Programmatic Factors Associated with Undergraduate Athletic Training Student Retention and Attrition Decisions

Thomas G. Bowman, PhD, ATC*; Jay Hertel, PhD, ATC, FACSM, FNATA†; Heather D. Wathington, PhD‡

*Department of Athletic Training, Lynchburg College, VA; †Department of Kinesiology, ‡Department of Educational Leadership, Foundations, and Policy, University of Virginia, Charlottesville

Context: Athletic training programs (ATPs) are charged with meeting an increased demand for athletic trainers with adequate graduates. Currently, the retention rate of athletic training students in ATPs nationwide and the programmatic factors associated with these retention rates remain unknown.

Objective: Determine the retention rate for athletic training students nationwide and the programmatic factors associated with retention.

Design: Cross-sectional online survey.

Setting: Undergraduate ATPs.

Patients or Other Participants: Program directors (PDs) of all Commission on Accreditation of Athletic Training Education–accredited undergraduate ATPs were surveyed. We obtained responses from 177 of the 343 PDs (51.6%).

Intervention(s): The survey asked PDs for information about their institution, ATP, and themselves.

Main Outcome Measure(s): Self-reported retention rate.

Results: The participants reported an average retention rate of $81.0\% \pm 17.9\%$. We found a significant prediction equation ($F_{4,167} = 16.39$, $R^2 = 0.282$, P < .001), using the perceptions of student success factor (P < .001, $R^2 = 0.162$), the timing of formal admission (P < .001, $R^2 = 0.124$), the number of years the ATPs had been accredited (P = .001, $R^2 = 0.039$), the number of students admitted to the ATP annually (P = .001, $R^2 = 0.037$), and the number of years the PDs had held their position at their current institution (P = .03, $R^2 = 0.018$).

Conclusions: Program directors should work to provide a stimulating atmosphere to motivate students. Delaying the formal admission of prospective students may allow athletic training students to make an informed decision to enter an ATP. A rich history of success and consistent leadership can provide an ATP environment that fosters retention. Program directors should carefully consider how many students to admit into the ATP annually, as individual attention may alter retention decisions of athletic training students.

Key Words: Persistence, departure, athletic training education

Dr Bowman is currently an Associate Professor in the Department of Athletic Training at Lynchburg College. Please address all correspondence to Thomas G. Bowman, PhD, ATC, Department of Athletic Training, Lynchburg College, 1501 Lakeside Dr, Lynchburg, VA 24501. bowman.t@lynchburg.edu.

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Note: The term "undergraduate" has changed to "professional bachelor's." Original terminology preserved throughout to reflect time of study.

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INTRODUCTION

Retention is a term used by an institution, department, or program to refer to maintaining student enrollment¹ until degree completion.² Leaving college before degree completion is called attrition.³ According to Tinto's Student Integration Model,⁴⁻⁶ students must become involved in the institution both socially and intellectually to solidify commitment to their educational goals and their commitment to the institution, leading to retention. The student must have similar abilities, goals, and values as the campus community to become integrated.⁷ Students finish their degrees because they perceive a cohesive peer environment, frequently participate in events sponsored by their institution, and feel as though their institution shows individual concern for them.8 Institutional factors, such as admissions selectivity,9 career development assistance,10 and first-year seminars, have the ability to improve college graduation rates. Several socializing factors also play a large role in student retention decisions. A student's academic advisor has the ability to positively impact a student's decision to persist to degree completion by appropriately and promptly dealing with any problems the student encounters.^{11,12} Informal faculty-student interaction also tends to aid in student retention^{13–17} by improving the student's willingness and enthusiasm to learn on his or her own.7 Students are also socialized to the academic atmosphere, and the relationship between the student and the institution is strengthened through positive interactions with faculty.⁹ Finally, positive interactions between undergraduate peers^{8,17} also has the potential to improve undergraduate student retention.

Student retention in health care disciplines, such as athletic training, is a national concern as health care has become the biggest industry in the United States.¹⁸ As the demand for quality health care within the United States continues to grow, institutions of higher education must produce the next generation of qualified health care professionals. An inade-quate production of health care professionals can have a detrimental effect on the ability of physicians to care for the public.¹⁹ The relationship between physicians and health care professionals stresses the importance of properly retaining high-achieving health care students, including athletic trainers who care for physically active individuals.

In 1998, the American Medical Association²⁰ recommended that all high schools offer athletic training services to their athletes, as athletic trainers have been shown to significantly improve the level of medical care received by interscholastic athletes.²¹ However, many high schools across the United States do not employ athletic trainers,²² probably owing to budget constraints.²³ Currently, only 42% of high schools have access to an athletic trainer.²⁴ Further, the American Academy of Neurology²⁵ recommends an athletic trainer be present at all sporting events, including practices, where athletes may sustain a concussion. By the year 2018, the profession of athletic training is expected to see a 37% increase

in positions available in various work settings.²⁶ Athletic training has also been listed in several top-10 lists for the fastest growing careers during the next few years.^{27–30} The United States Department of Labor also states that a much faster-than-average job growth should be expected for athletic training programs (ATPs) is essential to meet the demand for competent health care professionals for the physically active population.

Maintaining high retention rates is important to preserve the status, financial stability, and quality of the ATP.³² Attrition of lower-achieving students has been considered a necessary and inevitable³³ "weeding-out" process,³⁴ yet improving retention to graduation of academically sound students will assist the profession of athletic training by providing strong clinicians. Therefore, it is important for athletic training program directors (PDs) to gain further understanding about how to retain high-achieving athletic training students. Retaining athletic training students will allow the growing demand for athletic trainers to be met in the health care arena and permit institutional and program reputations to be maintained. Exploring athletic training PD perceptions on athletic training student retention may improve understanding of the aspects of ATPs that facilitate and hinder student success. Providing PDs with insight into positive and negative ATP characteristics has the potential to initiate curricular changes to improve student retention. Currently, the athletic training student retention rate is unknown as well as what factors might be associated with student retention or attrition. It also remains unknown whether PDs view athletic training student retention as a problem. Therefore, the purpose of this research was to identify the retention rate of athletic training students in ATPs across the United States and to determine programmatic variables associated with athletic training student retention and attrition.

METHODS

We developed an Internet-based survey to gather data for the current study. We chose to use a survey because we were interested in understanding the perceptions and opinions of a particular group,³⁵ athletic training PDs. The primary delivery method for the survey was the Internet because reliable e-mail addresses were available for our population, an immediate response was not required, and it allowed us to reduce costs.³⁵ Also, Internet-based surveys can achieve robust response rates, compared to other survey methods (eg, mail).³⁶

Participants

We asked PDs from all 343 Commission on Accreditation of Athletic Training Education (CAATE)–accredited undergraduate ATPs in the United States as of January 2011 to volunteer to participate in our study by completing a survey. We chose all PDs nationwide to allow for institutional and geographic diversity of the data while limiting coverage and

Table 1. Comparisons Between Respondents and theAthletic Training Program Population

Variable	Respondents, %	Population, %	
Carnegie Classification			
Research	29.4	27.6	
Master's	47.5	49.1	
Baccalaureate	23.2	23.3	
Institutional type			
Public	50.8	52.5	
Private	47.4	47.7	
Other	0.6	NA	

Abbreviation: NA, not applicable.

sample error.³⁷ Program directors are easily identifiable, as only 1 individual holds this position at an institution and CAATE must be notified before any change in leadership. Further, PDs are accountable for the day-to-day operations of the ATP, including didactic and clinical education based on the CAATE accreditation standards.³⁸

A total of 177 PDs completed the survey for a response rate of 51.6% (177 of 343). The response is representative of the population for several demographic variables (Tables 1 and 2).^{39–41} Background information on the institutional affiliations of each ATP is illustrated in Table 3, while important factual information for the ATPs can be seen in Tables 4 and 5. Of the PDs who responded, the average age was 43 years, although directors ranged in age from 27 to 64 years (median = 42 years). On average, PDs held their position for 8 years (median = 6 years).

Instrumentation

We used an Internet-based survey, the Athletic Training Student Retention Survey for Program Directors, to collect our data (see Appendix). The survey began with an institutional review board–approved consent form followed by a brief demographic section that asked PDs straightforward questions about the institution and their program, including the affiliation of most of the institution's sponsored athletic teams and number of students enrolled in the ATP. We also asked the PDs to identify, to the best of their ability, the retention rate of the students in their ATP by estimating the percentage of students who graduated from their ATP out of the total number of students admitted into their ATP

Table 2.Comparison Between Respondents and theAthletic Training Program Population^a

Variable	Respondents, %	Reported Previously, %	
Athletic affiliation			
NCAA Division I	42.4	39.9	
NCAA Division II	24.3	24.8	
NCAA Division III	25.4	27.7	
NAIA	7.9	7.6	

Abbreviations: NAIA, National Association of Intercollegiate Athletics; NCAA, National Collegiate Athletic Association. ^a As per Carr and Volberding.³⁹

Table 3. Frequencies for Institutional Information ofAthletic Training Program Respondents

Variable	No.	Percentage
Carnegie Classification		
Research	52	29.4
Master's	84	47.5
Baccalaureate	41	23.2
Enrollment		
≤1000	11	6.2
1000–3000	47	26.6
3000–5000	21	11.9
5000-10 000	24	13.6
10 000–20 000	37	20.9
20 000-30 000	23	13.0
\geq 30 000	13	7.9
Athletic affiliation		
NCAA Division I	75	42.4
NCAA Division II	43	24.3
NCAA Division III	45	25.4
NAIA	14	7.9

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

during the past 5 years. The self-reported retention rate acted as our main outcome measure. Other questions included within this section sought demographics specific to the PDs, such as how long they had been working in their current role at their current institution. The second portion of the survey included 5-point Likert scale questions derived from previous research^{33,34} to gather the perceptions of PDs about athletic training student retention. The survey tool for our study contained questions based on the theoretic model derived from Tinto's Student Integration Model⁴ and from the current literature.^{33,34}

Table 4. Frequencies for Athletic Training ProgramInformation

Variable	No.	Percentage
Formal admittance to ATP		
Before college coursework	13	7.3
After 1 semester of coursework	20	11.3
After 2 semesters of coursework	91	51.4
After 3 semesters of coursework	26	14.7
After 4 semesters of coursework	25	14.1
Other	1	0.6
Missing	1	0.6
Minimum grade or GPA requirement to maintain enrollment in ATP		
Yes	174	98.3
No	2	1.1
Missing	1	0.6
Clinical education hour requirement		
Yes	125	70.6
No	49	27.7
Missing	3	1.7

Abbreviations: ATP, Athletic Training Program; GPA, grade point average.

Variable	Mean \pm SD	Median	Range
No. of years accredited	10.7 ± 4.0	9	2–18
Student applications to ATP	27.8 ± 34.8	17	1–300
Student acceptances to ATP	16.0 ± 13.9	12	1–100
Observation hours required before application	57.2 ± 49.1	50	0-250
No. enrolled in ATP	36.3 ± 23.0	30	3–145
Academic years of clinical education	2.8 ± 0.6	3	0–4
Clinical hours required for graduation	851.3 ± 347.0	900	0–1590
Retention rate. %	81.0 ± 17.9	87.5	9–100
Athletic training career placement rate, %	71.32 ± 18.47	75	15–100

Table 5. Descriptive Statistics for Athletic Training Program Background Information

Abbreviation: ATP, Athletic Training Program.

To reduce measurement error³⁵ and provide construct validity, the survey questions were pilot tested through 3 separate processes. First, 3 athletic training faculty members completed tape-recorded, think-aloud interviews while completing the survey and responding to the interview questions. Think-aloud interviews have been described previously in survey development⁴² as a way to help the researcher understand how questions are perceived by different participants. Through this procedure, we asked the participants to verbalize their thoughts as they completed the survey and answered the interview questions.⁴³ After the think-aloud pilot interviews, we modified questions to improve consistency of participant interpretation and added questions on the basis of recommendations. Afterwards, 4 additional athletic training faculty members evaluated the survey questions for content and clarity⁴⁴ individually. Feedback, including suggestions for improvement, was sought during this piloting phase to give face and content validity to the instrument.⁴⁵ After revision, a panel of 4 experts reviewed the instrument in a focus group to further attest to face, content, and construct validity.⁴⁵ We identified experts as researchers who have published peer-reviewed manuscripts on the topic of athletic training student retention or socialization issues. We gathered further comments for improvements from the experts after the focus group to improve content and clarity and obtained confirmation of the survey's comprehensiveness from each expert before finalizing the instrument. We excluded results from pilot tests in the final analysis, as any participants who completed a pilot and were within the study population were asked to complete the final survey version.

Data Collection Procedures

We asked PDs from all accredited undergraduate ATPs in the United States to complete the survey. We obtained their email addresses from the CAATE Web site⁴⁰ and used survey techniques similar to those described previously to collect data.³⁵ First, we sent a personalized e-mail in advance of the survey to each PD, explaining the purpose of our study and notified each PD that he or she would receive an e-mail with a link to the survey. One week later, we sent an e-mail asking each PD to volunteer to participate in our study by clicking on a link and completing the survey. We used QuestionPro Survey Software (QuestionPro Inc, Seattle, WA) to deliver the survey electronically; the first page of the survey was an institutional review board-approved consent form. After 2 weeks, we sent a follow-up e-mail requesting a response from those who had not yet completed the survey, followed 1 week later by a third request for participation. One week after the

third survey participation request, we called the remaining PDs who had not completed the survey to ask them personally for their participation. We terminated data collection 1 week after making the personalized phone calls, as no new completed surveys had been received for 2 days.

Statistical Analysis

We calculated descriptive statistics for the institutions represented, the ATPs represented, and the participants who completed the survey by using IBM's SPSS (version 19; IBM Inc, Somers, NY). We calculated descriptive statistics for the Likert scale data with SPSS by assigning numerical values to the response categories (eg, *strongly disagree* = 1, *disagree* = 2, *neutral* = 3, *agree* = 4, and *strongly agree* = 5).

To establish the characteristics associated with athletic training student retention and attrition, we used multiple regression. We entered various demographic and factual variables as independent variables and used the self-reported athletic training student retention rates as the dependent variable. We used exploratory factor analysis to identify factors from the Likert scale data section of the survey. We performed principal axis-factor extraction and considered both varimax and oblique rotations to uncover simple structure. We relied on the scree test⁴⁶ but also examined the theoretic interpretability of the resulting factors and the amount of variance accounted for by each factor to decide on the number of factors to retain. We measured the reliability of the factors identified by using the average interitem correlation between the survey questions by calculating Cronbach α ⁴⁴ The factors identified through the exploratory factor analysis were also considered for inclusion in the multiple regression equation. We set the α level at .05 a priori.

RESULTS

Program directors reported an average athletic training student retention rate of $81.0\% \pm 17.9\%$. The participants responded almost evenly to the question of whether they thought retention was a problem in athletic training education. Ninety-one PDs (51.4%) indicated retention is a problem, while 86 (48.6%) responded that it is not a problem. To explore this finding further, we ran a Mann-Whitney U test by using the self-reported retention rate as the test variable and the response to the question of whether retention is a problem in athletic training education as the grouping variable. We found a strong relationship between the selfreported retention rate and the response to whether retention Figure. Scree plot for the factor analysis illustrating a change in slope starting with the fifth factor point.



is a problem in athletic training education nationwide (U = 2413.50, P < .001), as PDs who did not view retention as a problem in athletic training education reported higher retention rates ($86.74\% \pm 12.21\%$) than those who did believe retention is a problem ($75.55\% \pm 20.53\%$).

Development of the Factors

We used exploratory factor analysis to develop factors or constructs from the 22 Likert scale questions from the second portion of the survey. Review of the scree plot (Figure) suggested including 4 factors, based on the change in slope starting with the fifth factor point. The theoretic interpretability of the resulting factors and the amount of variance accounted for by each factor also suggested the inclusion of 4 factors. These factors accounted for 45.3% of the variance in the selfreported retention rates. When we applied an unrotated principal-axis factoring, the factors accounted for 37.7% of the variance in the self-reported retention rates. However, the structure matrix did not produce a clear pattern of simple structure across the 4 factors, leading us to examine both varimax (orthogonal) and oblique (nonorthogonal) rotations. The structure matrix of the varimax rotation also did not produce a clear pattern of simple structure across the 4 factors. The oblique rotation, however, provided simple structure with factors that accounted for 34.1% of the total variance in selfreported retention rates. The first factor was defined by 8 questions, the second had 5 questions, 7 questions made up the third factor, and the last factor contained 2 questions. We found no examples of a question loading on 2 factors. We found a reliability score of 0.78 for factor 1, with slightly lower reliability scores for factor 2 (0.65), factor 3 (0.68), and factor 4 (0.62). The 4 factors (social engagement, perceptions of student success, strong role of clinical education, and sufficient resources) are listed in Table 6 with the α reliability score, factor loadings, and the survey questions that defined each.

Factors Associated with Athletic Training Student Retention

Before determining the factors associated with athletic training student retention, we evaluated the self-reported retention rates.

We found the data were not normally distributed (skewness = -1.633, kurtosis = 2.847). Owing to the importance of data being normally distributed in statistical inference, we computed a logit transformation for the self-reported retention rates by taking the natural log of the odds of a person graduating from each program to use in our multiple regression.

We found a significant prediction equation ($F_{5,166} = 20.36$, $R^2 = 0.38$, P < .001), using 5 variables. We included the second factor (perceptions of student success) (P < .001, $R^2 = 0.162$), the timing of formal admission into the ATP (P < .001, $R^2 = 0.124$), the number of years the ATPs had been accredited (P = .001, $R^2 = 0.039$), the number of students admitted to the ATP annually (P = .001, $R^2 = 0.037$), and the number of years the PDs had held their position at their current institution (P = .03, $R^2 = 0.018$).

DISCUSSION

The average self-reported retention rate for our participants' students was 81.0% with a standard deviation of 17.9%. The nationwide athletic training student retention rate was previously reported as 89%, with younger ATPs having lower retention rates (V. W. Herzog, unpublished data, 2002). We identified the number of years an ATP has been accredited and the number of years the PDs had been in their current position at an ATP as important factors related to athletic training student retention. Because of these findings, we expected the retention rate in our study to be lower than the previously found rate (V. W. Herzog, unpublished data, 2002), as there has been a dramatic increase in the number of programs since athletic training educational reform in 2004.

According to a previous article,⁷ the National League for Nursing Accrediting Commission has previously set the minimum standard for baccalaureate nursing student retention at 80% in 1996,47 although currently, nursing programs have institutional autonomy to declare a retention minimum standard (ie, no standard accreditation cutoff exists).⁴⁸ The median and average rates reported in our study are both above this minimum criterion, although we did obtain responses below 80% from 59 respondents (33%, 59 of 177). When comparing the retention rate obtained in our study to the previous standard for nursing programs, the abilities of ATPs to retain students may be acceptable on average. The standards set by the CAATE³⁸ appear to allow programs to be successful at retaining students while preparing them for professional practice by providing minimum thresholds for such things as faculty and preceptor qualifications, resources, and program evaluation.

Our results suggest that approximately half of PDs do believe athletic training student retention is a problem. We found the answer to this question was related to the self-reported retention rate of the athletic training students enrolled in the ATP of the participant. As expected, PDs who reported lower retention rates thought attrition was a problem in athletic training education and those who reported higher retention rates did not think retention was a problem. Based on the data, it appears to be program-specific whether institutions struggle with retaining students in ATPs.

According to PDs in our study, we found that 71.32% of athletic training students pursue a career in athletic training after graduation. An interest in another career has been found to be a barrier to pursuing a degree in athletic training,⁴⁹

Table 6. Questions, Factor Loadings, and Reliability Scores (a Score) for the Variables Included in Each Factor

Factor Name (α score)	Factor Loading	Question Example
Social engagement (0.78)	0.81	To what extent are you satisfied or dissatisfied with the ability of your ATP to foster relationships between the students in your ATP?
	0.79	To what extent are you satisfied or dissatisfied with the ability of your ATP to foster relationships between the students in your ATP and the athletic training faculty?
	0.68	To what extent are you satisfied or dissatisfied with the ability of your ATP to foster relationships between the students in your ATP and clinical instructors?
	0.53	What type of feedback do you receive for the didactic portion of your ATP on your comprehensive assessment plan from most of your students?
	0.44	What type of feedback do you receive for the clinical portion of your ATP on your comprehensive assessment plan from most of your students?
	0.41	What type of feedback do the faculty in your ATP generally receive on teaching evaluations from most of the athletic training students?
	0.36	What type of feedback do the preceptors in your ATP generally receive on their evaluations from most of the athletic training students?
	0.25	To what extent are you satisfied or dissatisfied with the quality of academic advising for the students in your ATP?
Perceptions of student success (0.65)	0.75 0.73	I am concerned about the retention rate of students in my ATP. The administration at my institution is concerned about the retention rate of students in my ATP.
	0.54	Most students in my ATP are confident that their initial decision to enroll in an ATP was the right choice.
	0.39 0.28	Most students in my ATP are dedicated to finishing the ATP. To what extent do you agree or disagree with the following statement, "The majority of the students in my ATP are able to achieve the academic standards required to remain in my ATP."
Strong role of clinical education (0.68)	0.71	The students in my ATP have sufficient opportunities to practice appropriate clinical skills.
	0.65	The clinical experiences of the students in my ATP prepare them to meet the demands of professional practice.
	0.55	To what extent are you satisfied or dissatisfied with the amount of time the students in your ATP are engaged in clinical education?
	0.51	The students in my ATP know what is expected of them during clinical education.
	0.40	The limitations set by CAATE for the amount of time a student can spend in clinical education allow sufficient time for students to engage in activities outside of athletic training.
	0.33	The limitations set by the CAATE for the amount of time a student can spend in clinical education allow for sufficient learning.
	0.24	To what extent do you agree or disagree with the following statement, "The majority of the students in my ATP have sufficient time to themselves away from athletic training?"
Sufficient resources (0.62)	0.42	My ATP is given appropriate <i>personnel resources</i> to successfully graduate students.
	0.36	My ATP is given appropriate <i>financial resources</i> to successfully graduate students.

Abbreviations: ATP, Athletic Training Program; CAATE, Commission on Accreditation of Athletic Training Education.

leading us to believe this was the case for the students who graduated from our participants' ATPs but did not find careers in athletic training. We believe that the remaining 28.68% of students probably use their undergraduate degree in athletic training as a gateway to other postbaccalaureate health care professions, although some may decide to enter a completely different career path. Previous research⁵⁰ identified the use of an athletic training degree to enter other health care professions, with physical therapy being the most popular.⁵¹

Variables Related to Retention

We were able to identify 5 variables that could successfully predict 38% of the variation in the self-reported retention rates. We created a factor pertaining to the perception of student success from the Likert scale data and also found the timing of formal admission into the ATP, the number of years the ATPs had been accredited, the number of students admitted to the ATP annually, and the number of years the PDs had held their position at their current institution to be significant predictors of athletic training student retention.

Student Success. The perception of student success factor took into account the PDs' perceptions of the ability of athletic training students to complete the requirements to earn a degree from an ATP (Table 6). Student success in higher education is typically defined through retention rates,⁵² making the ability of this factor to assist in identifying self-reported retention rates not surprising. Two questions pertained to the PDs' concern over the retention rate of students in their program. Also included in this factor were questions regarding students' decisions to enter the ATP, their dedication to the ATP, and their ability to meet the academic requirements of the ATP. Program directors who reported a lower retention rate are more likely to be concerned about attrition in the ATP they lead and the student thoughts about the ATP. We believe these results show that keeping retention rates high can improve morale of the faculty and students in the program. Providing a supportive environment can also help improve retention rates,⁵³ potentially by reaffirming the decision to enter the program, the dedication to finishing it, and by helping students meet program expectations. Further, previous research³³ has shown that students who are motivated are more likely to complete a degree in athletic training. To improve motivation, students need to become confident in their knowledge and seek advancement in their skills.

Secondary Admissions Process. Programs that admit students into the professional phase of the ATP later in their college career, after providing a preprofessional phase where students complete gateway coursework and observation at some level, were led by PDs who reported higher retention rates We believe the reason for this is the fact that students need time to decide if a program is the best fit for them. This finding corroborates previous research that stresses the importance of early socialization to allow students to understand the roles and responsibilities of an athletic trainer.49,51 Socialization is imperative because many prospective athletic training students do not have a full and lucid understanding of the profession, leading to a misunderstanding of the roles and responsibilities of an athletic trainer.⁴⁹ A longer preprofessional phase to an ATP may allow students to gather background information they need to fully understand the profession and reflect on whether a career in athletic training is the right decision for them. If students enter an ATP before they have adequate knowledge of the profession, they may realize athletic training is not what they expected and switch to a different academic discipline. Having a later admissions process may allot students the time they need to explore other academic interests. Reducing the length of the professional phase of the ATP also reduces the amount of time students have to change their major or drop out.

Accreditation and PD History. A long history of athletic training student success at an ATP and stability in the programmatic leadership likely facilitate recruitment and retention of students because of a strong ATP reputation and the fact that the key components of the program remain consistent The finding that programs that have been accredited longer have higher retention rates is similar to previous research (V. W. Herzog, unpublished data, 2002). The result may have 2 implications. An ATP that has a long history of accreditation allows leadership to try new initiatives and curricular approaches to improve student learning (V. W. Herzog, unpublished data, 2002). Second, a program will reap reputational benefits from a long history of accreditation, which will prove beneficial (V. W. Herzog, unpublished data, 2002). Well-established programs will also find ways to promote strengths, facilitating the recruitment of high-achieving prospective students. In addition, a lack of PD turnover will allow the leadership to provide students with a supportive environment. Retention may improve, as administrative stability may be a key factor in solving curricular challenges that arise. Program directors with extensive experience may be better primed to handle the demands of program leadership including maintaining accreditation without the pressure of earning tenure.⁵⁴ Finally, stability in the PD position can also help recruitment efforts by showing consistency and allowing for the development of an ATP reputation among recruits.

Student Enrollment. The results of our survey also support the fact that the number of students admitted into an ATP influences retention Program directors who admit a lower number of students annually reported higher retention rates. This was not surprising, as previous research has supported the fact that students enjoy small class sizes and the close-knit, family-style atmosphere found in their ATPs.⁵³ Smaller class sizes allow faculty, staff, and preceptors to provide students with more individualized attention and mentoring. An increase in the individual attention students receive may give them a sense of a supportive environment, leading to social integration.^{4–6} Perhaps the bigger issue is finding ways to provide students with individual attention and support regardless of institutional or program size, as PDs likely have to illustrate the ATP's viability to higher-ranking administrators. Program directors who are able to provide students with more one-on-one mentoring, including academic advising and clinical instruction, may have better retention rates.

Survey Factors

We were able to identify 4 factors through the Likert scale data from the survey the PDs completed to help explain retention and attrition decisions of athletic training students. We described the perception of student success factor above as it was included in the regression equation. The remaining 3 factors are explained in the following section. First, the social engagement of students helps to explain retention decisions. This factor took into account the relationships students build with their peers, faculty, preceptors, and advisors. Similar to the results of our study, previous research^{33,53} has stressed the importance of appropriate relationship building among the various stakeholders of an ATP. It has been hypothesized that these relationships can improve both intellectual and social integration of students into the institution and ATP, leading to improved student retention.^{4,5,34}

The clinical education factor dealt primarily with the amount of time students are engaged in athletic training. Program directors reporting higher retention rates felt their students had sufficient time outside of athletic training but also had sufficient opportunities to learn and prepare themselves for the demands of future clinical practice. It is important to be mindful of the stress placed on athletic training students while understanding the necessity of preparing them for future practice-this can often be a difficult balancing act for PDs, faculty, and preceptors to manage. Perhaps encouraging students to become involved in other social and academic activities, such as club sports, the fine arts, or student government, will help improve student academic and social integration and lead to improved retention.⁴ Also, clinical education experiences should allow students to apply their skills with appropriate autonomy, leading to improved knowledge and confidence.55

The final factor accounted for the resources, both personnel and financial, available to the program to successfully graduate students. Not surprisingly, PDs who reported higher levels of satisfaction with the resources available to them also reported higher retention rates. Expectations for resources that are required to support an ATP must be made clear to institutional administrators. If athletic training administrators are not able to secure adequate funding by showing the importance of the availability of adequate resources, retention rates of ATPs can suffer. This likely occurs owing to the decreased ability of the PD to provide a supportive environment for students to thrive. Financial resources are required to purchase and maintain equipment necessary to teach the athletic training competencies. Personnel are vital to providing students with one-on-one mentoring from faculty, staff, and preceptors. Having an appropriate number of personnel also allows students to enjoy the individual attention that has been shown to factor into enrollment decisions of athletic training students.⁵³

Implications for Athletic Training Programs

The results of our study can be used to help maximize student retention in ATPs. First, the decision on when students can be formally admitted to the ATP should be intentional. We found PDs who admit students later during their college careers retain students at a higher rate. Providing students with more time before they commit to the program can allow them to gain information about both the ATP and the profession, permitting them to make an educated decision. A longer preprofessional phase may also reduce the possibility of the ATP not meeting student expectations owing to the additional socialization time. Delaying formal acceptance into the ATP will provide program personnel with additional time to evaluate a student's fit into the ATP by allowing time for personal relationships to be built. As the conversation over moving the entry-level athletic training degree to the postbaccalaureate level continues,⁵⁶ providing recruits with sufficient information to enter an ATP will become increasingly important, as the preprofessional portion of the ATP will differ in multiple ways. It will be important to start the socialization process before students enter the ATP in order to maintain acceptable student retention rates.

Program administration and faculty should also consider the number of students they admit per year. Program directors of ATPs admitting fewer students reported having higher retention rates. Providing students with sufficient individual attention can improve retention rates, as students enjoy small class sizes and the family atmosphere of ATPs regardless of the size of the institution.⁵³ We suggest that program administrators and faculty should only admit the number of students they can support based on the number of faculty, staff, and clinical preceptors they have associated with their program.

Recent changes in athletic training education may cause ATPs to shift the way they function. The CAATE³⁸ has started a move toward an outcomes-based evaluation of ATPs. The outcomes that are now used to determine future reaccreditation decisions are focused on program effectiveness, including Board of Certification (BOC) pass rates for the most recent 3 test-cycle years.³⁸ Programs with a first-time BOC pass rate below 70% must now analyze their deficiencies and create an action plan to address the identified deficiencies.³⁸ Other components of the assessment plan can include retention and graduation rates as well as academic-course performance.³⁸ The implications of the outcomes-based evaluation model may have profound effects on athletic training educators, as accreditation is now tied to the ability to recruit, enroll, and retain students capable of completing the ATP and passing the BOC examination. The results of our study can help PDs struggling with student attrition make changes to their ATPs to help improve retention rates.

Limitations

It is important to note some limitations of our study. First is the potential for survey bias. Some PDs may have been more likely to complete the survey than others, resulting in nonresponse error. Although we kept the data confidential, PDs of programs with higher retention rates may have been more likely to participate than PDs of programs with lower retention rates. Further, we asked PDs to retrospectively estimate the retention rate of the athletic training students in the ATP they lead, which may have led to measurement error. It is also possible that PDs were not forthcoming regarding the areas for improvement of their ATP. Although the respondents were representative of the accredited population in terms of Carnegie Classification, type (public or private funding), and athletic affiliation, it is possible they are not representative when considering student retention rates. Since we were interested in perceptions and opinions of PDs, the questions in the survey have the potential for measurement error, as personal attitudes and beliefs are often fluid and changing.³⁵ However, to minimize measurement error, we developed the survey carefully to include specific language and avoid vague questions. The survey data were derived from self-reported responses of the participants; therefore, the accuracy of the results was limited by the truthfulness of the responses of the participants,⁵⁷ who may have given

socially acceptable answers based on the information that was of interest. Variations in interpretations of the questions by the PDs were also possible, potentially altering responses. However, the tape-recorded, think-aloud pilot interviews should have reduced the possibility of interpretation variability. We only asked for the opinions of 1 professional from each institution, although they have ultimate responsibility for the ATP. Gathering data from additional key stakeholders, such as faculty, students, and other administrators, may provide different results. Although we were able to identify several factors associated with athletic training student retention and attrition, the reasons for student-enrollment decisions are multifaceted. The regression equation developed was able to identify 38% of the variance in the self-reported retention rates. The remaining 62% of the variance could be due to a number of additional factors that cause students to leave. Institutional factors, such as admissions selectivity,⁹ career development assistance,10 and first-year seminars, have been shown to improve college graduation rates. Informal interactions between students and faculty outside the academic major can improve student retention,^{13–17} as well as positive interactions between undergraduate peers.^{8,17}

CONCLUSIONS

Our study extends the literature by identifying the estimated retention rate of undergraduate athletic training programs and several factors associated with athletic training student retention and attrition. We also found that approximately half of PDs believe athletic training student retention is a problem and half do not. We identified several demographic variables that were helpful in predicting self-reported retention rates of undergraduate ATPs. From these results, ATP PDs should work to provide a dynamic and exciting atmosphere to help motivate students. Program directors should also carefully plan curricular sequencing, particularly the timing of formal admission, to provide an environment for students to thrive. Professional socialization should be a key component of ATPs, particularly early on to allow students to enter the program with a rich understanding of the profession. A long history of educating athletic trainers and consistent ATP leadership provide reputational benefits that may help PDs recruit successful students. Finally, PDs should carefully consider how many students to admit into the ATP annually, as individual attention from faculty, staff, and preceptors may alter enrollment decisions of athletic training students.

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Appendix. Athletic Training Student Retention Survey for Program Directors

Background Information – Please provide us with some information to help us understand your ATP.

- Which type of Athletic Training Education Program will you be responding to this survey about?
 a. Undergraduate
 - b. Professional Masters
- 2. Please identify the approximate number of students enrolled in your institution.
 - a. Up to 1000
 - b. 1000–3000
 - c. 3000–5000
 - d. 5000-10000
 - e. 10 000–20 000
 - f. 20 000–30 000
 - g. 30 000 or greater
- 3. Please indicate your institution's type.
 - a. Public
 - b. Private Non-Religious
 - c. Private Religious
 - d. Private for Profit
 - e. Other

- 4. Please indicate the athletic affiliation of the majority of sports at your institution.
 - a. NCAA Division I
 - b. NCAA Division II
 - c. NCAA Division III d. NAIA
 - a. NAIA e. Other
- 5. In what year did the ATP at your institution first gain accreditation?
- 6. How many years have you held your program director position at your current institution?
- 7. What is your age?
- 8. When are the majority of students first able to be formally admitted into your ATP and begin the professional portion of your ATP?
 - a. Before the student begins coursework
 - b. After 1 semester of coursework
 - c. After 2 semesters of coursework
 - d. After 3 semesters of coursework
 - e. After 4 semesters of coursework
 - f. Other
- 9. Please explain why you have this type of admission process.
- 10. On average, how many students apply to your program each year?
- 11. On average, how many students are accepted into your program each year?
- 12. How many observation hours, if any, do you require before students can apply to your ATP?
- 13. How many total students are currently in your program after formal admission?
- 14. Does your ATP have a minimum grade requirement for particular courses or a minimum GPA requirement for students to obtain to remain in good standing in your ATP?
 - a. Yes
 - b. No
- 15. If yes, what are they?
- 16. How many academic years of clinical education experience do your students obtain following admission to your ATP?
- 17. Does your ATP have a requirement for the number of hours students must be engaged in clinical education per semester?
 - a. Yes
 - b. No
- 18. How many clinical education hours excluding observation hours, if any, are your students required to complete to qualify for graduation?
- 19. What type of clinical education experiences does your program offer (select all that apply)?
 - a. On campus collegiate athletics
 - b. Other colleges/universities
 - c. Professional or semi-professional sports
 - d. High schools
 - e. PT/sports medicine clinics
 - f. Physician offices
 - g. Hospitals
 - h. Industrial settings
 - i. Law enforcement/military setting
 - j. Other
- 20. Please estimate the percentage of students, for example 50%, who find careers in athletic training after

graduation over the past 5 years to the best of your ability.

- 21. Please estimate the percentage of students, for example 50%, who graduated from your ATP out of the total number of students admitted into your ATP over the past 5 years to the best of your ability.
- 22. Do you think retention of athletic training students at all programs nationwide is currently a problem facing athletic training education?a. Yes
 - a. Yes b. No
- 23. Please provide any additional comments or rationale behind your responses for this section of questions.

ATP Environment – This section will ask you questions about the atmosphere of your ATP. Please choose the answer that best describes your opinion.

- 1. The majority of students in my ATP are dedicated to finishing the AT program.
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 2. The majority of students in my ATP are confident that their initial decision to enroll in an ATP was the right choice.
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 3. I am concerned about the retention rate of my ATP's students.
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 4. The administration at my institution is concerned about the retention rate of my ATP's students.
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 5. My ATP is given appropriate financial resources to successfully graduate students.
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 6. My ATP is given appropriate personnel resources to successfully graduate students.
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 7. Please provide any additional comments or rational behind your responses for this section of questions.

Didactic Education – This section will ask you questions about the didactic portion of your ATP. Please choose the answer that best describes your opinion.

- 8. What type of feedback do you receive for the didactic portion of your ATP on your comprehensive assessment plan from the majority of your students?
 - a. Very negative
 - b. Negative
 - c. Neutral
 - d. Positive
 - e. Very positive
 - f. We do not seek feedback
- 9. What type of feedback do the faculty in your ATP generally receive on teaching evaluations from the majority of athletic training students?
 - a. Very negative
 - b. Negative
 - c. Neutral
 - d. Positive
 - e. Very positive
 - f. We do not have teaching evaluations
- 10. To what extent do you agree or disagree with the following statement, "The majority of the students in my ATP are able to achieve the academic standards required to remain in my ATP."
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 11. Please provide any additional comments or rational behind your responses for this section of questions.

Clinical Education – This section will ask you questions about the clinical portion of your ATP. Please choose the answer that best describes your opinion.

- 12. What type of feedback do you receive for the clinical portion of your ATP on your comprehensive assessment plan from the majority of your students?
 - a. Very negative
 - b. Negative
 - c. Neutral
 - d. Positive
 - e. Very positive
 - f. We do not seek feedback
- 13. What type of feedback do the preceptors in your ATP generally receive on their evaluations from the majority of athletic training students?
 - a. Very negative
 - b. Negative
 - c. Neutral
 - d. Positive
 - e. Very positive
 - f. We do not have preceptor evaluations
- 14. To what extent are you satisfied or dissatisfied with the amount of time the students in your ATP are engaged in clinical education?
 - a. Very dissatisfied
 - b. Dissatisfied
 - c. Neutral
 - d. Satisfied
 - e. Very satisfied

Please indicate your level of disagreement or agreement with the following statements.

- 15. The limitations set by the CAATE for the amount of time a student can spend in clinical education allow for sufficient learning.
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 16. The limitations set by CAATE for the amount of time a student can spend in clinical education allows sufficient time for students to engage in activities outside of athletic training.
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 17. The students in my ATP know what is expected of them during clinical education.
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 18. The students in my ATP have sufficient opportunities to practice appropriate clinical skills. a. Strongly disagree

 - b. Disagree c. Neutral

 - d. Agree
 - e. Strongly agree
- 19. The clinical experiences of the students in my ATP prepare them to meet the demands of professional practice.
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 20. Please provide any additional comments or rational behind your responses for this section of questions.

Social Experiences – This section will ask you questions about the relationships within your ATP. Please choose the answer that best describes your opinion.

- 21. To what extent are you satisfied or dissatisfied with the ability of your ATP to foster relationships between the students in your ATP?
 - a. Very dissatisfied
 - b. Dissatisfied
 - c. Neutral
 - d. Satisfied
 - e. Very satisfied
- 22. To what extent are you satisfied or dissatisfied with the ability of your ATP to foster relationships between the students in your ATP and the athletic training faculty? a. Very dissatisfied
 - b. Dissatisfied
 - c. Neutral
 - d. Satisfied

 - e. Very satisfied

- 23. To what extent are you satisfied or dissatisfied with the ability of your ATP to foster relationships between the students in your ATP and clinical instructors?
 - a. Very dissatisfied
 - b. Dissatisfied
 - c. Neutral
 - d. Satisfied
 - e. Very satisfied
- 24. To what extent are you satisfied or dissatisfied with the quality of academic advising for the students in your ATP?
 - a. Very dissatisfied
 - b. Dissatisfied
 - c. Neutral
 - d. Satisfied
 - e. Very satisfied

- 25. To what extent do you agree or disagree with the following statement, "The majority of the students in my ATP have sufficient time to themselves away from athletic training?
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 26. Please provide any additional comments or rational behind your responses for this section of questions.

Abbreviations: AT, athletic training; ATP, Athletic Training Program; CAATE, Commission on Accreditation of Athletic Training Education; NAIA, National Association of Intercollegiate Athletics; NCAA, National Collegiate Athletic Association; PT, physical therapy.