IMPLICIT BIAS ON AGE AMONG ANESTHESIA PROVIDERS

by

Melvin A. Okuta

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Approved by:

_____
Dr. David Langford

_____
Dr. Dianne Earnhardt

_____
Paula Ospina Gómez

_____
Dr. Susan Lynch

_____
Dr. Zhou Job Chen

_____
Dr. Suzanne Boyd

ABSTRACT

MELVIN A. OKUTA. IMPLICIT BIAS ON AGE AMONG ANESTHESIA PROVIDERS. (Under the direction of DR. DAVID LANGFORD).

Social disparities and implicit bias are detrimental to patient care and exist among providers. Research has shown that implicit bias hinders rapport between patient and provider, leading to patients becoming resistant to medical advice and treatment protocols and lead to providers to misinterpret or misunderstand patients. Therefore, it is crucial to identify levels of implicit bias among healthcare providers and the ramifications that implicit bias could induce. This quality project aims to assess and establish baseline levels of existing implicit bias among anesthesia providers in a healthcare system located in a large southeastern city.

Anesthesia providers from four different hospitals were asked to complete the Harvard Implicit Bias Association test on age to assess their baseline level of bias. The email was sent to 378 anesthesia providers and 32 student registered nurse anesthetists. The student registered nurse anesthetists are current students completing their clinical education at the four different facilities. In addition, participants provided demographic information about their location of practice, age, race, and anesthesia title. The results were scored using the Harvard IAT D-score' slight' (.15), 'moderate' (.35), and 'strong' (.65). A total of 46 individuals completed the survey; 26 certified registered nurse anesthetists, 18 students registered anesthetists and two anesthesiologists. The results indicated no statistical significance at 95% confidence, showing the difference in provider bias based on race, location, or title.

Keywords: *Implicit bias in healthcare, Implicit Association Test, ageism, and effects of ageism in healthcare.*

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LIST OF ABBREVIATIONS

CDC	Centers for Disease Control and Prevention
CRNA	Certified Registered Nurse Anesthetist
DNP	Doctor of Nursing Practice
EMG	electromyography
IAT	Implicit Association Test
IB	Implicit Bias
IRB	Institutional Review Board
MDA	Medical Doctor in Anesthesia
NORA	non-operating room anesthesia
QR Code	quick response code
SD	standard deviation
SI	suicidal ideation
SRNA	Student Registered Nurse Anesthetist

Defining the Problem

Bias is universal and can be positive or negative. Negative implicit bias is of particular concern among healthcare providers as it can perpetuate disparities in vulnerable populations. Multiple studies have shown that implicit bias exists in healthcare providers. McQuade et al. (2021) define implicit bias as "the attitudes or stereotypes that affect understanding, actions, and decisions unconsciously" (pg. 1). bias occurs related to various factors, such as gender, race, sexual orientation, and weight. Implicit bias hinders rapport between patient and provider, resulting in misunderstanding and resistance to medical advice and treatment protocols. In addition, implicit bias may increase the morbidity and mortality observed among certain minority groups and people of low socioeconomic status (Ehie et al., 2021).

In healthcare, implicit bias on age can negatively impact mental health and the well-being of those affected. For example, according to Chrisler et al. 2016, "disrespectful treatment of older patients, through baby talk, other forms of infantilization or the shrugging off patients' complaints and concerns as "just old age," are some of the examples older patients endure in healthcare (Chrisler et al., 2016 p. 86). In a systematic review conducted by Gopal et al. (2021), most studies found that healthcare professionals have a negative bias toward people of different backgrounds.

Stakeholders

Moran (2017) states, "Stakeholders are those individuals or groups who touch the project or are interested in the project outcome. These individuals can affect or could be affected by the project's outcome" (p. 135). This project's stakeholders are patients, patients' families, anesthesia providers within the health care system, and the larger community.

Literature Review

A review of the literature on Implicit Bias within Healthcare was conducted using Cochrane, CINAHL Complete, PubMed, and Google Scholar databases published between January 2000 and February 2022. The search criteria included: '*Implicit bias in healthcare, ageism, effects of ageism in healthcare, implicit bias association test.*' Additionally, the searched terms targeted peer-reviewed academic journals pertinent to healthcare providers' implicit bias. Although hundreds of journal articles resulted across the four sites, this project utilized fourteen age bias articles. Relevant articles were selected by focusing on the keywords mentioned above. In addition, articles that discussed the properties of the IAT and its validity were also chosen for this project. Articles that discussed explicit bias, racial bias, and any other bias were intentionally excluded from this quality improvement project.

Bias Based on Age

The Centers for Disease Control and Prevention (CDC) estimates that the population of older adults will increase to 80.8 million by 2040 and 94.7 million by 2060 (CDC, 2022). As the population continues to age, there is an increase in sicker patients requiring more care for chronic illnesses such as cognitive diseases, heart disease, type II diabetes, and cancer (CDC, 2022). Burnes et al. (2019) define ageism as "stereotypical behavior, prejudice, and discrimination against people based on their age" (pg. 1). Research has cited that healthcare professionals play an essential role in the lack of access to quality care for the elderly (Kessler & Blachetta, 2020). Healthcare providers usually encounter older adults when they are sick and frail. These engagements distort the outlook of healthcare professionals, making them label all older adults as ill and fragile. This distorted form of prejudice and discrimination places this vulnerable population at a higher risk of adverse outcomes and misdiagnosis.

People hold negative opinions and biases towards older adults, perceiving them as physically weak and reminders of death and decline. (Kessler & Blachetta, 2020). Chopik and Giasson (2017) conducted a study involving 700,000 participants investigating the differences in age bias across the lifespan and concluded that all participants (especially older adults) preferred younger people. They credited this outcome to the phenomenon of avoidance-oriented behavior. This behavior occurs when a minority population avoids associating with their group to prevent bias (Chopik & Giasson, 2017). Furthermore, older people's age-based internalized stereotypes can affect their health. For example, those with a stronger negative outlook on age reported more frequent hospitalizations than those who viewed their age positively (Chrisler et al., 2016).

Kessler and Blachetta's (2020) vignette-based study among psychotherapists-in-training illuminates how deep-rooted this issue is. They found that these professionals were reluctant to offer their services to the elderly and were pessimistic about these patients' prognoses. Barriers such as these have led healthcare professionals to identify depression-like symptoms as a normal part of aging. A qualitative study by Harush et al. (2016) revealed that physicians were reluctant to perform invasive procedures, initiate aggressive treatments and even treat suicidal ideations (SI) in older adults. They believed that these patient populations would not fare well, and that SI is logical and normal among the elderly. In the same study, nurses also demonstrated ageism when communicating with older adults. They were noted to possess negative attitudes and did not involve older patients in medical decisions. Depersonalizing behaviors and discussing the patient's case in front of them without addressing the patient contribute to the patient feeling left out and isolated. In addition, disrespectful talk can be seen in healthcare staff when not referring to patients by their names or by calling them "sweetie," "darling," and "good girl."

Training of healthcare providers is geared toward curing patients. However, Chrisler et al. (2016) found that many physicians avoid caring for patients with chronic illnesses as curing their diseases is impossible. They also found that Medicare reimbursement for the same services as younger patients using work-based private insurance is far less in the United States. "Physicians and medical students' stereotypes of older adults include rigid, religious, irritable, boring, lonely, isolated, asexual, easily confused, depressed and depressing, needy, frustrating, and nonproductive" (Chrisler et al., 2016, p. 91).

Ageism promotes high mortality risk, poor functional health, and slower recovery from illness (Burnes et al.,2019). The authors discovered that healthcare providers make assumptions about older patients' cognitive and functional abilities, withhold treatment, and even exclude them from clinical trials (Burnes et al., 2019). Recently, COVID-19 has illuminated the prevalence of this issue in healthcare as discussion of rationing healthcare emerged. As the ventilator shortage soared through the Intensive Care Units nationwide and globally, older adults found themselves on the less fortunate end of the limited resource discussion. Ethical concerns arose when the aging population felt abandoned and denied care during the pandemic, further showcasing how ageism affects the health of this vulnerable population (Curryer & Cook, 2021). Chrisler et al. (2016) discuss negative ageism that results in the denial of healthcare to elders, especially if care is expensive. Care thought futile led to elders' coercion to sign the do-not-resuscitate orders. Dunkelman and Dressel (1994) termed this as therapeutic nihilism, where younger people would be favored whenever resources were scarce or whenever providers believed older patients were not resilient enough to receive advanced care (Kane & Jacobs, 2018; Dunkelman & Dressel, 1994).

Research studies on implicit bias based on age in anesthesia providers are lacking, creating a need to establish a baseline of implicit bias in anesthesia providers to address necessary changes in practice and training. Anesthesia providers should adjust their care plan based on the patient's age to facilitate a safe and efficient anesthetic. Older patients have a significant risk of anesthesia-related complications related to their age and age-related comorbidities (Kanonidou and Karystianou, 2007).

PICO Question

This project is part of a larger quality improvement project that aims to assess and establish baseline levels of existing implicit bias among anesthesia providers in a healthcare system in a large southeastern city. The PICO question guiding this part of the project is: Among three types of anesthesia providers, what is the proportion who hold implicit bias toward patients' age?

Project Explanation

This project aims to establish a baseline of age-related implicit bias in anesthesia providers in one urban healthcare system. The Anesthesia Quality & Safety Committee for the healthcare system identified implicit bias as a problem within its community or anesthesia providers. Therefore, establishing an implicit bias baseline related to age among current SRNAs and CRNAs can provide insight into the current practice environment.

The health care system uses a team care model in providing anesthesia. That model requires the anesthesiologist and CRNA to work in conjunction. The anesthesiologists are often the person leading the team. The CRNA determines the anesthetic care patients receive while undergoing surgery and the course of care related to anesthesia after the surgery. Establishing a baseline of implicit bias among these providers will help "improve health, elevate hope, and

advance healing for all." (Atrium Health, 2021). Currently, many interventions are being implemented in the anesthesia community to provide inclusive care and improve the impact of bias and stereotypes.

Conceptual Theoretical Framework

The Plan, Do Study, Act (PDSA) model will guide the implementation of this project. This framework encourages continual change assessment and allows necessary modifications before starting the cycle (Agency for Healthcare Research and Quality, 2020). Initial PDSA cycles are typically implored to examine change implementation on a small scale (Perla et al., 2013). The planning phase includes exploring the literature on implicit bias and its effects. The Doing phase is recruiting and conducting the survey. The Study phase involves analysis. After the analysis has been collected, the stage focuses on making recommendations for action and compiling an informal educational pamphlet to return to the participants.

The PDSA cycle is a quality improvement model designed to be continuously adjusted; therefore, this model depicts the goals of this project. Implicit bias is an issue that healthcare organizations need to understand and then implement programs to address or mitigate them.

Project Design

Methodology

This project will collect data using the Harvard Implicit Association Test offered by Project Implicit (Project Implicit, 2011). "The IAT) evaluates the relative strength of a person's mentally-held automatic associations of two opposing attributes as either positive or negative" (Chevance et al., 2017, p.71). Participants are instructed to quickly use "E" or "I" to classify words as positive or negative.

The first stage includes inviting physician anesthesiologists, CRNA, and student nurse anesthetists via email with instructions on accessing and completing the Harvard implicit association test (IAT). These instructions included step-by-step pictorial directions for accessing the website and where to return the surveys. The instructions contained a link to the Harvard IAT test, a link to the QR code, and instructions on taking the correct assessment and anonymously reporting results. Participants were informed about the anonymity and confidentiality of the survey, detailing its use and asking for their commitment to finishing the study before beginning the survey. Demographic information such as age, title, years of experience, and employment site were collected after completing the IAT.

The second stage is collecting the surveys. The original email included instructions to link to survey monkey to report the data or deposit the results in a drop box in the anesthesia breakrooms. To increase accessibility to the test, the email also contained a link to a QR code easily accessible through the participants' mobile devices. Printed QR code copies were also located in the lounges and on the collection boxes.

The final stage entailed data analysis and computation of the results. After the completion of the project, an educational pamphlet on the findings of implicit bias will be distributed to the anesthesia department. In addition, the informational pamphlet will compile the latest research surrounding implicit bias within healthcare. This project was submitted to the IRB and deemed a quality improvement project with no further review necessary. See (Appendix A and B).

Participants

Participants were drawn from a large sample of anesthesia providers practicing within four hospitals. The sample consisted of anesthesia providers, sampling from the list of employed certified registered nurse anesthetists (CRNAs), anesthesiologists (MDAs), and student

registered nurse anesthetists (SRNAs). These SRNAs are students in an anesthesia program conducting their clinical rotations with other anesthesia providers. 378 estimated active anesthesia providers currently practice within Health System's Metropolitan Region. Of those, anesthesia providers consist of 60 identified as MDAs, 318 as CRNAs, and 32 as SRNAs.

The health system provided the email list of providers at four primary sites. Communication of the project was conducted through the health care systems secure network. The inclusion criteria include those identified as active anesthesia providers within the healthcare system. If anesthesia providers did not work in hospitals or day/outpatient operating rooms (endoscopy labs, interventional radiology, etc.), participants were excluded.

Setting

This integrated nonprofit healthcare system serves patients at 40 hospitals and more than 1,400 care locations, primarily in the southeastern United States. However, the setting for this project specifically focused on the four facilities serving a Metropolitan area. These sites include a level 1 trauma center, an inner-city hospital, a suburban hospital, and an ambulatory surgery center.

Tools/Measures

The IAT is a computerized test housed at Harvard University on the following website: Project Implicit (harvard.edu). Greenwald, McGhee, and Schwartz proposed the implicit association test in 1998 as a measure of individual differences in implicit social cognition (Schimmack, 2021). In the years to follow, this test gained popularity in psychology and sociology, garnering over 4000 featured citations (Schimmack, 2021). "IAT evaluates the relative strength of a person's mentally-held automatic associations of two opposing attributes (e.g., positive and negative)" (Chevance et al., 2017, pg. 72). The IAT scores the implicit attitude

by how fast one responds and associates an image with an instructed letter or word. For instance, in the IAT on age, one is asked to quickly use the letters “E” or “I” to classify words as positive or negative. Then, an image emerges on the screen, and participants are rated by how fast or slow they respond to categorize the two objects. The developers of the IAT explain the results as having an implicit preference, e.g., “flowers compared to insects is if you responded faster when Flowers + Good/ Insects + Bad are paired together compared to when Insects + Good / Flowers + Bad are paired together.” (Project Implicit, 2011). Therefore, a moderate or strong implicit preference corresponds with how fast you respond to, for instance, “Flowers + Good / Insects + Bad versus Insects + Good / Flowers + Bad” (Harvard University, 2011).

Numerous studies have assessed this test’s reliability and validity, with many findings approving or debunking its authenticity. However, in an article to refute the reliability of the IAT test, Blanton et al. (2009) argued that trying to explain behavior based on the results of the IAT is problematic because the test relies on an arbitrary metric (Blanton et al., 2009; Marcelin et al., 2019). Due to the fluctuations in the IAT score, Brownstein, Madva, and Gawronski (2020) found “a low correlation between individuals’ scores across days, weeks, and months” (pg. 278). Numerous studies have also concluded that IAT scores are poor predictors of behavior toward others (Brownstein, Madva, and Gawronski 2020; Greenwald et al., 1998).

Conversely, Greenwald et al. (2009) conducted a study investigating the reliability of IAT. They found that even when participants were asked to alter the test by slowing their response time deliberately, only the self-report questionnaires were skewed, while the IAT results were not. This further indicated that the sensitivity of IAT measures to automatically activated associations is resistant but not immune to faking (Greenwald et al., 2009). The IAT is the only measurable test for implicit bias that uses response latency (Staats, 2014). This delay in

response highlights the implicit associations the test-taker holds. An educational series by the *Kirwan Institute for the study of Race and Ethnicity* highlights how implicit bias has been measured throughout the years. For example, utilizing functional Magnetic Resonance Imaging (fMRI) to assess bodily and neurological reactions to stimuli. “fMRI focused on the amygdala that responds to fear and threat to emulate race-related mental process” (Staats, 2014, p. 18). Other means of determining IB relied on facial electromyography (EMG) and cardiovascular and hemodynamic changes. Studies believe this delay in response is a valuable way of measuring implicit bias compared to other methods mentioned (Staats, 2014).

The implicit association test provides users with results ranging from a strong, moderate, or slight preference to no preference when testing between subjects. These categories are associated with a D score, a scaled estimate of the difference in mean reaction times in stereotype-congruent and -incongruent matching tasks (Greenwald et al., 2003, p. 201). According to the Harvard Implicit Association website, the D score has a range of -2 to +2, broken into points for ‘slight’ (.15), ‘moderate’ (.35), and ‘strong’ (.65) association. “The positive scores indicate an implicit preference for young over old, while the negative scores indicate an implicit preference for old over young” (Busso, Volmert, & Kendall-Taylor, 2019, p. 561). This project analyzed the results and their corresponding D scores for anesthesia providers and student nurse anesthetists.

Project Success

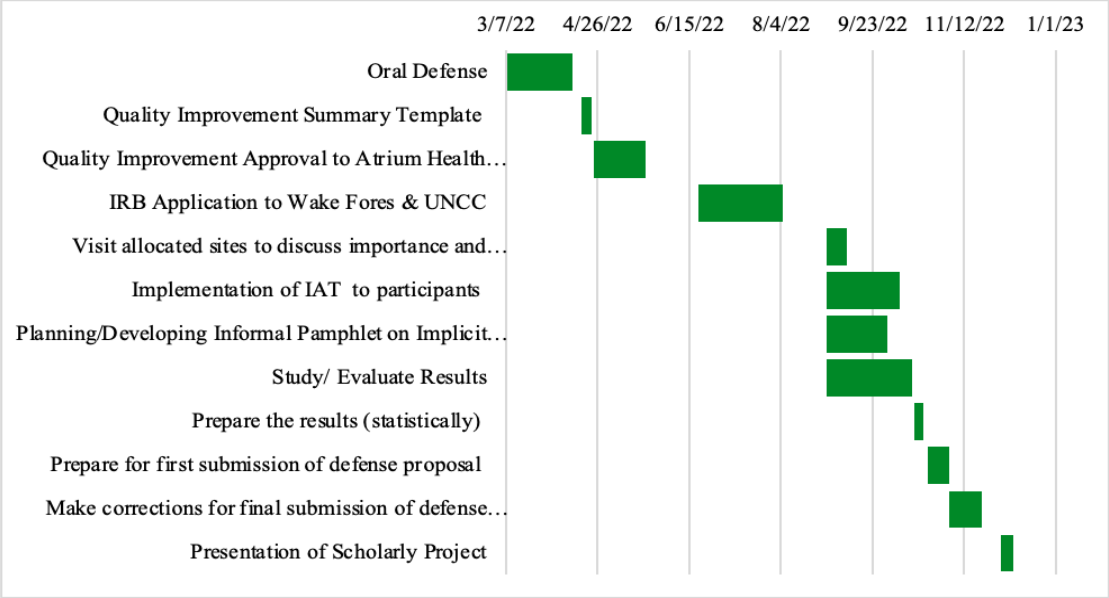
According to Pedersen & Nielsen (2016), poor survey response rates skew the data and reduce the effectiveness of the study. Survey responses are lower, especially in online surveys averaging approximately 11% lower than in other surveys. (Pedersen & Nielsen, 2016). Therefore, for this project to be successful, a 30-50% return rate on the survey will quantify

meaningful participation and provide sufficient data for analysis. Therefore, efforts to increase the response rate are vital. The utilization of remainders and project champions helped encourage participation.

Timeline

Figure 1

Quality Improvement project timeline

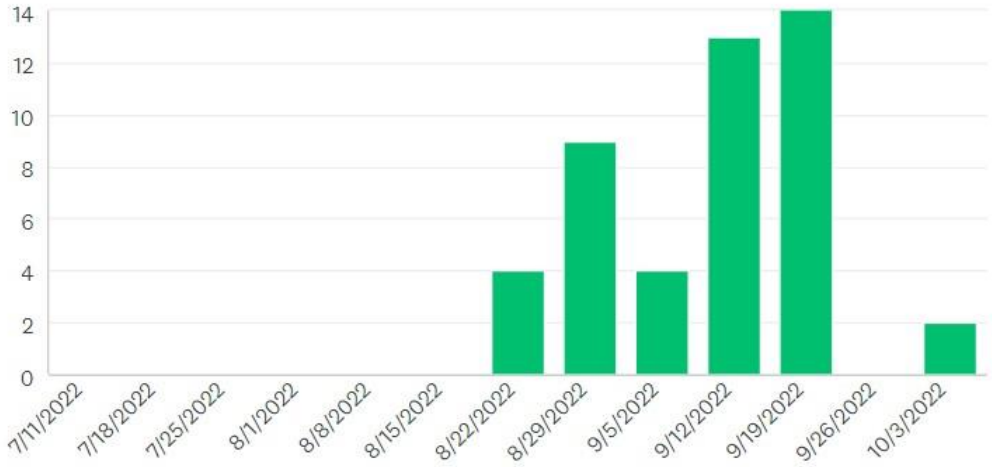


Note. The figure represents this quality improvement timeline.

The timeline figure above depicts the planning and implementation of the project over six months. Site visits started in June to discuss the importance of the project and garner participants. The time allotted for participants' feedback is six weeks, from August 21, 2022, to October 8, 2022. Within those six weeks, reminder emails were sent every two weeks for recruitment. The project transitioned into its final stage of studying the data collected on implicit bias among anesthesia providers following the six weeks. During this phase, the collected data was computed statistically, creating a graph to represent implicit bias on age.

Figure 2

Survey Response



Note. Figure 2 shows the participants' responses after every two-week reminder.

The project rollout had a low turnout, as anticipated. After the first two-week reminder, the anesthesia department allocated an hour during the morning meeting to allow the providers time to complete surveys. The uprise indicated in weeks 9/12 and 9/19 resulted from the time allocation.

Needed resources, support, and challenges to the project's success

The most anticipated challenge is the poor return rate. The success of this project relies on collaboration with clinical experts/liaisons, classmates, and the anesthesia staff. Good communication is necessary to garner participation from their colleagues. One strategy to increase communication was to identify a CRNA interested in implicit bias and have her act as a "champion" for this project. Paula GomezOspina, a practicing CRNA, was recognized as the clinical expert who significantly encouraged providers to participate in the project and answer questions.

This project was part of a larger project on implicit bias that included an assessment of age, race, and weight. Participants were asked to complete three different IAT types, which is

time-consuming and might deter people from participating. In addition, because this is a computer survey, some participants might feel uncomfortable asking them to print the results and drop them in the drop box or provide a screenshot that they can upload to a data repository (SurveyMonkey$_{TM}$). See Appendix C. Appendix C represents one example of the results collected from the IAT survey. In this result slip, the score was noted to be a "strong automatic preference for young people vs. older people."

Bias in healthcare and the workplace is very sensitive and made some participants uncomfortable. There were comments made by providers such as ("this topic is divisive," "this is the reason this country is divided," and "I do not believe in bias, so I am not biased") that reflected the topic's sensitivity. To help alleviate this, it was essential to have a trusted "insider" serve as a champion. The anonymity of the results was emphasized at the beginning. In addition, the project team presented the project to the providers in a morning "huddle" where the project's anonymity was highly emphasized.

Foreseen issues are retention, turnaround times, and IAT- self-reporting and data collection issues. With the project having three different components, some participants started the process and failed to complete it, which impacted the retention rate and completion time. To mitigate this issue, an announcement at the start of the process explained the importance of completing all three parts sequentially and promptly once the participants received the email. In addition, data will be analyzed using descriptive slots by age and provider type, years of experience & race/age will be interpreted against the IAT scores.

Data Analysis & Interpretation of Findings

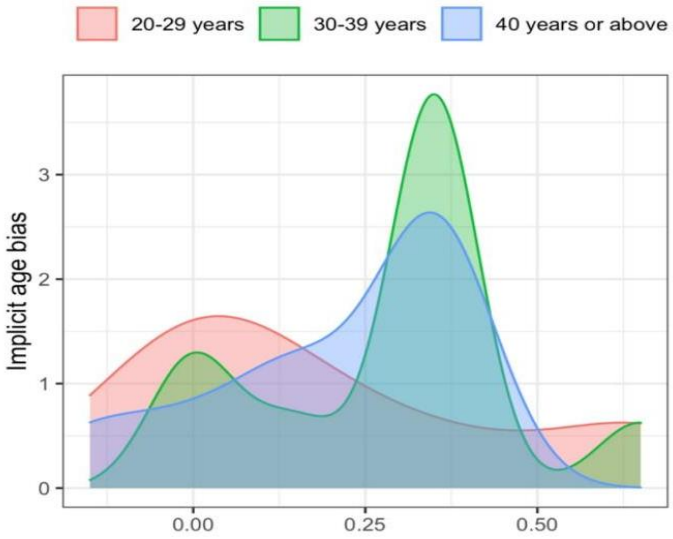
Results

The email on completing the implicit bias test was sent to 60 MD anesthesiologists, 318 CRNAs, and 32 SRNAs, excluding the three SRNAs conducting the larger project. Unfortunately, none of the participants utilized the drop boxes to submit their results. Instead, the data from survey monkey was manually inputted into excel sheets starting with the demographic information (title, age, race, and location), followed by the screenshot of the computerized test results and the D score that represented it.

Forty-six individuals participated in the survey. Twenty-six were CRNA, eighteen were SRNAs, and two were MDA. Most identified as white (n=31), three as black, one as multi-race, and one as Hispanic. The most significant number of participants worked at the level 1 trauma center (n = 35); five failed to disclose their location, one responded from the suburban hospital, three from the inner-city hospital, and two from the ambulatory surgery center.

Figure 3

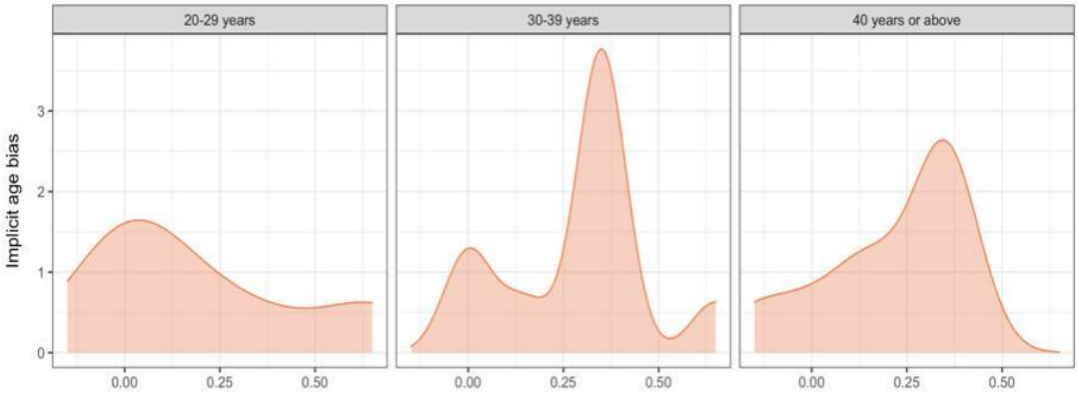
Implicit bias by age categories



Note. The figure shows the score distribution of biases across three age groups.

Figure 4

Implicit bias is separated by age groups.



Note. The figure is a simplified version of Figure 3 that shows the score distribution of biases across three age groups.

Age

When comparing to a p-alpha (p= 0.775) level of 0.05, we can say with 95% confidence that there is no statistical significance that shows a difference of age bias between ages 20-29, 30-39, and providers over 40 years old.

Age group 20-29, *n=17,* has a mean and standard deviation (SD) of 0.2 and 0.27, respectively. Three participants fall between the mean and one SD below the mean. This indicates they have a moderate preference for younger individuals vs. older ones. One scored two standard deviations below the mean representing a D score of -0.15: a slight preference for older individuals vs. young. Two scores between the mean and one standard deviation indicate a moderate preference for younger vs. older individuals. Three other responses in the 20-29 age group scored 1-2 standard deviations above the mean, with a D score of 0.65, corresponding with a strong preference for younger individuals vs. older. Data from the other three participants were

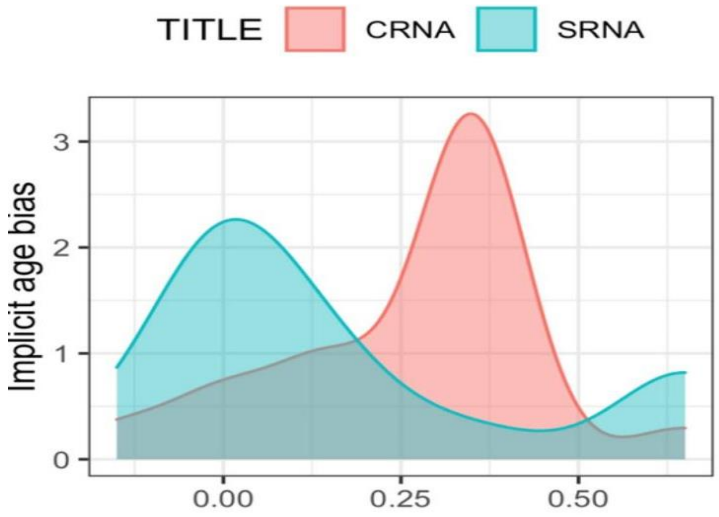
nullified as they skipped the question. Four participants had a score of no preference for old vs. young individuals: demonstrating no bias.

Age group 30-39, *n= 16*, has a mean of 0.29 and an SD of 0.19. One participant fell between the mean and one standard deviation below the mean, scoring a D score of 0.15. This indicates a slight preference for younger individuals vs. older ones. Most of this age group (six) fell between the mean and one deviation above the mean, with a D score of 0.35, indicating a moderate preference for young vs. older individuals. One fell 1 to 2 standard deviations above the mean, scoring 0.65. This shows a strong preference for young vs. old. Six participants' data got nullified for skipping or uploading a graph, while two showed no bias.

In the ages over 40, *n=13*, they had a mean of 0.21 and an SD of 0.19. One response fell 3 to 2 SD below the mean with a D score of -0.15. This indicates a slight preference for old individuals vs. young ones. Two fell between the mean and one SD below, scoring a D-score of 0.15, representing a slight preference for young vs. old. Finally, four fell between the mean and one SD above, with a D score of 0.35 showing a moderate preference for young vs. old.

Figure 5

Implicit bias by title categories



Note. Figure 5 shows the score distribution of biases across the two title groups.

Title

Two of the 60 MDAs (3.33%) responded to the email. One responded to the demographic information indicating their title and race, and age but skipped uploading their IAT score on age. The other MDA scored a D-Score of 0.35, indicating a moderate preference for younger people vs. older ones, meaning this provider was moderately biased towards older individuals.

A total of 318 CRNAs received the email inviting them to participate in the survey. Twenty-six (8.18%) of them responded and completed the survey. Likewise, 32 SRNAs were invited to participate, and 18 (56.25%) completed the test. Of the 410 providers included in the inclusion criteria, 11.22% participated. Eleven (23.91%) of the respondents were deemed inconclusive due to the participant skipping the question or uploading a graph instead of the required results.

When narrowing the results based on titles, twelve CRNAs and eighteen SRNAs responded. Twelve CRNAs demonstrated a moderate preference for younger individuals over older ones, with a D score of 0.35. This indicates a moderate bias towards older persons. Five in the SRNAs group demonstrated no preference for either young or old, showing no bias, while three strongly preferred young (D score of 0.65). The strong preference for young people strongly discriminates against older vs. younger persons. Three other SRNAs scored 0.15, signifying a slight preference for the young and a slight bias against the old.

Table 1.
Implicit biases on age

Table 1. Implicit biases.

	Age (bias against old)
Overall	0.23 ± 0.23
Age groups	p = .775
20-29 years (n = 17)	0.20 ± 0.27
30-39 years (n = 16)	0.29 ± 0.19
40 or above (n = 13)	0.21 ± 0.19
Title	p =.444
CRNA (n = 26)	0.27 ± 0.18
SRNA (n = 18)	0.17 ± 0.27

Note. Implicit biases were measured on a -0.35 to 0.65 scale, with higher values indicating the source as more distracting. In the cells are mean ± standard deviations. Analysis of variance (ANOVA) compared group differences across age groups and titles, respectively.

Table 1 displays the mean ratings of implicit biases for age. The implicit biases ranged from -0.35 to 0.65, with a positive score indicating a bias against older individuals (vs. younger). The first row (‘Overall’) displayed the mean and standard deviation for age bias. Analysis of variance (ANOVA) compared the means across age and title groups. There was no difference across the groups (ps > 0.303). Therefore, when comparing to a p-alpha level of 0.05, we can say with 95% confidence that there is no statistical significance that shows a difference of bias (age bias) between SRNA vs. CRNA (p=0.444.)

Location

As established at the beginning of the results section, most participants worked at the level 1 trauma center (n = 35). Five failed to disclose their location; one responded from the suburban hospital, two from the inner-city hospital, and two from the ambulatory surgery center. The mean and SD for the trauma center were both 0.23, while the ambulatory was 0.175 and 0.25, with the inner city having the mean and SD of 0.4 and 0.35, respectively. The p-alpha value

based on location was 0.586, indicating no statistical significance that shows a bias difference based on the provider's site.

Race

Most responses came from individuals identifying as white (n=31), with three as black, one as multi-race, and one as Hispanic. Twenty-three white participants had usable data with a mean of 0.20 and an SD of 0.21. The p-alpha value across the different races fell around 0.177, indicating no statistical significance at 95% confidence that shows a difference of bias based on the provider's race.

Discussion and Recommendations

Discussion

The level determined for SRNAs will be an essential value compared to more experienced anesthesia providers and may lead to optimizing interventions. This value can also aid in creating a foundation for educators to increase awareness and foster an early understanding of the CRNA's role in addressing disparities in anesthetic care, as illustrated by the American Association of Nurse Anesthesiology (American Association of Nurse Anesthesiology, 2021). Bias exists in healthcare providers. This project aimed to establish a baseline of age-related bias in anesthesia providers in four facilities in an urban healthcare system using age, race, title, and location variables. While the results showed a bias of different magnitude, there was no statistically significant difference in age bias based on age, clinical site, race, and anesthesia title.

A significant finding was the lack of participation, especially from the anesthesiologists, which made it hard to compare the results. The low participation may be related to several factors. First, the topic is sensitive, and many people are hesitant to participate for fear of being labeled or discovering unsettling things about themselves. Alternatively, participants were asked

to complete the survey during their work hours. Finally, it may be that work demands and schedules did not allow time to participate.

While it was not significant, the presence of bias among the different age groups is an interesting finding for further analysis.

Limitations

Participants expressed their concerns about the project, from the length of the test and its representation. The data collection method posed a limitation as it required the participants to complete three tests, screenshot their results, and submit them to survey monkey to assure confidentiality. This led to numerous steps that might have been confusing to the participants. Some thought the IAT was too long, time-consuming, and confusing. The IAT requires at least ten minutes per test. This was a challenge as many participants only accessed their work emails at work. It required providers to have downtime at work to dedicate the time to complete the tests. And the request to need complete three different studies also added to the time issue. Another concern was the length of instructions provided in the emails. Many found them confusing and too long.

The content of the study was a significant issue; many people politicized the topic and termed it divisive. This contributed to a decrease in the number of responses. As a student obtaining my clinical experiences at the facility, the idea of having a contentious topic reduced my efforts to aggressively talk about the topic. Tremendous support was received from the leadership after the rollout of the project. Not many of the staff knew what IAT assessed and the scoring. Feedback suggested that some may have stopped taking the tests because they thought they were getting the test wrong whenever an “X” appeared on the screen.

Survey fatigue also contributed to a decrease in response. Many surveys are sent to providers by the health care system, and the providers feel bombarded with survey requests.

Recommendations

All three providers showed implicit age-based bias from their results, especially regarding the provider's age. This data will be combined with the data from the larger project to establish a baseline where future projects can further assess the impact of bias and implement strategies to reduce its effects. One such potential area is to address bias better in nurse anesthesia education. For example, students could reflect on their scores after completing assigned topics in the IAT. In addition, a better understanding of how IB on age is addressed in the curriculum will help shape providers that provide culturally competent care.

The healthcare system can introduce the topic of implicit bias by completing annual competency modules or by having a committee that openly discusses the topic. Unfortunately, research on bias among anesthesia providers is not well-represented in the literature. This project establishes a baseline for the anesthesia department to assess further how implicit bias presents during preoperative, intraoperative, and postoperative care.

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APPENDIX A: WAKE FOREST IRB APPROVAL

WAKE FOREST
UNIVERSITY
HEALTH SCIENCES

Office of Research
INSTITUTIONAL REVIEW BOARD

MEMORANDUM

To: Exie Earnhardt
Atrium/Carolinas Healthcare System

From: Brian Moore, Chair
Institutional Review Board

Date: 7/5/2022

Subject: Not Human Subjects Research: IRB00086381
Utilizing the Harvard Implicit Association Test to evaluate the level of implicit bias among Anesthesia Providers based on age, weight, and race.

The Wake Forest University School of Medicine Institutional Review Board has reviewed your protocol and determined that it does not meet the federal definition of research involving human subject research as outlined in the federal regulations 45 CFR 46. 45 CFR 46.102(f) defines human subjects as "a living individual about whom an investigator (whether professional or student) conducting research obtains (1) data through intervention or interaction with the individual, or (2) identifiable private information."

The information you are receiving is not individually identifiable. In recent guidance published by the Office of Human Research Protections (OHRP) on the Guidance on Research Involving Coded Private Information or Biological Specimens, OHRP emphasizes the importance on what is being obtained by the investigator and states "if investigators are not obtaining either data through intervention or interaction with living individuals, or identifiable private information, then the research activity does not involve human subjects."

Note that only the Wake Forest University School of Medicine IRB can make the determination for its investigators that a research study does not meet the federal definition of human subject research. Investigators do not have the authority to make an independent determination that a study does not meet the federal requirements for human subject research. Each project requires a separate review and determination by the Board. The Board must be informed of any changes to this project, so that the Board can determine whether it continues to not meet the federal requirements for human subject research. If you have any questions or concerns about this information, please feel free to contact our office at 716-4542.

The Wake Forest School of Medicine IRB is duly constituted, has written procedures for initial and continuing review of clinical trials; prepares written minutes of convened meetings, and retains records pertaining to the review and approval process; all in compliance with requirements of FDA regulations 21 CFR Parts 50 and 56, HHS regulations 45 CFR 46, and International

Medical Center Boulevard, Winston-Salem, NC 27157-1023 (336) 716-4542 / fax (336) 716-4480

APPENDIX B: UNCC IRB APPROVAL

UNIVERSITY OF NORTH CAROLINA CHARLOTTE | RESEARCH AND ECONOMIC DEVELOPMENT

To:	Shanita George University of North Carolina at Charlotte
From:	Office of Research Protections and Integrity
Date:	27-Jul-2022
RE:	Determination that Activity is not Research and does not require IRB Approval
Study #:	IRB-23-0056
Study Title:	Utilizing the Harvard Implicit Association Test to evaluate the level of implicit bias among Anesthesia Providers based on age, weight, and race.

This submission was reviewed by the Office of Research Protections and Integrity, which has determined that this submission does not constitute research as defined under federal regulations 45 CFR 46.102(l) and 21 CFR 56.102(c) and/or (l) and does not require IRB approval.

Study Description:
This is a quality improvement project being conducted as part of the DNP in Nurse Anesthesia program. The project topic is a practice issue selected by the Anesthesia Quality and Safety Committee at Atrium Health aimed at improving the quality and outcome of care within the Atrium facility(s) identified for the project. Therefore, establishing a baseline level of implicit bias related to race, weight, and age among current anesthesia providers that practice at the four different Atrium Health sites, will provide insight into the current practice environment.

Please be aware that approval may still be required from other relevant authorities or "gatekeepers" (e.g., school principals, facility directors, custodians of records), even though IRB approval is not required.

If your study protocol changes in such a way that this determination will no longer apply, you should contact the above IRB before making the changes.

APPENDIX C: RESULT SCREENSHOT

Screenshot