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The Size and Scope of Collegiate Athletic Training Facilities and Staffing

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Context: Athletic training facilities have been described in terms of general design concepts and from operational perspectives. However, the size and scope of athletic training facilities, along with staffing at different levels of intercollegiate competition, have not been quantified.

Objective: To define the size and scope of athletic training facilities and staffing levels at various levels of intercollegiate competition. To determine if differences existed in facilities (eg, number of facilities, size of facilities) and staffing (eg, full time, part time) based on the level of intercollegiate competition.

Design: Cross-sectional study.

Setting: Web-based survey.

Patients or Other Participants: Athletic trainers (ATs) who were knowledgeable about the size and scope of athletic training programs.

Main Outcome Measure(s): Athletic training facility size in square footage; the AT's overall facility satisfaction; athletic training facility component spaces, including satellite facilities, game-day facilities, offices, and storage areas; and staffing levels, including full-time ATs, part-time ATs, and undergraduate students.

Results: The survey was completed by 478 ATs (response rate = 38.7%) from all levels of competition. Sample means for facilities were 3124.7 ± 4425 ft^2 (290.3 ± 411 m^2) for the central athletic training facility, 1013 ± 1521 ft^2 (94 ± 141 m^2) for satellite athletic training facilities, 1272 ± 1334 ft^2 (118 ± 124 m^2) for game-day athletic training facilities, 388 ± 575 ft^2 (36 ± 53 m^2) for athletic training offices, and 424 ± 884 ft^2 (39 ± 82 m^2) for storage space. Sample staffing means were 3.8 ± 2.5 full-time ATs, 1.6 ± 2.5 part-time ATs, 25 ± 17.6 athletic training students, and 6.8 ± 7.2 work-study students. Division I schools had greater resources in multiple categories ($P < .001$). Differences among other levels of competition were not as well defined. Expansion or renovation of facilities in recent years was common, and almost half of ATs reported that upgrades have been approved for the near future.

Conclusions: This study provides benchmark descriptive data on athletic training staffing and facilities. The results (1) suggest that the ATs were satisfied with their facilities and (2) highlight the differences in resources among competition levels.

Key Words: sports medicine resources, physical resources, personnel resources

Key Points

- In terms of full-time and part-time athletic trainers, National Collegiate Athletic Association Division I institutions had greater staffing resources than all other competition levels.
- With respect to total square footage in central athletic training facilities, satellite athletic training facilities, office space, and storage space, Division I institutions possessed more athletic training facilities resources than all other levels of competition.
- Investments to improve athletic training facilities have been common over the past 5 years, with 62.8% of athletic trainers reporting expansion or renovation of facilities and another 44.6% reporting approved upgrades in the near future.

In the collegiate setting, the size of the patient population has grown significantly during the past 3 decades. Since the 1988–1989 academic year, member institutions of the National Collegiate Athletic Association (NCAA) have added 9057 (3772 men's, 5285 women's) teams across all divisions (ie, Divisions I [DI], II [DII], and III [DIII]) in sports hosting championship events.[1] This increase in the number of sponsored teams has resulted in a record level of participation, with 472 625 student-athletes competing in sports in which the NCAA sanctioned championships during the 2013–2014 school year.[1] It should be noted that the sizable increases do not account for a number of emerging sports recognized by the NCAA that do not yet have a sponsored national championship event. The expanded size and scope of NCAA participation have increased the demands placed upon collegiate athletic trainers (ATs) to provide the appropriate level of care to athletes. Although approximately 24% of the National Athletic Trainers' Association's (NATA's) certified members are employed in the collegiate or university setting, very little is known about current athletic training staffing patterns or athletic training facilities at the intercollegiate level. The lack of published research in this area is surprising given that research[2–5] in other health care professions has shown that staffing levels and facilities affect patient outcomes. Lower staff-to-patient ratios and better facilities improve quality-of-care outcomes and reduce mortality rates.[2,4,5]

Recently, Aparicio et al[6] addressed the paucity of athletic training staffing research by examining staffing levels at

institutions participating in the NCAA Football Bowl Subdivision (FBS). The average FBS athletic training staff consisted of approximately 9 full-time staff members.[6] However, the authors addressed staffing only at the FBS level and did not evaluate staffing levels in other NCAA divisions or the National Association of Intercollegiate Athletics (NAIA). Given the growth of the NCAA and the differences in financial resources among the 3 divisions,[7] it is important to provide a staffing benchmark for ATs currently working in these environments to help justify additional human resources as well as physical space. It is also important to quantify the level of staffing that exists among institutions affiliated with the NAIA, as this group of institutions is often overlooked in studies of collegiate sports.

The athletic training facility is another aspect of the intercollegiate setting that requires evaluation. Facilities are foundational to the work that is conducted within them, and the greatest ability to influence those facilities occurs during the planning before construction occurs. As a part of a school/athletic facility complex, the athletic training facility has a typical lifespan of 50 years.[8,9] Therefore, it is imperative that these facilities be planned and built to meet the future needs of both professional practitioners and student-athlete patients, because facility shortcomings will be endured throughout the long lifespan of the building. The athletic training facility is essential to the delivery of health care services and must be able to serve the various needs of all teams and athletes using the facility.[10,11] The importance of the athletic training facility is underscored by the considerable text that has been dedicated to the conceptual development of the ideal facility.[10–13] However, recommendations for the amount of space needed to provide adequate medical care are scant. Secor[12] advised a formulaic approach to determining the appropriate size of an athletic training facility. The formula suggested that the size of an athletic training facility be calculated by dividing the total number of patients at peak by 20 people per table and then multiplying that number by 100 to approximate the total square footage needed. Another author[14] reported that a minimum of 500 square feet (46 m^2) is needed and that the size of the athletic training facility depends on the size and scope of the athletic department. However, athletic training textbooks have stated only that an athletic training facility should be large enough to meet the needs of the sports medicine program and should be organized in a manner that takes advantage of the space available.[10,11]

Despite the importance of athletic training facilities in intercollegiate sports, the size and scope of these facilities are not well understood. Although it has been theorized that institutions at higher levels of competition would have larger and better-equipped facilities,[15] to date, no known studies have quantitatively assessed the differences in athletic training facilities by level of competition (ie, NCAA, NAIA). Judge et al[16] examined NCAA DI strength and conditioning facilities and found that significant differences in facilities and staffing existed based on football status. Institutions sponsoring a football program reported more numerous and larger spaces for strength and conditioning. Based on these results, it is reasonable to infer that differences in the number and size of athletic training facilities based on level of competition will exist.

PURPOSE

The goal was to define the staffing, size, and scope (ie, type of facilities, number of facilities, office space, storage space) of intercollegiate athletic training facilities across the 3 divisions of the NCAA as well as in the NAIA. We also assessed overall facility satisfaction and whether significant differences in facilities (ie, number of facilities, size of facilities, storage space, office space) or staffing (ie, full time, part time, athletic training student, work-study student) existed among the competition levels.

We hypothesized that we would see an incremental decrease in facilities and staffing from the DI level to the NAIA. It was also hypothesized that personnel at DI institutions would have greater overall satisfaction with their facilities than those at all other levels of competition.

METHODS

Procedures

This study received institutional review board approval, and the data were collected from a sample of ATs from across the United States. To recruit participants, we first developed an e-mail list of persons responsible for overseeing athletic training services (eg, director of sports medicine, head AT, associate athletic director) at institutions governed by the NCAA and the NAIA by reviewing publicly accessible Web sites. This review identified 1235 valid e-mail addresses for persons responsible for overseeing athletic training services at all levels of the NCAA and the NAIA. A recruitment e-mail was then sent to all potential participants explaining the purpose of the study, providing informed consent information, and including a hyperlink to the online survey. Two reminder e-mails were sent to the same e-mail list at 2-week intervals.

The hyperlink in the recruitment e-mail directed participants to an informed consent page. This page explained the study's purpose and indicated that participants would not be asked for any identifiable information that would link them to the responses provided. The page also stated that participants could discontinue the survey at any time and were free to skip any question in the survey. Lastly, the informed consent page made clear that only the AT overseeing athletic training services should complete the survey and that no incentive would be provided for participating in the study.

To limit duplicate responses, settings were established in the survey software that limited 1 Internet protocol address to 1 survey entry. At the end of the data-collection period, we reviewed all surveys to determine both the completeness of responses and whether any duplicate entries existed. We identified 1 response from an AT who did not meet the inclusion criteria and 10 sets of identical responses. These responses were subsequently removed, resulting in a total of 523 responses from the 1235 valid e-mail addresses contacted. An additional 45 responses were removed because they failed to fully answer the questions assessing the square footage of their facilities. Removing these responses resulted in a sample of 478 to be used for analyses and a validated response rate of 38.7%.

Instrumentation

Survey Development. Questions examining the size and scope of athletic training facilities were created by a facilities expert and a certified AT. To increase face validity and clarity, an initial version of the survey was reviewed by 1 athletic training educator, 1 head AT, and 1 facilities context expert. This review identified several minor errors (eg, formatting problems, typographical errors) that were subsequently revised. Then the instrument was pilot tested among a small sample of collegiate ATs. This process identified potential confusion in the wording of some questions and confirmed that the survey could be completed in the desired time frame. Revisions were made based on the feedback received, and the final version of the survey was submitted for institutional review board approval. The psychometric properties of the survey were not assessed.

Survey Overview. We assessed the size and scope of athletic training staffing and facilities at various levels of collegiate competition using a 50-question survey. The online survey was distributed using Qualtrics (Provo, UT) survey software. The survey included questions to assess various aspects of the athletic training facilities that existed at the institution. The portions of the survey that are relevant to the present study are discussed here.

Demographics. Participants responded to questions that assessed their age, sex, and level of education (ie, highest degree completed). Participants were also asked to report their current title (eg, director of sports medicine, head AT), time in the current position, time at the current institution, and years of work experience as a certified AT.

Characteristics of Athletic Department. Participants were asked to supply the total numbers of varsity student-athletes and men's and women's varsity teams being provided athletic training services. Respondents were also asked to identify the classification (ie, NCAA DI, NCAA DII, NCAA DIII, NAIA) of the athletic teams and the NATA district. Finally, participants indicated if their school sponsored a varsity football program. Those answering in the affirmative categorized the team's level of competition (ie, FBS, Football Championship Subdivision, other). Those indicating *other* as a response option were provided an open text box to manually enter the level of competition.

Staffing. Participants were queried about the size of their staffs. First, respondents were requested to identify the number of full-time Board of Certification (BOC)–certified ATs currently employed at their institution. Then, they were asked for the number of BOC-certified graduate-assistant or intern ATs currently under contract at their institution, along with the number of part-time BOC-certified ATs serving on their staff. Noncertified staffing was also recorded. Participants were asked to report the number of athletic training students (from Commission on Accreditation of Athletic Training Education [CAATE]–accredited programs only) and work-study students called upon. Responses were entered manually into a text box.

Central Athletic Training Facilities. Participants were questioned as to the number and size of their central athletic training facilities. For the purposes of this study, a *central athletic training facility* was defined as any space that served at least 100 athletes and multiple certified ATs with a full complement of equipment (eg, modalities, exercise equipment) and that was used on a regular basis. For institutions that did not have 100 student-athletes, the central facility was considered the one in which the majority of patients were provided athletic training services. Participants first entered the number of central athletic training facilities at their institution using a manual text-box entry. Then, respondents were asked to approximate the square footage of the facility or facilities. To assist participants in making more accurate estimations, contextual examples were included within the survey, such as the exact square footage of a football field (goal line to goal line), a football end zone, a collegiate basketball court, and the lane on a collegiate basketball court. After reviewing these examples, participants entered the square footage of each central athletic training facility in a text box.

Ancillary Athletic Training Facilities. Participants were also asked to provide the number and size of satellite and game-day facilities if applicable. For the purposes of this study, a *satellite athletic training facility* was defined as a facility that was separate from the central athletic training facility and used on a daily basis by fewer than 100 student-athletes. A *game-day athletic training facility* was defined as a space that was used solely on a game day for team preparation or treatment (or both). The processes for reporting the number and size of satellite and game-day facilities were the same as those described for the central facility. Respondents who did not identify at least 1 facility in either category were not asked to address subsequent items within this section of the survey instrument.

Office and Storage Space. Participants indicated if their institution provided dedicated office space for ATs. For the purposes of this study, a *dedicated office* was defined as a room with a door and a desk. Thus, a desk in the middle of the athletic training facility was not considered a dedicated space. Subsequent items asked respondents to identify the total number of offices provided and the total square footage of those spaces. To assess storage space, respondents first indicated if they had dedicated storage space and then were asked to estimate the total amount of storage space provided. Similarly, *dedicated storage space* was operationally defined as an area that included a door to secure equipment or supplies. Reported storage spaces were not limited to the athletic training facility and included all areas used for athletic training supplies and equipment, regardless of location.

Facility Improvements and Satisfaction. Five items were used to investigate facility improvement and satisfaction. In separate questions, participants were asked if their school had expanded or renovated the athletic training facilities within the previous 5 years and if the university administration had approved any future facility improvements. Then, participants were asked to rate the overall change in the quality of facilities provided to the ATs over the past 5 years. The 5-point response scale ranged from *major deterioration* (1) to *major improvements* (5), with *no change in facilities* (3) as the midrange response. Next, respondents were asked if they felt they could provide the necessary level of care to the institution's athletes based on the facilities and equipment available. Responses were on a 5-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5). Finally, participants were asked if their current facilities and equipment met the needs of the institution's athletes and

Table 1. National Athletic Trainers' Association (NATA) District Affiliations of Participating Schools

NATA District	Level of Competition				Total, No. (%)[a]
	NCAA Division			NAIA	
	I	II	III		
1	13	5	35	0	53 (11.5)
2	18	15	39	0	72 (15.7)
3	20	15	17	4	56 (12.2)
4	19	14	43	16	92 (20.0)
5	10	10	1	19	40 (8.7)
6	10	8	6	3	27 (5.9)
7	7	5	2	2	16 (3.5)
8	9	8	3	9	29 (6.3)
9	18	12	10	9	49 (10.7)
10	8	7	3	8	26 (5.7)

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

[a] 18 schools failed to report a district.

staff. Responses were on the same 5-point Likert scale. These questions were derived from previous work on high school athletic facilities including athletic training areas[17] as well as strength facilities studies at the high school and collegiate levels that assessed facility satisfaction, safety, and adequacy.[16,18] However, neither those studies[16–18] nor the present study assessed the validity or reliability of those items.

Data Analysis

All statistical analyses were conducted using SPSS (version 22; IBM Corp, Armonk, NY). As appropriate, data are reported as mean ± standard deviation (SD) or as count (%). We entered the data from 478 completed surveys and calculated descriptive statistics for each participant (ie, age, sex, level of education, time in the current position, time at the current institution, years as a certified AT) and the associated institution (ie, number of varsity student-athletes, number of men's and women's varsity teams, athletic classification, primary conference affiliation). Descriptive statistics were also calculated for staffing (ie, full time, part time, noncertified), quantity of facilities (central, satellite, and game day), and size of facilities (central, satellite, and game day). Then mean differences in staffing and facilities were examined among the 4 levels of intercollegiate competition using χ^2 analyses, Pearson correlations, and analyses of variance (ANOVAs). Levene tests were conducted before ANOVAs were completed to determine the appropriate post hoc test. In significant ANOVA models, Tukey post hoc analyses were calculated when equal variances were assumed and Tamhane post hoc analyses were used when equal variances were not assumed.

RESULTS

Respondents

As previously stated, recruitment efforts resulted in 478 ATs (response rate = 38.7%, n = 478 of 1235) who completed all aspects of the survey for data analyses. By division, the sample comprised 146 ATs (30.5%) working at DI institutions, 103 (21.5%) at DII institutions, 159 (33.3%) at DIII institutions, and 70 (14.6%) at NAIA institutions. In comparison, the total membership of the NCAA and NAIA comprised 1350 total institutions, with 345 DI institutions (25.5%), 307 DII institutions (22.7%), 438 DIII institutions (32.4%), and 250 NAIA institutions (18.5%). Therefore, the sample obtained was generally proportional to the overall distribution of collegiate institutions. As displayed in Table 1, responses were received from all 10 NATA districts at all competition levels except for the NAIA, which lacked respondents from Districts 1 and 2. The majority of survey respondents were male (n = 325, 68%) and had completed a master's degree (n = 420, 87.9%). The mean age of the overall sample was 42.4 ± 9.9 years (range, 24–69 years); participants had been certified for 18.47 ± 9.4 years (range, 0–45 years) and had been employed at their institution for 11.66 ± 9.1 years (range, 0–47 years).

Institutions

Institutional Composition. A summary of the total number of student-athletes, men's teams, and women's teams at each of the 4 collegiate levels is provided in Table 2. As both the number of teams and the total number of athletes affect athletic training facility needs, these variables were important to assess and compare. Given the typical large squad size of football teams, additional data regarding the football status of all participating schools were collected. Of the 146 DI institutions, 67.1% (n = 98) sponsored a varsity football program. Approximately 54% (n = 53) of these programs competed in the FBS. More than half (n = 56, 54.4%) of the DII institutions sponsored a

Table 2. Athletes and Sponsored Teams by Competition Level

Institutional Characteristics	Level of Competition, Mean ± SD (Range)			
	NCAA Division			
	I	II	III	NAIA
Total student-athletes	408.1 ± 117.1[a] (140–800)	349.8 ± 130.8 (92–650)	399.2 ± 182.6[b] (60–850)	318.1 ± 154.6 (95–745)
Men's varsity teams	8.5 ± 2.8[b] (5–17)	7.5 ± 2.9 (0–20)	8.5 ± 3.3[b] (0–20)	6.9 ± 3.0 (3–16)
Women's varsity teams	9.9 ± 1.9[a] (7–18)	8.3 ± 1.9 (5–13)	9.4 ± 2.5[a] (0–17)	7.4 ± 3.0 (3–16)

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

[a] Significantly more than Division II and NAIA ($P < .05$).

[b] Significantly more than NAIA ($P < .05$).

Table 3. Athletic Training Staffing Levels by Competition Level

	Level of Competition, Mean ± SD (Range)			
	NCAA Division			
Staffing	I	II	III	NAIA
Full-time ATs	6.1 ± 2.8[a] (2–14)	3.2 ± 1.4[b] (1–7)	2.8 ± 1.3 (1–8)	2.4 ± 1.2 (1–6)
Part-time ATs	3.4 ± 2.9[a] (0–15)	1.3 ± 2.2[c] (0–5)	0.4 ± 1.1 (0–5)	0.8 ± 1.4 (0–5)
Athletic training students	27.1 ± 18.8 (0–110)	26.9 ± 20.4 (2–95)	21.9 ± 12.1 (2–48)	17.9 ± 11.1 (2–45)
Work-study students	9.4 ± 8.9[d] (1–45)	3.7 ± 3.1 (1–20)	7.7 ± 7.6[d] (1–50)	3.8 ± 2.9 (1–12)

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

[a] Greater than all other levels ($P < .001$).
[b] Greater than NAIA ($P < .01$).
[c] Greater than Division III ($P < .01$).
[d] Greater than Division II and NAIA ($P < .05$).

varsity football program. Approximately 51% (n = 81) of the DIII institutions sponsored varsity football, and just over one-third of NAIA institutions in the sample (n = 24, 34.3%) sponsored varsity football. A trend of declining levels of offering a football program was noted in the sample when moving from the DI to the NAIA level.

Institutional Differences. Mean values for total student-athletes were different ($F_{3,469} = 7.8$, $P < .001$). Post hoc analyses revealed that the DI institutions had more total student-athletes (mean ± SD = 408.1 ± 117.1) than those at the DII (349.8 ± 130.8) and NAIA levels (318.1 ± 154.6). Post hoc analyses also revealed that the DIII schools (399.2 ± 182.6) reported more student-athletes than the NAIA institutions. With respect to men's varsity teams sponsored, ANOVA results showed differences in mean values ($F_{3,474} = 6.4$, $P < .001$), with post hoc testing demonstrating that DI (8.5 ± 2.8) and DIII (8.5 ± 3.3) institutions sponsored more men's teams than did the NAIA schools (6.9 ± 3.0). A comparison of women's varsity teams also identified differences ($F_{3,474} = 23.1$, $P < .001$). Post hoc testing determined that the DI (9.9 ± 1.9) and DIII (9.4 ± 2.5) schools sponsored more women's teams than both the DII (8.3 ± 1.9) and NAIA schools (7.4 ± 3.0).

Staffing

Staffing Levels. A complete summary of staffing across each of the 4 levels of competition is shown in Table 3. All institutions reported employing 1 or more full-time ATs, and declining mean values for full-time ATs were noted from DI to NAIA. The use of part-time ATs was not universal. A number of institutions reported that they did not employ ATs on a part-time basis, including 19.2% (n = 28) of DI schools, 52.0% (n = 53) of DII schools, 78.0% (n = 124) of DIII schools, and 68.6% (n = 48) of NAIA schools.

The evaluation of athletic training students within schools was limited to those institutions with CAATE-accredited programs. Therefore, the results reported for this variable included only those schools. At 60 DI institutions (41%), athletic training students assisted in providing health care within their athletic training facilities. Approximately one-third (n = 33, 32.4%) of DII schools had assistance from athletic training students. Only 27 (16.9%) of the DIII schools reported assistance from athletic training students, as did 14 NAIA schools (20%). For this variable as a whole, the mean values for athletic training students showed declining numbers from the DI to the NAIA level.

Employment of work-study students on an hourly basis was another staffing method used by many but not all institutions. As with the athletic training student variable, the mean values for work-study students as reported in Table 3 were determined from only those schools relying on work-study students in their athletic training programs. At the DI level, just more than half the schools (n = 75, 51.3%) used work-study students to assist with daily operations. These levels rose to 63.1% (n = 65) for DII and 71.6% (n = 114) at DIII schools, but the employment of work-study students dropped to 52.8% (n = 37) at the NAIA schools.

Staffing Differences. We identified a moderate positive correlation ($r = 0.45$, $P < .001$) between the number of student-athletes and the total number of certified ATs on staff. Analysis of variance indicated differences in mean values for full-time ATs ($F_{3,462} = 98.7$, $P < .001$), and post hoc analysis showed that DI institutions employed more full-time staff members than did all other levels of competition. Post hoc analyses also demonstrated that full-time staffing levels at DII schools (mean ± SD = 3.2 ± 1.4) were greater than those at NAIA schools (2.4 ± 1.2).

Differences in mean values for part-time ATs were present ($F_{3,462} = 98.7$, $P < .001$), with post hoc assessment showing that DI institutions (mean ± SD = 3.4 ± 2.9) employed more part-time ATs than all other levels of competition. Post hoc results also reflected that DII schools (1.3 ± 2.2) had significantly more part-time ATs on staff than did DIII institutions (0.4 ± 1.1). The number of athletic training students assisting in the provision of health care services did not differ among the levels of competition. With regard to work-study students, differences were evident in mean values ($F_{3,287} = 11.1$, $P < .001$), and DI (9.4 ± 8.9) and DIII (7.7 ± 7.6) institutions relied on more students than both DII (3.7 ± 3.1) and NAIA (3.8 ± 2.9) institutions.

Size and Scope of Facilities

A complete summary of data regarding both the number and size of athletic training facilities across each of the 4 levels of competition is provided in Table 4.

Central Athletic Training Facility. For the purposes of this study, a *main or central athletic training facility* was operationally defined as one that served approximately 100 athletes, was used by multiple ATs, and had a full complement of therapeutic modalities. The mean square footage of the central athletic training facilities declined by level of competition. A similar but less notable decline occurred in the number of central athletic training facilities provided from the DI to the NAIA level ($F_{3,472} = 18.4$, $P < .001$), with DI schools having a greater number of central athletic training facilities than all other levels. Differences were also present for the total size of the central athletic training facilities ($F_{3,458} = 24.5$, $P < .001$). Post hoc testing showed that the DI schools (mean ± SD = 5608.4 ± 6545.3) had more square footage than all other levels, and the DII (2348.9

Table 4. Athletic Training Facilities by Competition Level

Facility	Unit	Level of Competition, Mean ± SD (Range)			
		NCAA Division			
		I	II	III	NAIA
Central athletic training facilities					
No. of facilities		1.7 ± 1[a] (1–6)	1.3 ± 0.6 (1–4)	1.2 ± 0.4 (1–3)	1.2 ± 0.4 (1–3)
Total size					
	ft²	5608.4 ± 6545.3 (200–48 000)[a]	2348.9 ± 2156.7 (200–10 000)[b]	2122.4 ± 2840.7 (144–30 000)	1492.7 ± 1573.6 (240–9500)
	m²	521.0 ± 608.1 (19–4459)[a]	(218.2 ± 200.4) (19–929)[b]	197.1 ± 263.9 (13–2787)	138.7 ± 146.2 (22–883)
Satellite athletic training facilities					
No. of facilities		1.6 ± 1.8[a] (0–10)	0.7 ± 0.9 (0–4)	0.5 ± 0.8 (0–3)	0.4 ± 0.5 (0–2)
Total size					
	ft²	1564.6 ± 1953.5 (75–10 000)[a]	729.2 ± 760.5 (50–4000)	659.1 ± 1214.9 (40–9100)	422.5 ± 343.9 (50–1500)
	m²	145.4 ± 181.5 (7–929)[a]	67.7 ± 70.7 (5–372)	61.2 ± 112.9 (4–845)	39.3 ± 31.9 (5–139)
Game-day facilities					
No. of facilities		0.4 ± 0.9 (0–6)	0.3 ± 0.7 (0–5)	0.2 ± 0.5 (0–2)	0.3 ± 0.5 (0–2)
Total size					
	ft²	1350.1 ± 1192.3 (150–4500)	1297.3 ± 1095.8 (200–4700)	1722.4 ± 1954.5 (50–7500)	611.1 ± 540.3 (150–2400)
	m²	125.4 ± 110.8 (14–418)	120.5 ± 101.8 (19–437)	160.0 ± 181.6 (5–697)	56.8 ± 50.2 (14–223)
Office space					
No. of facilities		4.4 ± 2.9[a] (1–15)	2.3 ± 1.4 (1–6)	2 ± 1.4 (1–11)	1.8 ± 1.1 (0–6)
Total size					
	ft²	633.3 ± 882.4 (40–7000)[c]	395 ± 445.4 (20–2500)[c]	223.3 ± 181.4 (12–1200)	218.7 ± 202.9 (0–1000)
	m²	58.8 ± 82.0 (4–650)[c]	36.7 ± 14.4 (2–232)[c]	20.7 ± 16.9 (1–111)	20.3 ± 18.9 (0–93)
Storage space					
	ft²	696.5 ± 943.8 (25–4700)[a]	253.8 ± 249.6 (10–1200)	224.9 ± 250.5 (10–2000)	209.0 ± 192.9 (10–1100)
	m²	64.7 ± 87.7 (2–437)[a]	23.6 ± 23.2 (1–111)	20.9 ± 23.2 (1–186)	19.4 ± 17.9 (1–102)

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

[a] Greater than all other levels ($P < .01$).

[b] Greater than NAIA ($P < .01$).

[c] Greater than Division III and NAIA ($P < .01$).

± 2156.7) schools had larger facilities than the NAIA (1492.7 ± 1573.6) institutions.

Satellite Athletic Training Facilities. *Satellite facilities* were defined as those that were located away from the central athletic training facility and were used on a daily basis by fewer than 100 student-athletes. Division I institutions had the highest levels and NAIA institutions the lowest levels in both total number and total size in square feet (Table 4). In addition, satellite athletic training facilities were more numerous ($F_{3,470} = 26.2$, $P < .001$) and larger in size ($F_{3,213} = 7.2$, $P < .001$) at the DI level than at all other levels. No other differences based on the size or number of satellite facilities were detected among the other levels of competition.

Game-Day Facilities. A *game-day facility* was operationally defined as an athletic training facility associated with a competition venue that was used solely for game-day purposes. A relatively low number of schools reported the presence and use of game-day athletic training facilities. For the entire sample, only 18.4% of the institutions had game-day facilities, and the distribution by level of competition was as follows: 28 DI schools (19.2%), 24 DII schools (23.3%), 20 DIII schools (12.8%), and 16 NAIA schools (22.8%). Analyses of variance revealed no differences in the number ($F_{3,466} = 2.04$, $P = .108$) or size ($F_{3,87} = 2.2$, $P = .096$) of game-day athletic training facilities based on level of competition.

Office and Storage Space. A vast majority of schools (n = 394, 85%) provided their athletic training staff with dedicated office space. Division I institutions had more dedicated offices ($F_{3,378} = 39.8$, $P < .001$) and office space ($F_{3,378} = 13.3$, $P < .001$) than all other levels of competition. Post hoc testing failed to identify differences

Table 5. Quality and Satisfaction of Athletic Training Facilities by Competition Level

Variable	Level of Competition, Mean ± SD (Range)			
	NCAA Division			
	I	II	III	NAIA
Overall change in athletic training facilities[a]	3.6 ± 1.2 (1–5)	3.3 ± 1.0 (1–5)	3.7 ± 1.0 (1–5)[b]	3.8 ± 1.1 (1–5)[b]
Ability to provide necessary level of care to athletes[c]	3.6 ± 1.1 (1–5)[b]	3.1 ± 1.2 (1–5)	3.5 ± 1.2 (1–5)[b]	3.3 ± 1.2 (1–5)
Facilities and equipment meet the needs of staff and athletes[c]	3.2 ± 1.3 (1–5)[b]	2.7 ± 1.2 (1–5)	3.1 ± 1.2 (1–5)	3.0 ± 1.2 (1–5)

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

[a] 5-point scale (1 = *major deterioration*, 5 = *major improvements*).

[b] Greater than Division II ($P < .05$).

[c] 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*).

in the total number of offices or office square footage among schools at the other 3 levels of competition.

Respondents were asked to provide the total amount of dedicated storage space available for athletic training purposes, regardless of location. Mean storage space square footage declined from the DI to the NAIA level ($F_{3,391} = 19.6$, $P < .001$), and DI institutions (mean ± SD = 696.5 ± 943.8) supplied more storage space than all 3 other levels of competition. No other differences in mean storage space based on competition level were identified.

Facility Improvements and Satisfaction

A total of 62.8% (n = 300) of participants indicated that their athletic training facilities had been expanded or renovated in the previous 5 years. Of the overall sample, 44.6% (n = 213) specified that improvements to the athletic training facilities had been approved by upper-level administration (eg, board of regents). Respondents at more than half (n = 77, 52.7%) of DI institutions reported improvements in the past 5 years and 48.6% (n = 71) noted that future improvements had been approved. Among DII schools, 59.2% (n = 61) of participants cited recent renovations and 40.8% (n = 42) stated that facility renovations had been approved. The majority of DIII institutions (n = 98, 61.6%) had undergone recent renovations, and less than half (n = 69, 43.4%) had received approval for renovations. Finally, 64.3% (n = 45) of NAIA schools had recently renovated their facilities, and 44.3% (n = 31) had approved plans to improve the facilities.

Three survey questions used a scaled response to assess satisfaction with the current facilities. Participants in the overall sample reported a slightly positive change (mean ± SD = 3.6 ± 1.1) in their facility during the previous 5 years. They also gave neutral responses to being able to provide the necessary level of care (3.4 ± 1.2) and having a facility that met the needs of the staff and athletes (3.0 ± 1.2). Although no distinct trend of increasing or decreasing mean values within the levels of competition was evident (Table 5), the lowest values for each of the 3 facility satisfaction items were at the DII level.

Respondents at NAIA institutions (mean ± SD = 3.8 ± 1.1) and DIII institutions (3.7 ± 1.0) reported higher mean scores for overall changes to their facilities when compared with DII schools (3.3 ± 1.0; $F_{3,438} = 3.4$, $P = .017$). No other differences occurred among institutional levels for opinions of facility changes. Analysis of variance regarding the ability to provide necessary care to patients showed differences in mean values ($F_{3,438} = 3.5$, $P = .016$). The mean value for DI schools (3.6 ± 1.1) was higher than that for DII schools (3.1 ± 1.2), and DIII schools (3.5 ± 1.2) also had a higher mean value than DII schools. Similarly, participants at DI institutions (3.2 ± 1.3) reported higher levels of overall satisfaction with facilities and equipment than those at DII schools (2.7 ± 1.2; $F_{3,436} = 4.2$, $P = .006$). Post hoc testing failed to identify any additional differences among competition levels for overall satisfaction.

DISCUSSION

We conducted our study to provide benchmarks related to the size and scope (ie, type of facilities, number of facilities, office space, storage space) of athletic training facilities as well as staffing at various levels of collegiate competition. In addition, we assessed 3 factors regarding overall satisfaction with those facilities. Our findings failed to fully support our hypothesis, as an incremental decline in facilities was not observed. Although the DI institutions provided greater resources in many areas of staffing and facilities, these differences were not incrementally distributed from the DI through the DII, DIII, and NAIA levels. Instead, a general and pronounced difference occurred between the DI and all other levels. These differences may be attributed in part to the increased facility and program investment at the DI level that has been coined the "facility arms race."[19]

Staffing Levels

Although an instrument[20] exists to determine the full-time equivalent needed to provide appropriate athletic training services at the collegiate level, the researchers sought only to quantify the actual number of ATs on staff. We reported results in this manner to provide ATs and administrators with another point of comparison by competition level. Division I athletic training staffs reported treating an average of 408 student-athletes with 6 full-time ATs and 3 part-time ATs. The staffing levels at the DI level were larger than those reported at any other level of competition. However, staffing sizes at this level were slightly lower than those identified in previous research.[6] Because earlier examinations of staffing levels addressed only FBS members of DI, these differences were not unexpected. Football Bowl Subdivision institutions typically have more resources, which could result in the ability to staff additional ATs.[7]

Further investigation of staffing patterns among the levels of competition identified several interesting findings. First, only a moderate positive correlation was present between staffing levels and the number of student-athletes. In the sample, participants at DII and NAIA institutions reported providing care to similar numbers of student-athletes. However, these institutions employed similar numbers of

part-time ATs, whereas DII institutions employed more full-time ATs. This result suggests that ATs at NAIA institutions are being asked to provide care to comparable numbers of student-athletes with fewer staffing resources. It should be noted that the increased numbers of athletic training staff at DII institutions could reflect a higher prevalence of football programs. In the sample, 52% of DII institutions sponsored a football program, compared with 32% of NAIA institutions.

Staffing differences between DI and DIII institutions were also noted. Although the average numbers of students receiving care were similar, DIII institutions had fewer full-time and part-time staff members. Previous researchers[21,22] have observed that a lack of staffing resulted in increased work-life conflict and increased workloads for ATs at the DI level. Therefore, it is possible that ATs at other levels of competition could have work-life conflicts and workloads that are greater than those at the DI level based on decreased staffing levels. Even though we did not measure either weekly workload or work-life conflict, further exploration of these factors based on collegiate level is warranted.

Although the employment of BOC-certified ATs is foundational to providing athletic training services, we also assessed the contributions of athletic training students and work-study students. Athletic training students from CAATE-accredited programs work under the supervision of a preceptor (eg, an AT) who must be present to directly intervene if necessary. Therefore, they should not be considered an independent work force. However, work-study students support certified ATs on an hourly basis and do not have supervision mandates. To our knowledge, this is the first published study to assess support roles. It is interesting that the analyses failed to identify differences in the average number of athletic training students providing support. This finding could indicate the small proportion of CAATE-accredited programs at the DIII and NAIA levels. However, differences in work-study students were identified, with DI and DIII institutions employing more students than DII and NAIA schools.

Facilities

As expected, respondents at DI institutions reported having more central athletic training facilities and more total space than those at all other levels of competition. In fact, the average square footage reported for the central athletic training facilities at DI institutions was more than double that reported at any other level. Similar results were associated with satellite athletic training facilities. Participants at DI schools reported more than double the total number of satellite facilities and total square footage when compared with those at the other levels of competition. To put this into context, DIII institutions were providing care to a comparable number of student-athletes as DI schools with approximately 2 fewer total facilities available (1 central athletic training facility, 1 satellite athletic training facility) and approximately one-third of the total space (DI = 7173 ft^2 [666 m^2] versus DIII = 2781.5 ft^2 [258.4 m^2]).

Based on the variable sizes and scopes of athletic training facilities, future researchers should seek to develop a formula for determining the appropriate size of an athletic training facility. This formula should account for anticipated changes in the athletic department (eg, increased number of athletes, addition of teams) over time to provide ATs with an idea of the space needed to accommodate both current and future athletic training requirements. Such an approach should account for feedback from athletic training staff regarding athletic training facility satisfaction and specifications for additional space. This approach to space recommendation formulations has been adopted in the development of other sport facilities,[17,23,24] and it should be considered an important next step in athletic training facility research.

Other differences between central and satellite athletic training facilities among the remaining levels of competition (ie, DII, DIII, NAIA) were not as pronounced. Despite differences in staffing and the number of student-athletes treated, participants at institutions not competing at the DI level reported comparable numbers of central and satellite athletic training facilities on campus. The size of these facilities was also similar among the DII, DIII, and NAIA levels, with the lone exception being that the central athletic training facilities at DII schools had more square footage than those at the NAIA level (729.2 versus 422.5 ft^2 [67.7 versus 39.3 m^2]). Finally, game-day facilities were not a common feature among intercollegiate institutions in the sample. In fact, respondents at only 23% of the schools described having facilities specifically for game-day use. However, a small and select group of staff at 7 schools reported multiple game-day facilities (between 3 and 6 separate facilities) at their institutions. Although no differences were found related to the size or number of game-day athletic training facilities, these facilities should be monitored in the future, as they could become a point of differentiation among schools in the "facility arms race."[25,26]

Results associated with storage and office space were comparable with those related to the other athletic training facilities. Respondents at DI schools reported a greater number of offices and more storage areas than at all other levels. However, the differences with regard to total office square footage were not as pronounced. No differences in total office space were identified between DI and DII institutions, though staff at both reported more office space than at the other 2 levels of competition. The average storage space of 696.5 ft^2 (64.7 m^2) reported by DI institutions was more than the average spaces of the remaining 3 levels of competition combined (DII = 253.8 ft^2 [23.6 m^2], DIII = 224.9 ft^2 [20.9 m^2], NAIA = 209.0 ft^2 [19.4 m^2]). Although we did not assess satisfaction with storage and office areas as components of collegiate athletic training facilities, this factor should be explored further, as well as the effect these facilities have on daily athletic training operations.

The final portion of this study addressed the condition of the athletic training facilities and the level of satisfaction that participants had with those facilities. Recent investments in athletic training facility renovation were common, with more than 60% of the sample reporting that athletic training facility renovations had been completed within 5 years of the survey. This type of facility investment was consistent with the findings of the exploration of DI strength and conditioning facilities by Judge et al.[16] Respondents indicated that another 40% of the schools had received approval to improve some aspect of their

athletic training facilities in the near future. Although a majority of athletic training facilities had been improved recently and staff members were positive about the changes to their facilities, the idea that their facilities were meeting the needs of the staff and student-athletes was rated as neutral at all 4 competitive levels. Despite the differences in staffing and facilities, these feelings transcended the sample, with an overall mean of 3.0 (ie, neutral) for this variable on the 5-point Likert scale. This outcome suggests that the athletic training facilities were meeting only the current needs of their sports medicine team and that further renovations may be warranted. This result should be reexamined in the future to determine if the planned renovations identified in the current study prompted a more positive outlook on the athletic training facilities associated with collegiate sports.

Limitations and Future Research

Despite the strengths of our study, some limitations should be noted. We used a cross-sectional study design, which limits the inferences that can be made and prevents the assessment of changes in facilities over time. Participants in this study self-reported and estimated the sizes of all of their facilities. We expected that the ATs participating in this study would know or be able to determine the exact sizes of their facilities. However, it is possible that respondents erred by providing inaccurate estimates of their facility size. To obtain better estimates, we provided respondents with multiple spatial examples in the survey. The results are also limited because we studied a convenience sample of ATs from across the United States. Yet the data set obtained was proportional to the overall composition of member institutions at these levels of competition. We also did not ask institutions to evaluate staffing levels based on the Appropriate Medical Coverage of Intercollegiate Athletics (AMCIA) recommendations and guidelines.[20] A previous group[6] reported confusion in using the AMCIA document correctly, and our focus was on quantifying existing levels outside that context. Future investigators should determine if the AMCIA recommendations are being met in the various divisions of the NCAA and among NAIA members.

Because we wanted to explore differences among all levels of competition, we did not evaluate differences between the FBS and Football Championship Subdivision within the NCAA's DI level. Failing to evaluate differences among DI institutions could have resulted in an imprecise evaluation of staffing and facilities at that level. Research[16] on ancillary areas of the athletic department suggests that differences between these 2 levels within DI could exist. Future researchers should focus on identifying differences in staffing and facilities within this division, which could further reflect the role that football plays in athletic training facilities' size and staffing. Athletic training program budgets were not directly assessed. Examinations of other intercollegiate facilities[16,25,26] suggest that facility differences might be associated with budget disparities. Therefore, future explorations of athletic training facilities should determine if facility differences are also directly associated with budgetary discrepancies within and perhaps outside of the athletic departments within the institutions.

Limitations related to the survey used to collect the data also existed. Although the survey items were based on previous research,[16–18] we did not assess the validity or reliability of the items we created. Future authors should seek to validate the items included in the survey to ensure accuracy. We also did not ask respondents to evaluate their satisfaction with equipment and supplies separately or with individual facilities. Therefore, it is possible that respondents reported an overall satisfaction level while being dissatisfied with some aspects. Creating separate items to more accurately assess satisfaction levels in these areas would be useful. Finally, only 1 person on each campus rated overall satisfaction with the athletic training facilities. It is possible that the respondent's opinion of the facilities did not represent the overall opinion of the athletic training staff.

CONCLUSIONS

To our knowledge, we are the first to quantify athletic training staffing and facilities at all levels of intercollegiate competition. In the not-so-distant past, it was stated[14] that ATs desired only a space with running water and a sufficient number of electrical outlets to provide care. However, to provide optimal care for patients, ATs now require better facilities and more staffing. To this end, our results should be used as a benchmark for practitioners to provide additional justification for the enhancement of their staff, facilities, or both. In the absence of sufficient data for advocacy, athletic training professionals have a more difficult challenge in making the case for investing additional resources in their programs; therefore, this study and future related inquiries are of value to the profession.

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