ATHLETIC TRAINING EDUCATION JOURNAL

www.natajournals.org
ISSN: 1947-380X
DOI: 10.4085/1947-380X-24-016

ORIGINAL RESEARCH

Assessment of Perceived Diversity and Inclusivity of Athletic Training Textbooks

Jennifer Ostrowski, PhD, LAT, ATC; David Wilkenfeld, EdD, LAT, ATC; Alissa Strouse, MS, ATC; Johnpatrick Montgomery, MS, ATC
Rehabilitation Sciences, Moravian University, Bethlehem, PA

Context: Adopting diverse perspectives is increasingly important for athletic trainers (ATs) to provide care that fosters inclusion for all patients. Despite the NATA's commitment to diversity, NATA membership remains approximately 80% White. Additionally, although ATs work with people from ethnically diverse backgrounds with unique body expression and body-size characteristics, it is unknown whether athletic training textbooks represent this diversity.

Objective: To investigate diversity characteristics of images including patients and clinicians within athletic training textbooks.

Design: Cross-sectional study.

Patients or Other Participants: Twenty percent (n = 15) of athletic training and health care textbooks included on the Board of Certification reference list were selected. Twenty percent of chapters from those textbooks were then randomly selected for inclusion.

Main Outcome Measure(s): Descriptive statistics were calculated for person (athlete, nonathlete, clinician), setting (athletic venue, clinic, physician office, other), and demographic categories (perceived skin tone, race/ethnicity, age, gender, body size, body expression). Chi-square tests of goodness of fit were performed to determine significant differences between categories, and χ^2 tests of independence were performed to determine differences across person type and category and across textbook domain and category.

Results: One thousand six hundred sixty-seven people were assessed from 1190 images. Images depicted statistically more persons with light skin tone (86%) assumed to be White (86%), young adults (75%) of average weight (95%), with no body expression diversity (95%). There were no major differences in subject characteristic majorities across person type or textbook domain.

Conclusions: Like other health care professions, a lack of image diversity was demonstrated within athletic training textbooks. To better recruit diverse students to the athletic training profession, and to prepare professional students to provide culturally competent and patient-centered care, these resources should better represent the diversity of ATs and their patients.

Key Words: Education, disparities, culture, competence

Dr Ostrowski is the Director of the Doctor of Athletic Training Program and Full Professor at Moravian University. Address correspondence to Jennifer Ostrowski, PhD, LAT, ATC, Moravian University, Sports Medicine and Rehabilitation Center 1441 Schoenersville Road, Bethlehem, PA 18018. Address email to ostrowskij@moravian.edu.

Full Citation:
Ostrowski JL, Wilkenfeld D, Strouse A, Montgomery J. Assessment of perceived diversity and inclusivity of athletic training textbooks. *Athl Train Educ J*. 2024;19(4):185–193.

Assessment of Perceived Diversity and Inclusivity of Athletic Training Textbooks

Jennifer Ostrowski, PhD, LAT, ATC; David Wilkenfeld, EdD, LAT, ATC; Alissa Strouse, MS, ATC; Johnpatrick Montgomery, MS, ATC

KEY POINTS

- Athletic training textbooks can contribute to a more inclusive education for athletic training programs through diverse representation of gender, race/ethnicity, age, body size, and body expression.
- Athletic training educational textbooks included on the Board of Certification exam reference list lack inclusive images that reflect the diversity of patient and clinician population.
- A lack of diversity in educational images may negatively impact student preparation to evaluate and treat people of different ages, body sizes, or skin tones.

INTRODUCTION

Diversity, equity, and inclusion (DEI) is a conceptual framework used to describe an inclusive environment recognizing the contributions and backgrounds of all, regardless of nationality, ethnicity, race, religion, age, sex, marital status, gender identity and expression, sexual orientation, or ability.[1] According to the 2020 US Census, White non-Hispanic individuals make up 57.8% of the population, which is a decrease from 63.7% in 2010. In 2020 the Hispanic or Latino population was the second largest racial/ethnic group at 18.7%, and the Black or African American non-Hispanic population was the third largest at 12.1%.[2] As of 2020, only 47.3% of the population under age 18 identified as White non-Hispanic,[2] and the US Census projects that the population aged 18 to 29 will become "minority White" in 2027 and the entire US population in 2045.[3] Health care providers need to be aware of how this shift in patient population can affect the ability to provide quality patient care to a diverse population.[4]

The National Athletic Trainers' Association (NATA) was founded by 200 White men in 1950, before *Brown v Board of Education* (1954) and the Civil Rights Act (1964). As stated in a recent *Journal of Athletic Training* editorial, the foundation and mission of the profession were cultivated without the influence of underrepresented groups, and by the time the Board of Certification (BOC) and the Commission on Accreditation of Athletic Training Education (CAATE) were incorporated, the profession's cultural framework was already well established.[5] It was not until 1986 that the NATA directly focused on issues related to diversity in the profession. The Minority Athletic Trainers' Committee was created in 1986 and restructured in 1991 before transforming into the Ethnic Minority Advisory Council and finally the Ethnic Diversity Advisory Committee (EDAC) in 1999.[6] The NATA states its commitment to diversity, equity, inclusion, and access as part of its mission statement: to promote unparalleled delivery of athletic training services amid ever-growing global and diverse populations, and recognize that increasing the racial and ethnic diversity of the health care workforce is essential for culturally competent care and to impact health outcomes.[7] However, the athletic training profession is not as diverse as the patient population it serves.[4]

Although the athletic training profession continues to expand its reaches to diverse patient populations, the demographics within the profession (based on NATA membership) remain relatively unchanged. A review of NATA membership data from 1997, 2015, and 2018, as well as 2022–2023 BOC data on certified athletic trainers, shows that, despite a 2-fold increase in membership, the membership remains approximately 80% White (Table 1).[4,8,9] This disparity between provider and patient demographics emphasizes the need for cultural competency in order to provide the highest quality of patient care.

Diversity within patient populations is not limited to race and ethnicity, but should also consider gender identity, sexual orientation, and ability status.[4] Adopting diverse perspectives within the athletic training profession is increasingly important, and athletic training education should foster representation all patient populations within educational materials.[10–12] Inclusive teaching practices include the use of learning materials that include diverse examples in course content.[13] It has been recommended that cultural competency is enhanced by gaining exposure to patients of varying ethnicities.[4,14–17] Textbooks are commonly used as part of athletic training education and as preparation for the BOC examination. Across the health professions there is lack of diversity in images of both patients and clinicians within educational resources (ie, textbooks, journal articles).[18–25] The majority of images represent persons with light skin tone assumed to be White/Caucasian, young or middle-aged adults of average weight, with no "unusual" body expression (ie, tattoo, unusual piercings, religious clothing, or head covering).[18–25]

Athletic training accreditation requires educators to prepare professional students within a culturally competent, patient-centered approach; however, to our knowledge there is no published literature highlighting the representation of racial and ethnic demographics of clinicians or patients within athletic training educational resources.[10,26] The purpose of this study is therefore to investigate the diversity and individual expression visible in photographs and illustrations of patients and clinicians within textbooks commonly used in athletic training education.

METHODS

Material Selection

This study used a cross-sectional survey design to collect data. Athletic training and health care textbooks listed on the 2023–2024 BOC exam reference list were eligible for inclusion in this study; this list was the most current list available at the time of data collection.[27] The BOC exam reference list represents the materials used to support exam items as determined by the BOC Exam Development Committee. Twenty percent of the 76 texts on this list were randomly selected for inclusion using a random numbers table (n = 15; Table 2). For these 15 texts, 20% of chapters were selected for examination, again

Table 1. Athletic Trainer Ethnicity Demographic Data (%)

	White Not of Hispanic Origin	Hispanic/ Latino	Black Not of Hispanic Origin	Asian or Pacific Islander	American Indian/Alaskan Native	Multiethnic	Other	Ethnicity Not Available
1997 (n = 21 126)[a]	79.68	2.06	1.21	1.92	0.49	—	0.38	14.26
2015 (n = 41 676)[a]	80.98	4.18	3.48	3.46	0.44	1.40	0.93	5.12
2018 (n = 50 124)[b]	79.89	5.46	4.26	3.73	0.48	1.98	0.94	3.26
2022–2023[c]	79.99	5.9	4.58	3.66	0.63	2.24	0.35	2.56

[a] Data from Grantham.[4]

[b] Data from National Athletic Trainers' Association.[8]

[c] Data from Board of Certification for the Athletic Trainer.[9]

using a random numbers table. For example, a textbook with 20 chapters would have 4 chapters randomly selected. If a chapter had no images where patient and/or clinician features were observable, a different chapter from that textbook was randomly selected. Included textbooks represented each of the 5 domains of practice as outlined by the BOC Practice Analysis, 8th edition.[26] A priori sample size analysis indicated the desired sample size was 231 images (calculated using G*Power; $\alpha = .05$, power = .80, effect size = 0.25).

Image Assessment

An online survey was created in Qualtrics; survey criteria were modeled after criteria used in cultural competence research performed by the doctor of physical therapy program at our institution.[25] Some modifications were made to represent the more diverse clinical practice settings and patient populations in athletic training (*athlete* or *nonathlete* category was added, *setting* category was added). Face and content validity of the modified survey were established by a panel of 3 athletic training educators with more than 50 combined years of experience in education and experience as textbook authors. The survey prompted each reviewer to identify who reviewed the text, which textbook they were reviewing, and the figure number identifying the image. If there was more than 1 person in the image each person was coded separately, and researchers entered an identifier for the person within the image they were coding (eg, "person on the left"). The survey consisted of 9 sections categorized by image type, setting, person, assumed skin tone, assumed race or ethnicity, assumed gender, body size, age grouping, and body expression (Table 3). Images were excluded from coding if they depicted a human body for anatomical purposes only (eg, an opened cadaver) or if no aspect of the person's body could be viewed. All reviewers completed coding individually and were blinded to other reviewers' codes.

Five faculty members and 2 students enrolled in a single CAATE-accredited professional Master of Science in Athletic Training program were recruited as coders. As image coding is a subjective process, all coders participated in a coding training session conducted by the lead author. As part of this training, each subcategory (Table 3) was defined and images from textbook chapters not randomly selected for inclusion were displayed. Coders were instructed to mark *other* or *unable to assess* if it was not clear which category subtype was represented in the image. Skin tone subcategories were based on the Fitzpatrick scale (light: types I–III, medium: types IV–V, dark: type VI), which has often been used to classify pigmentation in patient populations.[28] The Fitzpatrick scale has been used in previous studies on image diversity,[19,23] and was selected over the Taylor Hyperpigmentation Scale due to fewer categories. An image of the Fitzpatrick scale was also shared with coders. Each of the sample images was coded individually by each potential coder and coding was reviewed by the lead author. All coders were consistent in coding the sample images.

After the training session, 2 coders independently coded each textbook image that included at least 1 person, based on criteria outlined in Table 3. Coders 2 through 6 were randomly assigned chapters from the textbook list; the number of images in each chapter was unknown at the time of chapter assignment (Table 2). A third independent coder (coder 7, the lead author) confirmed that all image coding was consistent between the 2 coders. If there was inconsistency, the coders were asked to review the image to ensure their code was entered correctly. If there was still inconsistency the 3 individuals consulted and reviewed the image together to agree on a code. If agreement could not be reached the image category was coded as *unable to assess*.

Statistical Analysis

Frequency statistics were generated for each characteristic included in Table 3 and χ^2 goodness-of-fit tests were performed to determine if frequencies were significantly different. The expected frequency counts for all categories were >5, indicating the study was appropriately powered. Included textbooks were divided into 5 categories based on the 5 domains included in the BOC Practice Analysis (8th ed), and χ^2 tests of independence were performed to determine if frequencies were significantly different based on domain. Chi-square tests of independence were also performed to determine if frequencies were significantly different based on person type (athlete, nonathlete, clinician).

RESULTS

Images were coded from 66 chapters across 15 textbooks (Table 2). A total of 1667 persons were assessed from 1190 images. There were 1318 photographs, of which 1244 (94%) were color and 74 (6%) were black and white, and a total of 342 illustrations, of which 141 (41%) were color and 201 (59%) were black and white or blue and white. The overall breakdown of diversity in images is included in Table 3. Images primarily depicted persons who were of light skin tone (86%) and assumed to be

Table 2. Athletic Training Textbooks Used

Practice Analysis Domain	Textbooks Used	No. of Chapters Selected/Total Chapters	No. of Images Coded	Coder Nos. Assigned
Domain I: Risk Reduction, Wellness, and Health Literacy	Bhojani RA, O'Conner DP, Fincher AL. *Clinical Pathology for Athletic Trainers: Recognizing Systemic Disease.* 2015. SLACK Incorporated,	3/14	45	1, 5
	Anderson M, Barnum M. *Foundations of Athletic Training: Prevention, Assessment & Management.* 2016. Wolters Kluwer.	6/33	173	2, 5
	Kenney WL, Wilmore JH, Costill DL. *Physiology of Sport and Exercise.* 2015. Human Kinetics.	4/22	43	1, 4
Domain II: Assessment, Evaluation, and Diagnosis	Starkey C, Brown SD. *Examination of Orthopedic & Athletic Injuries.* 2015. F.A. Davis.	4/20	246	1, 5
	Walsh Flanagan K, Cuppett M. *Medical Conditions in the Athlete.* 2017. Human Kinetics.	4/18	49	4, 5
	Shultz SJ, Houglum PA, Perrin DH. *Examination of Musculoskeletal Injuries.* 2016. Human Kinetics.	4/20	69	2, 5
	Konin J, Lebsack D, Snyder Valier A, Isear J. *Special Tests for Orthopedic Examination.* 4th ed. 2016. CRC Press.	3/12	105	1, 6
Domain III: Critical Incident Management	Rehberg RS, Konin JG. *Sports Emergency Care: A Team Approach.* 2018. Routledge.	3/17	28	3, 6
Domain IV: Therapeutic Interventions	Prentice WE. *Rehabilitation Techniques for Sports Medicine and Athletic Training.* 2015. Routledge.	5/24	185	3, 6
	Colby L, Kisner, Borstad J. *Therapeutic Exercise: Foundations and Techniques.* 2018. F.A. Davis.	5/26	234	4, 6
	Starkey C. *Therapeutic Modalities.* 2013. F.A. Davis.	4/19	23	3, 6
Domain V: Healthcare Administration and Professional Responsibility	Kahanov L, Payne E. *Athletic Therapy & Training, Foundations of Behavior & Practice.* 2022. Human Kinetics.	5/24	220	3, 6
	Miller-Isaac K, Noble M. *Athletic Training Clinical Workbook.* 2015. F.A. Davis.	6/29	79	2, 5
	Houglum J, Harrelson GL, Seefeldt TW. *Principles of Pharmacology for Athletic Trainers.* 2015. Routledge.	4/17	6	2, 4
	Prentice W. *Principles of Athletic Training: A Guide to Evidence-Based Clinical Practice.* 2017. McGraw Hill.	6/29	162	4, 6
Total		66	1667	

White or Caucasian (86%), young adults (75%) of average weight (95%), with little diversity in body expression (95% *none of the above*). Persons who were not obviously identified as *athlete* were most often depicted (41%) and the majority of settings were clinic based (72%). Chi-square goodness of fit for each of these characteristics was significant at $P < .001$, indicating that the majority category frequencies were significantly different than would be expected by chance. Visual inspection of the data indicated that the most recent textbook included in this study, published by Kahanov and Payne in 2022, contained the most diverse images.

Image diversity breakdown by person depicted (Table 4) and textbook domain (Table 5) was also assessed. Chi-square tests of independence were performed with person or textbook domain as the presumed independent variable, and subject characteristics as the perceived dependent variables. All χ^2 statistics were significant at $P < .05$ (Tables 4 and 5). There was greater representation of assumed race/skin tone in textbooks categorized under Domain V: Healthcare Administration and Professional Responsibility, suggesting that the content of the domain may demand more heterogeneous images.

Table 3. Survey Questions and Responses

Characteristic	Category	χ^2 and *P* Values
Image type	Photograph = 1318 (94% color, 6% black and white) Illustration = 342 (41% color, 59% black & white/blue & white)	
Setting depicted (n = 848)	Athletic venue = 179 (21%) Clinic = 607 (72%) Physician office = 38 (4%) Other/unable to assess = 24 (3%)	$\chi^2_3 = 1050.632$, $P < .001$
Person depicted (n = 1503)	Athlete = 419 (27%) Nonathlete = 609 (41%) Clinician or other = 475 (32%)	$\chi^2_2 = 38.052$, $P < .001$
Assumed skin tone (n = 1448)	Light = 1250 (86%) Medium = 112 (8%) Dark = 86 (6%)	$\chi^2_2 = 1830.536$, $P < .001$
Assumed race/ethnicity (n = 1263)	White or Caucasian = 1084 (86%) Black or African American = 123 (10%) Latino = 21 (2%) Asian/Pacific Islander = 32 (2.5%) Other = 3 (<1%)	$\chi^2_4 = 3454.573$, $P < .001$
Assumed gender (n = 1249)	Male = 712 (57%) Female = 527 (42%) Nonbinary = 10 (<1%)	$\chi^2_2 = 635.963$, $P < .001$
Body size (n = 1057)	Underweight = 11 (1%) Average weight = 1005 (95%) Overweight = 39 (4%) Obese = 2 (<1%)	$\chi^2_3 = 2771.462$, $P < .001$
Age grouping (n = 918)	Infant (<1 year) = 3 (<1%) Child (1–12 years) = 6 (<1%) Youth (13–17 years) = 19 (2%) Young adult (18–29 years) = 684 (75%) Middle-aged adult (30–49 years) = 172 (19%) Older adult (50–64 years) = 12 (1%) Senior adult (65+ years) = 22 (2%)	$\chi^2_6 = 2883.000$, $P < .001$
Body expression (n = 947)	Hair style (color, style, etc): 16 (<2%) Tattoo: 6 (<1%) Facial hair: 6 (<1%) Hearing aid: 5 (<1%) Nail/toenail polish: 5 (<1%) Amputee: 4 (<1%) Jewelry/rings/unique piercings: 4 (<1%) Religious clothing or head covering: 0 (0%) Other: 17 (<2%) None of the above = 900 (95%)	$\chi^2_2 = 2964.717$, $P < .001$

DISCUSSION

This study investigated the diversity and individual expression of patients and clinicians in images found in commonly used athletic training textbooks. The findings of this study support existing literature in the fields of physical therapy, nursing, dermatology, and medicine, in that the majority of textbook images represented persons with light skin tone assumed to be White/Caucasian, young or middle-aged adults of average weight, with no "unique" body expression (eg, tattoo, unusual piercings, religious clothing or head covering).[18–20,23–25] This lack of diversity in textbook images suggests that underrepresentation of persons of diverse skin tones and body expression is present within the educational resources of most health care professions, including athletic training.

It was reported in a previous study with physical therapy students that students may have difficulty relating to the profession if they do not see themselves represented as health care professionals within the educational material.[16] This feeling of not belonging has the potential to limit the number of people from underrepresented groups who enter the profession.[29,30] Without diverse students within the athletic training education system, the profession lacks a workforce representative of the populations it serves.[31] Despite various initiatives by the NATA to increase the diversity of the profession, including the development of the EDAC, demographics of certified athletic trainers remain approximately 80% White.[9] This is similar to physical therapists (76% White), occupational therapists (81.6% White), speech-language pathologists (83.2% White), and physician assistants (75.6% White), but higher than physicians (63.8% White) as of 2022.[32–36] It has

Table 4. Frequency and χ^2 Results by Person Depicted

	Athlete (n = 419)	Nonathlete (n = 609)	Clinician/Other (n = 475)	Significance
Assumed skin tone				$P < .001$; more clinicians with dark skin; fewer patients with dark skin
Light	346	421	347	
Medium	29	42	31	
Dark	25	13	44	
Unable to assess	19	133	53	
Assumed race/ethnicity				$P = .05$; more patients were White
White or Caucasian	337	388	325	
Black or African American	42	28	48	
Latino	6	9	6	
Asian/Pacific Islander	8	6	11	
Other	26	178	85	
Assumed gender				$P < .001$; more athletes were male, more clinicians were female
Male	241	293	134	
Female	167	121	195	
Nonbinary	0	3	7	
Unable to assess	11	191	139	
Body size				$P = .29$; fewer patients who were overweight/obese
Underweight	4	7	0	
Average weight	348	347	266	
Overweight	22	9	8	
Obese	2	0	0	
Unable to assess	43	246	201	
Age grouping				$P < .001$; more young adult athletes, more senior nonathletes, more middle-aged and older adult clinicians
Infant	0	3	0	
Child	3	3	0	
Youth	11	8	0	
Young adult	280	223	159	
Middle-aged adult	58	41	63	
Older adult	0	3	8	
Senior adult	3	19	0	
Unable to assess	64	311	243	
Body expression				$P < .001$; more *no* for patients and clinicians
Yes	17	15	31	
No	401	593	444	

been suggested that the NATA review the impact the EDAC should have on the larger population, and that the EDAC should act and advise the NATA on how to tackle diversity within itself.[5]

It is also important for the diverse patient populations who receive athletic training services to be represented in educational resources. If students are not exposed to diverse populations in their education, they may be poorly prepared to evaluate and treat people of different ages, body sizes, or skin tones.[18,20,25] This lack of diversity in educational materials also impacts current clinicians who use textbooks to assist in evaluation of patients. In addition to diverse characteristics of the patient, diverse clinical practice settings should also be represented. The settings most often depicted in our study were clinic (72%) and athletic venue (21%); however, the athletic training profession has expanded to provide services in occupational health, industrial medicine, military, performing arts, and other diverse settings.[4,8,37] These settings should be represented in educational materials so athletic training students are exposed to various opportunities available to them upon entering the workforce. Similarly, the majority age group represented in these images was young adult (75%), with children, adolescents, and older adult categories each making up 2% or less of all images. Textbook images should represent the broad range of age groups to whom athletic trainers provide services to better demonstrate the scope of our professional competence. It is important for athletic trainers to be exposed to multicultural perspectives and to be empowered to maximize their capacity to deliver high-quality patient care and education.[38]

Athletic training educators are tasked with influencing the profession through the production of competent athletic trainers; however, they can also influence the profession through their choices in learning materials. Educators can and should seek out textbooks with diverse images of patients, clinicians, and clinical settings. When published materials are not available, educators should consider creating their own learning materials that feature patient populations and clinical settings that are underrepresented in published educational materials. These types of diverse educational materials may better prepare students to serve underrepresented populations.[20,39] The NATA as the member organization, the BOC as the credentialing organization, and the CAATE as the accreditation organization should truly work together as a strategic alliance towards

Table 5. Frequency and χ^2 Results by Textbook Domain

	Domain I (n = 261)	Domain II (n = 469)	Domain III (n = 28)	Domain IV (n = 442)	Domain V (n = 467)	Significance
Assumed skin tone						$P < .001$; more light skin tone in Domain IV, more medium skin tone in Domain V
Light	206	415	24	254	351	
Medium	27	27	0	8	50	
Dark	13	22	2	13	36	
U/A	15	5	2	167	30	
Assumed race/ethnicity						$P < .001$; fewer White and more A/PI in Domain I, more White and fewer AA in Domains II and IV, fewer White and more AA in Domain V
White/C	104	388	24	250	318	
Black/AA	19	24	2	13	65	
Latino	2	5	0	4	10	
Asian/PI	13	7	0	4	8	
U/A	123	45	2	171	66	
Assumed gender						$P < .001$; more female in Domain II, more male in Domain III
Male	107	177	22	231	175	
Female	70	188	3	162	104	
Nonbinary	3	7	0	0	0	
U/A	81	97	3	49	187	
Body size						$P = .019$; more underweight in Domain V
Underweight	0	3	0	2	7	
Average	140	291	23	327	244	
Overweight	3	18	1	12	5	
Obese	0	0	0	0	2	
U/A	118	157	4	101	209	
Age grouping						$P < .001$; more young adults and fewer middle-aged in Domain II, fewer young adult and more middle-aged in Domain IV, more youth in Domain V
Infant	0	0	0	3	0	
Child	1	0	3	0	2	
Youth	4	2	2	2	9	
Young adult	71	276	12	192	133	
Middle-aged adult	28	27	3	92	22	
Older adult	2	2	0	8	0	
Senior adult	6	3	0	13	0	
U/A	149	159	8	132	301	
Body expression						$P < .001$; more *yes* in Domain II
Yes	6	35	0	119	3	
No	255	434	28	423	462	

Abbreviations: AA, African American; C, Caucasian; PI, Pacific Islander; U/A, unable to assess.

alignment of educational and promotional materials with the diversity of the athletic training profession.

Our study found greater representation of assumed race/skin tone in textbooks categorized under Domain V: Healthcare Administration and Professional Responsibility, suggesting that the content of the textbook may demand more heterogeneous images. Additionally, the most recent textbook included in this study, authored by Kahanov and Payne in 2022, contained some of the most diverse images, which may suggest increasing awareness of the need for image diversity by textbook authors. The BOC Exam Development Committee can influence the profession through the materials they choose to place on the BOC exam reference list, and by using the most current version of textbooks to develop exam questions. Because athletic training programs often require or recommend textbooks from this list, being removed from the list due to lack of diverse images could send a powerful message to publishers about the need for greater inclusion of underrepresented populations and settings in textbook images. Previous researchers have suggested that publishers collaborate with DEI experts and offices to increase the diversity of images included in textbooks; it is therefore recommended that authors and publishers of athletic training–related textbooks increase such collaborative efforts, and that they follow the NATA Style Guide for Cultural Competency in NATA Projects.[25,40]

A limitation of this study is that only 20% of textbooks randomly selected from the BOC exam reference list as of March 2023 were included and only 20% of textbook chapter images were coded. Although this is consistent with previous research, the sample may not be representative of all athletic training texts and images. Additionally, since the time of data collection newer editions of some textbooks have been published, which may have increased image diversity. Finally, only face and content validity were established for the survey used in this study. Future research should include a larger sample of textbooks and/or evaluate textbooks not on the BOC exam reference list that are frequently used by athletic training programs. It would also be of interest to investigate how images are selected for textbooks, and how much autonomy authors themselves have as compared with publishers in creating or selecting images. Finally, future researchers may consider exploring the decision-making processes of athletic training educators when selecting textbooks and whether there is consideration related to image diversity.

The current study highlights disparities in health care education. The overarching DEI framework aims to promote fairness and equal participation of all people, especially those who have been historically underrepresented or discriminated against because of their background, identity, or ability level.[41] Institutions offering degrees in health care professions should seek to extend the framework of diversity and inclusion into their educational models. Underrepresentation of persons with diverse skin tones and of various ages within athletic training textbooks and educational images is a concern, as it may hinder the development of culturally competent clinicians and contribute to disparities in medical diagnoses across different racial groups. Additionally, the lack of diversity in clinical practice settings may limit the number of people seeking to pursue work within less traditional settings. The act of learning about diverse patient populations and differences in their clinical presentation may allow athletic training programs to build more inclusive learning environments and graduate professionals who perform more culturally competent patient care.

REFERENCES

1. Equity, diversity, and inclusion. American Psychological Association. Accessed April 3, 2024. https://www.apa.org/topics/equity-diversity-inclusion
2. Jensen E, Jones N, Rabe M, et al. 2020 U.S. population more racially and ethnically diverse than measured in 2010. United States Census Bureau. August 12, 2021. Accessed June 29, 2024. https://www.census.gov/library/stories/2021/08/2020-united-states-population-more-racially-ethnically-diverse-than-2010.html#:~:text=the%20data%20visualization.-,Prevalence%20Rankings%20and%20Diffusion%20Score,%2Dlargest%20group%20at%2012.1%25
3. Frey WH. The US will become "minority White" in 2045, Census projects. Brookings. March 14, 2018. Accessed June 29, 2024. https://www.brookings.edu/articles/the-us-will-become-minority-white-in-2045-census-projects/
4. Grantham J. Cultural competence and diversity in athletic training. *NATA News*. February 2015:10–12.
5. Corbett RO. Diversity in action or inaction? *J Athl Train*. 2024;59(4):333–334. doi:10.4085/1062-6050-0337.23
6. NATA Ethnic Diversity Advisory Committee. National Athletic Trainers' Association. Accessed August 14, 2024. https://www.nata.org/sites/default/files/EDAC-history.pdf
7. Sitzler B. NATA enters next phase of diversity, equity, inclusion and access plan. National Athletic Trainers' Association. Published April 8, 2021. Accessed April 3, 2024. https://www.nata.org/nata-now/articles/2021/04/nata-enters-next-phase-diversity-equity-inclusion-and-access-plan
8. Ethnicity demographic data. National Athletic Trainers' Association. Accessed April 3, 2024. https://www.nata.org/sites/default/files/ethnicity-demographic-data-sept-2018.pdf
9. Board of Certification for the Athletic Trainer. BOC certified AT demographics: 2022–2023 BOC certification maintenance data. April 2024. Accessed August 14, 2024. https://7f6907b2.flowpaper.com/202223BOCCertifiedATDemographics/#page=3
10. Claiborne T, Kochanek J, Pangani JF. The impact of an intergroup dialogue workshop on culturally competent clinical behaviors in athletic trainers. *Athl Train Educ J*. 2022;17(1):1–11. doi:10.4085/1947-380X-21-013
11. Rizzone KH, Day C, MacKenzie S, Issac L, Sanchez A, Jones CMC. Racial and ethnic diversity of athletic trainers in National Collegiate Athletic Association institutions, 2008–2018: a retrospective study. *J Athl Train*. 2024;59(6):673–679. doi:10.4085/1062-6050-0741.20
12. Volberding JL. Perceived cultural competence levels in undergraduate athletic training students. *Athl Train Educ J*. 2013;8(3):66–70. doi:10.4085/080366
13. Addy TM, Reeves PM, Dube D, Mitchell KA. What really matters for instructors implementing equitable and inclusive teaching approaches. *Improve Acad*. 2021;40(1):1–48. doi:10.3998/tia.182
14. Bauer K, Bai Y. Using a model to design activity-based educational experiences to improve cultural competency among graduate students. *Pharmacy (Basel)*. 2018;6(2):48. doi:10.3390/pharmacy6020048
15. Campinha-Bacote J. Cultural competemility: a paradigm shift in the cultural competence versus cultural humility debate—part I. *Online J Issues Nurs*. 2018;24(1). doi:10.3912/OJIN.Vol24No01PPT20
16. Campinha-Bacote J. Promoting health equity among marginalized and vulnerable populations. *Nurs Clin North Am*. 2024;59(1):109–120. doi:10.1016/j.cnur.2023.11.009
17. Fitzgerald E, Campinha-Bacote J. An intersectionality approach to the process of cultural competemility—part II. *Online J Issues Nurs*. 2019;24(2). doi:10.3912/OJIN.Vol24No02PPT202
18. Kaundinya T, Kundu RV. Diversity of skin images in medical texts: recommendations for student advocacy in medical education. *J Med Educ Curric Dev*. 2021;8:238212052110258. doi:10.1177/23821205211025855
19. Abduelmula A, Akuffo-Addo E, Joseph M. The progression of skin color diversity and representation in dermatology textbooks. *J Cutan Med Surg*. 2022;26(5):523–525. doi:10.1177/12034754221099668
20. Oozageer Gunowa N, Brooke J, Hutchinson M, Jackson D. Embedding skin tone diversity into undergraduate nurse education: through the lens of pressure injury. *J Clin Nurs*. 2020;29(21–22):4358–4367. doi:10.1111/jocn.15474
21. De Guzman FLM, Moukoulou LNN, Scott LD, Zerwic JJ. LGBT inclusivity in health assessment textbooks. *J Prof Nurs*. 2018;34(6):483–487. doi:10.1016/j.profnurs.2018.03.001
22. Dijkstra A, Verdonk P, Lagro-Janssen ALM. Gender bias in medical textbooks: examples from coronary heart disease, depression, alcohol abuse and pharmacology. *Med Educ*. 2008;42(10):1021–1028. doi:10.1111/j.1365-2923.2008.03150.x
23. Wilson BN, Sun M, Ashbaugh AG, et al. Assessment of skin of color and diversity and inclusion content of dermatologic published literature: an analysis and call to action. *Int J Womens Dermatol*. 2021;7(4):391–397. doi:10.1016/j.ijwd.2021.04.001
24. Ebede T, Papier A. Disparities in dermatology educational resources. *J Am Acad Dermatol*. 2006;55(4):687–690. doi:10.1016/j.jaad.2005.10.068
25. Elinich J, Roll A, Wynarczuk K, Mikovits J, Nakhlah S, Rauch M. "Assessment of perceived visual diversity and inclusivity in doctor of physical therapy textbooks." Poster presented at: APTA Combined Sections Meeting, February 23–25, 2023; San Diego, CA.
26. Content outline for practice analysis, 8th edition. Board of Certification for the Athletic Trainer. Accessed September 5, 2024. https://bocatc.org/wp-content/uploads/2024/03/boc-pa8-content-outline-20230109.pdf
27. BOC exam references. Board of Certification for the Athletic Trainer. Accessed September 1, 2023. https://www.bocatc.org/candidates/exam-preparation-tools/exam-references/exam-references

28. Gupta V, Sharma VK. Skin typing: Fitzpatrick grading and others. *Clin Dermatol*. 2019;37(5):430–436. doi:10.1016/j.clindermatol.2019.07.010
29. Moerchen V, Williams-York B, Ross L, et al. Purposeful recruitment strategies to increase diversity in physical therapist education. *J Phys Ther Educ*. 2018;32(3):209–217. doi:10.1097/JTE.0000000000000032
30. Woods A, Tharakan S. *Hiring for Diversity: The Guide to Building an Inclusive and Equitable Organization*. John Wiley & Sons; 2021.
31. Salsberg E, Richwine C, Westergaard S, et al. Estimation and comparison of current and future racial/ethnic representation in the US health care workforce. *JAMA Netw Open*. 2021;4(3):e213789. doi:10.1001/jamanetworkopen.2021.3789
32. Physical therapists. DATA USA. Accessed June 28, 2024. https://datausa.io/profile/soc/physical-therapists
33. Occupational therapists. DATA USA. Accessed June 28, 2024. https://datausa.io/profile/soc/occupational-therapists
34. Speech language pathologists. DATA USA. Accessed June 28, 2024. https://datausa.io/profile/soc/speechlanguage-pathologists
35. Physician assistants. DATA USA. Accessed June 28, 2024. https://datausa.io/profile/soc/physician-assistants
36. Physicians. DATA USA. Accessed June 28, 2024. https://datausa.io/profile/soc/physicians
37. 2021 salary survey executive summary. National Athletic Trainers' Association. February 23, 2022. Accessed April 4, 2024. https://www.nata.org/sites/default/files/nata_2021_salary_survey_executive_summary.pdf
38. Adams WM, Terranova AB, Belval LN. Addressing diversity, equity, and inclusion in athletic training: shifting the focus to athletic training education. *J Athl Train*. 2021;56(2):129–133. doi:10.4085/1062-6050-0558-20
39. Sterman J, Njelesani J, Carr S. Anti-racism and occupational therapy education: beyond diversity and inclusion. *J Occup Ther Educ*. 2022;6(1):Article 3. doi:10.26681/jote.2022.060103
40. Style guide for cultural competency in NATA projects. National Athletic Trainers' Association. Accessed August 14, 2024. https://www.natafoundation.org/wp-content/uploads/Style-Guide-for-Cultural-Competency_June-3-2019.pdf
41. Akbar M, Parker TL. Equity, diversity, and inclusion framework. American Psychological Association. April 8, 2021. Accessed Auguest 14, 2024. https://www.apa.org/about/apa/equity-diversity-inclusion/framework