 OR #3) AND #4) Sort by: Relevance	9
#7	Search (healthcare AND (practitioner OR professional OR provider)) Sort by: Relevance	141693
#6	Search (#1 AND (#2 OR #3) AND #4) Sort by: Relevance	0
#5	Search (#1 AND #2 AND #3 AND #4) Sort by: Relevance	0
#4	Search (("implicit bias" OR "unconscious bias") AND (race OR racial))	239
#3	Search (((workplace OR job OR office OR professional) AND (diverse OR diversity)))	10478
#2	Search (education OR "education* intervention" OR training OR retraining)	1405376
#1	Search ("physical therap*" OR physiotherapy* OR "rehabilitation therap*" AND ((orthopedic OR orthopaedic) AND (pediatric OR paediatric)))	467

Databases and Sites Searched	Number of results	Limits applied, revised number of results (if applicable)
PubMed	9	The initial search strategy (Search #5) yielded 0 results even once the comparison of educational interventions to workplace diversity was abandoned to include articles with either intervention (Search #6). For this reason, the population had to be expanded from orthopedic and pediatric physical therapists to include all healthcare practitioners (Search #8), No limits were applied across any databases due to the low number of results yielded from the final search strategy (Search #8).
CINAHL	5	
PsycINFO	8	
Scopus	7	

INCLUSION and EXCLUSION CRITERIA

Inclusion Criteria
<p>Participants were healthcare practitioners regardless of profession or setting</p> <p>Design included some type of educational intervention(s) or assessment of workplace diversity</p> <p>Study measured change in implicit racial bias using a related outcome measure</p> <p>Article was published in English</p>
Exclusion Criteria
<p>Abstracts, conference proceedings, letters to the editor and narrative reviews</p>

RESULTS OF SEARCH

Summary of articles retrieved that met inclusion and exclusion criteria

Author (Year)	Risk of bias (quality score)	Level of Evidence	Relevance	Study design
Maina et al. (2017) ⁴	AMSTAR: 5/11	Level 2a	Moderate	Systematic review of cohort studies
Steed (2010) ⁵	Downs and Black: 10/29	Level 4	High	Pre-test post-test single group
Weech-Maldonado et al. (2016) ⁶	PEDro: 2/11	Level 2b (downgraded: low quality randomized control trial with poor follow-up and reporting)	High	Pre-test post-test control group

BEST EVIDENCE

The following 2 studies were identified as the 'best' evidence and selected for critical appraisal. Rationale for selecting these studies were:

- **Weech-Maldonado et al. (2016)⁶**— While this study is *extremely* low quality (PEDro: 2/11), it included the expanded population from the final search strategy, healthcare practitioners, and interventions of interest implemented on the organizational and individual levels to some degree. This study implemented a pre-test post-test control group design, making comparisons possible across both levels at two points of measurement. Compared to the other studies, this one informs the clinical question despite its *extremely*

low quality.

- **Steed (2010)**⁵— This study is also low quality (Downs and Black: 10/29) but higher than the Weech-Maldonado et al. (2016) study. It included a comparable population to the clinical question, occupational therapists, who are similar, if not the same, in terms of the patients they treat and the settings they work. The author cited that these professionals are majority white and female, which is overwhelmingly similar to the professional demography of physical therapists.⁷ This study also included one intervention of interest using a pre-test post-test single group design, making comparison possible at two points of measurement. Compared to the other studies, this one best informs the clinical question despite its low quality.

SUMMARY OF BEST EVIDENCE

(1) Description and appraisal of Hospital Cultural Competency as a Systematic Organizational Intervention: Key Findings from the National Center for Healthcare Leadership Diversity Demonstration Project by Weech-Maldonado et. al (2016)

Aim/Objective of the Study/Systematic Review:

The objective of this study was to assess the effects of a systematic, multi-level cultural competency/diversity intervention introduced by the healthcare system on organizational and individual level competencies and outcomes (listed under **Outcome Measures**).

Study Design

- This was a randomized control trial (at the hospital level) with a pre-test post-test control group study design
- Two healthcare systems agreed to participate out of a national sample of 25 systems
- Two hospitals within each system were selected to participate but it is unclear how these were chosen
- Random assignment was then performed to determine the intervention and control hospitals within each system, but it is unclear how this was performed
- There was no blinding of any parties involved or allocation concealment
- Comprehensive pre-assessment was performed over 6 months → the intervention (or control) was applied over 2.5 years → comprehensive post-assessment was performed over 6 months

Setting

Both healthcare systems that agreed to participate from a national sample were located in the eastern United States. Within each healthcare system, both hospitals selected to participate served the same metropolitan communities.

Participants

Within the intervention hospitals, the chief executive officer (CEO), leadership team and one general medical/surgical nursing unit received the intervention. The units consisted of caregivers, directors, supervisors, managers and support staff, but it is unclear how the units were selected to receive the intervention as no eligibility criteria or sampling and selection methods were specified. The intervention units were then matched with control units at their respective control hospitals, presumably for unit and unit member similarities. It is also unclear whether unit members at the intervention hospitals had the option to participate in the cultural competency/diversity intervention or whether it was an employment requirement.

Ultimately, there were 287 participants with varied roles in the organization including non-clinical staff (6.7%), clinical support staff or licensed clinicians (12.9%), nursing (64.3%), medicine (1.6%) and administration (14.5%). The race and gender makeup were 13.2% male and 86.8% female, and 67.7% white, 25.1% black, 1.8% Hispanic & 5.4% other. The majority of participants (51.2%) were in the late career stage (>10 years) while 30.6% and 18.1% were in the early (<5 years) and mid (5-10 years) stages. Education attained varied with 2.1% completing some high school, 11.5% high school or GED, 44.9% some college or 2-year degree, 28.9% college graduates & 12.5% Master's degree or above.

Intervention Investigated

Control

The control hospitals received no intervention relative to the intervention hospitals but underwent identical pre- and post-assessments.

Experimental

A project team conducted comprehensive pre-assessment consisting of the outcome measures (described under **Outcome Measures**) plus interviews, focus groups and website analysis. Based on this, a feedback report was

developed by the project team then a diversity coach met with the hospital's CEO and leadership team to review the report. The diversity coach, in collaboration with the hospital's CEO and leadership team, created an organizational plan with cultural competency/diversity intervention including infrastructure development, executive coaching and trainings at the organizational level and individual-level action plans at that respective level to be applied over 2.5 years. The intervention's conceptual framework is based on two models—The Model of Organizational Performance and Change and The Interactional Model of Cultural Diversity. Other interventions were provided as necessary at the discretion of the intervention hospitals but were not described. Further it is unclear who comprised the project team and applied specific interventions as well as the time frame for specific interventions.

Outcome Measures

Organizational level competencies were identified as (including their respective **outcome measures**):

1. Diversity Leadership

- **National Center for Healthcare Leadership (NCHL) Diversity Leadership and Cultural Competence Assessment** completed online by executive leadership at the intervention and control hospitals
 - measured 5 subscales—1. Diversity Leadership (10 items), 2. Strategic Orientation (15 items), 3. Diversity Infrastructure (14 items), 4. Professional Development (14 items) and 5. Culture/Climate (15 items)
 - for a total of 68 items, each was scored on a 7-point Likert scale where 1 indicates *strongly disagree* and 7 indicates *strongly agree* for a total range of 68 to 476
 - subscale scores were reported as an average of the item scores within each subscale
- **Cultural Competency Assessment Tool for Hospitals (CCATH)** completed online by executive leadership at the intervention and control hospitals, relying on consultation with human resources, nursing managers and diversity leaders as necessary
 - measured 7 relevant *Diversity Leadership* subscales—1. Leadership and Strategic Planning (6 items), 2. Data Collection on Inpatient Population (2 items), 3. Data Collection on Service Area (7 items), 4. Performance Management Systems and Quality Improvement (3 items), 5. Human Resources Practices (8 items), 6. Diversity Training (3 items) & 7. Community Representation (2 items)
 - for a total of 31 items, each was scored on a 0-100 range where 100 indicates complete adherence⁸
 - subscale scores were reported as an average of the item scores within each subscale

2. Strategic Human Resource Management

- **NCHL Healthcare Leadership Questionnaire** completed online by the CEO at the intervention and control hospitals and submitted via email
 - measured 8 subscales—1. Recruitment and Selection (15 items), 2. Job Design/Work Systems (4 items), 3. Learning and Development (15 items), 4. Performance Management (8 items), 5. Reward and Recognition (3 items), 6. Succession Planning (10 items), 7. Governance (8 items) & 8. Leadership (2 items)
 - for a total of 65 items, each was scored on a 7-point Likert scale where 1 indicates *not at all* and 7 indicates *a great deal* for a total range of 65 to 455
 - subscale scores were reported as an average of the item scores within each subscale

3. Patient Cultural Competency

- **Cultural Competency Assessment Tool for Hospitals (CCATH)** completed online by executive leadership at the intervention and control hospitals, relying on consultation with human resources, nursing managers and diversity leaders as necessary
 - measured 5 relevant *Patient Cultural Competency* subscales—1. Availability of Interpreter Services (4 items), 2. Interpreter Services Policies (4 items), 3. Quality of Interpreter Services (3 items), 4. Translation of Written Materials (6 items) & 5. Clinical Cultural Competency Practices (4 items)
 - for a total of 21 items, each was scored on a 0-100 range where 100 indicates complete adherence
 - subscale scores were reported as an average of the item scores within each subscale

Organizational level outcomes were identified as (including their respective **outcome measures**):

1. Diversity Climate

- **Diversity Perceptions Scale: Organizational Domain** completed online by all leadership and staff members at the intervention and control hospitals
 - measures 2 subscales—1. Organizational Fairness (items 1-6) & 2. Organizational Inclusion (items 7-10)
 - for a total of 10 items, each was scored on a 6-point Likert scale where 1 indicates *strongly disagree* and 6 indicates *strongly agree*
 - subscale scores were reported as an average of the items scores within each subscale

2. Workforce Diversity

- based on data from the **Equal Employment Opportunity's Employer Information Report (EEO-1)**

- reported as the percentage of non-white minorities and women in/among 1. Executive/senior management, 2. First/mid management, 3. Professionals, 4. Technicians, 5. Administrative support & 6. Service workers

Individual level competencies were identified as (including their respective **outcome measures**):

1. Diversity Attitudes

- **Discovering Diversity Profile** completed on-site by all leadership and staff members at the intervention and control hospitals
 - measured 4 subscales (with 2 dimensions each)—1. Knowledge (1-stereotypes, 2-information), 2. Understanding (3-awareness, 4-empathy), 3. Acceptance (5-receptiveness, 6-respect) & 4. Behavior (7-self-awareness, 8-interpersonal skills)
 - for a total of 80 items, each was scored on a 4-point Likert scale where 1 indicates *strongly disagree* and 4 indicates *strongly agree*
 - dimension scores were reported as an average of the item scores for each dimension

2. Implicit Bias

- **Implicit Attitude Test (IAT)** completed online by all leadership and staff members at the intervention and control hospitals
 - completed 3 subtests—1. Race, 2. Gender/Having a Professional Career & 3. Age
 - for each subtest, participants are presented a series of concepts and must select between two evaluations or stereotypes for each
 - the strength of the associations between concepts and evaluations/stereotypes are calculated with consideration to reaction time for selection (latent response time)
 - results of each subtest are reported as either no/slight/moderate/strong preference for one group over another

3. Racial/Ethnic Identity

- **Black Racial Identity Attitude Scale (BRIAS)** completed on-site by all leadership and staff members who self-identified as black at the intervention and control hospitals
 - measured 5 identity development stages—1. Conformity (17 items), 2. Dissonance (8 items), 3. Immersion (14 items), 4. Emersion (8 items) & 5. Internalization (13 items)
 - for a total of 60 items, each was scored on a 5-point Likert scale where 1 indicates *strongly disagree* and 5 indicates *strongly agree*
 - composite scores were reported as a sum of the item scores within each progressive stage
- **White Racial Identity Attitude Scale (WRIAS)** completed on-site by all leadership and staff members who self-identified as white at the intervention and control hospitals
 - measured 6 identity development stages—1. Contact (10 items), 2. Disintegration (10 items), 3. Reintegration (10 items), 4. Pseudoindependence (10 items), 5. Immersion/Emersion (10 items) & 6. Autonomy (10 items)
 - for a total of 60 items, each was scored on a 5-point Likert scale where 1 indicates *strongly disagree* and 5 indicates *strongly agree*
 - composite scores were reported as a sum of the item scores within each progressive stage
- **People of Color Racial Identity Attitudes Scale** completed by all leadership and staff members who did not self-identity as black or white
 - **Only 7 participants racially identified in a category different than Black or White and since this amount was so few, this corresponding outcome measure was excluded from post-intervention analysis*

Main Findings

Regarding analysis, the authors wrote: "Descriptive statistics (means and standard deviations) were calculated for all the measures used in this study both pre- and post-intervention. All hypothesis involving multiple observations were evaluated by conducting *t* tests and chi-square tests of the pre-post score differences and to test whether the pre-post change score was significantly different when comparing the intervention to the control hospital within each system. Hypotheses involving single observations at the hospital level were evaluated descriptively by comparing the change scores (before and after intervention) for intervention and control hospitals." (pg.7) Despite this, the authors did not provide any descriptive or inferential statistics but instead a summary of findings wherein they stated whether their hypotheses were supported, partially supported or not supported based on statistical analysis of the relevant outcome measure(s). In some instances, the authors reported examples of score changes (% change) but not for every subscale or domain of every outcome measure. All reported score changes are listed in the table below if provided in the original article.

Hypotheses:

1a. "Intervention hospitals will experience an increase in diversity leadership compared to the control hospitals." (pg.8)		
	Intervention Hospital 1 vs. Control Hospital 1	Intervention Hospital 2 vs. Control Hospital 2
Supported, Partially supported, or	Supported	Partially supported

Not supported?		
NCHL Diversity Leadership and Cultural Competence Assessment	Increase in total scores Reported changes: •Diversity Infrastructure: 1.0 point (20.4%) •Diversity Leadership: 0.4 (8.3%)	Decrease in totals scores Reported changes: •Strategic Orientation: 1.3 points (27.6%) •Diversity Leadership: 0.2 (3.4%)
Cultural Competency Assessment Tool for Hospitals (CCATH)	Increase in subscales scores for 3/6 subscales Reported changes: •Data Collection on Service Area: 14.3 points (23.4%) •Human Resources Practices: 14.3 points (20%) •Leadership and Strategic Planning: 0.1 points (8.5%)	Increase in subscale scores for 4/6 subscales Reported changes: •Leadership and Strategic Planning: 33.3 points (199%) •Data Collection on Service Area: 25 points (25%) •Performance Management Systems: 25% (25%) •Human Resources Practice: 14.3 points (25%)
Hypothesis 1b: "Intervention hospitals will experience an increase in strategic human resource management compared to the control hospitals." (pg.8)		
	Intervention Hospital 1 vs. Control Hospital 1	Intervention Hospital 2 vs. Control Hospital 2
Supported, Partially supported, or Not supported?	Supported	Supported
NCHL Healthcare Leadership Questionnaire	Increase in total scores Reported changes: •Governance: 1.9 points (41.3%) •Recruitment and Selection: 0.2 (4.9%)	Increase in total scores Reported changes: •Recruitment and Selection: 3.0 points (54.9%) •Job Design/Work System: 0.2 points (-5.0%)
Hypothesis 1c: "Intervention hospitals will experience an increase in patient cultural competency compared to the control hospitals." (pg.8)		
	Intervention Hospital 1 vs. Control Hospital 1	Intervention Hospital 2 vs. Control Hospital 2
Supported, Partially supported or Not supported?	Partially supported	Not supported
Cultural Competency Assessment Tool for Hospitals (CCATH)	Increase in subscale scores for 4/5 subscales Reported changes: •Clinical Cultural Competency Practices: 75 points (97.5%) •Interpreter Services Written Policies: 50 points (58.3%) •Quality of Interpreter Services: 33.3 points (33.3%) •Translation Services: 20 points (28.6%) Decrease in subscale score for Interpreter Services Availability: -30 points (-50%)	Decrease in subscale scores for 4/5 subscales Reported changes: •Translation Services: -30 points (-40%) •Interpreter Services Written Policies: -25 points (-25%) •Interpreter Services Quality: -33.4 points (-50.1%) •Interpreter Services Availability: -10 points (-10%) Increase in subscale score for Clinical Cultural Competency Practices: 25 points (33.3%)
Hypothesis 2a: "Participants in intervention hospitals will experience an improvement in diversity attitudes compared to participants in control hospitals." (pg.8)		
	Intervention Hospital 1 vs. Control Hospital 1	Intervention Hospital 2 vs. Control Hospital 2
Supported, Partially supported or Not supported?	Partially supported	Not supported
Discovering Diversity Profile	Increase in dimension scores for 7/8 dimensions Reported changes: •Information: 2.1 points (7.4%) •Respect: 0.25 points (0.6%)	Increase in dimension scores for 6/8 dimensions Reported changes: •Stereotypes: 1.3 points (4.6%) •Self-Awareness: 0.3 points (1.0%)
Hypothesis 2b. "Participants in intervention hospitals will experience a reduction in implicit bias compared to participants in control hospitals." (pg.8)		

	Intervention Hospital 1 vs. Control Hospital 1	Intervention Hospital 2 vs. Control Hospital 2
Supported, Partially supported or Not supported?	Supported	Partially supported
IAT scores for race, age and gender	Race: Decrease in <i>strong preference</i> for whites over blacks Age: Decrease in <i>strong preference</i> for young over old Gender: Significant trend from <i>no preference</i> toward general preference for women with careers	Race: Trend from general preference for whites over blacks toward <i>no preference</i> or general preference for blacks over whites Age: Trend toward greater preference for young over old Gender: Trend toward greater preference for men with careers
Hypothesis 2c. "Participants in intervention hospitals will experience a greater development in their racial/ethnic identity status compared to participants in control hospitals. (pg.8)		
	Intervention Hospital 1 vs. Control Hospital 1	Intervention Hospital 2 vs. Control Hospital 2
Supported, Partially supported or Not supported?	Partially supported	Partially supported
White Racial Identity Attitude Scale (WRIAS)	Fewer participants scored within the higher-order stages of racial identity development (Immersion/Emersion and Autonomy)	Fewer participants scored within the higher-order stages of racial identity development (Immersion/Emersion and Autonomy)
Black Racial Identity Attitude Scale (BRIAS)	More participants scored within the higher-order stages of racial identity development	More participants scored within the higher-order stages of racial identity development
People of Color Racial Identity Attitudes Scale	<i>Only 7 participants racially identified in a category other than black or white and since this amount was so few, this corresponding outcome measure was excluded from analysis</i>	
Hypothesis 3a. "Intervention hospitals will experience greater improvement in diversity climate compared to the control hospitals." (pg.9)		
	Intervention Hospital 1 vs. Control Hospital 1	Intervention Hospital 2 vs. Control Hospital 2
Supported, Partially supported or Not supported?	Supported	Partially supported
Diversity Perceptions Scale: Organizational Domain	Increase in both subscales within the domain Reported changes: •Organizational Inclusion: 0.4 points (8.9%) •Organizational Fairness: 0.1 points (2.2%)	Decrease in both subscales within the domain for the intervention and control hospitals but to a lesser extent for the intervention hospital
Hypothesis 3b. "Intervention hospitals will experience a greater increase in the diversity of their workforce compared to the control hospitals." (pg.9)		
	Intervention Hospital 1 vs. Control Hospital 1	Intervention Hospital 2 vs. Control Hospital 2
Supported, Partially supported or Not supported?	Partially supported	Not supported
based on data from the Equal Employment Opportunity's Employer Information Report (EEO-1)	Reported changes for percentage of non-white minorities: •Increased for Management for intervention and control hospitals but to a greater extent at the intervention hospital (16.4%) Reported changes for percentage of women: •Increased for Professionals (2.7%), Administrative support (1.1%), Service Workers (3.3%) •Decreased for Management (-44.8%), Technicians (-0.5%)	Reported changes for percentages of non-white minorities: •Increased slightly for Services workers for intervention and control hospitals •Decreased for Management for intervention and control hospitals Reported changes for percentage of women: •Increased for Administrative support (4.0%)

Summary of Important Results:

Both intervention hospitals outperformed their matched controls across every organizational level competency and outcome except *Patient Cultural Competency* and *Workforce Diversity*. Similarly, both intervention hospitals

outperformed their matched controls across every individual level competency. Further, Intervention Hospital 1 generally scored better than Intervention Hospital 2 on most measures. Implicit racial bias, measured via the Implicit Association Test (IAT), improved so that the preference for whites over blacks was generally reduced in Hospital 1 and even shifted toward neutral and/or somewhat of a preference for blacks in Hospital 2. Diversity attitudes, measured via the Discovering Diversity Profile, improved in 7/8 and 6/8 dimensions for Hospitals 1 and 2 respectively.

Original Authors' Conclusions

The authors concluded that the improved performance of the intervention hospitals relative to the controls suggests that this systemic, multi-level approach is an effective cultural competency/diversity intervention at the organizational and individual levels. They attributed the differences in performance between the intervention hospitals to contextual factors wherein Hospital 1 had more direct control to implement the intervention than Hospital 2. The authors ultimately acknowledge that the 2.5-year intervention period was relatively lengthy and that a shorter, targeted intervention may produce better outcomes.

Critical Appraisal

Validity

This study only scored 2 out of 11 possible points on the PEDro scale for the random assignment of intervention and control hospitals within healthcare systems and the similarity of groups, both systems and hospitals, at baseline. Key limitations according to the PEDro scale included the absence of blinding of all parties, attrition without intention-to-treat analysis at the individual level and the inadequate reporting of results for statistical comparison. The authors gave no explanations for these shortcomings in methodological quality.

The overwhelming weakness of this study is how the authors reported results, which they label a "summary of findings." This appears to stem from the fact that this present study was a part of a larger national project, despite a reasonable description of statistical analysis methods (quoted under **Main Findings**). The authors stated that the intervention hospitals mostly outperformed the control hospitals across all metrics at post-assessment, but it is generally unclear whether this difference was significant or not or if any changes occurred at all for the control hospitals between pre- and post-assessment. They presented the results in a table similar to what is presented above in **Main Findings** (Intervention Hospital 1/2 vs. Control Hospital 1/2) but this is very misleading as nearly all of the data presented pertains to the intervention hospitals. Further, the authors acknowledged the positive or negative changes on outcome measures by points and percentages for each hypothesis; however, they mentioned significance only once without any defined p-value. It is also generally unclear whether the other score changes not reported for the intervention hospitals were not significant at post-assessment. Finally, the poor reporting of descriptive statistics limited further statistical calculation and interpretation of metrics like confidence intervals, effect size, and power. I attempted to find a resource from the larger project with comprehensive descriptive and inferential statistics but was unable to do so.

While random assignment of the intervention and control hospitals within each healthcare system favors internal validity, threats include the key limitations listed above. In terms of attrition, the authors explain that no more than 24% of participants who completed the outcome measures related to individual level competencies at pre-assessment did so at post-assessment. Because of this, the authors were unable to compare specific participants' change at this level, including implicit racial bias and attitudes, and instead had to do so at the hospital level. Some attrition was attributed to the intervention itself "which resulted in some departures by individuals who were not supportive of the enhanced organizational focus on diversity." (pg.10) Conversely, the intervention explained some of the employment of new hires who valued the intervention hospitals' renewed focus on cultural competency/diversity. This may have also skewed results for outcome measures like implicit bias at the hospital level in favor of the intervention if those presumed likely to harbor biases left the staff and those who did not joined.

Threats to external validity appear in sampling and randomization practices at the hospital and individual levels. Twenty-five healthcare systems across the nation were invited to participate along with follow-up recruitment calls but only the 2 included in the study ultimately agreed. The authors stated that the healthcare systems were located in similar metropolitan areas in the eastern United States and that hospitals within each system served the same metropolitan communities. Based on this, it possible that positive results of the intervention are only applicable to similar healthcare systems and hospitals based on both regional and community characteristics like existing racial/ethnic diversity and socioeconomic status among others. Similarly, one general medical/surgical nursing unit was selected at each intervention hospital and matched at their respective controls hospitals. This does not fulfill randomization at the individual level. These sampling and randomization practices coupled with seemingly small sample sizes at the hospital and individual levels relative to the population may limit the generalizability of results to the population as they already have effect size and power.

Despite the key limitations and threats to internal and external validity, strengths include that the authors had clearly defined hospital and individual level competencies with stated hypothesis and employed relevant outcome measures with strong psychometric properties by which to evaluate these hypotheses.

Interpretation of Results

This is one of the only studies that examines the effect of educational intervention(s) on implicit racial bias and attitudes in the healthcare setting. These results suggest that the systemic, multi-level approach is at least somewhat effective for reducing implicit racial bias and attitudes but it cannot be determined whether these results are significant yet alone clinically meaningful based on the descriptive and inferential statistics, or lack thereof, provided. Further, the pre- and post-assessment comparisons for changes in implicit racial bias were made at the hospital level rather than the individual level due to attrition so it is also unclear whether these results are statistically significant or clinically meaningful for individual hospital employees who directly interact with patients. Beyond implicit racial bias, this approach appears to be a somewhat effective comprehensive approach to improving all around cultural competency and diversity in healthcare settings.

Applicability of Study Results

On the surface, this study seems relevant to the clinical question given the gross lack of available evidence, however, critical analysis challenges applicability. While the study did include majority healthcare practitioners, the amount of physical therapists, if any, cannot be determined from the participant demographics provided. Also, the intervention was delivered in the acute care setting, which does not reflect either outpatient setting outlined in the clinical question. It is possible that the acuity of illness in the acute care setting and resultant patient presentation may influence attitudes or stereotypes toward individuals based on group characteristics compared to outpatient settings. The same goes for the regional and community characteristics of the healthcare systems and hospitals that limit applicability in addition to generalizability.

While the systemic, multi-level approach appears effective for reducing implicit racial bias and attitudes measured via the Implicit Association Test and Discovering Diversity Profile based on reporting, it cannot be determined due to the complexity of the intervention whether one aspect affected these observed changes more than others (i.e. individual-level action plans versus group trainings for staff). This also underlines the fact that the authors provide no specific description of intervention elements. The costs that the intervention hospitals likely incurred during the lengthy, comprehensive intervention period should also be considered. As I am interested only in implicit racial bias in the clinical question and this is only one of many variables in this study, there are potentially shorter, less costly single interventions to target that construct or outcome.

Finally, the study did evaluate how workplace diversity was impacted by the intervention but it was not considered an intervention itself as stated in the clinical question. If the authors provided more comprehensive descriptive statistics, I potentially could have examined the correlation post hoc between workplace diversity and implicit racial bias pre- and post-intervention for the intervention hospitals. Some experts suggests that exposure alone to diverse individuals is sufficient to challenge held attitudes and stereotypes and subsequently reduce implicit racial bias.⁹

(2) Description and appraisal of (study title) by (authors, Year)

Aim/Objective of the Study/Systematic Review:

The objective of this study was to examine the effects of a brief educational intervention workshop about cultural competency on the attitudes and beliefs of Louisianan occupational therapists.

Specific research questions were:

1. "What is the phenomenological experience of occupational therapists participating in cultural competency training?" (pg.144)
2. "Does participation in cultural competency training produce a significant difference in attitude as measured by implicit tests of racial bias? (pg.144)

Study Design

- This was a quasi-experimental, pre-test/post-test single group study design
- Participants were divided into two self-selected groups based on their availability to attend the workshop
- There was no blinding of any parties involved or allocation concealment
- Pre-assessment was performed on the day of the workshop prior to receiving the educational intervention and post-assessment was performed on the same day upon conclusion of the workshop

Setting

Louisiana State University Health Science Center School of Allied Health Professionals

Participants

Participants included 13 white, female occupational therapists licensed in the state of Louisiana (eligibility criteria) recruited from advertisements and personal contacts. Six participants comprised one group and 7 in the other based on their availability to attend the scheduled workshops. Data was analyzed as a single group so

the author does not provide demographics for the two different workshop dates attended. Instead, the single group mean age was 39 years old with an average of 9 years of career experience as occupational therapists. Two participants did not complete one of the post-test outcome measures although they completed the other but the authors did not provide any explanation as to why this occurred.

Intervention Investigated

Control

In this pre-test/post-test single group design, the participants served as their own controls.

Experimental

The blocked 6-hour workshops met in-person in a computer lab. The comprehensive intervention plan was described by the author in a previous article.¹⁰ For each study objective, there were respective educational interventions:

Objective	Educational intervention
1a. "Therapists will demonstrate an increased awareness of personal cultural heritage." (pg.145)	First, therapists were shown a multimedia presentation about differences between white and majority non-white neighborhoods including education, environment and socioeconomic status. Next, therapists wrote reflections to prompts about cultural privilege and differences then discussed their responses as a group.
1b. "Therapists will compare their own cultural background with that of minorities in the United States." (pg.145)	
2. "Therapists will articulate an understanding of healthcare disparities in Louisiana and possible causes." (pg.145)	First, therapists watched both a DVD titled <i>Bridging the Great Divide</i> and a PBS video titled <i>Unnatural Causes: Kim Anderson's Story</i> . ^{11,12} Then, therapists discussed the DVD and video in small groups using the adapted <i>Unnatural Causes Discussion Guide</i> to structure the activity. ¹³
3. "Therapists will demonstrate ability to verbally advocate for, and interact with, African American clients." (pg.145)	First, therapists were shown a PowerPoint presentation about racism. Next, therapists were presented problem-based learning scenarios to be discussed in small groups.

In addition to the structured educational intervention, the therapists wrote reflections to questions related to each objective to be used for qualitative analysis. They also completed exit survey questions to evaluate their perceptions about the effectiveness of the workshop.

Outcome Measures

Implicit Bias Association Test (IAT) completed by all participants in-person online

- all participants completed the race subtest labeled the Race Attitude Implicit Association Test (RAIAT)
- for the subtest, participants are presented a series of concepts and must select between two evaluations or stereotypes for each
- the strength of the associations between race-related concepts and evaluations/stereotypes are calculated with consideration to reaction time for selection (latent response time)
- the results of this subtest are reported as either no/slight/moderate/strong preference for whites/blacks over blacks/whites
- the author computed a sign test to analyze the difference between pre- and post-test scores (but did not describe this test)

Racial Argument Scale (RAS) completed by all participants in-person online

- participants are presented arguments about African-Americans in paragraphs and subsequent conclusion statements to which they must rate how well the argument supports the conclusion, not how much they personally agree
- for a total of 13 items, each was rated on a 5-point Likert scale where 1 indicates *not at all* and 5 indicates *very much*¹⁴
- scale scores were reported as the sum of the item scores with a range of 13 to 65, where higher scores indicates higher levels of racism and negativity towards blacks¹⁴

Main Findings

Quantitative findings:

	N	mean (SEM)		p	d	Absolute effect size**
		Pre-test	Post-test			
RAS	11*	37.45	36.73 (1.917)	0.639	0.204	0.72
RAIAT	13	2.08	1.85	1	-	0.23

*Two participants did not complete the post-test RAS and were not included in pre- or post-test analysis.

**Absolute effect sizes calculated manually as within-group differences by the CAT author (Bria Dunn, SPT).

Qualitative findings:

Upon review by the author and two occupational therapy faculty members, 3 themes emerged from the occupational therapists' reflections:

1. "Healthcare disparities are not due to racial discrimination." (pg.146)
2. "Therapists should listen to and educate African American clients." (pg.146)
3. "Racial bias and stress contributes to health issues in African American clients." (pg.146)

Original Authors' Conclusions

The author concluded that the educational intervention was not sufficient to improve the attitudes and beliefs of Louisianan occupational therapists toward black people measured by the RAIAT and RAS. The author surmised that either the 6-hour intervention was too short to induce statistically significant or clinically meaningful change in the occupational therapists' longstanding attitudes and beliefs or that the outcomes measures, specifically the RAIAT, was not sensitive enough to smaller changes in implicit racial bias. The mean pre-test and post-test scores for both measures were significantly higher for this sample of occupational therapists than the published population means suggesting that this sample of occupational therapists held moderate to strong negative attitudes towards black people. The author further concluded that the majority of the participants were in the cultural blindness stage of cultural competence but some were able to progress to the pre-competency stage with the educational intervention workshop.¹⁵

Critical Appraisal

Validity

This study only scored 10 out of 29 possible points on the Downs and Black checklist for non-randomized studies. Relative strengths come from the Reporting and Internal validity-bias sections of the checklist while weaknesses amass in the External Validity and Internal validity- confounding (selection bias) sections.

In terms of internal validity, the author chose two outcome measures with strong psychometric properties to measure implicit racial bias and attitudes amongst the participants. However, they additionally performed a sign test for the RAIAT to compare the differences between pre- and post-test scores but give no description of this test for interpretation of results. Also, 2 participants did not complete the post-intervention RAS although all completed the RAIAT and the author gives no explanation for this occurrence. For this reason, only 11 participants' scores were considered for analysis of the RAS compared to 13 for the RAIAT. Because the sample size is so small, this becomes a roughly 15% difference in the number of participants who completed the RAIAT compared to the RAS. Additional threats to internal validity according to the checklist include the lack of blinding of all parties involved, allocation concealment and randomization.

Threats to external validity mainly reflect poor sampling practices and the delivery of the intervention to a lesser extent. The author set the eligibility criteria to include licensed occupational therapists that were white females, stating that the vast majority professionals identify with this demographic. Further, participants constituted a convenience sample. Together, this impacts how well the entirety of the population of occupational therapists practicing in Louisiana was represented even if the majority are white females. An additional consideration according to the checklist is whether the participants were treated in a setting that most would be treated in. The educational intervention was provided at a large university health science center whereas similar interventions would likely be deliver by employers, or hired professionals, in respective places of employment.

Besides threats to internal and external validity, another glaring limitation was the inconsistent reporting of descriptive statistics. While the author lists the pre-test and post-test mean scores of the RAIAT and RAS, they only provide standard error of the mean (SE) for one intervention*time condition (post-test RAS). The SEs could otherwise be calculated (to later calculate and interpret confidence intervals) if the author at least

provided standard deviations (SD) but they do not. The author gives no explanation for this inconsistent reporting that thwarts further descriptive and inferential statistical analysis.

Interpretation of Results

This is another one of the only studies that examines the effect of educational intervention(s) on implicit racial bias among healthcare practitioners, specifically occupational therapists. Although there were reductions in both RAIAT and RAS mean scores from pre- to post-test, these were not significant ($p > 0.05$). Standardized effect size is provided only for the difference in RAS scores ($d = 0.204$) indicating a small effect of the intervention. Despite having no published data on minimal clinically important difference (MCID) or mean detectable change (MDC) for the RAS, when absolute effect size is calculated manually as the within-group difference, it is less than 1 which does not even represent a change in responses by at least 1 point, the minimum amount of change possible on an individual item. Methodology and interpretation of the sign test computation for the RAIAT is not explained and the absolute effect size calculation cannot be interpreted without this context. There is undoubtedly no statistical significance for pre-test post-test differences for both measures and a miniscule to small effect size for the RAS based on absolute and standardized effect sizes. Ultimately, implicit racial bias and attitudes were statistically, and seemingly clinically, unchanged following this educational intervention workshop given the statistics provided and assessment of the qualitative data. Given the small sample size coupled with the inconsistent reporting of descriptive statistics, further research is indicated.

Applicability of Study Results

This study is promising and answers the clinical question in part. Regarding implicit racial bias, educational intervention(s) were not sufficient to reduce this type bias. There is no mention of workplace diversity, the comparison intervention. In fact, the author states that the vast majority of occupational therapists in the state of Louisiana are white females, which is why this sample was chosen rather than an exhaustive sample of all of the state's licensed occupational therapists. Not only are occupational therapists similar to physical therapists in terms of the patients they treat and the settings they work, but physical therapy professionals are also overwhelming white females.⁷ It can be argued that this enhances the relevance but I am hesitant in terms of applicability because the small homogenous sample does not entirely represent the population specified in the clinical question. Additionally, the small sample size likely limits power and effect sizes though the calculations could not be made from the data provided by the author.

The educational intervention workshop appears to be both a practical and feasible intervention with consideration to the methods. It is neither excessively lengthy nor costly, using mostly materials prepared by the author or available online and few purchased materials. Considerations for employers who would like to employ this intervention include whether the materials can be presented by untrained persons and the implications of employees potentially sharing societally unfavorable beliefs or the extent to which not doing so impedes meaningful discussion among colleagues. I would not employ this intervention, however, until additional research using these methods was conducted because despite its short length and low cost, the present study suggests that it is ineffective for the study's population. Perhaps the intervention would be more effective at reducing implicit racial bias and attitudes if the sample was larger and more heterogeneous. For example, there are likely regional influences of attitudes and stereotypes associated with working in the Deep South that may not be prevalent in other parts of the country. This may explain why these occupational therapists' scores indicated higher levels of racism and negativity towards African-Americans than population means despite completing the educational intervention workshop.

SYNTHESIS AND CLINICAL IMPLICATIONS

The evidence reviewed above for this critical appraisal is ultimately inconclusive regarding the effectiveness of educational intervention(s) and workplace diversity on reducing implicit racial bias. Notably, both studies were of extremely low to low methodological quality (internal and external validity) but were selected as they best informed the clinical question compared to the other available evidence. Weech-Maldonado et al. reported reductions in implicit racial bias and attitudes following a systemic, multi-level cultural competency/diversity intervention at the organizational and individual levels⁶, however, the inadequate reporting of results, including descriptive and inferential statistics, renders it impossible to assess the statistical significance or clinical meaningfulness of these reported reductions. This is partly due to the fact that the intervention was enacted over a 2.5 year period and contributed to employee turnover at the intervention hospitals, which is not only unfavorable from a human resource standpoint but also meant that fewer employees who participated in pre-assessment completed the post-assessment outcome measures. For this reason, reductions in implicit racial bias and attitudes were measured on the hospital level only instead of the individual level as planned.

In the study by Steed, there were no statistically significant reductions in implicit racial bias or attitudes following a 6-hour educational intervention workshop.⁵ Further, inconsistent reporting of results, including descriptive and inferential statistics, made it impossible to further assess clinical meaningfulness. Despite the results, qualitative data consisting of exit survey responses suggest that intervention was not entirely in vain as participants reported learning about the detrimental effects of implicit racial bias and stress on the general health of African-Americans. Compared to the intervention in the study by Weech-Maldonado et al., the educational intervention workshop was notably shorter but the Steed concluded that it was perhaps too short to facilitate statistically significant or clinically meaningful change in the occupational therapists' held attitudes and beliefs towards African-Americans detected by the chosen outcome measures. This suggests that the optimal period for educational intervention(s) may lie somewhere between a day-long workshop and (potentially costly) multiyear intervention(s) to induce meaningful change in implicit racial bias without contributing to excessive employee turnover or disinterest.

Future research should be careful to consider parameters like this as well as the methodological quality of studies. Both studies were limited by relatively small sample sizes and had either inadequate or inconsistent reporting of results, which severely hindered the conclusions that could reliably be made. This is unfortunate given the marked lack of available evidence to inform intervention(s) for the reduction of implicit racial bias among healthcare practitioners. Future research should also consider the complexity of intervention(s), like multi- versus single-level, as well as the magnitude of intervention(s) with respect to pre-existing attitudes and beliefs to attain clinically meaningful change. As with all evidence-based practice, clinically meaningful reductions in implicit racial bias should be measured not only according to effect size, power and MCID/MDC but also by how patient-provider interactions, clinical decision-making and subsequent healthcare outcomes improve given the studied detrimental effects of biases here.^{2,3} Many expert opinions exist regarding the reduction of implicit racial bias among healthcare practitioners but only research can inform the most effective intervention(s) for individuals and organizations.

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