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*Original Research*

# Athletic Trainers' Familiarity, Comfort, Knowledge, and Recognition of Social Determinants of Health

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***Context:*** Social determinants of health (SDOH)—education, transportation, housing, employment, health systems and services, economic status, and physical and social environments—influence patient outcomes; therefore, athletic trainers (ATs) need to understand and address these factors. However, little is known about how ATs perceive SDOH or how knowledgeable they are about social factors that contribute to patient health and well-being.

***Objective:*** To evaluate ATs' familiarity and comfort with SDOH and their perceived knowledge and recognition of SDOH.

***Design:*** Cross-sectional study.

***Setting:*** Online survey.

***Patients or Other Participants:*** Our survey was distributed to 17 000 ATs; 1829 accessed it (access rate = 10.8%), and 1694 completed it (completion rate = 92.6%, AT experience = 15.2 ± 10.6 years, age = 36.6 ± 10.8 years).

***Main Outcome Measure(s):*** The survey included multipart questions that evaluated ATs' perceptions of their familiarity, comfort, and knowledge about SDOH. Data were summarized using descriptive statistics.

***Results:*** Few respondents (4.1%, 70/1691) reported being extremely familiar with SDOH. Most indicated being moderately familiar (45.0%, 761/1691), minimally familiar (34.7%, 587/1691), or not familiar at all (16.1%, 273/1691). For questions about comfort, few described being extremely comfortable (3.5%, 59/1691) with SDOH, and most reported being moderately comfortable (35.4%, 598/1691), minimally comfortable (41.1%, 695/1691), or not comfortable at all (18.6%, 314/1691). For questions about knowledge, few indicated being extremely knowledgeable (2.7%, 46/1686) about SDOH, and the majority described being moderately (36.8%, 622/1686), minimally (41.8%, 704/1686), or not knowledgeable at all (18.6%, 314/1686). Over half of ATs accurately categorized 8 of the 9 SDOH listed in the survey, and 22% endorsed more correct than incorrect items.

***Conclusions:*** A majority of ATs perceived their familiarity, comfort, and knowledge about SDOH to be moderate to low, which may reflect the relatively recent emphasis on SDOH in athletic health care. Because SDOH can have a major effect on patient health and well-being, strategies should be developed for educating ATs about SDOH. Developing strategies to increase comfort with SDOH in patient care is critical to ensure that those factors that can be addressed at the patient level are identified and managed.

***Key Words:*** social factors, health inequalities, patient-centered care

**Key Points**

- Most responding athletic trainers reported limited familiarity, comfort, and knowledge concerning social determinants of health (SDOH).
- Although athletic trainers indicated moderate to low levels of familiarity and comfort with SDOH, they were able to correctly recognize SDOH. With this baseline level of recognition, the field is ripe for further education to increase athletic trainers' awareness and comfort with recognizing and addressing SDOH affecting those they care for at the point of care.
- Athletic trainers have consistent connections with people, providing ready opportunities to affect and address SDOH at a local level.

*Social determinants of health* (SDOH) have been defined as the conditions in which we live, learn, work, worship, grow, play, and age.[1–3] Categories of SDOH include but are not limited to education, transportation, housing, employment, health systems and services, income and wealth, physical environment, public safety, and social environment.[3] Although defined independently, these social determinants are interconnected and often complex, and they have various effects on health and patient outcomes.[2] Researchers have identified that SDOH may account for 50% of the modifiable factors that contribute to negative health outcomes[4–6]; the actual health care received contributes to a lesser degree. Further, hundreds of thousands of adult deaths in the United States have likely been hastened by SDOH, including poor education, little social support, individual-level poverty, and income inequality.[7] Understanding the complexities and inner workings of SDOH is important in being able to recognize and address them when they negatively influence health at an individual or population level.

Braveman et al[8] further described SDOH as upstream or downstream nonmedical factors that influence health. Upstream

factors, such as neighborhood violence, create the causal pathways and shape downstream factors, such as an individual's chronic stress and anxiety.[3] In some cases, the downstream SDOH are the quicker solutions, but not addressing the larger concerns allows the negative effects on health and well-being to persist. Both upstream and downstream social factors must be considered in order to improve patient health. The recent attention on SDOH of the greater health care community is notable, and efforts to address SDOH are being explored on many public health levels.[1–3,9] For example, states that spend more on social services (an upstream social factor) relative to health care have lower rates of asthma, cancer, obesity, and mental health disorders.[2] These data suggest that SDOH can negatively affect the health of patients and that addressing them can positively influence health outcomes, creating healthier populations. Therefore, evaluating SDOH as a part of any health care interaction is essential to providing comprehensive and effective patient-centered care and promoting patient health and well-being, even if at a local or individual level.

As suggested by the authors of recent studies investigating access to health care,[10,11] the athletic training community is increasingly recognizing the importance of SDOH in patient care. Additionally, the *2020 Standards for the Accreditation of Professional Athletic Training Programs*[12] were updated to include SDOH as required educational content. Athletic trainers (ATs) closely interact with their patients, often spending more time with them than other health care providers do.[13] The athletic training model of care frequently involves daily patient interactions and services for underserved populations, such as students at public secondary schools. Athletic trainers may be the only health care providers to whom high school athletes have regular access. Thus, the athletic training model of care provides a unique opportunity for ATs to address certain SDOH affecting their patients on an individual level.

Clinician awareness of SDOH commonly observed in athletic health care is needed so that opportunities to positively affect social determinants at the individual level can be identified and pursued. Observation and action may also lead to better health outcomes for patients and athletic populations. However, because the educational emphasis on SDOH in athletic training is relatively new, little information exists about the baseline levels of ATs' familiarity and comfort with and knowledge of these concepts. Theories of knowledge translation state that, for new knowledge to be disseminated and successfully translated to practice, people should have a positive attitude and "buy in" toward the change.[14] Greater understanding of ATs' perceptions of SDOH will help identify areas of strength and opportunities for education and training. Therefore, the purpose of our study was to evaluate ATs' perceived familiarity and comfort with identifying SDOH and their perceived knowledge and recognition of SDOH.

## METHODS

We used a cross-sectional web-based survey modified from 2 existing surveys[15,16] to assess ATs' perceptions of SDOH in athletic health care. The study was determined to be exempt research by the A.T. Still University's Institutional Review Board.

### Participants

Certified ATs who were members of the National Athletic Trainers' Association (NATA) in good standing were eligible to participate in the study. Athletic trainers in various settings and positions and at various education levels were included in this study to ensure that the results reflected the broad perceptions of ATs. Using convenience sampling, we drew potential participants from across the United States using the NATA Survey Research Service.

### Instrumentation

The Athletic Trainers' Perceptions of Social Determinants of Health Survey (AT-SDH) was used to evaluate ATs' familiarity and comfort with SDOH as well as their perceived knowledge and recognition of SDOH. The survey was adapted from 2 previously validated surveys that were used to evaluate SDOH in a health department residency population.[15,16] A variety of question types were used in the survey, such as Likert-type scales, multiple choice, and multiselect. Perceived familiarity and comfort with and knowledge about SDOH were assessed using a 4-point Likert-type scale (ie, *not familiar at all*, *minimally familiar*, *moderately familiar*, *extremely familiar*). All perception questions followed a similar format. For example, we evaluated comfort by asking, "How comfortable are you with identifying the SDOH?" and general knowledge by asking, "How knowledgeable are you about the [SDOH]?" Recognition of SDOH was assessed by having ATs identify SDOH items from a list of examples of SDOH, structural inequalities, and other constructs. In the list, SDOH were education, employment, health systems and services, housing, income and wealth, physical environment, public safety, social environment, and transportation.[3] Structural inequalities included class, gender, racism, and sexism. Other constructs were genetics, health behavior, and psychosocial characteristics. Demographic information of respondents was also requested. The survey was distributed on the Qualtrics management software platform (Qualtrics, Inc).

We reassessed content and face validity for our survey. Two content and survey design experts completed an established validation rubric[17]; each expert is a PhD-trained researcher with more than 15 years of experience conducting health care research. One individual has extensive expertise designing and conducting survey research, and the other has published research related to SDOH. Based on their feedback, we made minor updates to the survey. To ensure clarity and comprehension of the survey items, 19 pilot participants who met our inclusion criteria for the study completed the survey; their data were not included in our final analyses. Based on pilot participant feedback, no additional edits were made to the survey. Thus, the final AT-SDH survey consisted of 45 questions that assessed ATs' familiarity and comfort with SDOH and their perceived knowledge and recognition of SDOH. Skip logic was used, so the total number of survey questions varied by respondent. The AT-SDH survey was designed to take 10 to 15 minutes to complete.[18]

### Procedures

Via the NATA Survey Research Service, we identified 17 000 certified ATs who met the study inclusion criteria. During September 2019, an invitation to the survey was

emailed to potential participants. The email explained the purpose of the study, provided the expected time for completion, and listed contact information for the research team. Participants were informed that they provided their consent by voluntarily completing any portion of the survey. A reminder email was sent every week during the 4-week data-collection period to those who had not yet completed the survey.

### Data Analysis

Due to the exempt nature of survey research, respondents were not required to answer every item in the current survey. We included partial and complete survey responses in the data analyses. Descriptive statistics, including means, SDs, frequencies, percentages, medians, and interquartile ranges, were calculated to summarize the survey data. An index of SDOH recognition was computed to offset inflation of scores by guessing. The percentages of correct response endorsements of the social determinant of health recognition question and incorrect response endorsements were calculated for each respondent; the percentage of incorrect responses was then subtracted from the percentage of correct responses.[19] Percentages, rather than counts, were used to report recognition findings because the scale was imbalanced with regard to correct (9) and incorrect (7) items. A higher composite score indicated greater recognition. Specifically, a negative score indicated that the respondent endorsed a higher percentage of incorrect than correct responses, whereas a positive score indicated the endorsement of a higher percentage of correct than incorrect responses. Statistical analyses were performed using SPSS (version 26; IBM Corp).

## RESULTS

Of the 17 000 ATs invited to complete the survey, 1829 accessed the survey (access rate = 10.8%), and 1694 completed the survey (completion rate = 92.6%). The demographic characteristics of respondents are presented in Table 1. The mean age of respondents was 37.6 ± 11.3 years, and more than half were female (61.1%, 856/1400). The mean respondent experience was 15.2 ± 10.6 years.

Overall, only 4.1% (70/1691) of ATs reported they were extremely familiar with SDOH (Table 2). Similarly, only 3.5% (59/1691) of ATs indicated being extremely comfortable with SDOH (Table 3), and 2.7% (46/1686) of ATs perceived themselves to be extremely knowledgeable about SDOH (Table 4).

Regarding recognition of SDOH, 8.0% (138) did not identify any of the items listed as SDOH; 11.8% (199) endorsed all listed SDOH. Those who did not identify any and those who identified all SDOH were excluded from analysis of the recognition items because they contributed no variance to the analysis. Results for the recognition of SDOH items are shown in Table 5. Of the 1360 respondents who remained in the analysis, 23.4% (318/1360) selected more incorrect (ie, not an SDOH) than correct items (ie, an actual SDOH). The mean recognition index score was 21.8% ± 30.2%, which reflected that respondents were somewhat more likely (21.8%) to endorse a correct item than an incorrect item. The median (interquartile range) index score was 20.6 (3.2–42.9). Only 1.9% (3) respondents scored >90% on the index, correctly identifying almost all listed SDOH items and misidentifying very few non-SDOH items.

**Table 1. Demographic Characteristics of Athletic Trainers Participating in the Current Study (N = 1694)**

| Demographic Characteristic | No. (%) |
|---|---|
| Gender (n = 1400) | |
| Female | 856 (61.1) |
| Male | 533 (38.1) |
| Prefer not to answer | 6 (0.4) |
| Other | 3 (0.2) |
| Intersex | 1 (0.07) |
| Transgender | 1 (0.07) |
| Level of education completed (n = 1388) | |
| Master's | 953 (68.1) |
| Bachelor's | 274 (19.6) |
| Academic doctorate | 116 (8.3) |
| Clinical doctorate | 45 (3.2) |
| Professional doctorate | 12 (0.9) |
| Employment setting (n = 1394) | |
| Secondary school | 468 (33.6) |
| College or university | 403 (28.9) |
| Other | 144 (10.3) |
| Physician practice | 88 (6.3) |
| Higher education | 86 (6.2) |
| Health care administration or rehabilitation | 84 (6.0) |
| Occupational health or industrial | 39 (2.8) |
| Professional sports | 38 (2.7) |
| Military | 27 (1.9) |
| Performing arts | 12 (0.9) |
| Public safety | 5 (0.4) |

## DISCUSSION

Athletic trainers often interact with their patients regularly, placing them in a unique position to recognize and intervene when SDOH are negatively influencing health and well-being at the local level. In the current study, we evaluated ATs' perceived familiarity and comfort with identifying SDOH and their perceived knowledge and recognition of SDOH. Our primary results suggested that ATs had a minimal to moderate level of familiarity, comfort, and perceived knowledge about SDOH. When provided with a list of SDOH, structural inequalities, and other constructs, ATs were somewhat more likely to correctly recognize SDOH. These seemingly contrasting findings may be explained by the ability of ATs to recognize factors that affect the health of their patients regardless of their knowledge of the formal labels. It is important that ATs can recognize SDOH from a list, but lower perceptions of comfort and knowledge may make them less likely to document and address SDOH. Thus, the timing is ripe for more education regarding recognition and documentation of and actions to address SDOH. More research is needed to determine if recognizing the concept in theory translates to recognition in clinical practice.

### Familiarity and Comfort With SDOH

Few ATs reported being extremely familiar or comfortable with the concept of SDOH; at best, ATs were minimally to moderately comfortable. This finding was not surprising given that SDOH are a recent addition to educational standards in athletic training,[12] and most of the respondents had been practicing for an average of 15 years and may not have received specific training on this concept. In contrast, health care providers in community health centers described being very familiar with SDOH.[15] Although the difference between the familiarity of providers in athletic health care and those who

**Table 2. Athletic Trainers' Familiarity With Social Determinants of Health**

| Demographic Characteristic | No. of Responses (%) | | | |
|---|---|---|---|---|
| | Extremely Familiar | Moderately Familiar | Minimally Familiar | Not Familiar at All |
| Total (n = 1691) | 70 (4.1) | 761 (45.0) | 587 (34.7) | 273 (16.1) |
| Levels of education completed (n = 1398) | | | | |
| Academic doctorate | 13 (11.3) | 70 (60.9) | 23 (20.0) | 9 (7.8) |
| Clinical doctorate | 3 (6.7) | 27 (60.0) | 12 (26.7) | 3 (6.7) |
| Professional doctorate | 3 (25.0) | 6 (50.0) | 3 (25.0) | 0 (0) |
| Master's | 40 (4.2) | 416 (43.7) | 346 (36.3) | 150 (15.8) |
| Bachelor's | 9 (1.8) | 120 (43.8) | 100 (36.5) | 45 (16.4) |
| Employment setting (n = 1392) | | | | |
| College or university | 13 (3.2) | 166 (41.2) | 153 (38.0) | 71 (17.6) |
| Health care administration or rehabilitation | 11 (13.1) | 40 (47.6) | 24 (28.6) | 9 (10.7) |
| Higher education | 7 (8.1) | 51 (59.3) | 23 (26.7) | 5 (5.8) |
| Military | 0 (0) | 13 (48.1) | 11 (40.7) | 3 (11.1) |
| Occupational health or industrial | 3 (7.7) | 24 (61.5) | 8 (20.5) | 4 (10.3) |
| Performing arts | 0 (0) | 7 (58.3) | 4 (33.3) | 1 (8.3) |
| Physician practice | 4 (4.5) | 31 (35.2) | 32 (36.4) | 21 (23.9) |
| Professional sports | 0 (0) | 14 (37.8) | 18 (48.6) | 5 (13.5) |
| Public safety | 1 (20.0) | 2 (40.0) | 1 (20.0) | 1 (20.0) |
| Secondary school | 18 (3.8) | 225 (48.1) | 157 (33.5) | 67 (14.3) |
| Other | 9 (6.3) | 63 (43.8) | 51 (35.4) | 21 (14.6) |

work in community health centers is unknown, some differences in the practice should be considered. Community health centers are designed to provide greater access to patients and may more frequently support patients with lower incomes and state-issued insurance and serve patients with a variety of general medical conditions. Many ATs do not bill for their services and work independently, reducing the opportunity for interprofessional interactions across health specialties. Also, they tend to focus on athletic injuries, potentially limiting their familiarity and comfort with SDOH. Increasing ATs' familiarity and comfort with SDOH may assist in greater recognition of these factors in their patients, which is a starting place for managing these factors and referring patients as a part of care. Athletic trainers may not be able to address all SDOH themselves, but providing information about resources, such as food pantry distribution centers and referral to community services, is within ATs' scope of practice.

Informal workplace learning is one opportunity for increasing familiarity and comfort with SDOH. For example, Joynes et al[20] described triggers for informal workplace learning, including awareness of patient needs and exposure to the practices and policies of other health care professionals. In previous studies,[21–23] when health care providers had experience with or were exposed to injuries, illnesses, and disabilities, their comfort in diagnosing, treating, and caring for certain patients increased. Ensuring that ATs are exposed to patients experiencing negative influences of SDOH is important and should be coupled with the purposeful integration of SDOH assessment into practice. One example of a purposeful integration is to include a screening tool for SDOH, such as the American Academy of Family Physicians Social Needs Screening Tool,[24] into preparticipation physical or standard injury evaluations. With the knowledge that SDOH can negatively influence athletes under their care, ATs can begin to improve their

**Table 3. Athletic Trainers' Comfort With Social Determinants of Health**

| Demographic Characteristic | No. of Responses (%) | | | |
|---|---|---|---|---|
| | Extremely Comfortable | Moderately Comfortable | Minimally Comfortable | Not Comfortable at All |
| Total (n = 1666) | 59 (3.5) | 598 (35.4) | 695 (41.1) | 314 (18.6) |
| Level of education completed (n = 1398) | | | | |
| Academic doctorate | 10 (8.7) | 57 (49.6) | 37 (32.2) | 11 (9.6) |
| Clinical doctorate | 3 (6.7) | 21 (46.7) | 17 (37.8) | 4 (8.9) |
| Professional doctorate | 3 (25.0) | 4 (33.3) | 5 (41.7) | 0 (0) |
| Master's | 34 (3.6) | 325 (34.1) | 403 (42.3) | 190 (20.0) |
| Bachelor's | 7 (2.6) | 97 (35.4) | 105 (38.3) | 65 (23.7) |
| Employment setting (n = 1392) | | | | |
| College or university | 8 (2.0) | 138 (34.2) | 169 (41.9) | 88 (21.8) |
| Health care administration or rehabilitation | 7 (8.3) | 34 (40.5) | 31 (36.9) | 12 (14.3) |
| Higher education | 5 (5.8) | 43 (50.0) | 32 (37.2) | 6 (7.0) |
| Military | 1 (3.7) | 9 (33.3) | 14 (51.9) | 3 (11.1) |
| Occupational health or industrial | 2 (5.1) | 13 (33.3) | 21 (53.8) | 3 (7.7) |
| Performing arts | 1 (8.3) | 5 (41.7) | 4 (33.3) | 2 (16.7) |
| Physician practice | 5 (5.7) | 26 (29.5) | 30 (34.1) | 27 (30.7) |
| Professional sports | 0 (0) | 13 (35.1) | 19 (51.4) | 5 (13.5) |
| Public safety | 1 (20.0) | 2 (40.0) | 0 (0) | 2 (40.0) |
| Secondary school | 16 (3.4) | 171 (36.5) | 185 (39.5) | 95 (20.3) |
| Other | 8 (5.6) | 48 (33.3) | 62 (43.1) | 26 (18.1) |

**Table 4. Athletic Trainers' Knowledge About Social Determinants of Health**

| Demographic Characteristic | No. of Responses (%) | | | |
|---|---|---|---|---|
| | Extremely Knowledgeable | Moderately Knowledgeable | Minimally Knowledgeable | Not Knowledgeable at All |
| Total (n = 1686) | 46 (2.7) | 622 (38.9) | 704 (41.8) | 314 (18.6) |
| Level of education completed (n = 1395) | | | | |
| Academic doctorate | 9 (7.8) | 63 (54.8) | 34 (29.6) | 9 (7.8) |
| Clinical doctorate | 2 (4.4) | 25 (55.6) | 14 (31.1) | 4 (8.9) |
| Professional doctorate | 2 (16.7) | 7 (58.3) | 3 (25.0) | 0 (0) |
| Master's | 27 (2.8) | 335 (35.3) | 415 (43.7) | 173 (18.2) |
| Bachelor's | 5 (1.8) | 95 (34.8) | 119 (43.6) | 54 (19.8) |
| Employment setting (n = 1389) | | | | |
| College or university | 8 (2.0) | 136 (33.7) | 173 (42.9) | 86 (21.3) |
| Health care administration or rehabilitation | 8 (9.6) | 38 (45.8) | 28 (33.7) | 9 (10.8) |
| Higher education | 4 (4.7) | 46 (53.5) | 30 (34.9) | 6 (7.0) |
| Military | 0 (0) | 8 (29.6) | 15 (55.6) | 4 (14.8) |
| Occupational health or industrial | 1 (2.6) | 17 (43.6) | 17 (43.6) | 4 (10.3) |
| Performing arts | 0 (0) | 5 (41.7) | 5 (41.7) | 2 (16.7) |
| Physician practice | 3 (3.4) | 30 (34.1) | 30 (34.1) | 25 (28.4) |
| Professional sports | 0 (0) | 12 (32.4) | 17 (45.9) | 8 (21.6) |
| Public safety | 1 (20.0) | 2 (40.0) | 1 (20.0) | 1 (20.0) |
| Secondary school | 12 (2.6) | 174 (37.2) | 207 (44.2) | 73 (15.6) |
| Other | 6 (4.2) | 53 (37.1) | 61 (42.7) | 23 (16.1) |

clinical management and care decisions. Athletic trainers may consider including school psychologists, social workers, and teachers to tackle negatively influencing SDOH where appropriate, further promoting whole-patient care.

Among health care providers, including ATs, training or educational interventions have been suggested to increase comfort and familiarity with SDOH.[25–28] For example, Freiburger et al[27] implemented a 3-part SDOH learning activity for postprofessional athletic training students with the goal of increasing student knowledge and promoting recognition of these factors in practice. Preintervention versus postintervention results suggested that the students improved their familiarity and comfort with identifying SDOH at the point of care as a result of this educational technique.[27] Educational techniques, such as those described by Frieberger et al,[27] have the potential to influence the familiarity and comfort of future ATs, yet additional ideas and strategies are needed to support clinicians who completed their education before the change in educational standards. A critical consideration is how to translate the knowledge about SDOH to use in clinical practice. Researchers have proposed that a learner who develops a positive attitude toward the concept is more likely to translate the new knowledge to practice.[14] Only when clinicians find value, familiarity, and comfort in a concept will attitudes and behavior change to advance the integration of said concept into practice.[14] Continued efforts to include SDOH in educational programs and continuing education opportunities should be a professional priority to increase the uptake of knowledge and translation to practice.

**Table 5. Athletic Trainers' Recognition of Social Determinants of Health**

| Listed Survey Item | Endorsed No. (%) |
|---|---|
| Social determinants of health | |
| Income and wealth | 1223 (89.9) |
| Social environment | 1183 (87.0) |
| Education | 1169 (86.0) |
| Physical environment | 985 (72.4) |
| Housing | 919 (67.6) |
| Employment | 911 (67.0) |
| Transportation | 758 (55.7) |
| Public safety | 549 (40.4) |
| Structural inequalities | |
| Class | 970 (71.3) |
| Racism | 630 (46.3) |
| Gender | 620 (45.6) |
| Sexism | 553 (40.7) |
| Other constructs | |
| Psychosocial characteristics | 777 (57.1) |
| Health behavior | 764 (56.2) |
| Genetics | 244 (17.9) |

## Knowledge and Recognition of SDOH

Winkelmann et al[29] assessed the actual knowledge of ATs regarding various public health topics, including SDOH. Athletic trainers performed poorly on SDOH items.[29] In our study, approximately 60% of ATs perceived that they had no or minimal knowledge of SDOH. Despite this perception about SDOH, more than half of ATs endorsed 8 of the 9 listed SDOH in the survey, and 22% endorsed more correct than incorrect items, which suggests some level of SDOH recognition without strong feelings of knowledge about these factors. Although recognition of factors described on a survey may not directly translate to recognition in practice, this information is a start to understanding ATs' perceptions of the complex construct of SDOH. Athletic trainers recognize SDOH in a broad sense. Recognition in the real world with complex patient cases warrants further investigation.

Similar to our findings, previous researchers in athletic training have found that perceived knowledge[30] and confidence in knowledge[31] did not always correlate with actual knowledge. Additionally, ATs have noted lack of knowledge as a barrier to implementing other critical concepts, such as evidence-based practice, into educational programming and practice.[32,33] The inclusion of SDOH content in professional athletic training education has progressed, but continuing education resources and opportunities are necessary to promote profession-wide

adoption of SDOH as an important component of whole-person health care.

Clearly, clinician exposure to SDOH and education related to SDOH are not enough to improve the overall health and well-being of patients. However, the recognition of SDOH by ATs can be beneficial. Athletic trainers are in a unique position to identify and refer patients who may need additional support caused by the negative influence of SDOH. For instance, because ATs often have regular interactions with their patients, improving their abilities to recognize those who may be vulnerable to the negative influence of SDOH can help identify resource needs within specific patient communities. Given that these factors matter more to the health of patients than the health care provided,[3,4,6] the need to address SDOH is clear. Therefore, beginning to assess or screen for SDOH in athletic training practice may increase familiarity and comfort with SDOH at the point of care and fill knowledge gaps. When clinicians screen for SDOH and provide guidance, the health and satisfaction of patients improve,[34] patients make fewer visits to the emergency room, and prescription medications for environmental-related conditions decrease.[35–37] Authors who evaluated the implementation of a screening tool for SDOH in primary care determined that 92% of clinicians reported screening was beneficial to their patients, and 96% supported continued use of the screening tool.[38] Successfully addressing upstream SDOH is a complex process and requires an approach that includes all health care providers, organizations, communities, public health activists, and policymakers. Only by including all interested parties can benefits at the population level be actualized. Because ATs are often the first health care providers to interact with patients, the athletic training profession needs to more fully consider assessment of SDOH before we can begin to address negatively influencing social factors at an individual level.

### Limitations

Our results should be interpreted in the context of their limitations. The survey access rate was low; however, the gender and age of our participants were similar to recently reported AT demographics by the Board of Certification (https://bocatc.org/system/document_versions/versions/293/original/at-demographics-20220414.pdf?1649950857). Among potential participants who accessed the survey, almost all completed it. Those who accessed the survey were probably more likely than other ATs to be interested in SDOH. Additionally, the survey was open to ATs who were educators and researchers, as they will be the ones to educate future ATs. As such, the findings of this study may overestimate the interest and perceived knowledge about SDOH in the AT community. We assessed recognition of SDOH using a single multiselect question, which limited the ability to explore ATs' recognition of the full range of complexities associated with this broad concept. Given that the survey was intended as a foundation for future research in this area, results from the recognition question should be considered a starting point to gauge basic SDOH knowledge. Finally, these data were collected in 2019, before distinguishing world events. Global phenomena, including the COVID-19 pandemic and numerous events highlighting social injustice concerns, have garnered media attention to social inequity and SDOH. How these events may have affected the perceptions and knowledge of ATs regarding SDOH is unknown, but ATs' perceptions and knowledge of SDOH may have increased since the current study. Future researchers should investigate which SDOH are commonly encountered by ATs at the point of care in a variety of settings. Ideally, such information would promote the assessment of SDOH in patient care and provide ATs with the necessary resources to mitigate the negative influence of SDOH.

## CONCLUSIONS

Because SDOH can have a marked effect on patient outcomes, it is imperative that ATs recognize SDOH at the point of care, document when SDOH have potential negative consequences on the patients they serve, and refer patients to those who can address specific SDOH at the local level. Our findings suggested that ATs have minimal to moderate levels of familiarity and comfort with and knowledge about SDOH. Therefore, increasing ATs' familiarity and comfort with SDOH and their knowledge of SDOH may promote greater recognition of social factors that affect patient health. Further, greater understanding of how SDOH influence patient well-being will better inform clinical care decisions and, ultimately, improve patient outcomes.

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