Mindfulness Matters: Utilization and Perceptions of Mindfulness Practices Among Athletic Trainers

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Context: Mindfulness practices are effective for injury/illness recovery, decreasing stress and anxiety, and strengthening emotional resilience. They are also beneficial for healthcare professionals’ well-being and improved patient outcomes and safety. However, mindfulness has not been studied in athletic trainers.

Objective: To investigate athletic trainers’ utilization of mindfulness practices and their perceptions on its importance for self- and patient/client-care.

Design: Cross-sectional study.

Setting: All athletic training practice settings.

Patients and Other Participants: A total of 547 athletic trainers who are currently practicing completed the survey.

Main Outcome Measure(s): We developed an 18-item survey that measured utilization (1(Never) to 6(Very Frequently)) and perceptions (1(Strongly Disagree) to 7(Strongly Agree)) of mindfulness practices. Mann-Whitney U or Kruskal-Wallis tests with post-hoc pairwise comparisons were performed to assess differences in utilization (p<0.05). A related samples Wilcoxon-signed-rank test was performed to assess differences in participants’ perceptions between self- and patient/client-care.

Results: Overall, 86% (n=471) of respondents reported participating in some form of mindfulness practice with females (Median(IQR) 4(2-5) vs. 3(2-4);p<0.002), those not in a committed relationship (4(2-5) vs. 3(2-4);p=0.048), and those without children in the home (4(2-5) vs. 3(2-4);p=0.040) reporting the highest frequency of use for self-care. Females (4(2-4) vs.
3(2-4); p<0.001), those without children in the home (3(2-4) vs. 3(2-4); p=0.036), and those in emerging (4(2-4); p=0.003) or collegiate settings (3(2-4); p=0.006) most frequently incorporated mindfulness into patient/client-care. Overall, frequency of use for self-care was higher than for patient/client-care (4, ‘occasionally’ (2-4) vs. 3, ‘rarely’ (2-4); p<0.001). Mindfulness practices were perceived as more important for self- than patient/client-care (6(5-7) vs. 5(5-6); p<0.001).

Conclusions: Athletic trainers perceived mindfulness practices as more important for personal well-being and they utilized it, albeit occasionally, more for self- than for patient/client-care. Differences in gender, relationship status, children and setting were observed. Mindfulness-based interventions on athletic trainer well-being and patient-centered care and implementation barriers should be explored.

Key Words: complementary health, meditation, occurrence, attitudes

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Key Points:

1. Athletic trainers utilize mindfulness practices more frequently for self-care than for patient/client-care, using it only occasionally for self-care and rarely for patient/client care.

2. Athletic trainers perceive mindfulness practices as important, yet more for self-care than for patient/client-care.

3. Participants that identified as female, were not in a committed relationship, and with no children living in the home reported the highest utilization of mindfulness practices for self-care, while those in the collegiate and emerging settings incorporated these practices more frequently in patient/client-care.
The concept of mindfulness originated from Buddhism in fifth century B.C.E. and became prominent in the West in the 1980s.\(^1\) This movement was led by John Kabat-Zinn, a molecular biologist who founded the now world-renowned Mindfulness-Based Stress Reduction Clinic in 1979. For decades, Zinn and colleagues researched various mind-body interactions for healing, including the first studies on the impact of a mindfulness-based stress reduction (MBSR) program on chronic pain. According to Zinn, mindfulness is, “The awareness that arises through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment.”\(^1\) (p.145) This greater sense of awareness and well-being is perceived to have a mental and physical impact. Zinn focused on the importance of the “mind-body connection” and the belief that mental and emotional health can have a significant positive or negative effect on our physical health, including one’s capacity to recover from illness and injury.\(^1\)

Mindfulness practices have been incorporated into diverse environments, including business,\(^1\) athletics,\(^2\) and healthcare.\(^3\) Techniques used to achieve and maintain this mind-body connection vary. Some of the most common practices include meditation, MBSR courses, mindfulness-based cognitive therapy, metacognition techniques, progressive relaxation, breathing, and body scanning techniques, and mind-body exercise activities such as yoga, tai chi, and qigong.\(^4\) Mindfulness is now considered a form of complementary health that integrates unconventional or alternative medicine with mainstream Western medicine to achieve holistic health and wellness.\(^5\)

Interest in the concept of mindfulness has grown exponentially worldwide, and scientific interest in mindfulness practices has surged in the last two decades. Although the quality of evidence is still improving, the evidence suggests that mindfulness practices can be effective for
many illnesses and disorders, including chronic pain, depression, and anxiety,\textsuperscript{3} and for fostering emotional resilience and empathy, strengthening coping strategies, and decreasing stress.\textsuperscript{6} Specifically in the realms of athletics and sports medicine, research\textsuperscript{7,8} has demonstrated positive effects of mindfulness practices on athletic and academic performance, as well as reduction in stress, burnout, and injury rates. A meta-analysis\textsuperscript{7} of the effects of mindfulness-based interventions (eg, meditation, yoga, and breathing/relaxation techniques) on sports performance demonstrated that these practices show potential to improve athletic and physical outcome measures, especially in precision sports, and decrease psychological stress. Bühlmayer and colleagues\textsuperscript{7} propose that mindfulness may positively affect motor learning at multiple developmental stages in novice- to elite-level athletes. Moen and colleagues\textsuperscript{8} found that elite youth athletes’ degree of mindfulness was positively correlated with their performance in academics and various sports, and mindfulness served as a buffer to stress and early burnout.

Mindfulness practices may also help prevent injuries, decrease time lost to injury, and improve overall well-being in high school and college athletes\textsuperscript{9} and elite soccer players.\textsuperscript{10,11} Notably, Naderi et al.\textsuperscript{11} found that mindfulness training was twice as likely to reduce acute injury risk compared to no mindfulness training. There is also preliminary evidence\textsuperscript{12} that MBSR courses may increase pain tolerance, awareness, and improve mental health in injured athletes.

Healthcare professionals face challenges in their home and work environments that can be detrimental to their physical and mental well-being,\textsuperscript{13} and can lead to compassion fatigue.\textsuperscript{14} Mindfulness practices have been associated with positive outcomes for healthcare professionals in regards to burnout,\textsuperscript{13-15} anxiety,\textsuperscript{13,15} and stress.\textsuperscript{15-18} Research suggests the healthcare professional’s personal use of mindfulness practices fosters empathy, compassion, and enhanced communication, which can thereby improve patient outcomes.\textsuperscript{19,20} Mindfulness has been
proposed to be essential to professional competence because it reduces the clinician’s psychological distress, promotes greater regulation of emotions, and therefore, clearer decision making and less medical error.\textsuperscript{21} Although healthcare degree programs have incorporated mindfulness into their curriculums,\textsuperscript{22,23} barriers, such as time limitations and perceived knowledge, have made implementation of mindfulness techniques and programs in routine clinical practice challenging.\textsuperscript{15,24} Evidence on the efficacy and importance of mindfulness practices and its health benefits continues to increase, yet the integration into healthcare systems appears to lag behind.\textsuperscript{25}

The most comprehensive data examining general utilization of mindfulness practices in the United States comes from the Centers for Disease Control’s National Health Interview Survey (NHIS).\textsuperscript{5} Since 2002, these data have provided insight into patterns and sociodemographic characteristics of mindfulness users. Simonsson and colleagues’ recent analysis\textsuperscript{4} of the 2017 NHIS data show that, during the 12 months prior to the survey, 5\% of adults, or approximately 13 million adults, used mindfulness practices; a significant increase compared to 2\% of adults in the 2012 NHIS data. Self-reported mindfulness users were less likely to be married and more likely to identify as women, White, young to middle-aged, of a sexual minority, employed, without minor children, and from the Western region of the United States. Women were more likely to have used meditation and twice as likely to have participated in yoga. Comparisons of the NHIS data from 2002 to 2017 demonstrate significant increases in yoga (6\% to 14\%) and meditation (4\% to 14\%) among United States adults.\textsuperscript{26,27}

Few studies have focused on the utilization and perceptions of mindfulness practices among practicing healthcare professionals for self- and patient/client-care. Most have focused on mindfulness-based interventions and its effects on the provider’s well-being.\textsuperscript{13,15} In 2002,
Schoenberger and colleagues found that occupational therapists had a more positive attitude towards meditation, followed by physical therapists and physicians. Older professionals had more positive attitudes towards meditation than younger professionals. Being a meditator was the strongest predictor for incorporating meditation in patient/client-care. A more recent mixed-method study showed mindfulness practices were effective for emotion regulation and stress reduction in occupational therapists; yet, it included only 16 participants.

Athletic trainers are healthcare professionals who navigate high-stress and high-demand work environments. Multiple studies have demonstrated that athletic trainers experience burnout, job-related stress and dissatisfaction, and conflict between their personal and professional lives. Although many strategies to improve athletic trainer retention and work-life balance have been suggested and investigated, the concept and practice of mindfulness has not been studied. The use of mindfulness practices may be beneficial to the athletic trainer by decreasing burnout, anxiety, and stress and increase work-life balance and overall quality of life. Incorporating these practices for self-care may foster compassion, empathy, and emotion regulation for clearer, sound, clinical reasoning. Mindfulness practice in the athletic trainer’s personal life as well as their professional practice may improve athletic trainers’ and their patients’ well-being, and promote patient-centered care; the latter of which is a core competency in athletic training education and a desired attribute of quality healthcare. However, little is known regarding athletic trainers’ use of and attitudes toward mindfulness.

In order to better investigate the impact, effectiveness, and any implementation barriers of mindfulness-based interventions in athletic training we must first establish athletic trainers’ utilization and perceptions of mindfulness in their personal and professional practice. Therefore, the purpose of our study was two-fold: 1) Investigate athletic trainers’ utilization of mindfulness
practices for self- and patient/client-care, and 2) Investigate athletic trainers’ perceptions on the
importance of mindfulness practices for self-care, and as a tool to achieve optimal outcomes in
patient/client-care. We hypothesized that:

1. Based on data from other healthcare providers and established time and knowledge
   barriers, athletic trainers’ utilization of mindfulness practices would be greater for self-
   care compared to patient/client-care.

2. Given the previously established association between personal use and professional
   application, there would be no differences in athletic trainers’ perceptions regarding the
   importance of mindfulness practices for self- or patient/client-care.

3. Our results would be comparable to the NHIS data. Athletic trainers who identified
   as female, White, not in a committed relationship, and with no children living in the
   home would show higher utilization of mindfulness practices for self-care.

Given the novelty of our study, and in order to paint a broader picture of mindfulness use in
athletic training, we also explored the relationship between frequency of utilization and
perceptions, common mindfulness practices used by athletic trainers, potential differences in age
and athletic training setting, and the potential impact the coronavirus pandemic has had on
athletic trainers’ utilization of mindfulness practices for self-care and patient/client-care.

METHODS

Study Design

Our study utilized a cross-sectional design. Data were collected using an online survey
software program (Qualtrics, Provo, Utah). The University’s Institutional Review Board (IRB)
determined that our study was exempt from oversight.
We performed a review of the literature and found no comparable survey instrument that measured perceptions, opinions or attitudes on mindfulness, and utilization, including current and all-time use, of mindfulness practices. Therefore, the lead author developed a questionnaire and assessed its face and content validity and reliability prior to distributing it to the main sample pool. The formation of the questionnaire is discussed below.

We recruited individuals to participate in our study using two sample pools. One, we utilized a list of 4,000 emails of athletic trainers in the college/university and secondary school setting that were obtained from the review of organizational websites in the public domain that identify athletic trainers and provide their email addresses (eg, colleges, universities, high schools, athletic conferences, etc.). To obtain this list the National Collegiate Athletic Association Division I, II, and III; National Association of Intercollegiate Athletics; and National Junior College Athletic Association Junior College membership lists were randomized using a random number generator, and emails of athletic trainers were collected from institutional websites in the randomly generated order until 2,500 emails were collected. The National Athletic Trainers’ Association (NATA) Athletic Training Locations and Services Database maintained by the Korey Stringer Institute at the University of Connecticut was utilized to identify email addresses for 1,500 secondary school athletic trainers. The number of athletic trainers identified by random school selection per state were weighted based on 2017 United States Census Bureau population data. Two, we purchased access from the NATA Research Survey Service to a random sample of 2,000 athletic trainers in the clinic/hospital, professional sports, and emerging settings (eg, military, performing arts, occupational health, and public safety).
We contacted individuals using the online survey program’s distribution option. Individuals received an email explaining the purpose of our study and a web link to the online questionnaire. The questionnaire began with an informed consent page and an option to accept or decline participation. We sent reminder emails to unfinished respondents at three, seven, and fourteen days after the initial request for participation. To ensure participant confidentiality, no identifiable information was collected.

Participants

Inclusion criteria for our study, which was stated in the informed consent, was that the participant must be currently practicing athletic training. Out of 5,621 potential participants with eligible email addresses, a total of 589 athletic trainers responded to our questionnaire, for a response rate of 10.5%. After a review of the data, we found and discarded 42 incomplete responses. A total of 547 athletic trainers completed the survey for a completion rate of 10%.

Questionnaire

The lead author developed an 18-item questionnaire to investigate athletic trainers’ perceptions on mindfulness practices and the frequency of their use for self- and patient/client-care. This questionnaire included two items on utilization that were adapted from the NHIS. The introduction to the first item began with a brief explanation of mindfulness, as defined by Jon Kabat-Zinn and a brief list of common mindfulness practices. Participants then answered questions on utilization and perceptions. The questionnaire ended with eight demographic questions collecting the participants’ age, gender, ethnicity, relationship status, status of children in the home, education level, athletic training setting, and years of athletic training experience.

Utilization. We measured the participants’ frequency of participation in mindfulness practices in two separate items using a six-point Likert scale (1 = never to 6 = very frequently). All scale
options, with the exception of “never,” included examples of frequency in parentheses (eg, very frequently (daily to multiple times a day); very rarely (1-5 times per year), etc.). Participants were asked: 1) “How frequently do you participate in the practice of mindfulness?” and 2) “How frequently do you incorporate mindfulness practices into patient/client-care, including suggestions for their home care plan?” These were the items adapted from NHIS items that asked about the utilization of specific mindfulness practices within the last 12 months.\(^5\)

We incorporated skip logic into the questionnaire so that if a participant chose “never” on these items, they skipped items that asked about which specific mindfulness practices they participated in personally and incorporated into patient/client-care. We asked participants to select the specific mindfulness practices they have ever participated in and ones in which they were currently participating. Mindfulness practice options included meditation, yoga, qigong, tai chi, progressive relaxation, breathing or body scanning techniques, mindfulness-based stress reduction or related formal courses, and metacognition techniques. We chose these practices based upon the options used in the NHIS survey as well as in other mindfulness survey research.\(^6\) Participants also had an “other” option with space to type in a practice not listed.

During the time of data collection, participants were navigating the coronavirus pandemic. Therefore, we asked participants if their personal practice or incorporation into patient/client-care has increased, decreased, not changed, or if they had started mindfulness practices during the pandemic.

Perceptions. In order to investigate the participants’ perceptions about mindfulness we asked the participants to rate their agreement with two statements: 1) “Mindfulness practices are important for the athletic trainer’s self-care and well-being” and 2) “Mindfulness practices are an important tool to incorporate in patient/client-care in order to achieve optimal outcomes.”
Participants rated their agreement using a seven-point Likert scale (e.g., 1=strongly disagree to 7=strongly agree). Overall, the questionnaire took approximately four to six minutes to complete. If the participant answered “never” on both utilization questions, they only answered 12 of the 18 survey questions.

Establishing instrument validity and reliability. Prior to data collection, we established face and content validity of the questionnaire. Four individuals participated: 1) An athletic training researcher with experience in mindfulness, consciousness and survey research, 2) An athletic training researcher with experience in survey research, 3) a public health researcher with experience in mindfulness practices, and 4) A practicing athletic trainer with experience in mindfulness practices and alternative therapies. We provided each individual with our study’s purpose and asked them to review each questionnaire item and the overall intent of the survey. Suggestions for content, clarity, and flow were discussed with each individual and edits were incorporated to produce a final draft of the questionnaire.

We established reliability of the instrument using the test-retest method. Forty-two individuals from the database of 4,000 and 15 individuals from a convenience sample were contacted in the same manner as described above. Once they completed the survey, they were prompted to complete the questionnaire again at least three days later. Ten individuals participated in the reliability portion of the study. For this portion of the study, individuals were informed that email addresses would be collected to match the participant’s two responses. Once the match was completed, their responses, including their email addresses were deleted from the online survey program and from the data analysis.

Data Analysis
Data were downloaded from the online survey program into SPSS (version 26.0; IBM Corporation, Armonk, NY, USA). We then cleaned the data and removed incomplete responses. We set the a priori level of significance at $p<0.05$. Spearman correlations were performed to assess test-retest reliability and to examine the relationship between frequency of utilization and perceptions for self-care and patient/client-care. Descriptive statistics were performed on all survey items. Given the ordinal nature of the data, Mann-Whitney U-tests or Kruskal-Wallis tests with post-hoc pairwise comparisons for significant main effects were performed to assess differences in the utilization and perceptions of mindfulness practices for self- and patient/client-care based age, gender, race/ethnicity, relationship status, having children in the home, and athletic training setting. A related samples Wilcoxon-signed-rank test was performed to assess differences in participants’ perceptions on the importance of mindfulness practices for self-care compared to patient/client-care.

RESULTS

Reliability and Demographics

Spearman correlation results for test-retest reliability demonstrated the questionnaire had sufficient reliability ($\rho=0.82 – 1.000$, $p<0.05$). Overall, demographics reflect a population sample that is overwhelmingly White (87%, n=474), predominantly age 40 or younger (61%, n=335), in a committed relationship (72%, n=396), and with a master’s level education (76% n=414). Completed demographics data are presented in Table 1.

Utilization and Perceptions

Histograms representing frequency of use and perceptions regarding mindfulness practices across all participants are presented in Figure 1. Median responses and interquartile ranges (IQR 25th -75th) by subgroups are presented in Table 2. Overall, 86% (n=471) of
respondents reported participating in some form of mindfulness practice, and 81% (n=446) reported some incorporation of mindfulness practices into patient/client-care. Overall frequency of use for self-care was greater than use for patient/client-care (Z=-4.553, p<0.001) with a median response of 4 - ‘occasionally (a couple of times a month up to 1-2 times a week)’ for self-care and 3 - ‘rarely (to a few patients/clients)’ for patient/client-care. Similarly, participants perceived the use of mindfulness as more important to self-care than for patient/client-care (Z=-8.548, p<0.001) with a median response of 6 ‘agree’ for the self-care statement and 5 ‘somewhat agree’ for the patient/client-care statement.

Characteristics of Athletic Trainers who Utilize Mindfulness Practices

**Gender.** Those identifying as female reported greater frequency of mindfulness use for self-care (H=12.051, p=0.002) and patient/client-care (H=16.616, p<0.001) as compared to those identifying as male (post-hoc Z=3.442, p<0.001, and Z=4.049 p<0.001). Female identifying individuals also perceived mindfulness practices as more important for self- (H=18.699, p<0.001) and patient/client-care (H=14.785, p<0.001) as compared to those identifying as male (post-hoc Z=4.320, p<0.001 and Z=3.845, p<0.001). There were no statistical differences between those identifying as something other than male or female and those identifying as male or those identifying as female.

**Race/Ethnicity.** Differences in perceptions of importance for self-care (H=13.479, p=0.004) were observed with individuals identifying as African American/Black perceiving mindfulness as more important for self-care than those identifying as White (Z=3.146, p=0.002). No other differences were observed based on race/ethnicity.
Relationship status. Those not in a committed relationship reported using mindfulness practices for self-care more often than those reporting being in a committed relationship (U=33099, p=0.048). No other differences were observed based on relationship status.

Children. Participants without children in their home reported a greater frequency of use of mindfulness practices for both self-care (U=38445.5, p=0.040) and for patient/client-care (U=38480.5, p=0.036) when compared to those with children in the home. Similarly, those without children in the home perceived mindfulness practices as more important for self-care (U=39353, p=0.009) and for patient/client-care (U=38415, p=0.038) when compared to those with children in the home.

Exploratory Results

Relationship between Utilization and Perceptions. Mindfulness utilization for self-care was correlated to use in patient/client care (rho=0.493, P<0.001), perceptions regarding the importance of mindfulness practice to self-care (rho=0.581, p<0.001) and patient/client-care (rho=0.416, p<0.001). Similarly, use in patient/client-care was correlated to perceptions for self-care (rho=0.480, P<0.001) and patient/client-care (rho=0.584, p<0.001). Finally, perceptions regarding self-care were correlated with perceptions regarding patient/client-care (rho=0.741, p<0.001).

Common Mindfulness Practices. The most common currently used mindfulness practice for self-care was progressive relaxation and breathing or body scanning techniques (63%, n=344). This was also the most commonly used practice for patient/client-care (55% n=300) (Table 3.) Prayer was the most common participant provided “other” response among mindfulness practices in which participants were currently participating (3%, n=19). Additionally, 23% (n=128) of respondents reported having previously participated in a MSBR or related formal course.
Age. Based on age, differences for perception of importance for self- (H=11.000, p=0.027) and patient/client-care (p=0.021) were observed. Those between 20-30 years perceived mindfulness practices as more important for self-care than those aged 41-50 (Z=2.797, p=0.005) or 51-60 (Z=2.394, p=0.017). Similarly, those 31-40 years of age also reported higher perceived importance for self-care compared to those aged 41-50 (Z=2.173, p=0.030). Differences for perception of importance were also observed for patient/client-care between participants 20-30 and 31-40 years of age and participants 41-50 years of age (Z=2.089, p=0.037 and Z=2.063, p=0.039) and 51-60 year of age (Z=2.674, p=0.007 and Z=2.687 p=0.007).

Athletic Training Setting. There were significant differences based on setting for incorporating mindfulness into patient/client-care (H=13.314, p=0.010) with those in emerging (Z=2.957, p=0.003) and collegiate (Z=2.732, p=0.006) settings reporting more frequent use than those in the secondary school settings. Those in emerging settings also more frequently incorporated mindfulness into patient/client care than those in clinic/hospital settings (Z=-2.341, p=0.019). No other differences based on athletic training setting were observed.

Impact of the Coronavirus Pandemic. Among those who reported participating in mindfulness activities for self-care, 34% (n=159) reported increased frequency during the coronavirus pandemic, 8% (n=46) reported decreased frequency, 49% (n=232) reported no change to frequency and 7% (n=34) reported starting their mindfulness practice since the pandemic began. With respect to frequency of incorporating mindfulness practices into patient/client-care, among those who reported incorporating mindfulness practices, 20% (n=88) reported increased frequency during the pandemic, 9% (n=41) reported decreased frequency, 67% (n=300) reported no change to frequency and 4% (n=17) reported starting to incorporate mindfulness practices since the pandemic began.
DISCUSSION

Athletic trainers have been shown to experience burnout, work-life conflict, and job dissatisfaction. The reported benefits of mindfulness practices may help athletic trainers mitigate these issues, foster empathy and self-compassion, and improve their quality of life as well as the lives of the patients/clients they serve. The purpose of our study was to investigate athletic trainers’ utilization and perceptions of mindfulness practices in self- and patient/client-care. The results of our study highlight a disconnect between athletic trainers’ perceptions and utilization of mindfulness practices. The majority of our participants strongly agreed or agreed that mindfulness practices are important for self-care, and they somewhat agreed, agreed, or strongly agreed these practices are important for patient/client-care. These findings are similar to the literature on healthcare professionals’ positive perceptions of mindfulness practices. Furthermore, the top three mindfulness practices (Table 3) utilized by our participants (yoga, meditation, and progressive relaxation, breathing or body scanning techniques) are consistent national trends in mindfulness use. However, although our participants viewed mindfulness as important, the majority utilized these practices only occasionally (ie, a couple of times a month up to one to two times per week) or less for self-care and rarely (ie, to a few patients/clients) or less for patient/client-care. Our results add to the recent concerns in healthcare about the lack of implementation of mindfulness-based programs and techniques for clinicians and patients/clients. Below, we discuss specific differences found in utilization and perceptions in regards to self- and patient/client care, and in accordance with our study’s hypotheses.

Athletic Trainers and Mindfulness: Self-Care Versus Patient/Client-Care
The majority of our participants perceived mindfulness practices as more important for self- than patient/client care, and they utilized these practices more for self-care. Therefore, we accepted our first hypothesis, and rejected our second hypothesis. Given the helping nature of the profession, we expected athletic trainers would view the benefits of mindfulness as equally important for themselves and their patients/clients, regardless of their utilization. However, our data suggest that participating athletic trainers prioritized their personal use of mindfulness practices over professional use. Given the strong evidence supporting the positive effects of mindfulness on the well-being and performance\textsuperscript{7-12} of individuals that comprise the majority of their patient/client base, athletic trainers should strongly consider incorporating mindfulness practices into their clinical practice. Authors have noted that implementation barriers for clinicians include time limitations (eg, time-intensive MBSR courses and limited time with patients/clients), perceived knowledge of the best mindfulness techniques to offer and teach to patients/clients, and cost-effectiveness.\textsuperscript{15,24,25} Our findings expose the need to investigate potential barriers to the utilization of mindfulness practices specific to athletic training clinical practice and to educate athletic trainers and students on the most useful practices that are time- and cost-effective.

We must note that athletic trainers prioritizing mindfulness practice for self-care over patient/client-care is not necessarily a negative finding for two reasons. First, research suggests that the strongest predictor of professional mindfulness use is personal use.\textsuperscript{28} Therefore, as athletic trainers continue to use mindfulness practices for self-care, they are more likely to incorporate it into patient/client care, and this is supported by the correlation between self- and patient/client-care observed in our results. Second, research has demonstrated that healthcare professionals use of mindfulness for self-care can improve patient/client outcomes and safety.
Braun and colleagues’ recent review of studies on the impact of mindfulness-based interventions in healthcare professionals found moderate support for improved patient safety, treatment outcomes, and patient-centered care. Kareaga and colleagues’ research review suggests that compassion- and mindfulness-based strategies are effective for fostering physicians’ empathy, compassion, patient communication, and patient-reported quality of care. Given the reported benefits of mindfulness practices for healthcare professionals and their patients/clients, we strongly encourage athletic trainers to explore and incorporate practical, brief mindfulness-based programs and techniques more consistently into their personal and professional care. Examples of these techniques are discussed later in the Recommendations for Practice section.

Characteristics of Athletic Trainers and Mindfulness Use

Our final hypothesis stated that our results would be comparable to the NHIS data, and athletic trainers who identified as female, White, not in a committed relationship, and with no children living in the home would show higher utilization of mindfulness practices for self-care. Our results supported this hypothesis for every characteristic except for race/ethnicity. Similar to self-reported mindfulness use in the general United States population, our results show athletic trainers who utilized mindfulness practices most frequently were more likely to identify as female, were not in a committed relationship, and had no children living in their home. Females and those with no children in the home also perceived mindfulness practices to be more important for both self- and patient/client-care. However, there were no differences based on relationship status for use in patient/client-care, or for perceptions related to self- or patient/client-care.
Although there are several proposals as to why females utilize mindfulness practices more than males, there are no known empirical studies on gender-specific mindfulness utilization. Female athletic trainers have been shown to experience higher levels of burnout and exhaustion, and may be more inclined to utilize mindfulness practices to combat these issues. In regards to social and familial status, significant others and children will often contend with one’s personal and professional time, so it is not surprising that participants who were in committed relationship and who had children living in the home utilized mindfulness practices less often, because, as stated above, one of the main barriers to healthcare professionals’ mindfulness use is the perceived time commitment.

In contrast with the NHIS data, we observed no differences in race/ethnicity for utilization of mindfulness practices for both self- and patient/client-care, or for perceived importance for patient/client-care. We must acknowledge a confounding factor in this observation is that our participants were disproportionately White (87%), which is comparable to the race/ethnicity demographics of the NATA (80%). An interesting finding in our results was that, although there were no differences in utilization, participants identifying as African American/Black perceived the personal use of mindfulness practices as more important than those identifying as White. The median response for Black participants was ‘strongly agree’ that personal mindfulness use was important and ‘agree’ that professional use was important, both of which surpassed the overall group medians of ‘agree’ and ‘somewhat agree’. However, their median personal and professional use was only rarely. At the time of our survey’s administration the Black community in the United States was disproportionately impacted by national events, conversations, and protests related to social injustices and racism, and a disproportionate rate of infections and death from the coronavirus pandemic. This has been termed a “pandemic within a
pandemic\textsuperscript{37} for Blacks, which is and will continue to be profoundly detrimental to their health and well-being. These combined injustices and disparities may contribute to Black athletic trainers’ heightened awareness that the state and improvement of their well-being, as well as their patients’ well-being, is critical in order to navigate such difficult and challenging times and issues. Given the ongoing nature these challenges, this topic warrants further investigation.

In regards to age differences, our findings are not comparable to the NHIS data,\textsuperscript{4} which show that young and middle-aged adults were more likely to report mindfulness use. Although young and middle-aged participants in our study were more likely to perceive mindfulness practices as important for both self- and patient/client-care, there were no differences in frequency of personal or professional use. The trend of younger participants, along with an upper limit of age 70 in our sample may have contributed to the lack of differences observed in frequency of use.

Our results show that participating athletic trainers in the university/collegiate and emerging settings used mindfulness practices more frequently for patient/client-care than those in the secondary school setting. A potential contributing factor for this difference could be the clinician/patient ratio. Secondary school athletic trainers are often assigned to one or more schools as the sole athletic trainer providing medical care for hundreds of student-athletes. Therefore, the time commitment barrier to incorporating mindfulness techniques into patient/client-care, many of which require some degree of one-on-one attention, may be more of a factor in secondary schools than in other settings with lower clinician/patient ratios. Interest and implementation of mindfulness-based programs in secondary schools has grown considerably as school administrators and teachers attempt to provide students with early self-regulation skills, and individual and group-based mindfulness programs have been shown to be
effective on a variety of outcomes from emotion regulation to enhanced athletic and academic performance.\(^9,38\) To reduce the time commitment, in addition to implementing the low-cost, brief mindfulness practices discussed later, group-based mindfulness programs could be implemented in the secondary school setting with the assistance of the school counselor. Schools may also be participating in projects\(^38\) such as “Mindful Schools” or the “Mindfulness in Schools Project” and athletic trainers can gain access to training and other materials, or access their websites for free resources.

Limitations, Future Directions for Research, and Recommendations for Practice

**Limitations**

Our study is not without limitations. First, our response and completion rates were quite low and may not represent the entire athletic training profession. Even though the survey was short and we sent multiple reminders, data were collected during a time when potential participants were navigating a coronavirus pandemic, subsequent economic and job uncertainty, social/racial injustices and unrest, and a polarized presidential election. This likely had a negative impact on our response and completion rates. Second, there is likely a response bias in that those who never utilize mindfulness practices or do not perceive them as important did not begin the survey, and this would also have a negative impact on our response and completion rates. Third, our study was a cross-sectional design and does not reflect athletic trainers’ mindfulness use and perceptions over time. Fourth, we did not ask participants about their regional identity, nor area of residence so we could not compare this data to the NHIS data.

**Future Research**

Now that we have knowledge of athletic trainers’ perceptions and utilization of mindfulness practices for self- and patient/client care, we must better understand the disconnect
between athletic trainers’ perceived importance of mindfulness and their inconsistence use personally and professionally. Future directions for research should include mixed method investigations into reasons for mindfulness use and potential barriers to its use in self- and patient/client care among athletic trainers and in their workplaces. Researchers should include future participants’ regional identity and current area of residence, educational background including those with exposure or specific training on complementary health, and availability of mindfulness programs in the workplace to gain a better understanding of athletic trainers’ geographical and educational background, and life exposure to mindfulness practices. Greater efforts must be made to include athletic trainers who are Black, Indigenous, and Persons of Color in mindfulness-based intervention research. The larger gap observed between perceived benefits and use among this group of athletic trainers, compared to others, suggests they could strongly benefit from additional access, support and training related to implementation of mindfulness-based practices in both self- and patient/client-care, particularly, given they are disproportionately affected by social injustices and health disparities which impact mental and physical well-being. Furthermore, as our profession continues to grow and advance, there is a substantial need for longitudinal studies that investigate the effectiveness of mindfulness-based interventions in three populations: 1) athletic training students, 2) practicing athletic trainers, and 3) the patients/clients we serve. Incorporating and investigating mindfulness-based programs in athletic training curriculums that facilitate students’ emotional resilience, empathy, and coping strategies, can act as a catalyst for improved work-life balance and well-being for future athletic trainers, and potentially improve their patients’/clients’ outcomes. Administrators and supervisors should incorporate and assess the impact of workplace-based, mindfulness education programs for athletic trainers that are practical, cost- and time-efficient. Overall,
further investigation and implementation of mindfulness based-practices are necessary to understand and overcome challenges related to transferring positive perceptions into higher rates of utilization for both self- and patient client/care. Such efforts may result in improved well-being and quality of life for both athletic trainers and their patients.

Recommendations for Practice

Time, resources, and knowledge/confidence are commonly cited barriers to mindfulness practice and implementation.\textsuperscript{9,15} The time barrier is supported by our observations of lower rates of mindfulness use among those with children in the home, in a committed relationship, and working in secondary school settings. Therefore, brief mindfulness practices, such as smart phone apps with 5-10 minute meditation sessions (many of which have free options), brief yoga, tai chi, and qigong sessions found on YouTube channels, 30-60 second metacognition moments (eg, thinking about your thinking; awareness and management of your own thoughts\textsuperscript{1}), breathing (eg, 4-8 breathing; inhale for four seconds, exhale for 8 seconds, repeat for a total of three times) and body scanning techniques are more feasible for overworked, stressed healthcare professionals and students, and can be effective in improving their well-being. Incorporating brief mindfulness programs into the workplace has been observed to promote the health and well-being of employees in various occupational settings,\textsuperscript{39} yet more work is required to incorporate them more consistently into healthcare settings. Workplace-based programs focused on brief mindfulness practices represent a potential intervention strategy to increasing mindfulness use among athletic trainers, particularly those with limited time due to family/relationship commitments. Furthermore, these brief techniques may be more easily integrated into clinical practice once the athletic trainer becomes familiar with the techniques, and more comfortable with teaching them to their patients/clients.
Athletic trainers should explore resources within their institutions’ counseling and human resource centers to assist with self and patient/client mindfulness-based programs, including the feasibility of involving qualified mindfulness instructors to implement programs, such as MBSR options,\textsuperscript{12} the Mindfulness-Acceptance and Commitment Approach, and the Mindfulness Meditation for Sport Training.\textsuperscript{7} Authors\textsuperscript{9} have stated the most important component to successful and consistent mindfulness implementation is educating the stakeholders (eg, patients/clients, athletes, coaches, administrators, etc.) on what being mindful entails, and its benefits to performance and well-being. Therefore, continuing education opportunities involving mindfulness-based training would be beneficial in expanding the athletic trainer’s knowledge and confidence in successfully implementing mindfulness into clinical practice.

Conclusions

Mindfulness-based practices are an established intervention for combatting stress, burnout, and anxiety, as well as fostering empathy, compassion, emotion regulation, and strengthening coping strategies. Therefore, mindfulness may be an effective intervention for enhancing work-life balance and well-being among athletic trainers. Although the majority of our participants reported participating in mindfulness occasionally or less frequently, and rare to never use in patient/client-care, there was strong agreement across participants that mindfulness practices were important, particularly for self-care. These results suggest that effective interventions to increase frequency of mindfulness use among athletic training students and athletic trainers for self-care may be well received and have both direct and indirect benefits for patient/client outcomes and safety. Given the personal and professional demands on athletic trainers, brief, workplace, mindfulness-based interventions may be one strategy to increase utilization of mindfulness practices among athletic trainers and patients/clients. Additionally,
strategies to increase the use of mindfulness-based programs and techniques into athletic training education curriculums should be explored.
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| Descriptives                           | n   | Percent of Sample |
|---------------------------------------|-----|------------------|
| Gender                                |     |                  |
| Females                               | 280 | 51%              |
| Males                                 | 263 | 48%              |
| Other                                 | 4   | 1%               |
| Age                                   |     |                  |
| 20-30                                 | 129 | 24%              |
| 31-40                                 | 206 | 38%              |
| 41-50                                 | 106 | 19%              |
| 51-60                                 | 86  | 16%              |
| 61-70                                 | 20  | 4%               |
| Race/Ethnicity                        |     |                  |
| White                                 | 474 | 87%              |
| Black or African American             | 16  | 3%               |
| Latinx or Hispanic                    | 25  | 5%               |
| Other                                 | 32  | 6%               |
| Currently in a Committed Relationship |     |                  |
| Yes                                   | 396 | 72%              |
| No                                    | 151 | 28%              |
| Children Under 18 in Your Home        |     |                  |
| Yes                                   | 202 | 37%              |
| No                                    | 345 | 63%              |
| Primary Setting                       |     |                  |
| Clinic/Hospital                       | 67  | 12.0%            |
| Collegiate                            | 260 | 48.0%            |
| Emerging Settings                     | 37  | 7.0%             |
| Professional Sports                   | 13  | 2.0%             |
| Secondary School                      | 170 | 31.0%            |
| Highest Level of Education            |     |                  |
| Bachelor's Degree                     | 105 | 19%              |
| Master's Degree                       | 414 | 76%              |
| Doctorate                             | 27  | 5%               |
| Other                                 | 1   | 0.0%             |
| Descriptives                                                                 | How frequently do you participate in the practice of mindfulness for self-care? (Median (IQR)) | How frequently do you incorporate mindfulness practices into patient/client care? (Median (IQR)) | Mindfulness practices are important for the athletic trainer’s self-care and well-being (Median (IQR)) | Mindfulness practices are an important tool to incorporate in patient/client care in order to achieve optimal outcomes (Median (IQR)) |
|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| **Gender**<sup>c,d,e,f</sup>                                                |                                                                                                  |                                                                                                  |                                                                                                     |                                                                                                     |
| Female                                                                       | 4 (2 - 5)                                                                                         | 4 (2 - 4)                                                                                        | 6 (5 - 7)                                                                                           | 6 (5 - 6)                                                                                           |
| Male                                                                         | 3 (2 - 4)                                                                                         | 3 (2 - 4)                                                                                        | 6 (5 - 6)                                                                                           | 5 (4 - 6)                                                                                           |
| Other                                                                         | 3 (2 - 4)                                                                                         | 2.5 (1.5 - 4)                                                                                   | 6 (4 - 6.5)                                                                                         | 5.5 (3.5 - 6.5)                                                                                   |
| **Race/Ethnicity<sup>e</sup>**                                               |                                                                                                  |                                                                                                  |                                                                                                     |                                                                                                     |
| Black or African American                                                    | 3 (2 - 4)                                                                                         | 3 (1 - 3.5)                                                                                      | 7 (6 - 7)                                                                                           | 6 (4.5 - 7)                                                                                         |
| Latinx or Hispanic                                                           | 4 (2 - 4)                                                                                         | 3 (3 - 4)                                                                                        | 6 (5 - 7)                                                                                           | 6 (5 - 6)                                                                                           |
| White                                                                        | 4 (2 - 4)                                                                                         | 3 (2 - 4)                                                                                        | 6 (5 - 7)                                                                                           | 5 (4 - 6)                                                                                           |
| Other                                                                         | 3.5 (2 - 4)                                                                                       | 3.5 (2.5 - 4)                                                                                   | 6 (6 - 7)                                                                                           | 5 (6 - 6.5)                                                                                         |
| **Currently in a Committed Relationship<sup>c</sup>**                        |                                                                                                  |                                                                                                  |                                                                                                     |                                                                                                     |
| Yes                                                                          | 3 (2 - 4)                                                                                         | 3 (2 - 4)                                                                                        | 6 (5 - 7)                                                                                           | 5 (5 - 6)                                                                                           |
| No                                                                           | 4 (2 - 5)                                                                                         | 4 (2 - 4)                                                                                        | 6 (5 - 7)                                                                                           | 6 (5 - 6)                                                                                           |
| **Children Under 18 in Your Home<sup>c,d,e,f</sup>**                        |                                                                                                  |                                                                                                  |                                                                                                     |                                                                                                     |
| Yes                                                                          | 3 (2 - 4)                                                                                         | 3 (2 - 4)                                                                                        | 6 (5 - 7)                                                                                           | 5 (4 - 6)                                                                                           |
| No                                                                           | 4 (2 - 5)                                                                                         | 3 (2 - 4)                                                                                        | 6 (5 - 7)                                                                                           | 6 (5 - 6)                                                                                           |
| **Highest level of Education<sup>e</sup>**                                   |                                                                                                  |                                                                                                  |                                                                                                     |                                                                                                     |
| Bachelor's Degree                                                            | 4 (2 - 4)                                                                                         | 3 (2 - 4)                                                                                        | 6 (5 - 7)                                                                                           | 6 (4 - 7)                                                                                           |
| Master's Degree                                                              | 3 (2 - 4)                                                                                         | 3 (2 - 4)                                                                                        | 6 (5 - 7)                                                                                           | 5 (5-6)                                                                                             |
| Doctorate                                                                    | 4 (2 - 4.5)                                                                                       | 4.5 (3.5 - 4.5)                                                                                 | 7 (5 - 7)                                                                                           | 6 (5 - 6.5)                                                                                         |
| Other                                                                         | (n=1, excluded from analysis)                                                                     |                                                                                                  |                                                                                                     |                                                                                                     |
| **Age<sup>e,f</sup>**                                                       |                                                                                                  |                                                                                                  |                                                                                                     |                                                                                                     |
| 20-30                                                                        | 4 (2 - 5)                                                                                         | 3 (2 - 4)                                                                                        | 6 (5 - 7)                                                                                           | 6 (5 - 6)                                                                                           |
| 31-40                                                                        | 4 (2 - 4)                                                                                         | 3 (2 - 4)                                                                                        | 6 (5 - 7)                                                                                           | 6 (5 - 6)                                                                                           |
| 41-50                                                                        | 3 (2 - 4)                                                                                         | 3 (1.4 - 4)                                                                                     | 6 (4 - 7)                                                                                           | 5 (4 - 6)                                                                                           |
| 51-60                                                                        | 3 (1 - 5)                                                                                         | 3 (2 - 4)                                                                                        | 6 (4 - 7)                                                                                           | 5 (4 - 6)                                                                                           |
| 61-70                                                                        | 2.5 (1.5 - 4.5)                                                                                   | 2.5 (1 - 4)                                                                                     | 6 (4.5 - 7)                                                                                         | 5.5 (5 - 6)                                                                                         |
| **Athletic Training Setting<sup>d</sup>**                                    |                                                                                                  |                                                                                                  |                                                                                                     |                                                                                                     |
| Clinic/Hospital                                                              | 4 (2.5 - 4.5)                                                                                     | 3 (2 - 4)                                                                                        | 6 (5.5 - 7)                                                                                         | 6 (5 - 6)                                                                                           |
| Collegiate                                                                   | 3 (2 - 4)                                                                                         | 3 (2 - 4)                                                                                        | 5 (5 - 7)                                                                                           | 6 (5 - 6)                                                                                           |
| Emerging Settings                                                            | 4 (2 - 5)                                                                                         | 4 (2 - 4)                                                                                        | 6 (5 - 7)                                                                                           | 6 (5 - 7)                                                                                           |
| Professional Sports                                                          | 3 (3 - 5)                                                                                         | 3 (2 - 4)                                                                                        | 6 (6 - 7)                                                                                           | 5 (6 - 7)                                                                                           |
| Secondary School                                                             | 3 (2 - 4)                                                                                         | 3 (1 - 4)                                                                                        | 6 (5 - 7)                                                                                           | 5 (4 - 6)                                                                                           |

<sup>a</sup>Frequency rated 1 (Never) to 6 (Very Frequently - daily to multiple time per day)

<sup>b</sup>Perceived importance rated 1 (Strongly Disagree) to 7 (Strongly Agree)

<sup>c</sup> (p>0.05) for frequency of practice for self-care

<sup>d</sup> (p<0.05) for frequency of practice for patient/client-care

<sup>e</sup> (p<0.05) for perceived importance for self-care

<sup>f</sup> (p<0.05) for perceived importance for patient/client-care
Table 3. Mindfulness Practices for Self-Care or Patient/Client-Care

| Mindfulness Practices                                      | Self-Care: Ever | Self-care: Current | Patient/client-care |
|------------------------------------------------------------|-----------------|--------------------|---------------------|
|                                                            | n   | %    | n  | %   | n   | %   |
| Meditation                                                | 267  | 49%  | 151 | 28% | 153  | 28% |
| Yoga                                                      | 285  | 52%  | 141 | 26% | 243  | 44% |
| Qigong                                                    | 9    | 2%   | 1   | 0%  | 2    | 0%  |
| Tai Chi                                                   | 33   | 6%   | 1   | 0%  | 10   | 2%  |
| Progressive relaxation, breathing or body scanning        | 344  | 63%  | 275 | 50% | 300  | 55% |
| techniques                                               | Metacognition   | 128  | 23% | 138 | 25% | 141  | 26% |
| Other                                                     | 46   | 8%   | 75  | 14% | 36   | 7%  |
How Frequently do you participate in the practice of mindfulness?

Mindfulness practices are important for the athletic trainer’s self-care and well-being.

How frequently do you incorporate mindfulness practices into patient/client care?

Mindfulness practices are an important tool to incorporate in patient/client care in order to achieve optimal outcomes.

Figure 1: Utilizations and Perceptions of all Participants Regarding Mindfulness Practices for Self-Care and Patient/Client-Care. Frequency of utilization across all participants for self-care (A) was significantly greater than frequency of use for patient-care (B) (p<0.001). Mindfulness practices were also perceived to be more important for self-care (C) than for patient/client care (D) (p<0.001).