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Athletic Trainers' Competence, Education, and Perceptions Regarding Transgender Student-Athlete Patient Care

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Context: Transgender student-athletes are increasingly participating in sport, requiring athletic trainer (AT) preparedness to care for their needs.

Objective: To measure ATs' (1) perceived definition of transgender, (2) comfort and competence working with transgender student-athletes, (3) sources of education, (4) perceived legal concerns, and (5) perception of competitive advantage.

Design: Cross-sectional study.

Setting: Mixed-methods survey.

Patients or Other Participants: Collegiate or university ATs (n = 5537) received an email invitation to participate; the data of 667 ATs were included in the analysis.

Main Outcome Measure(s): A multipart 43-item questionnaire addressing the primary objectives of the study, with other factors that were explored in relation to these objectives to uncover potential influences on their responses. We calculated descriptive statistics, and for open-ended responses, we used the consensual qualitative research tradition.

Results: About half (48.1%, n = 321) of the participants agreed they were competent in treating transgender patients, but only 36.0% (n = 240) believed they were competent in practicing collaboratively with an endocrinologist in the drug-screening processes. Fewer than half (45.6%, n = 304) of participants felt they were competent in using appropriate terminology relating to transgender patients. The ATs disagreed when asked if they were competent regarding counseling transgender patients about the effects of hormone replacement therapy on sport participation (48.1%, n = 321) or on mental health concerns (40.3%, n = 269). Participants learned most frequently from media outlets (35.2%, n = 235) or personal experiences with family, friends, or themselves (33.7%, n = 225), yet 35.1% (n = 243) received no education in caring for transgender patients. Many ATs (41.2%, n = 278) believed that transgender female student-athletes had a competitive advantage. In contrast, 6.6% (n = 44) of participants indicated that transgender male student-athletes had a competitive advantage.

Conclusions: Although collegiate ATs generally felt competent in treating transgender patients, they did not feel capable of addressing specific aspects of transgender patients' health care needs. Regardless of the resulting perceived unfair advantage, ATs must be aware of the regulations and therapeutic effects associated with hormone-related therapy for transgender student-athletes.

Key Words: LGBTQ, inclusion, gender identity

Key Points

- Most collegiate athletic trainers reported feeling comfortable and competent overall when treating transgender patients but uncomfortable or incompetent with respect to many specific aspects of patient care, including working collaboratively with an endocrinologist, using appropriate terminology, counseling patients on mental health concerns, and the effects of hormone replacement therapy on sport participation.
- Most collegiate athletic trainers believed transgender female student-athletes had an unfair advantage in sport when competing against cisgender female student-athletes.
- More than one-third of participants lacked any education in caring for transgender student-athletes. Professional and continuing education initiatives are needed.

In the United States, fewer than 1% of American teenagers and adults identify as transgender.[1] However, this percentage may be low, due to fear of self-reporting as transgender, and thus, the true percentage of the population identifying as such may be higher. Almost 1 in 5 (19%) transgender patients reported they were refused care because of their gender identity.[1–2] Additionally, 33% of transgender people who saw a health care provider in the past year described at least 1 negative experience, including verbal or physical harassment or having to educate the health care provider about transgender care.[3] Because of the harassment and lack of respect, 23% of transgender people

in the United States indicated they did not seek care from a physician because of their fear of being mistreated.[3]

Transgender individuals face both health care disparities and health disparities. Refusal of care, lack of provider knowledge, and harassment are well documented problems facing transgender patients across all of medicine.[1–4] Transgender patients are often denied equal health care treatment by physicians, nurses, emergency medical technicians, and other medical personnel in various health care facilities.[4,5] In addition to the lack of equal care, health disparities are also greater in the transgender population. For example, 73% of transgender women who tested positive for human immunodeficiency virus were unaware of their status.[6] Transgender individuals are diagnosed with certain cancers, including breast, ovarian, cervical, and prostate cancers, at an increased rate.[7] Overall, several health disparities in the transgender population resulted in a higher burden of injury or illness. The data on health disparities, paired with a lack of comfort in seeking care from providers, establishes the need for improved resources for both patients and providers to enact change.

For clinicians practicing patient-centered care, the patient's individual health needs and desired health outcomes are the driving forces behind all care decisions.[8] As opposed to treating patients solely from a physiological perspective, patients should also be treated from emotional, mental, spiritual, societal, and financial perspectives.[9] The negative effects of heteronormativity lead many to express that heterosexuality is the norm or default of sexuality (https://www.merriam-webster.com/dictionary/heteronormative). This negative expression has been documented in medical care[10]; thus, cisnormativity plays a negative role in the health care landscape. To truly practice patient-centered care with transgender patients, eliminating the cisnormative culture in health care is paramount. As such, the US Department of Health and Human Service campaign, "Healthy People 2020," sought to end health care disparities for the lesbian, gay, bisexual, transgender, and queer (LGBTQ) patient community; however, the goal of removing this burden has not yet been achieved.[11]

In 2011, the National Collegiate Athletic Association (NCAA) implemented regulations intended to protect transgender student-athletes and their right to participate in sport.[12] No known research has been published assessing if health care providers and patients are aware of the extent of these protections. Transgender athletes face a distinctly unfriendly culture in athletics, which is believed to negatively affect both physical and mental health.[13] Due to their daily interactions with patients, athletic trainers (ATs) are in a unique position to help bridge the gap and work to end health care disparities among the transgender community. Specifically, in the collegiate and university setting, ATs can ensure quality care for transgender patients free of discrimination, with a focus on preventing injuries, illnesses, and conditions common to the transgender community. Previous authors[14,15] identified that health care professionals had a generally positive view of treating transgender patients but also that they felt inadequately educated and trained to do so. In addition, ATs must comply with the Board of Certification Standards of Professional Practice, which state one must "render quality patient care regardless of the patient's age, gender, race, religion, disability, sexual orientation, or any characteristic protected by law."[16(p4)] Thus, ATs are required to be competent in treating transgender patients.

We sought to identify potential gaps in knowledge related to 5 main domains related to caring for transgender athletes. These were (1) perceived definition of transgender, (2) comfort and competence working with transgender athletes, (3) sources of education, (4) perceived legal concerns, and (5) the perception of competitive advantage. To improve athletic health care for transgender patients, we must first identify the knowledge deficits in order to develop recommendations for educational interventions across the continuum of learners in athletic training.

METHODS

Design

We used a cross-sectional, mixed-methods survey research design to assess ATs' perceived competence and educational influences in caring for collegiate transgender student-athletes. Participants also indicated their perceptions regarding possible unfair advantages of transgender student-athletes when competing in sport.

Participants

A random sample of collegiate and university ATs from the NCAA and the National Association of Intercollegiate Athletics were recruited through the email addresses from the National Athletic Trainers' Association (NATA) membership database. Individuals who identified as AT educators in the collegiate and university setting were excluded from the sample. In total, 5537 emails were successfully sent via a survey software program (Qualtrics Inc, Provo, UT) and 5503 participants were eligible for the study. From this sample, 894 individuals started the survey (response rate = 16.2%), and 667 participants completed the critical qualitative question (defining *transgender* in their own words) and had their responses included in the data analysis (completion rate = 74.6%). The participants were 33 ± 10 years old and averaged 11 ± 10 years of experience as credentialed ATs. Complete participant demographics, including gender, sexuality, and job setting, are listed in Table 1.

Instrumentation

Based on previous literature and in consultation with an ally educator (an individual who trains others on how to serve as allies to the LGBTQ community), we developed, validated (content and face validity), and piloted a 43-item instrument to assess the perceived comfort and competence of ATs with respect to student-athletes who identified as transgender. The instrument contained 5 demographic questions and 2 items about relationships with transgender people.

The instrument also contained 1 question regarding how participants had received education on transgender patients (formal education, reading journal articles, reading media outlets, religious teachings, personal experiences through family or friends, personal experiences [oneself], no learning, other). Participants identified the influence of any methods of education they selected on a 4-point Likert scale (4 = *extremely influential* to 1 = *not at all influential*).

Table 1. Demographic Data

Statement[a]	Response	Frequency, n (%)
What gender do you identify as?	Male	220 (33.0)
	Female	369 (55.3)
	Prefer to self-describe	6 (0.9)
	Prefer not to say	5 (0.7)
	Missing data	67 (10.0)
What is your sexual orientation?	Straight or heterosexual	510 (76.5)
	Gay or lesbian or homosexual	57 (8.5)
	Bisexual	17 (2.6)
	Prefer to self-describe	6 (0.9)
	Prefer not to say	9 (1.3)
	Missing data	68 (10.1)
Have you had a friend or family member that identifies as transgender?	Yes	170 (25.5)
	No	402 (60.3)
	Unsure	28 (4.2)
	Missing data	67 (10.0)
What is your employment setting?	National Collegiate Athletic Association Division	
	I	262 (39.3)
	II	111 (16.6)
	III	169 (25.3)
	National Association of Intercollegiate Athletics or other	125 (18.7)
	Missing data	0 (0)

[a] Statements are presented in their original format.

Next were 5 items addressing comfort with various aspects of transgender care and 8 questions on competence in various aspects of transgender care, measured using a 4-point Likert scale (4 = *strongly agree* to 1 = *strongly disagree*). The tool included 2 items for participants to indicate whether they believed student-athletes assigned male or female status at birth who identified and competed as a female or male, respectively, had a competitive advantage (*yes*, *no*, or *unsure*) with an open-ended response regarding the perceived reason for the unfair advantage. Finally, the instrument contained 1 open-ended response item related to other legal or regulatory barriers faced by transgender patients.

After we developed the instrument, we compiled a panel of 3 ATs to serve as experts for a content analysis: 1 survey expert and 2 experts in the area of transgender student-athlete or AT relationships. After revising the tool based on their recommendations, we conducted a pilot study of an NCAA member institution's ATs. This allowed us to establish internal consistency of the comfort (Cronbach $\alpha = 0.78$) and competence (Cronbach $\alpha = 0.86$) items and assess navigation within the instrument. The pilot study was completed by 38 participants, and no changes were made to the instrument. The average time for instrument completion was reasonable at 10 minutes. The final tool was reviewed by 2 members of the research team before the study began.

Procedures

Using the random sample of email addresses provided by the NATA, we sent information to the college or university ATs describing the study and giving the directions along with a hyperlink to the instrument. On opening the hyperlink, the AT was presented an electronic informed consent and the instrument. The study instrument remained active from April 2018 through May 2018; reminder emails were sent once per week for 6 weeks. This study was deemed exempt by the Indiana State University Institutional Review Board.

Statistical Analysis

We performed analyses of central tendency (means, frequencies, and modes) to evaluate participant demographics, previous relationships with transgender individuals, comfort and competence in treating transgender patients, sources of education on transgender patients, and perceptions of unfair advantages. All data analyses were completed using SPSS (version 25; IBM Corp, Armonk, NY).

For the open-ended responses, the consensual qualitative research (CQR) tradition was used to develop the codes extracted from the qualitative feedback.[17] The data analysis was performed by a 3-person coding team (D.R.W., E.A.N., L.E.E.) using a multiphase process to assemble common codes into domains and further into categories. The CQR method allows the researcher to check for accuracy within the codes.[18] Using best practice for CQR research, we created a codebook with domains, categories, and subcategories.[18] The first 200 responses were evaluated by the data-analysis team, who compared thoughts and ideas on the responses until a consensus was reached and a codebook was created. The principal investigator (D.R.W.) then coded the remaining responses based on the codebook. Next, the data were sent to the rest of the data-analysis team, and a consensus meeting was held to determine agreement on the coding. If there was any disagreement, the majority made the decision, and all codes were finalized. Each response could be coded in multiple categories. Trustworthiness was achieved via multiple-analyst triangulation and external auditing. We shared a copy of the instrument and a file containing the consensus coded responses with the external auditor, who reviewed all codes and coded responses to check on selective perception and identify any blind spots in the coding process.

RESULTS

Overall, the participants described a lack of exposure to transgender individuals in their daily lives. The majority of

Table 2. Participants' Comfort and Perceived Competence in Working With Transgender Patients

Statement[a]	Mode[b]	Frequency of the Mode, n (%)	Mean ± SD
I am comfortable providing health care to a patient who was biologically assigned female at birth but identifies as male.	Strongly agree	312 (46.8)	3.40 ± 0.68
I am comfortable providing health care to a patient who was biologically assigned male at birth but identifies as female.	Strongly agree	306 (45.9)	3.39 ± 0.68
I am comfortable using pronouns that differ from a patient's biologically assigned sex.	Agree	280 (42.0)	3.16 ± 0.80
I am comfortable educating transgender student-athletes about the regulations (set forth by NCAA, NAIA, or other sport regulatory bodies) that might affect their participation in sports.	Agree	270 (40.5)	2.78 ± 0.87
I am comfortable educating coaches, administrators, and other student-athletes about the needs of transgender student athletes.	Agree	238 (35.7)	2.68 ± 0.86
I am competent in treating transgender patients in comparison to cisgender patients. Cisgender refers to persons whose sense of personal identity and gender corresponds with their birth sex.	Agree	321 (48.1)	3.10 ± 0.75
I am competent in using appropriate terminology relating to transgender patients.	Agree	304 (45.6)	2.88 ± 0.78
I am competent in counseling transgender patients on mental health concerns.	Disagree	269 (40.3)	2.30 ± 0.81
I am competent in counseling transgender patients on sexually transmitted infections.	Agree	343 (51.4)	2.82 ± 0.75
I am competent in counseling transgender patients about the impact of hormone treatments on sport participation.	Disagree	321 (48.1)	2.16 ± 0.79
I am competent in adjusting exercise prescription based on hormonal differences in transgender student athletes.	Disagree	318 (47.7)	2.25 ± 0.75
I am competent in counseling transgender patients about how hormone levels can affect NCAA, NAIA, or other sport regulatory bodies' drug-screening processes.	Disagree	263 (39.4)	2.31 ± 0.83
I am competent in collaboratively practicing with an endocrinologist about transgender patients who undergo drug-screening processes.	Agree	240 (36.0)	2.46 ± 0.84

Abbreviations: NAIA, National Association of Intercollegiate Athletics; NCAA, National Collegiate Athletic Association.

[a] Statements are presented in their original format.

[b] Level of agreement: 1 = *strongly disagree*, 2 = *disagree*, 3 = *agree*, 4 = *strongly agree*.

participants did not have a friend or family member who identified as transgender (n = 401, 60.3%), whereas a smaller percentage did have a close friend or family member who identified as transgender (n = 170, 25.5%). Similarly, most participants stated they had never cared for a patient who identified as transgender (n = 381, 57.1%), and a small percentage was unsure (n = 70, 10.5%).

Definition of Transgender

At the start of the instrument, participants were asked to define the word *transgender*. We compared the responses with the American Psychological Association's 2015 document, "Guidelines for Psychological Practice with Transgender and Gender Nonconforming People."[19] Responses were determined to be correct or incorrect based on a clear description of a gender identity or gender role that did not conform to the person's birth sex and no misuse of or confusion between the terms *sex* and *gender*. An overwhelming majority of participants incorrectly defined the word (n = 583, 87.4%); only 10.8% (n = 72) correctly defined it.

Comfort and Competence

Nearly half of the participants strongly agreed they were comfortable providing health care to a transgender male patient (n = 312, 46.8%) or a transgender female patient (n = 306, 45.9%). Respondents also described being comfortable using pronouns that differed from a patient's biologically assigned sex, educating transgender student-athletes about regulations that might affect their participation in sports, and educating other stakeholders and student-athletes about the needs of transgender patients (Table 2). Whereas roughly half of participants felt competent in treating transgender patients versus cisgender patients (n = 321, 48.1%), they did not feel competent in several aspects of care.

Sources of Education

Participants were asked which sources of education they used to learn about the individual needs of transgender patients. They most frequently selected *media outlets* (35.2%, n = 235, mode = *somewhat influential*), but 36.4% (n = 243) received no education (Table 3).

Individuals (n = 420) who had received education in the specific needs of transgender patients were asked to rate the influence of each educational source (Table 4). The most influential source was personal experience (n = 142, 33.8%, n = 142), followed by formal education (26.4%, n = 111) and media in only 7.9% (n = 33). Participants' personal experiences were broad and included learning from friends, family, or patients. One AT stated, "Learning through my friends [or] family has been the most influential because the information had a greater impact," whereas another attributed the most influential education to "working with

Table 3. Frequency of Reported Educational Sources Regarding the Individual Needs of Transgender Patients (n = 667)

Source	Frequency, n (%)
Nothing	243 (36.4)
Media outlets (news media, social media)	235 (35.2)
Personal experiences through family, friends, or self	225 (33.7)
Formal education (eg, professional education, conferences, presentations, safe space or safe zone training, ally training)	192 (28.8)
Journal articles (peer reviewed)	133 (20.0)
Other	57 (8.5)
Religious teachings	37 (5.5)
Missing data	4 (0.6)

a student-athlete that is transgender because I was able to get firsthand knowledge."

Religious teachings and personal experiences through family, friends, or oneself were very influential, and other outlets (eg, formal education, journal articles, and media outlets) were only somewhat influential. Regarding the most influential aspect of educational training, many participants cited content related to inclusion (n = 82, 19.5%), and a smaller percentage chose content on pronoun use (n = 24, 5.7%). One AT shared: "[The most influential education involved] feeling comfortable and accepting who they identify themselves as and respecting and complying with the pronoun they identify as."

Perceived Legal Concerns

Participants were also provided an open-ended item about potential legal concerns faced by transgender student-athletes. Data analysis revealed 4 main domains: (1) sport participation policy, (2) logistics, (3) culture, and (4) unsure of any legal concerns. Within the main domain of sport participation policy, 2 categories arose: (1) ability to participate and (2) drug testing or hormone use. In the domain of logistics, 3 categories arose: (1) bathrooms or locker rooms, (2) laws and regulations related to identity, and (3) insurance or ability to see a provider.

As for sport participation policy, 25.5% of ATs (n = 170) believed transgender student-athletes faced barriers, and nearly one-third (n = 195, 29.2%) believed barriers existed regarding drug testing or hormone use. They often pointed to NCAA regulations as barriers to transgender student-athletes' participation. As 1 AT commented,

Table 4. Level of Influence of the Sources of Education About the Individual Needs of Transgender Patients

Statement	Mode[a]	Respondents Who Responded to Previous Item, n (%)
Formal education	Somewhat influential	82/192 (42.7)
Journal articles	Somewhat influential	72/133 (54.1)
Media outlets	Somewhat influential	108/235 (46.0)
Religious teachings	Very influential	13/37 (35.1)
Personal experiences through family, friends, or oneself	Very influential	90/225 (40)

[a] Level of influence: 1 = *not at all influential*, 2 = *slightly influential*, 3 = *somewhat influential*, 4 = *very influential*, 5 = *extremely influential*.

> [Student-athletes] face barriers with participation depending on their hormone use. Sometimes athletes have to give up playing a sport because they need to start hormone [therapy]. The NCAA requires a lot of documentation and is very stringent with transgender athletes, and it turns many people away.

In the logistics domain, challenges were expected by 13.2% (n = 88) of participants with respect to using bathrooms or locker rooms, by 10.4% (n = 70) regarding laws and regulations related to identity, and by only 4.0% (n = 27) in terms of insurance or the ability to see a provider. An AT remarked,

> . . . It would depend on the state and how the legal system requires the individual to "label" themselves (identification, records, etc). There is also the issue of bathroom use (the one you identify as or born with) and if there are gender-neutral facilities (bathrooms [or] locker rooms, etc) available.

Some individuals also considered the overall culture of sports or college or even society as a whole a barrier (n = 118, 17.7%). One person explained, "Until society accepts transgender individuals, I believe barriers will be in place preventing them from competing against others." Many participants were simply unsure what barriers might exist (n = 101, 15.1%); an AT admitted, "I am not up to date on the legal [or] regulatory barriers that current athletes may face."

Perceived Competitive Advantage

Finally, the respondents were asked their perceptions about competitive advantages for transgender student-athletes (Table 5). Nearly half (41.7%, n = 278) of ATs thought a student-athlete who was assigned male status at birth but identified and competed as a female (*transgender female*) had a competitive advantage; nearly one-third (32.4%, n = 216) were unsure. In contrast, only 6.6% (n = 44) indicated that a student-athlete who was assigned female status at birth but identified and competed as a male (*transgender male*) had a competitive advantage, and 35.9% (n = 239) were unsure.

The 87% (n = 494) of participants who perceived transgender females as possibly having an unfair competitive advantage were asked why. Three domains emerged from the qualitative analysis: (1) transgender females had a competitive advantage because of the physical attributes of cisgender males, (2) the competitive advantage depended on the sport, and (3) the unfair advantage of transgender student-athletes hinged on where the individual was in transition and specifically the influence of hormone-related therapy. Many responses fell into more than 1 domain. Of the 494 ATs, 54.3% (n = 268) described a competitive advantage because of the student-athlete's physical attributes. As 1 participant noted, "Males are naturally bigger, faster, and stronger than females. This means a biological male playing a female sport will be able to do things a female cannot."

When asked which factors contributed to this perceived unfair advantage, 15.6% (n = 77) believed it depended on the sport and 28.1% (n = 139) on where the individual was

Table 5. Perceptions That a Transgender Student-Athlete Has a Competitive Advantage

Statement[a]	Unfair Advantage Mode	Frequency, n (%)			
		Yes	No	Unsure	Missing Data
Student-athletes assigned male at birth but identifying and competing as a female	Yes	278 (41.7)	119 (17.9)	216 (32.4)	54 (8)
Student-athletes assigned female at birth but identifying and competing as a male	No	44 (6.6)	330 (49.5)	239 (35.9)	54 (8)

[a] Statements are presented in their original format.

in transition and the influence of hormone-related therapy. One AT shared,

> I believe competitive advantage may be determined due to sport and stage of transition for each individual. I believe some advantages may exist in certain sports, but once an individual has been on [hormone-replacement therapy] long enough so where hormone levels fall within an average female range, most competitive advantages become negligible. However, some physical characteristics (ir [sic] height for basketball players) may still remain following medical transition. . .

Finally, 22.3% (n = 10) were unsure whether transgender females would have a competitive advantage when participating in female sports. One AT expressed, "I am unsure how body composition and naturally occurring hormones (eg, testosterone) can affect performance and how that might give them an advantage."

Previous Experience, Gender, and Sexual Identity

Among participants with a friend or family member who identified as transgender, 31.8% (n = 54) believed transgender females had an unfair advantage, whereas 39.4% (n = 67) were unsure, and 28.8% (n = 49) felt they did not. Among participants who had worked with a patient who identified as transgender, 41.6% (n = 62) believed transgender females had an unfair advantage, whereas 37.6% (n = 56) were unsure, and 20.8% (n = 31) felt they did not. The 5 study participants who identified as transgender unanimously believed that (100%) transgender females did not have an unfair advantage in sport.

Female respondents were much less likely to believe that transgender female student-athletes had an unfair advantage. Just over a third of female ATs (n = 141, 38.2%) thought transgender females had an unfair advantage; the same percentage was unsure (n = 141, 38.2%), and 23.6% (n = 87) felt they did not. However, more than half of males described transgender female student-athletes as having an unfair advantage (58.6%, n = 129), whereas 30% (n = 66) were unsure, and only 11.4% (n = 25) stated they did not. Almost half of the ATs who identified as straight or heterosexual (n = 252, 49.4%) considered transgender females to have an unfair advantage; 35.5% (n = 181) were unsure, and only 15.1% (n = 77) did not. By way of contrast, 41.9% (n = 31) of participants who identified as gay, lesbian, or bisexual believed transgender females did not have an unfair advantage, and 31.1% (n = 23) were unsure.

DISCUSSION

Our findings indicate that these ATs were unable to define transgender care, which supports the perceptions of more than half of the participants who indicated they were not competent in treating or in collaborating to treat transgender student-athletes. Specifically, the respondents thought they were uninformed about hormone replacement therapy and the mental health needs of transgender student-athletes. Fewer than one-third of the ATs had been exposed to formal education on this topic, resulting in perceived knowledge deficits. The participants acknowledged a lack of awareness surrounding the legal concerns faced by transgender student-athletes but were misinformed about possible unfair competitive advantages in the population.

Defining *Transgender*

Medical transition in the form of gender-affirming surgery or hormone replacement therapy is not necessary for a person to identify as transgender.[20] The term *transitioning* is often used to describe a transgender individual who is receiving gender-affirming health care,[20] yet it can also depict someone who is taking nonmedical steps to change an outward appearance (eg, altering clothing or grooming habits).[19] However, no outward changes in appearance need to occur in order for one to identify as transgender.[19] Additionally, although distress caused by a discrepancy between one's experienced and one's assigned gender may be diagnosed as gender dysphoria, being transgender alone does not constitute a mental illness.[19] The majority of our participants misunderstood the definition of transgender; many believed that being transgender specifically involved hormone replacement therapy, surgery, or mental illness. Many respondents also used the terms *gender* and *sex* interchangeably, despite their very different definitions (Appendix[21]). The overall misunderstanding about what it means for a patient to be transgender is a clear indicator of a lack of education about the individual needs of transgender patients.

Comfort and Competence

Participants were comfortable with transgender patient care, yet the data indicated they were perhaps overestimating that comfort and not considering all aspects of care. They agreed they were competent in treating transgender patients. Nonetheless, they did not feel competent in 2 distinct areas: (1) hormone replacement therapy related to sport participation, drug screening, and exercise prescription, and (2) mental health. As such, 1 way to effectively combat the perceived lack of competence is by improving education related to transgender patients' health care needs.

We will highlight the areas in which ATs need to pursue resources and education.

Hormone Therapy

In 2011, the NCAA provided regulations that addressed a transgender student-athlete's ability to participate in sport, specifically defining the role of a mixed team and limiting the participation of a transgender female student-athlete until the athlete has completed 1 calendar year of hormone replacement therapy.[12] However, based on our findings, ATs did not yet feel competent in counseling transgender patients about how their hormone levels can affect sport regulatory bodies' drug-screening processes or about the effects of hormone replacement therapy on sport participation. They also did not consider themselves competent to adjust exercise prescriptions based on hormonal differences or collaborate with endocrinologists when treating transgender student-athletes. Athletic trainers should be aware of the guidelines set forth by both the World Professional Association for Transgender Health[22] and the Endocrine Society,[23] as well as a 2016 article by Unger[24] describing hormone replacement therapy for transgender patients.

Mental Health

Counseling patients on aspects of their care has been a long-established role of the AT in sports health care.[25] However, our respondents disagreed that they were competent in counseling transgender patients on mental health concerns. Transgender people were at higher risk for suicide, depression, anxiety disorders, and substance abuse when compared with their cisgender counterparts.[26–28] In fact, 50% of adolescent transgender males and 30% of adolescent transgender females had attempted suicide.[26] The mental health needs of transgender patients are different than those of cisgender patients,[29] yet transgender patients have limited access to appropriate mental health services, even on college campuses.[30] Athletic trainers are in a unique position to help provide transgender patients with greater access to mental health services.

Sources of Education

Fewer than one-third of participants had received formal education regarding the care of transgender patients. These data are similar to those in a 2015 study of medical students who noted that they felt comfortable but not prepared to care for LGBTQ patients.[16] The authors believed it was a clear indicator of the need for more curricular content related to LGBTQ patients. Not surprisingly, neither the current Commission on Accreditation of Athletic Training Education standards nor the newly adopted 2020 Commission on Accreditation of Athletic Training Education standards require education on treating transgender patients.[31]

Our results reflect a distinct lack of education on caring for transgender patients in athletic training, as fewer than half of the ATs had received formal education or read journal articles about transgender care. This aligns with previous research indicating that up to 50% of transgender patients had to teach their medical providers about transgender health care needs.[1,2] In another investigation,[32] medical students indicated they were not comfortable addressing patients' sexuality and believed they could not critically address these patients' sexual concerns.

Several clear avenues exist for providing ATs with education on transgender patients. Professional-level curricula should ensure foundational knowledge in pharmacology that would help a learner understand the effects of hormone replacement therapy and subsequent responses to exercise under that therapy. In addition, professional-level learners should be prepared to advocate for the needs of their patients and to address the social determinants of health, including gender identity. Lastly, because of the health and health care disparities within the transgender patient populations, education should address the behavioral and mental health needs of these patients.

For clinicians who are not currently enrolled in professional programs, we must identify ways to "train them up." In 2017, the NATA approved the founding of the LGBTQ+ Advisory Committee.[33] Part of this committee's mission is to

> provide educational resources regarding emerging topics and concerns relevant to diverse sexualities, gender identities, and gender expressions within the profession and health care topics affecting patients in the LGBTQ+ community.[34]

The LGBTQ+ Advisory Committee shares resources, such as the Referral Aggregator Database Remedy "National Standards of Care for TGIQ Health" (http://static.radremedy.org/guides/RAD-Remedy-2017-Standards-of-Care-Color.pdf) for the care of trans, gender-nonconforming, intersex, and queer patients on a committee resource page. This national resource and various other health care initiatives provide examples and opportunities for educating ATs and athletic training students on model practices.

Perceived Legal Concerns

The transgender population faces a plethora of legal challenges, including but not limited to identity recognition, family law and relationship concerns, employment and housing discrimination, transphobic violence, immigration discrimination, access to public bathrooms, and insurance coverage.[35–36] Although some of these may not appear to be directly tied to health care access, they speak to an overall theme of discrimination and harassment that is also seen in transgender patients' experiences when attempting to access equal health care.[1–5]

When we asked participants in this study about legal concerns faced by transgender patients, many ATs focused heavily on topics related directly to athletics: ability to participate in sport, access to locker rooms and bathrooms, etc. These are indeed important items and should not be overlooked, yet far-reaching legal concerns extend beyond sport participation. These concerns directly relate to transgender patients' equal access to health care, and clinicians' lack of understanding only contributes to continued health care inequality.

Competitive Advantage

No evidence suggests that transgender student-athletes competing under the current NCAA or National Association of Intercollegiate Athletics policies have unfair

advantages over other student-athletes.[37] The idea that transgender females undergoing hormone replacement therapy have an unfair advantage due to increased bone density or muscle mass is not supported by research.[36] It is important that ATs be able to educate other ATs, coaches, administrators, and student-athletes regarding this aspect of sport participation. Almost three-quarters of our participants believed or were unsure that transgender females had an unfair advantage, despite the lack of scientific literature to support this perception.

The most notable transgender student-athletes currently in the news are Schuyler Bailar, a transgender male who was initially recruited by Harvard University for the women's swimming and diving team but opted to compete on the men's team,[38] and Mack Beggs, a transgender male wrestler who won the Texas high school girl's Class 6A 110-lb (50-kg) division state championship in 2017 and 2018.[39] Beggs no doubt drew more media attention than Bailar in winning 2 high school state championships with a mixture of public criticism and support. The story perhaps reignited discussion regarding changing various state high school sport transgender policies, as the Texas University Interscholastic League forced Beggs to compete in the girls' division because it requires student-athletes to compete according to their sex at birth. Still, it may have done little to dissuade the thought that transgender student-athletes have an unfair advantage. However, ATs must not rely on the media to educate them on medical topics but rather use scientific literature to help drive evidence-based practice. As health care providers, ATs are uniquely skilled to care for the active population, and we must address our implicit biases regarding unfair sport advantages.

LIMITATIONS AND FUTURE RESEARCH

A limitation to this study was the possibility for participant bias. We were unable to determine if any of the positive perceptions about comfort and competence reflected participants who had an interest in or a bias toward this topic. As all respondents were able to see the title of and information about the study before completing the survey, people with a negative feeling toward transgender patients may have been less likely to complete the survey.

This study offers opportunities for further investigation. We gave participants the option to indicate if they would like to be involved in further research, which could consist of interview-style research on perceptions of treating transgender patients and questioning about competence and comfort. Additional work is warranted to explore the effectiveness of educating ATs on treating transgender patients, the influence of implicit bias in the profession, and supplying athletic training services for transgender student-athletes.

CONCLUSIONS

Generally, ATs in the college or university setting felt comfortable providing all aspects of health care to transgender patients at both the personal and administrative levels. However, participants' perceived competence in various aspects of transgender care seemed to be low specifically regarding hormone replacement therapy and mental health. Overall, we identified a lack of education regarding transgender patients, including the definition of *transgender*, health care needs, legal concerns, and possible unfair advantages in sport. Athletic training students must be educated on the needs of transgender patients, and currently practicing ATs require continuing education about this emerging patient population in sport participation. The percentage of transgender adolescents is at an all-time high, and some of these individuals will become collegiate student-athletes. If we do not evolve quickly as a profession, ATs will continue to be underprepared to treat transgender patients, and the cycle of health care disparities for transgender individuals will continue.

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Appendix. Glossary of Lesbian, Gay, Bisexual, Transgender, and Queer (LGBTQ) Terms[21] Continued on Next Page

Ally: A member of the majority or dominant group who works to end oppression by supporting or advocating for the oppressed population. For example, any non-LGBTQ person who supports and stands up for the equality of LGBTQ people (sometimes referred to as a *straight ally*).

Androgynous: Having the characteristics or nature of both maleness and femaleness; neither specifically feminine nor masculine.

Asexual: A sexual orientation or identity of a person or both who does not experience sexual attraction.

Biphobia: An irrational fear of or aversion to bisexuality or bisexual people.

Bisexual: A sexual orientation or identity of a person or both who is emotionally and sexually attracted to some males and some females.

Cisgender: Refers to a person whose gender identity and expression are aligned with their gender assigned at birth.

Coming out: Declaring one's identity, specifically being lesbian, gay, bisexual, or transgender, whether to a person in private or a group of people. To be "in the closet" means to hide one's identity.

Drag: Wearing the clothing typically associated with another gender, often involving the presentation of exaggerated, stereotypical gender characteristics. Individuals may identify as drag kings (in drag presenting as male) or drag queens (in drag presenting as female) when performing gender as parody, art, or entertainment.

Dyke: A slang term referring to a lesbian, most often used in a derogatory way. Originally, it was a pejorative label for a masculine woman.

Fag or faggot: A slang term referring to a gay person, most often used in a derogatory way.

Gay: A sexual orientation or identity of a person or both who is emotionally and sexually attracted to some members of the same sex. Although *gay* can refer to both males and females, many prefer the term *lesbian* for females. *Gay* is sometimes used as an umbrella term to refer to all lesbian, gay, and bisexual people, but some prefer the more inclusive term *LGBT*.

Gender: A social construct based on a group of emotional, behavioral, and cultural characteristics attached to a person's assigned biological sex. The gender construct then classifies an individual as feminine, masculine, androgynous, or other. Gender can be understood to have several components, including gender identity, gender expression, and gender role.

Gender binary: The concept that everyone is of 2 genders: male or female. It also describes the system by which society divides people into male and female roles, identities, and attributes.

Gender dysphoria disorder: A clinical psychological diagnosis defined as intense, continuous discomfort resulting from an individual's sense of the inappropriateness of the assigned gender at birth, its corresponding gender identity, and the resulting gender-role expectations. This diagnosis is seen as offensive by some but is often required for those who wish to receive medical supervision of treatments relating to transition, such as hormones or surgery.

Gender expression: An individual's physical characteristics, behaviors, and presentation that are linked traditionally to either masculinity or femininity, such as appearance, dress, mannerisms, speech patterns, and social interactions.

Gender identity: How we identify ourselves in terms of our gender. Identities may be male, female, androgynous, transgender, genderqueer, and others.

Gender-neutral pronoun: A pronoun that does not associate a gender with the person being discussed. Two of the most common gender-neutral pronouns are *zie* replacing she and he and *hir* replacing her and him.

Gender nonconforming or gender variant: An identity of a person who has gender characteristics or behaviors or both that do not conform to traditional or societal binary gender expectations.

Gender orientation: An individual's internal sense of gender (eg, feeling male, female, or neither). Gender orientation does not necessarily align with the gender assigned at birth.

Gender role: The social expectations of how an individual should act, think, feel, or all the aforementioned based upon one's assigned biological sex. A set of traditional and stereotypical roles, traits, dress, characteristics, qualities, mannerisms, and behaviors that are associated with societal norms of what is male and what is female.

Genderism: The systematic belief that people need to conform to the gender role assigned to them based on a gender binary system which allows only female and male.

Genderqueer: An identity of a person who identifies as or expresses as or both somewhere in the continuum between maleness or masculinity and femaleness or femininity or outside of the gender binary system. Genderqueer people may or may not identify as LGBTQ.

Heteronormative: The belief system that heterosexuality is the norm; the assumption that heterosexuality is universal and that anything other than heterosexuality is unnatural.

Heterosexism: Applies to attitudes, bias, and discrimination in favor of heterosexual sexuality and relationships. It includes the presumption that everyone is heterosexual or that male or female attractions and relationships are the norm and therefore superior. It is the belief that everyone is or should be straight.

Heterosexual: A sexual orientation or identity or both of a person who is emotionally and sexually attracted to some members of another sex (specifically, a male who is attracted to some females or a female who is attracted to some males), often referred to as *straight*.

Homophobia: An irrational fear or aversion to homosexuality or lesbian, gay, or bisexual people.

Homosexual: An identity of a person who is emotionally and sexually attracted to some members of the same gender, originated in the medical and psychological professions. Currently, many prefer the terms *lesbian* or *gay*.

Intersex: A general term used for a variety of conditions in which a person is born with a reproductive or sexual anatomy that does not seem to fit the typical definitions of female or male. Intersex conditions can affect the genitals, the chromosomes, secondary sex characteristics, or all of the aforementioned.

Lesbian: A sexual orientation or identity or both of a person who is female identified and who is emotionally and sexually attracted to some other females.

LGBTQ: An umbrella term referring collectively to people who identify as lesbian, gay, bisexual, transgender, or queer. In the past *gay* was used as a general, overarching term, but currently, the more inclusive terms *LGBT* and *LGBTQ* are regularly used and preferred by many LGBTQ people and allies.

Queer: An umbrella term used to describe a sexual orientation, gender identity, or gender expression that does not conform to dominant societal norms. While it is used as a neutral or even a positive term among many LGBT people today, historically, it has been used negatively.

Questioning: An identity of a person who is uncertain of their sexual orientation or identity or gender orientation or identity or both.

Sex or biological sex: This is determined by our chromosomes (such as XX or XY), our hormones, and our internal and external genitalia. Typically, we are assigned the gender of male or female at birth.

Appendix. Continued From Previous Page

Sexual behavior: What we do sexually and with whom.

Sexual Identity: What we call ourselves in terms of our sexuality. Such labels include *lesbian, gay, bisexual queer, heterosexual, straight,* and many more.

Sexual orientation: The inner feelings of who we are attracted or oriented to emotionally and sexually.

Transgender: An identity of a person whose gender identity is not aligned with the sex assigned at birth or whose gender expression is nonconforming or both.

Transgender female: An identity of a person who was assigned the gender of male at birth and who identifies as female or feminine. Other related terms include *male-to-female* (*MTF* or *M2F*), and *transwoman,* and *affirmed female*.

Transgender male: An identity of a person who was assigned the gender of female at birth and who identifies as male or masculine. Other related terms include *female-to-male* (*FTM* or *F2M*), and *transman,* and *affirmed male*.