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Nurses' Implicit Attitudes Regarding the LGBTQ Population

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Abstract

Health inequities such as chronic medical conditions, mental health disorders, substance abuse, and suicide are prevalent in the LGBTQ population, resulting in part from minority stress, stigma, discrimination, and isolation. Studies showed mixed results regarding nurses' and other healthcare professionals' attitudes toward these individuals. Relatively little research has focused specifically on nurses, and most studies have centered on healthcare professionals' explicit attitudes. Given the lack of studies on nurses and implicit bias, more research is needed on nurses' implicit attitudes regarding LGBTQ patients. Using a retrospective design with secondary data from Project Implicit, the study compared United States (US) nurses' Transgender Implicit Association Test (IAT) scores with other types of healthcare providers and nonproviders (N = 53,586), determined if a significant difference existed between nurses' Transgender IAT scores and self-reported explicit attitudes (n = 1558), and identified whether nurses' implicit attitudes on sexuality had changed over time (N = 25,791). Results indicated that the nurses group held the strongest implicit preference for cisgender people. Although a comparison of means found no significant difference between nurses' implicit and explicit preferences (p = .052), some evidence of discrepancy existed between implicit preferences and self-reported explicit attitudes. In addition, nurses' implicit attitudes on sexuality trended toward less biased scores. Increased awareness of the implications of implicit bias may aid in the development of education strategies and training to mitigate nurses' negative attitudes and improve the overall quality of nursing care delivered.

Keywords: implicit bias, LGBTQ, transgender, IAT, implicit association test

Introduction and Background

In this age of gender revolution, research has identified the distinct effects of systemic marginalization in the United States (US) on the health and well-being of the lesbian, gay, bisexual, transgender, and questioning (LGBTQ) community. For people who identify as LGBTQ, health disparities exist that have evolved, in part, from stigma, discrimination, and extreme social isolation. Although laws have been formed to protect these groups, the rights of LGBTQ people are often limited or altogether violated (Divan et al., 2016; Nadal, 2018). Fear, hatred, bias, aggression, and violence against LGBTQ people stem from the refusal to accept those individuals who do not conform to society's perceived norms surrounding gender as equals (Divan et al., 2016).

Within the LGBTQ population, health inequities include higher rates of substance abuse related to maladaptive coping mechanisms resulting from minority stress (Center for Substance Abuse Treatment, 2019; Newcomb et al., 2019; Parent et al., 2019; Safer et al., 2016). In addition to life stressors experienced by many individuals across all populations, members of this community can also experience minority stress, which refers to unique, chronic, socially constructed stress created as a result of events that occur because a person belongs to a stigmatized group (Hendricks & Testa, 2012; Parent et al., 2019). Issues such as lack of protective laws, harassment, discrimination, and violence, along with proximity stressors, such as concealment of sexual orientation or gender identity, internalization of negative attitudes, and expectations of rejection, contribute to the development of minority stress (Meyer, 2003; Parent et al., 2019). Stress frequently results in negative physiological changes and can increase a person's vulnerability to addiction (Parent et al., 2019; Sinha, 2008).

Compared to non-LGBTQ individuals, LGBTQ individuals are more likely to cope with stress by using alcohol, tobacco, or other drugs (Carabez et al., 2015; National Institute on Drug Abuse, n.d.; Newcomb et al., 2019). Substance use disorders are also more prevalent in sexual minorities (National Institute on Drug Abuse, n.d). Of the respondents to the 2015 US Transgender Survey, 29% reported

illicit drug use, marijuana consumption, and nonmedical prescription drug use in the month preceding

the survey, nearly three times the rate found in the US population (James et al., 2016). Similar reports

have found that over 37% of LGBTQ individuals used marijuana, compared to 16.2% in the general

population (National Institute on Drug Abuse, n.d.). Transgender adults were twice as likely to smoke

cigarettes as their cisgender counterparts (Buchting et al., 2017). Using a substantial national

administrative claims database, Hughto et al. (2021) studied transgender adults (n=15,637) and

cisgender adults (n=46,911), primarily between the ages of 18 – 40. They found that polysubstance

abuse disorders (including nicotine, alcohol, cannabis, cocaine, and opioids) in the transgender

population were four times higher than the cisgender group.

Chronic medical conditions are another concern. Higher rates of asthma, anal cancer,

cardiovascular disease, and obesity have been reported in the LGBTQ population (Morris et al., 2019). A

comparison of the differences between lesbian, gay, and bisexual (LGB) adults age 50 or older and

heterosexuals of the same age found that the LGB group was significantly more likely to have weakened

immune systems and lower back or neck pain (Fredriksen-Goldsen et al., 2017). Males in the LGB group

were more likely to have angina pectoris and cancer, while females were more likely to report poor

general health and a higher number of chronic conditions (Fredriksen-Goldsen et al., 2017).

Mental health disorders, including depression, anxiety, shame, negative self-concept, and

deliberate self-harm, have also significantly affected LGBTQ individuals. In comparison to their

heterosexual peers, LGB youth in grades seven through 12 were more than twice as likely to attempt

suicide (Centers for Disease Control and Prevention, 2016). Up to 82% of the transgender and gender

diverse (TGD) population have considered suicide, and suicide attempts are as high as 41%, which is 26

times higher than the general US population (Fenway Health, 2015; Newcomb et al., 2019; Safer et al.,

2016). In addition, the quality of available LGBTQ healthcare is of concern. Prior classification of

"homosexuality" and "gender identity disorder" in the Diagnostic and Statistical Manual of Mental

Disorders (DSM) has contributed to the belief that homosexuality and gender dysphoria are pathological (Drescher, 2015; Gay & Lesbian Medical Association, 2001).

Across the nation, nurses are poised as the gatekeepers for effective, holistic patient care for LGBTQ patients. However, nurses' perceptions and biases regarding this vulnerable population may negatively affect care, contributing to less time spent with patients and inadequate assessment, treatment, and follow-up (Narayan, 2019). Biases are most often described in terms of explicit attitudes, which are outwardly acknowledged stereotypes, beliefs, and perceptions of others. Yet, there is another type of bias that exists called implicit bias. Influenced by variables such as family, media, and society, these implicit attitudes and perceptions exist outside of conscious awareness, develop at a very young age, and often conflict with explicitly stated beliefs (Chapman et al., 2013; Devine et al., 2002; Edgoose et al., 2019). An automatic cognitive process, implicit bias shapes a person's beliefs, behaviors, and attitudes through rapid assimilation of patterns. Individuals learn to associate specific attributes with different characteristics, such as race, ethnicity, age, gender, and sexual orientation. Although implicit bias may aid in quickly assessing an unfamiliar situation, it can result in adverse treatment and discrimination of marginalized populations such as the LGBTQ community.

Studies have had mixed results regarding nurses' and other healthcare professionals' attitudes toward LGBTQ individuals, finding both positive and negative viewpoints (Aynur et al., 2020; Della Pelle et al., 2018; Dorsen, 2012; García-Acosta et al., 2020; Kanamori & Cornelius-White, 2016; Lim & Hsu, 2016; Sabin et al., 2015). Of these studies, relatively few have focused specifically on nurses, and most have centered on explicit, rather than implicit, attitudes (Manns-James, 2015). Some research suggests that healthcare professionals' attitudes toward the LGBTQ community have become less biased over the past thirty years, as society's understanding and acceptance of potential differences in gender expression, gender identity, and sexual orientation have grown (Kanamori & Cornelius-White, 2016).

Nursing education on culturally competent LGBTQ patient care is also lacking, contributing to continued negative perceptions (Carabez et al., 2015; Collins, 2020).

Problem Statement

Given the lack of studies that specifically focus on nurses and the emphasis on nurses' and healthcare professionals' explicit attitudes, this study focused on investigating nurses' implicit attitudes regarding LGBTQ patients. Understanding nurses' implicit attitudes regarding these populations may aid in the development of education strategies and training to mitigate negative attitudes and improve the overall quality of care delivered. Identifying biases and barriers to competent nursing care of the LGBTQ community could help strengthen nurses' competence in providing effective, fair, and unbiased care. In addition, knowledge of the trends in attitudes toward this population may help researchers understand the subsequent effects on health disparities (Meyer, 2016).

Purpose

The purpose of the study was to compare US nurses' Transgender Implicit Association Test (IAT) scores with other groups, determine if a significant difference existed between nurses' Transgender IAT scores and reported explicit attitudes, and identify whether nurses' implicit attitudes on sexuality had changed over time.

Review of Evidence

Background

Throughout history, public attitudes have positively shifted on the moral stance regarding LGBTQ individuals. In the early 1970s, the General Social Survey (GSS) found that 73% of Americans believed lesbian and gay relationships were wrong, whereas only 11% believed they were not wrong at all (National Academy of Sciences, 2020). Almost 50 years later, the 2018 GSS found that 58% thought lesbian and gay relationships were not wrong at all, compared to only 32% of Americans who believed they were wrong. Over 73% of US adults believed that lesbian and gay relationships should be legal, and

up to 79% of Americans believed that LGBTQ people experience some level of discrimination. Five

major factors significantly contribute to a person's attitudes related to LGBTQ individuals, including

demographic characteristics, values, religion, emotional predispositions, and personal experiences.

Geographic differences also have an impact, such as in socially conservative religious communities and

rural areas where higher stigma and lower tolerance exist (National Academy of Sciences, 2020).

In recent years, attention has turned to healthcare providers' implicit biases as the National

Academy of Medicine (formerly the Institute of Medicine) called for more research on this topic

(Institute of Medicine, 2011). Literature, in general, has primarily focused on the negative effects of

healthcare professionals' attitudes on racial and ethnic minorities (Chapman et al., 2013; Fitzgerald &

Hurst, 2017; Maina et al., 2018). The Joint Commission (TJC) (2016) described physicians' racial

stereotypes, and other findings have supported statistically significant correlations between lower

quality of healthcare and racial implicit bias (Fitzgerald & Hurst, 2017). Similar effects of negative

explicit attitudes on LGBTQ patient care have been documented (Dorsen, 2012; Lim & Hsu, 2016).

Physicians have demonstrated implicit bias related to patients' race, weight, gender, and age, and they

may rely on stereotypes for decision-making during the diagnostic process in uncertain or time-sensitive

situations (Chapman et al., 2013). However, little is known specifically about nurses' implicit biases and

the subsequent effects on patient care in these populations (Manns-James, 2015).

Current Research

Studies on nurses' explicit attitudes have found varying results (Aynur et al., 2020; Della Pelle et

al., 2018; Dorsen, 2012; García-Acosta et al., 2020; Kanamori & Cornelius-White, 2016; Lim & Hsu, 2016;

Sabin et al., 2015). An earlier integrative review by Dorsen (2012) acknowledged that a range of nurses'

attitudes toward LGBTQ individuals existed from very negative to generally positive, and that negative

attitudes adversely affected the care of these patients; however, limitations of these studies restricted

interpretation and generalizability. Increased education, increased contact with LGBTQ persons,

decreased religiosity, and decreased fear of contracting human immunodeficiency virus (HIV) were markers for increased positive attitudes (Dorsen, 2012).

Recent studies that included nurses and other healthcare providers suggested more positively associated attitudes (García-Acosta et al., 2020; Kanamori & Cornelius-White, 2016). García-Acosta et al. (2020) compared the explicit attitudes of health students, healthcare professionals, and other individuals outside of the healthcare realm (N = 602) using a short version of the Genderism and Transphobia Scale (GTS) and the Negative Attitude towards Trans people Scale (referred to as EANT). Their research identified low transphobia rates, especially in the health student group (García-Acosta et al., 2020). Using an explicit attitude measurement scale called the Transgender Attitudes and Beliefs Scale (TABS), Kanamori and Cornelius-White (2016) surveyed 243 healthcare workers, including nurses (n = 83), and found generally positive attitudes.

In an integrative review of the literature from 1981 – 2015, Lim and Hsu (2016) reported both negative and positive explicit attitudes of nursing students, where more negative attitudes were reported prior to the year 2000. Five of the 12 studies suggested positive attitudes, six studies supported negative attitudes, and one study found neutral attitudes (Lim & Hsu, 2016). Although the authors noted that the study did not account for nursing students' translation of education into practice, they supported Dorsen's (2012) findings that negative attitudes may still adversely affect LGBTQ patient care.

In studies that focused solely on nurses' perspectives, results were also mixed. A survey of Italian nurses (N = 824) using multiple scales to gauge participants' attitudes found moderately positive explicit attitudes but pointed to the need to address nurses' cultural competence with sexual minority populations (Della Pelle et al., 2018). Nurses who had higher education levels and identified themselves as atheists had greater positive attitudes than nurses who identified as Catholic or another religious affiliation (Della Pelle et al., 2018). Aynur et al. (2020) called for the mitigation of nurses' negative

attitudes against LGBTQ individuals, as their findings supported homophobic attitudes of Turkish nurses and suggested that marital status played a role given the predominant Turkish heterosexual family structure. Differences in the country's culture, religious beliefs, epidemiological conditions, and laws protecting LGBTQ individuals may have accounted for these findings (Aynur et al., 2020).

Although several published scales have been used to measure explicit attitudes toward LGBTQ individuals, concerns exist related to factors such as reliability, construct validity, content validity, and the use of hypothetical or theoretical ideologies rather than existing societal attitudes (Billard, 2018; Morrison et al., 2019). In addition, these survey methods were formulated to address only explicit attitudes based on the scale design and by the nature of the questions posed. Limitations with the use of self-report questionnaire tools may include varying degrees of response bias, such as participants' abilities to perform objective self-assessment and a desire to answer the questions in a socially acceptable manner (Rosenman et al., 2011).

Studies on nurses' implicit attitudes regarding the LGBTQ population are lacking. Only one relevant published study was identified. Sabin et al. (2015) compared healthcare workers' IAT results from the Sexuality IAT globally available through Project Implicit. Healthcare providers were grouped as medical doctors, other diagnostic and treating providers, nurses, mental health providers, and nonproviders. Analyses of data from 2006 to 2012 supported an overall strong preference by heterosexual male and female nurses (n = 2287) for heterosexuals versus lesbian and gay people. Lesbian nurses (n = 131), in contrast, held strong implicit preferences for lesbians over heterosexual women, and gay male nurses (n = 119) held weak implicit preferences for gay men over heterosexual men. Out of the four provider groups, nurses had the strongest implicit preferences for heterosexuals. The authors noted several limitations, including the inability to determine providers' attitudes related to bisexual and transgender individuals. Also, the study was not focused specifically on US participants.

A growing body of literature has focused on the lack of LGBTQ training for nurses, which may support underlying feelings of discomfort and knowledge gaps that perpetuate negative attitudes and subsequent implicit biases. Although nurse educators agreed on the importance of education related to sexual minorities, they felt unprepared to teach students (Sirota, 2013). Carabez et al. (2015) reported that in a sample of 286 nurses in the San Francisco Bay area, 80% had no training regarding the care of LGBTQ patients, and almost 30% acknowledged some level of discomfort in providing care, which was typically based on the lack of training. Paradiso and Lally (2018) interviewed nurse practitioners (NPs) (N=11) and found significant knowledge gaps and a lack of formal training. The researchers described participants' unconscious biases that included confusion regarding anatomical changes, misunderstandings of gender identity and sexual orientation, and improper communication (calling a transgender person "it"), noting that the NPs believed they held no biases against this population (Paradiso & Lally, 2018). In a larger study (N=93), Collins (2020) focused on pediatric NPs and their knowledge of TGD care, where only 15% stated that they had received training about TGD patients during their advanced practice education.

Overall, explicit attitudes range from positive to negative and play a large role in nurses' attitudes regarding the LGBTQ population. Based on these variable findings, potential discrepancies in the models used to evaluate explicit attitudes, and lack of studies on implicit bias, further investigation of nurses' implicit attitudes is warranted. Manns-James (2015) described the need to include the IAT in addition to self-reported measures in nursing research, especially when studying socially sensitive topics. Both explicit and implicit attitudes are important in understanding nurses' behavior toward LGBTQ individuals and could provide a more comprehensive view of nurses' overall attitudes about this population.

Theoretical Model

Dual Process Theory

Based on the project's central concept of implicit bias, the Dual Process Theory helps to explain how implicit bias can occur within a nurse's individual thought process (see Figure 1). The first descriptions of Dual Process Theory evolved in the early 1970s and are found primarily in the literature pertaining to cognitive psychology (Bursell & Olsson, 2021). In more recent years, healthcare researchers have applied Dual Process Theory to explain the intricacies of clinical reasoning (Quaresma et al., 2019).

Although variations on Dual Process Theory exist, Daniel Kahneman's (2003) work in this field is highly regarded (Quaresma et al., 2019). In his description, Kahneman (2003) expanded on Stanovich and West's (2000) view of two distinct cognitive processes called *System one (S1)* and *System two (S2)*. System one is fast, intuitive, efficient, and based on pattern recognition. Reasoning using S1 occurs without conscious awareness of the process. In addition, S1 operations are typically emotionally charged and difficult to control or modify (Kahneman, 2003). In daily decision-making, 95% of decisions are intuition-based (Wu, 2020).

In contrast, S2 is a slow, analytical cognitive process that is time-intensive and deliberate. It involves the conscious interpretation of data. The operations of S2 are rule-governed and flexible (Kahneman, 2003). Although S2 functions as a quality monitor over S1 thought processes, it is relatively permissive and allows the expression of many intuitive, albeit potentially erroneous, S1 judgments (Kahneman, 2003). Despite the brain's primary reliance on S1 thought processes, S1 is prone to errors and implicit biases, especially when individuals are under stress, pressured for time, or in an unfamiliar situation (Wu, 2020). Regardless, intuitive thinking is not without merit and can be a powerful tool, especially when individuals are highly skilled through years of practice. Kahneman (2003) noted that some researchers have argued that experienced decision-makers can make better decisions based on intuition versus analytical reasoning.

Nursing practice itself has historically acknowledged the existence of alternate ways of knowing beyond the scientific model, beginning with Carper's (1978) distinction between empirics and personal knowledge. Empirics parallel psychology's view of S2, while personal knowledge, intuition, and other non-scientific ways of knowing align with S1 (Paley et al., 2007). Nursing has long defined the profession as both an art and a science, combining intuition coupled with scientific inquiry, which has formulated the basis for clinical reasoning. Intuitive thinking and evidence-based practice are considered equally essential processes in decision-making and patient care.

However, from a psychology perspective, these thought processes should not be given equal weight. Because of the potential for error, S1 thought processes require oversight from S2. Without S2, many mistakes in decision-making can result. Issues such as attribute substitution, structural availability bias, and belief bias can affect the integrity of an individual's thought process and result in errors in judgment (Paley et al., 2007). Paley et al. (2007) also described how lack of S2 oversight could lead to error because of sampling bias, overconfidence, and misconceptions about one's attitudes and motivations.

Application to Research Questions

In this project, comparisons were made between nurses and other groups to determine whether nurses had different levels of implicit biases regarding the LGBTQ population. As previously noted, Sabin et al. (2015) found that, within identified healthcare groups, nurses had the strongest preference for heterosexuals, which could negatively undermine nurses' thought processes when caring for LGBTQ patients. It is important, then, to consider how much nurses rely on S1 thought processes during patient care delivery.

Nurses utilize both S1 and S2 to engage in clinical reasoning. Nursing clinical judgment and decision-making are complex processes affected by many factors, including intuition and heuristics, knowledge and experience, and education and practice (Wu, 2020). Generally, less experienced nurses

rely on S2 thought processes, analytically considering unfamiliar situations, processing the information, and internalizing patterns. More experienced nurses automatically utilize S1 thought processes based on pattern recognition and previous experience (Quaresma et al., 2019). However, when faced with an unfamiliar situation under normal circumstances, individuals deliberately and consciously rationalize the event using S2 processes. Benner (1984) described how an experienced nurse would revert to analytical thinking in such a case.

Nurses are often placed in situations that require both quick judgment and critical thinking to ensure patient safety. In addition, nurses tend to work under conditions that predispose them to unique stressors, such as lack of appropriate staffing ratios, heavy workloads, long hours, and extended shifts. These stressful circumstances can heighten nurses' reliance on implicit biases (Narayan, 2019). Also, given the apparent lack of training, nurses are likely unfamiliar with LGBTQ patient healthcare needs (Carabez et al., 2015; Collins, 2020; Paradiso & Lally, 2018; Sirota, 2013). Because of these factors, nurses may continue to rely heavily on S1 thought processes even when faced with new or unknown situations. Having a high level of implicit bias about LGBTQ patients coupled with the primary use of S1 thought processes might, in turn, lead to higher rates of nursing errors when caring for this population. Examining nurses' level of implicit bias related to the LGBTQ population is, therefore, a critical first step.

Project Design

This retrospective study compared data from the Transgender IAT to determine if nurses' IAT scores differed from other groups and if a correlation existed between nurses' Transgender IAT scores and reported explicit attitudes. Data from the Sexuality IAT were also analyzed to identify whether nurses' implicit attitudes on sexuality had changed over time. The project design was based on the availability of IAT data from Project Implicit. Large sample sizes, publicly accessible databases, and longitudinal data were ideal research elements.

Three questions provided the basis for three separate analyses:

Question one (Q1): Is there a difference between US nurses' Transgender IAT scores and other groups?

Questions two (Q2): Does a significant difference exist between nurses' Transgender IAT scores and self-reported explicit attitudes?

Question three (Q3): Have nurses' implicit attitudes on sexuality changed over time?

Setting/Context

The study evaluated de-identified, retrospective secondary data from Project Implicit. Project Implicit, founded in 1998 by psychologists Greenwald, Banaji, and Nosek, is a nonprofit organization dedicated to research on implicit social cognition, public education about hidden biases, and data collection (Project Implicit, 2011a). Globally, individuals can access Project Implicit online at the organization's website (www.projectimplicit.net) to complete one of 14 different social attitude IATs, such as race, age, weight, religion, disability, transgender, and sexuality (Project Implicit, 2011c). In addition to completing the IAT, respondents can voluntarily answer questions related to personal demographics and explicit attitudes about the selected subject, which generally have Likert-scale response options.

Project Population

For Q1, participants consisted of US residents who completed the Transgender IAT. For Q2, participants were US nurses who completed the Transgender IAT and answered a question about explicit attitudes. For Q3, participants included US nurses who completed the Sexuality IAT. Individuals typically access the Project Implicit website to complete the IAT for work or school purposes. Other reasons individuals might complete the IAT include hearing about the IAT on the news, clicking on an associated Internet website link, or getting a recommendation from another person.

Sources of Data/Data Collection Instruments

Instrumentation and Methods

Measure of Implicit Attitudes.

All three study questions analyzed implicit attitudes using participants' IAT scores. The IAT has

been widely used for over two decades to collect information on implicit biases (Project Implicit, 2011a).

The IAT is a method that measures the strength of relative associations between concepts (such as

lesbian/gay or heterosexual) and evaluations or stereotypes (such as good or bad) (Greenwald et al.,

2015; Project Implicit, 2011b). In the Transgender IAT, respondents sort photographs of celebrities who

are either transgender or cisgender. The Sexuality IAT requires respondents to distinguish between

words and symbols representing lesbian/gay and heterosexual people.

Following the creation of the IAT in 1998, Greenwald and Nosek (2001) reported good reliability.

Greenwald et al. (2009) again found moderate predictive validity of the test (r = .274), which was

subsequently verified six years later (Greenwald et al., 2015). Greater IAT predictive validity versus self-

reported measures has been substantiated (Manns-James, 2015). Manns-James (2015) described

construct validity testing using known group comparisons, factor analysis, hypothesis testing, and multi-

trait multi-method strategies. This research supported and validated that the IAT assesses personal

attitudes rather than cultural or group attitudes (Manns-James, 2015). Consistently high Cronbach's

alpha scores were also reported, averaging 0.8 with an overall range of 0.7 – 0.9 (Manns-James, 2015).

The IAT scores are computed using respondents' performance speeds for two classification tasks

(Greenwald et al., 2003). Participants who respond more quickly to a pair of associations (i.e.,

"heterosexual + good" or "gay + bad") are considered to have stronger implicit attitudes toward that

group. In other words, responding quicker to "heterosexual + good" tasks would indicate a stronger

preference for heterosexuals (Project Implicit, 2011b). Latency times (in milliseconds), error rates, and

standard deviations of latencies are used to calculate the differences in mean response rates for each

grouping, which generate an overall score (D score) between -2 and 2. Results higher than 0.65 or lower

than -0.65 are considered strongly positive or strongly negative associations, respectively (Epifania et al., 2020). For the Transgender IAT, an IAT score greater than or equal to 0.65 indicates a strong preference for cisgender, while a score less than or equal to -0.65 indicates a strong preference for transgender. The Sexuality IAT scores are similar, with an IAT score greater than or equal to 0.65 indicating a strong preference for heterosexuals and a score less than or equal to -0.65 indicating a strong preference for lesbian or gay people. For both the Transgender and Sexuality IAT, neutral, slight, and moderate preferences are listed as ranges (Greenwald et al., 2003) (see Table 1).

Measure of Explicit Attitudes.

The study also explored the relationship between nurses' Transgender IAT scores and reported explicit attitudes (Q2). After completing the Transgender IAT, participants were asked to voluntarily rate their preference for transgender versus cisgender individuals by selecting one of the following statements:

1. I strongly prefer transgender people to cisgender people,

2. I moderately prefer transgender people to cisgender people,

3. I slightly prefer transgender people to cisgender people,

4. I like cisgender and transgender people equally,

5. I slightly prefer cisgender people to transgender people,

6. I moderately prefer cisgender people to transgender people, and

7. I strongly prefer cisgender people to transgender people.

On a scale from one to seven, one indicated a strong preference for transgender individuals, and seven indicated a strong preference for cisgender individuals. A score of four indicated no preference. Participants who scored greater than four were considered to have negative explicit attitudes about transgender people. Those participants who scored four or less were considered to have positive

explicit attitudes about transgender people. To make a valid comparison of IAT scores and explicit

responses, the scores were then recoded to align with IAT scores (see Table 2).

Databases.

The OSF website is a data repository that houses publicly available databases, including the

Project Implicit IATs completed online worldwide. Multiple databases are stored, including the

Transgender and Sexuality IAT databases that were the focus of this study. The Transgender IAT and

Sexuality IAT databases were downloaded and sorted to identify respondents that met the stated

inclusion criteria and then formatted into three master files pertaining to the related study question: the

Transgender IAT (Q1), Transgender Explicit (Q2), and Sexuality IAT (Q3) files.

Inclusion/Exclusion Criteria

For all study questions, inclusion criteria consisted of US residents who had a completed overall

IAT D score. Following the recommendation of previous studies such as Sabin et al. (2015), respondents

were disqualified if their IAT scores met any of the following criteria: (1) going too fast (less than 300

milliseconds) on more than 10% of the total test trials or (2) making more than 30% erroneous

responses across the critical blocks of the IAT. Going too fast or making multiple errors suggests that

respondents are not fully engaged in taking the IAT, which could compromise results.

For Q1, respondents who further self-identified their occupational status were included.

Respondents outside the US were excluded, as well as respondents who failed to complete the IAT

(resulting in an incomplete test or no associated overall IAT D score), or who did not self-identify their

occupation.

For Q2, respondents who self-identified their occupational status as "Healthcare – Nurses and

Home Health Assistants" and identified their education level as an associate's degree or higher were

included and grouped as nurses. Respondents to the IAT can choose from several occupational

categories including nursing, and education levels, including some college, associate's degree, bachelor's

degree, some graduate school, master's degree, MBA, JD, MD, PhD, and "other advanced degree."

Given that nursing entails a minimum of an associate's degree, education levels below this category

were excluded. Although this exclusion improved the probability that the nurses group was exclusively

nurses, it did not eliminate the possibility of including non-nurses.

Additionally, respondents who answered the measure of explicit attitudes were included.

Exclusion criteria included respondents who lived outside the US, did not have a reported IAT D score,

failed to self-identify their occupation or education level, did not meet the inclusion criteria as a "nurse,"

or did not answer the measure of explicit attitudes question.

For Q3, respondents who self-identified their occupational status as "Healthcare – Nurses and

Home Health Assistants" and identified their education level as an associate's degree or higher were

included and grouped as nurses. Exclusion criteria included lack of occupational status (which was not

collected prior to December 2006), lack of education level, respondents from outside the US, and those

individuals who self-reported an occupation other than nursing.

Data Collection Process/Procedures

Data Preparation

Data were cleaned to eliminate and correct any inaccuracies. Because the data were de-

identified, no additional processes for de-identification were required. To potentially compare findings

to the previous study by Sabin et al. (2015), groups in this study were similarly categorized. Participants

were identified as physicians (MDs) if they reported that their occupation was "Healthcare – Diagnosing

and Treating Practitioners (MD, Dentist, etc.)" and their education level was "MD." Participants were

identified as "other diagnostic and treating professionals" if they reported that their occupation was

"Healthcare – Diagnosing and Treating Practitioners (MD, Dentist, etc.)," and their education level was

not "MD," but their education level was a bachelor's degree or higher. Participants were identified as

nurses if they reported that their occupation was "Healthcare – Nursing and Home Health Assistants"

and their education level was an associate's degree or higher. Participants were identified as mental

health providers if they reported that their occupation was "Social Service – Counselors, Social Workers,

Community Specialists," and their education level was a bachelor's degree or higher. Participants were

identified as healthcare support workers if they reported that their occupation was "Healthcare -

Technologists and Technicians," "Healthcare – Occupational or Physical Therapy Assistants," "Healthcare

- Other healthcare support," or "Healthcare – Nurses and Home Health Assistants" and their education

level was less than an associate's degree. Participants were identified as nonproviders if they reported

that their occupation was not "Healthcare – Diagnosing and Treating Practitioners (MD, Dentist),"

"Healthcare – Nursing and Home Health Assistants," "Social Service – Counselors, Social Workers,

Community Specialists," "Healthcare - Technologists and Technicians," "Healthcare – Occupational or

Physical Therapy Assistants," or "Healthcare - Other healthcare support."

Statistical Analyses

Statistical analyses of quantitative data were performed using IBM SPSS Statistics software

version 28. An independent group *t*-test was used to compare the mean IAT scores (scale level,

continuous variables) of the nurses group to other identified groups. Comparisons of the groups were

conducted using a one-way analysis of variance (ANOVA). A paired *t*-test was calculated to understand

if a significant difference existed between IAT scores and explicit attitudes in the nurses group. The

mean IAT score for each year was calculated from the Sexuality IAT file for 2006 to 2020. Descriptive

statistics were used to discuss whether attitudes in the nurses group had changed over time.

Risks and Benefits to Human Subjects

Due to the de-identified, retrospective nature of the project, no risks or benefits to human

subjects existed. Given that the project was a retrospective study, it did not require current

engagement of the identified population, and informed consent was not required. Verification of

exempt status was secured through Belmont University's Institutional Review Board (IRB).

Results

The initial Transgender IAT (Q1) database consisted of 179,353 respondents. After applying

inclusion and exclusion criteria, 125,767 respondents were excluded, resulting in the total sample (N =

53,586). Participants were further divided into healthcare and nonproviders, resulting in 20.8%

healthcare (n = 11,163) and 79.2% nonproviders (n = 42,423). The healthcare group (n = 11,163) was

further divided into the following categories based on self-reported occupation: 14.2% nurses (n =

1584), 6.3% physicians (MDs) (n = 705), 8.6% other diagnostic and treating professionals (n = 965),

28.8% mental health providers (n = 3210), and 42.1% healthcare support workers (n = 4699).

Participants' reported gender identities were then calculated based on available choices, which included

"male," "female," "trans male/trans man," "trans female/trans woman," "genderqueer/gender

nonconforming," and "a different identity." Respondents who selected more than one gender identity

were classified as "other." Interestingly, in each identified group, gender identity was predominantly

female (see Table 3).

Results of the computed one-way ANOVA and post hoc Bonferroni tests provided evidence of

differences between some of the groups ($F(5, 53580)$ = 19.55, p <.001). Because standard deviation

calculations of the groups were similar, population variances were assumed to be equal. Based on mean

overall IAT D scores and score range interpretations by Greenwald et al. (2003), nurses showed a slight

preference for cisgender people (M = 0.19, SD = 0.43), while other groups had little or no preference

(see Table 1 and Table 4). Differences were identified between nurses and mental health providers,

healthcare support workers, and nonproviders (p < .001), and between nurses and other diagnostic and

treating providers (p = .035). However, no significant difference was identified between nurses and

physicians (p = .548). The most significant difference was found between nurses and mental health

providers (M difference = 0.12, p < .001, Cohen's d = 0.27) (see Table 5). Cohen's d calculations were

also computed and found to be very small or small (see Table 6).

The Transgender Explicit (Q2) database was created using the same Transgender IAT database and was initially sorted similarly, resulting in 53,586 respondents. From this total, the nurses group was identified (*N* = 1584). Only US nurses who answered the question regarding explicit attitudes were included in the Transgender Explicit database (*n* = 1558). A frequency table identified 61.7% of nurses who reported no preference between transgender and cisgender people, while 34.7% of nurses reported they had some level of preference for cisgender people (see Table 7). A paired *t*-test was conducted comparing the mean overall IAT D scores (*M* = 0.19, *SD* = 0.43) to the mean recoded explicit scores (*M* = 0.17, *SD* = 0.37), which found no significant difference between groups (*M* = 0.02, *SD* = 0.49, *t*(1557) = 1.948, *p* = .052) (see Table 8).

In the Sexuality IAT (Q3) database, 4,263,187 respondents started the test. After applying inclusion and exclusion criteria, 4,237,396 respondents were excluded, resulting in the total sample (*N* = 25,791). Mean overall IAT D scores were calculated for the years 2006 to 2020. Nurses' implicit attitudes on sexuality were found to be trending toward less biased scores. From 2007 to 2011, the mean overall IAT D score rose from 0.40 to 0.45, which indicated a moderate preference for heterosexuals. The year 2011 showed the highest overall IAT D score mean (*M* = 0.45, *SD* = 0.43). Between 2012 and 2020, the mean decreased from 0.41 to 0.22, indicating a shift from a moderate to a slight preference for heterosexuals (see Table 9 and Table 10).

Discussion

Differences between Nurses' Transgender IAT Scores and Other Groups

The initial aim of this project was to identify whether a difference existed between US nurses' Transgender IAT scores and other groups. The study is thought to be one of the first of its kind to describe the differences in nurses' implicit attitudes about transgender people compared to other occupations. Of all the categorized groups, nurses held the strongest implicit preference for cisgender people, and significant differences were found between nurses and other diagnostic and treating

providers, mental health providers, healthcare support workers, and nonproviders. Only the physicians

(MDs) group did not show a significant difference compared to nurses. With regard to gender identity,

mental health providers comprised the largest number of participants who identified as

genderqueer/gender nonconforming (3.5%) and had the lowest overall IAT scores (*M* = 0.07).

Nonproviders and mental health providers also had the highest total number of participants (7.1% and

6.8%, respectively) that chose a category other than "male" or "female," which may signify the

importance of having adequate levels of sexual minorities represented in the workforce.

As previously noted, research has centered around the harmful effects of healthcare

professionals' attitudes, identifying varied results ranging from very negative to positive (Aynur et al.,

2020; Della Pelle et al., 2018; Dorsen, 2012; Fitzgerald & Hurst, 2017; García-Acosta et al., 2020;

Kanamori & Cornelius-White, 2016; Lim & Hsu, 2016; Maina et al., 2018; Sabin et al., 2015). Yet, most of

these previous studies concentrated on explicit attitudes or did not focus on nurses. Comparable to this

analysis, Sabin et al. (2015) measured both implicit and explicit attitudes, determining that nurses had

the strongest implicit preferences toward heterosexuals while mental health providers had the weakest

implicit preferences. Likewise, the results from the current study found that nurses had the strongest

implicit preferences for cisgender people and mental health providers had the weakest implicit

preferences. However, based on overall IAT scores, the nurses group only slightly preferred cisgender

individuals, while mental health providers and all other groups had little to no preference. These

findings are consistent with the general trend toward LGBTQ acceptance (National Academy of Sciences,

2020).

Dual process theory may help shed light on the similarities between physicians' and nurses'

thought processes and explain the lack of a significant difference between these two groups. Both

physicians' and nurses' thought processes engage quick decision-making under time constraints and

stressful situations, influencing how these groups implicitly react toward transgender individuals. Like

nurses, physicians also may turn to stereotypes and biases when faced with uncertainty and time

pressure (Chapman et al., 2013).

In addition, dual process theory may explain the finding that nurses have the strongest implicit

preferences for cisgender people. Experienced nurses predominantly utilize S1 thought processes as

they rely heavily on past experiences, patterns, and intuition (Quaresma et al., 2019). Given the level of

emotional influence and difficulty in controlling S1 thought processes, it is not surprising that errors in

judgment occur. Lack of training related to LGBTQ patient care may also play a role in how nurses rely

on implicit biases in making treatment decisions. The combination of stress and lack of training may

ultimately lead nurses to continue to rely on their intuition and implicit biases as a result (Narayan,

2019).

Differences between Nurses' Transgender IAT Scores and Explicit Attitudes

The second objective of the project focused on identifying whether a significant difference

existed between nurses' Transgender IAT scores and self-reported explicit attitudes. Based on the

frequency of responses, most nurses reported having no preference between transgender and cisgender

individuals (n = 61.7%). Despite this finding, the mean recoded explicit scores calculation indicated a

slight preference for cisgender individuals (M = 0.17, SD = 0.37). When compared to the mean overall

IAT D scores (M = 0.19, SD = 0.43), a significant difference was not found. Implicit biases have been

commonly considered unconscious or unknown and vastly different from explicit attitudes (Chapman et

al., 2013; Devine et al., 2002; Edgoose et al., 2019; Narayan, 2019). However, in this study, both nurses'

implicit and explicit attitudes identified a slight preference for cisgender people, which indicates that the

nurses may have had a general awareness of their biases toward transgender individuals.

Sabin et al. (2015) also examined explicit attitudes, reporting similar results in their findings

related to nurses' attitudes about heterosexuals compared to lesbian and gay people. Almost all groups,

including nurses, reported moderate to strong preferences for people with identical sexual identities

(that is, heterosexuals preferred other heterosexuals and lesbians or gays preferred other lesbians or gays). Mean explicit scores of nurses were positive, indicating some degree of preference for heterosexual people (Sabin et al., 2015). Although nurses are apparently aware of their biases, they may not have the appropriate resources to effectively change their attitudes.

This lack of training and unfamiliarity with LGBTQ patient care needs may also perpetuate nurses' negative perceptions of this vulnerable population. Because nurses are generally more confident in their skills and abilities within familiar settings, nurses who are less familiar with LGBTQ care may have reservations about caring for LGBTQ patients. Rather than stereotyping or portraying LGBTQ patients in a negative light, nurses may simply be hesitant to care for these individuals because nurses fear they may not provide quality care or effectively meet these patients' needs. In turn, this situational anxiety and stress could enhance a nurse's reliance on S1 thought processes, further contributing to the introduction of implicit bias and clinical judgment errors.

Nurses' Attitudes on Sexuality Trends

Thirdly, the study considered whether nurses' implicit attitudes on sexuality had changed over time and determined that nurses' attitudes were trending toward less biased scores. Although Sabin et al. (2015) found that nurses had the strongest implicit preferences for heterosexuals, the current study suggests that nurses' attitudes have become more accepting of lesbian and gay individuals. As societal attitudes shift toward the affirmation of diversity, equity, and inclusion of the LGBTQ population, more nurses are likely to follow suit. However, without adequate preparation and training on LGBTQ healthcare needs, nurses will continue to rely on S1 thought processes, allowing for implicit bias and potential errors in judgment.

Implications and Future Directions for Practice

In light of these results, nursing programs and healthcare facilities should deliberately consider the impact of implicit bias and the need for education related to LGBTQ patient care. Understanding the

specific health needs of LGBTQ individuals could help nurses avoid errors in S1 thought processes and more effectively care for these patients. Training that supports nurses' knowledge of the LGBTQ community can strengthen nurses' abilities to develop relevant care plans, implement appropriate interventions, and support LGBTQ patients' unique needs. In addition, self-awareness of implicit biases and how implicit biases contribute to negative attitudes may lead nurses to make positive changes in their practice that more effectively support not only the patient-centered care model but also LGBTQ patients as individuals.

Future directions for nursing practice should support the development of methods that enhance implicit bias awareness and incorporate LGBTQ education into nursing programs, hospitals, and other healthcare facilities. Ongoing education is needed that supports nurses' understanding of the specific healthcare needs of LGBTQ individuals. Practices that help mitigate implicit biases, such as mindfulness and habit replacement, may also benefit nurses (Narayan, 2019). Rooted in the ethical concepts of empathy and compassion, mindfulness has been used to reduce stress and improve communication patterns. Habit replacement focuses on identifying a "bad" habit (i.e., implicit assumptions) and incorporating more desirable ones, such as nonbiased thinking.

Additional studies may consider the impact of demographics, such as age, race, religion, political affiliation, and geographic location, and how these data influence implicit and explicit preferences. The effects of implicit preferences on actual patient outcomes need further review. How these preferences influence health disparities within the LGBTQ population also requires more research. Health disparities continue to exist in healthcare, and methods to reduce these inequalities should be investigated.

Strengths and Limitations

This study offers additional insight into nurses' perspectives of a vulnerable population. As a profession, nurses can gain a greater awareness of the significance and impact of their attitudes, both implicit and explicit, related to the care of LGBTQ patients. Although the samples are not representative

of definable populations, the available data sets and the large sample numbers enhance the

generalizability of findings. In addition, the IAT has repeatedly shown statistical reliability, validity, and

internal consistency (Greenwald & Nosek, 2001; Greenwald et al., 2009; Greenwald et al., 2015; Manns-

James, 2015). One potential limitation includes recoding explicit scores to align with IAT scores, which

may have affected the reported outcomes.

Conclusion

Healthcare is not immune to implicit bias and its influence on patient care, including evident

health disparities within the LGBTQ community. Evaluating nurses' implicit and explicit attitudes offers

additional insight into implicit bias and how it may adversely affect LGBTQ patient care and perpetuate

errors in nurses' clinical judgment. This study compared nurses' IAT scores with other groups,

determining if a significant difference existed between nurses' reported explicit attitudes and implicit

attitudes, and examining whether nurses' attitudes related to sexuality were changing. Despite nurses'

implicit and explicit attitudes demonstrating a slight preference for cisgender people, nurses' attitudes

regarding the LGBTQ population have trended toward less biased scores. Although discrimination and

stigma still exist, overall attitudes about the LGBTQ population are gradually moving toward inclusion

and acceptance.

Supporting nurses' education and their awareness of the needs of LGBTQ patients can further

these efforts. Working together to promote an environment that defends diversity, inclusivity, and

equality requires continuous effort and practice. Nurses must protect the rights of all patients

regardless of gender identity or sexual orientation. Developing a therapeutic relationship requires

genuine caring and understanding of a patient's perspective, respect for differences, and partnership-

building (Narayan, 2019). When mindful of these aspects of patient care and aware of their own biases,

nurses will be able to deliver individualized care for each patient based on the person's unique

characteristics.

Nurses must not wait another decade to fully embrace the LGBTQ patient population. Implementing changes in current professional nursing programs and nursing education modalities would help mitigate the potentially adverse effects of implicit bias. Awareness is the first step in addressing implicit bias, followed by giving nurses the necessary tools to counteract its consequences. Additionally, education on the specific healthcare needs of the LGBTQ population would reduce nurses' unfamiliarity with caring for these patients. Nursing is highly regarded as a trustworthy profession. Addressing nurses' implicit bias is critical in maintaining that trust, providing better nursing care, improving patient health outcomes, and reducing health disparities for all LGBTQ individuals.

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Figures/Tables/Appendices

Figure 1

Dual Process Theory in Nursing
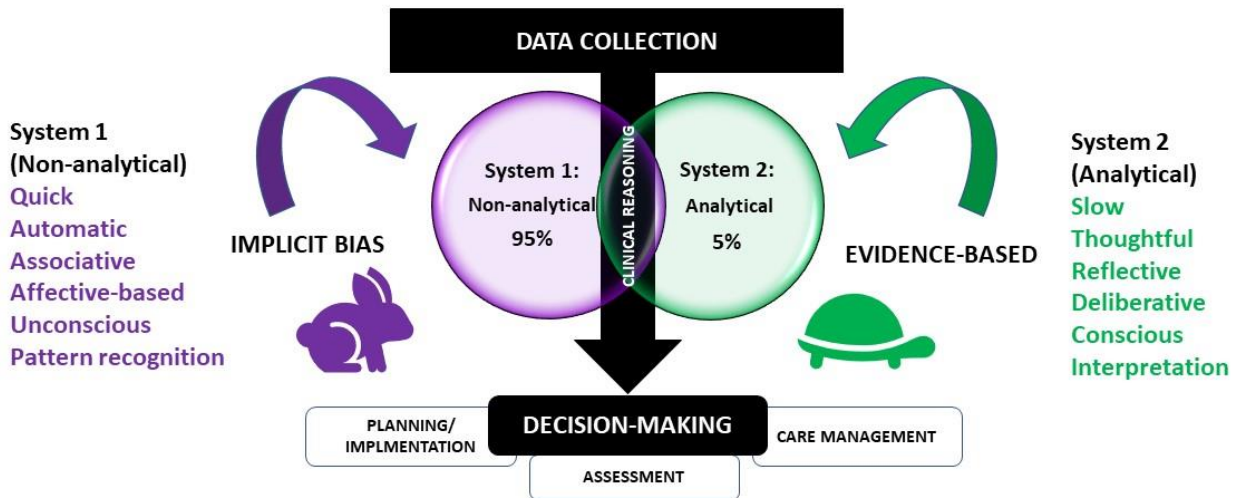
Note: This figure was adapted from Quaresma, A., Xavier, D., & Cezar-Vaz, M. (2019). Nurses' clinical

reasoning: A dual process theory approach. *Revista Enfermagem UERJ, 27*, e37682.

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Table 1

Project Implicit Transgender and Sexuality IAT Score Interpretations

Score Range	Transgender IAT interpretation	Sexuality IAT interpretation
Less than or equal to -0.65	Strong preference for transgender over cisgender	Strong preference for lesbian or gay people over heterosexuals
Greater than -0.65 and less than or equal to -0.35	Moderate preference for transgender over cisgender	Moderate preference for lesbian or gay people over heterosexuals
Greater than -0.35 and less than or equal to -0.15	Slight preference for transgender over cisgender	Slight preference for lesbian or gay people over heterosexuals
Greater than -0.15 and less than 0.15	No preference between transgender and cisgender	No preference between heterosexuals and lesbian or gay people
Greater than or equal to 0.15 and less than 0.35	Slight preference for cisgender over transgender	Slight preference for heterosexuals over lesbian or gay people
Greater than or equal to 0.35 and less than 0.65	Moderate preference for cisgender over transgender	Moderate preference for heterosexuals over lesbian or gay people
Greater than or equal to 0.65	Strong preference for cisgender over transgender	Strong preference for heterosexuals over lesbian or gay people

Note. Score ranges reproduced from Greenwald, A., Nosek, B., & Banaji, M. (2003). Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology, 85*(2), 197–216. https://doi.org/10.1037/0022-3514.85.2.197

Table 2

Recoded 7-point Scale

Transgender versus Cisgender Preference	7-point Scale Score	Assigned IAT Score
Strongly prefer transgender over cisgender	1	-1.325
Moderately prefer transgender over cisgender	2	-0.5
Slightly prefer transgender over cisgender	3	-0.25
No preference between transgender and cisgender	4	0
Slightly prefer cisgender over transgender	5	0.25
Moderately prefer cisgender over transgender	6	0.5
Strongly prefer cisgender over transgender	7	1.325

Table 3

Reported Gender Identity

Category	Male n(%)	Female n(%)	Trans male/Trans man n(%)	Trans female/Trans woman n(%)	Genderqueer/ Gender nonconforming n(%)	A different identity n(%)	Other* n(%)	Total n(%)
MDs	245 (34.9%)	447 (63.7%)	1 (0.1%)	0 (0.0%)	5 (0.7%)	0 (0.0%)	4 (0.6%)	702 (100%)
Other diagnostic and treating providers	231 (24.0%)	704 (73.0%)	1 (0.1%)	3 (0.3%)	16 (1.5%)	0 (0.0%)	11 (1.1%)	964 (100%)
Nurses	124 (7.8%)	1418 (89.6%)	5 (0.3%)	3 (0.2%)	16 (1.0%)	4 (0.3%)	13 (0.8%)	1583 (100%)
Mental health providers	364 (11.4%)	2619 (81.8%)	29 (0.9%)	11 (0.3%)	113 (3.5%)	15 (0.5%)	52 (1.6%)	3203 (100%)
Support	789 (16.8%)	3657 (78.0%)	34 (0.7%)	21 (0.4%)	122 (2.6%)	8 (0.2%)	59 (1.3%)	4690 (100%)
Nonproviders	12059 (28.5%)	27311 (64.5%)	327 (0.8%)	248 (0.6%)	1260 (3.0%)	194 (0.5%)	934 (2.2%)	53475 (100%)

*Other: Respondents selected two or more gender identities.

Table 4

One-way ANOVA for Comparison of Means

Category	*M*	*SD*	*F*-value	*p*-value	η^2
MDs	0.15	0.43	19.55	<.001**	.002
Other diagnostic and treating providers	0.14	0.45			
Nurses	0.19	0.43			
Mental health providers	0.07	0.45			
Healthcare support workers	0.12	0.44			
Nonproviders	0.10	0.45			
Total	0.11	0.45			

**The mean difference is significant at the <.001 level.

Table 5

Bonferroni Post Hoc Results

Groups	MDs	Other diagnosing and treating providers	Nurses	Mental health providers	Healthcare Support	Nonproviders
MDs	-	1.000	.548	<.001**	1.000	.073
Other diagnosing and treating providers	1.000	-	.035*	<.001**	1.000	.268
Nurses	.548	.035*	-	<.001**	<.001**	<.001**
Mental health providers	<.001**	<.001**	<.001**	-	<.001**	.001*
Healthcare Support	1.000	1.000	<.001**	<.001**	-	.347*
Nonproviders	.073	.268	<.001**	.001*	.347*	-

*The mean difference is significant at the .05 level.

**The mean difference is significant at the <.001 level.

Table 6

Cohen's d Calculations

Groups	MDs	Other diagnosing and treating providers	Nurses	Mental health providers	Healthcare Support	Nonproviders
MDs	-	0.03	-0.10	0.17	0.07	0.10
Other diagnosing and treating providers	-0.03	-	-0.13	0.15	0.04	0.08
Nurses	0.10	0.13	-	0.27	0.17	0.20
Mental health providers	-0.17	-0.15	-0.27	-	-0.11	-0.07
Healthcare Support	-0.07	-0.04	-0.17	0.11	-	0.03
Nonproviders	-0.10	-0.08	-0.20	0.07	-0.03	-

Table 7

Recoded 7-point Scale with Frequencies

Transgender versus Cisgender Preference	7-point Scale Score	Assigned IAT Score	Number of Responses (Percent)
Strongly prefer transgender over cisgender	1	-1.325	8 (0.5%)
Moderately prefer transgender over cisgender	2	-0.5	13 (0.8%)
Slightly prefer transgender over cisgender	3	-0.25	36 (2.3%)
No preference between transgender and cisgender	4	0	961 (61.7%)
Slightly prefer cisgender over transgender	5	0.25	285 (18.3%)
Moderately prefer cisgender over transgender	6	0.5	148 (9.5%)
Strongly prefer cisgender over transgender	7	1.325	107 (6.9%)

Table 8

Results of Paired t-test Comparing Mean IAT Scores to Mean Recoded Explicit Scores

Group	M	SD	t(1557)	p
Mean IAT Scores	0.19	0.43	1.948	.052
Mean Recoded Explicit Scores	0.17	0.37		

Table 9

Yearly Mean Overall IAT D Scores

Session Year	M	N	SD	Std. Error of Mean	Minimum	Maximum	Variance
2006	.32	79	.46	.051998	-.807	1.340	.214
2007	.40	892	.47	.015729	-1.039	1.454	.221
2008	.36	668	.47	.018244	-1.203	1.496	.222
2009	.38	927	.47	.015327	-1.097	1.481	.218
2010	.41	877	.45	.015083	-1.154	1.372	.200
2011	.45	1134	.43	.012633	-1.393	1.486	.181
2012	.41	1136	.47	.013836	-1.072	1.479	.217
2013	.41	1388	.45	.012061	-1.301	1.503	.202
2014	.37	1303	.47	.013021	-1.286	1.529	.221
2015	.35	2133	.45	.009780	-1.181	1.670	.204
2016	.31	1987	.47	.010482	-1.332	1.373	.218
2017	.30	2350	.46	.009560	-1.320	1.423	.215
2018	.28	3080	.46	.008372	-1.292	1.432	.216
2019	.27	3428	.47	.007979	-1.351	1.414	.218
2020	.22	4409	.47	.007063	-1.363	1.501	.220
Total	.32	25791	.47	.002909	-1.393	1.670	.218

Table 10

Mean Sexuality IAT Scores 2006 - 2020