

Relationship between Program and Faculty Characteristics and Success on the Board of Certification Examination

Context: When comparing success for health care professionals on certifying exams, Athletic Trainers perform lower. Other professions have identified predictors of success on their respective exams; however, Athletic Training (AT) has yet to do so. **Objective:** To determine the relationship between characteristics of Athletic Training Education Programs (ATEP), Program faculty and success on the Board of Certification Examination (BOC). **Design and Setting:** Survey. **Patients or Other Participants:** We solicited responses from the program directors (PD) of all 363 entry-level ATEPs and 38-52 PDs responded to various questions. We analyzed all completed responses for each item. **Data Collection:** We developed an internet survey to obtain information about each ATEP, PD, and program faculty. We emailed an invitation to all ATEP PDs to participate, which included a link to the survey. **Analysis:** We used a Spearman's rho to determine relationships between program and faculty characteristics and success on the BOC. We used descriptive means, frequencies and cross tabulations to determine the demographics. **Results:** The first time BOC success rate was 70.25±18.19%. PDs varied in age (43±9 years) and teaching experience (21±10 years). ATEPs reported having several faculty (5±3 members) with many years of teaching experience (11±5 years). The number of students in the program (19±10 students) moderately correlated ($r=0.464$, $p=0.003$) with the average number of clinical sites (15±8 sites). The number of clinical site types (4±2 types) failed to correlate with the number of students ($r=-0.281$, $p=0.087$), but moderately correlated with first time BOC success rate ($r=0.390$, $p=0.007$). **Conclusions:** The variety of clinical sites a program offers correlates with first time pass rate on the BOC. The number of clinical sites correlated with number of students in the program, but did not correlate with BOC success. **Key Words:** ATEP, pass rate, experience

Introduction

Athletic Training (AT), much like other health care professions, such as Physical Therapy, Occupational Therapy, Nursing, and Physician Assistant, employs similar educational practices that culminate in a student's preparation of a national qualifying/certification examination. However, comparing the national averages for health care professionals on the respective certifying exams, Athletic Trainers demonstrate considerably lower success.¹ National certifying examinations are often used as a barometer to measure educational success, in addition to ensuring public safety. Unlike AT, Physical Therapy, Physician Assistants, Nursing, and Occupational Therapy all have evaluated the determining characteristics that predict success on the respective certification examinations and some professions use these characteristics to assist in selecting students for program entry.^{2,3} AT currently lacks evidence-correlating predictors of success with passing rates in the BOC examination. This could possibly be a reason that health care professions other than AT have a higher first time pass rate on their certification examination as compared to the Board of Certification (BOC) Examination. The first time pass rate for BOC candidates in 2010 was 60.7%.⁴ Physical Therapy, Occupational Therapy, Nursing, and Physician Assistant all reported pass rates that are at least 20% higher: 80%⁵ 82%⁶, 89.9%⁷, and 94%⁸ respectively.

Research comparing the characteristics of an ATEP to first time success on the BOC is lacking. In fact, no publications assessing passing characteristics have been established since the examination was altered in 2007. Research published prior to 2007 suggests that student demographics, grade point average, and previous exposure to health care fields all were predictive of success on the BOC,⁹ and type of clinical experiences were not predictive of success.^{9,10} Although these findings are consistent with literature from other healthcare

professions, a re-evaluation of the findings since the BOC was altered is warranted. In addition, a need exists for additional research to determine if the role delineation study and CAATE's standards are appropriately aligned and emphasized in ATEPs to maximize student preparation and success on BOC exam.¹¹

The purpose of the current study is to determine the characteristics of ATEP and faculty that correlate with success on BOC.

Methods

We employed a descriptive design using an electronic survey to determine the characteristics of an ATEP that are strong predictors of student success on the BOC examination.

Participants

The participants in this study included Program Directors (PDs) from all 363 CAATE approved ATEPs. CAATE provides a public access website with contact information for all PDs. We received a limited number of responses, 52 in total for a response rate of 14.3%.

Measurements and Instruments

A 40-question internet survey using instrument software (Qualtrics) was created to obtain information regarding ATEP program requirements and demographics. The literature on the effectiveness of internet surveys verified the benefits and/or the possible limitations of using internet surveys. To establish face validity, three experts from AT education with a range of experience from 5-25 years reviewed the questionnaire. The questionnaire was organized into four sections: institutional characteristics (8 questions), program director and faculty characteristics (12 questions), clinical education characteristics (10 questions), and program

outcomes (10 questions). Response types include fill in the blank, drop down, 5-point Likert-scale, multiple choice, and percent scale (Table 1).

Procedures/Protocols

The Indiana State University Board of Human Subjects obtained IRB approval prior to initiation of the study. ATEP PDs email addresses were obtained through publically accessible information on the CAATE website. We emailed an invitation to all ATEP PDs to participate. We explained the purpose of the study and the possible future benefits to the education of AT students. This e-mail included a link to the survey with a request for completion of the survey. We e-mailed a follow up message 7 days following the original email, again with the link to the survey. This email also served as a thank you to participants who already responded and as a reminder to the PDs that have not yet responded. After a three-week window to allow completion of survey, we downloaded all data from the Qualtrics database.

Analysis

We performed statistical analyses using SPSS 18.0. We analyzed characteristics of central tendency to describe the program director and program characteristics. We also used a Spearman's rho correlation to determine the relationship between program passing rates and program/faculty characteristics. All respondents who did not answer the BOC pass rate questions were eliminated.

Results

Fifty-two of 363 surveyed (14.3%) individuals responded to the survey. Variable response rates on individual questions ranged from 31-52 individuals, resulting in a response rate of 8.5% to 14.3%. Of the total number of PDs (n=52), 49 (94%) were from undergraduate programs and three (0.05%) were entry-level master's programs. Forty-nine percent of the

programs were housed at Division 1 universities, 11.8% were from Division 2 universities, 29.4% were from Division 3 universities, and 9.8% were from NAIA institutions. The programs held accreditation for an average of 13 ± 6 years. An average of 20 ± 10 students enrolled in programs the previous year. Students completed the programs in an average of 6 ± 1 semesters. We found that the first time BOC success rate was ($n=48$) $70\pm 18\%$. The average age of the PD in these programs was 43 ± 9 years ($n=48$). The number of years of teaching experience that these PDs had was 21 ± 10 years. The average number of faculty for each program was 5 ± 3 members. Teaching experience for the ATEP staff at each institution was on average 11 ± 5 years (Table 2).

Program Characteristics

The number of students in the program (19 ± 10 students, $n=38$) moderately correlated ($r=0.464$, $p=0.003$) with the average number of clinical sites (15 ± 8 sites, $n=47$). The number of clinical site types (4 ± 2 types, $n=47$) failed to correlate with the number of students in the program ($r=-0.281$, $p=0.087$), but moderately correlated with first time BOC success rate ($r=0.390$, $p=0.007$). We did not find relationships among GPA (3.22 ± 0.28), semesters in the program (6 ± 1 semesters), clinical hours (870 ± 328 hours), number of students in the program (19 ± 10 students), or number of clinical sites (15 ± 8 sites) with first time BOC success rate (Table 3 & Figure 1).

Faculty

Cross tabulations revealed that of the 19 male PDs, 13 earned a Master's degree and six earned a Doctoral degree. Among the 33 women, 11 earned a Master's degree and 22 earned a Doctoral degree. We used Spearman's rho to identify that the age of the Program Director ($n=48$) correlated with number of years of teaching experience of the program director (0.876), $p < 0.05$. We did not find that number of faculty (5 ± 3 members), teaching experience of the PD (21 ± 10

years) or faculty, age of the PD (43 ± 9 years), or terminal degree to be related to first time BOC success.

Discussion

As employment rates for ATs in non-traditional settings continue to rise, students need to be exposed to a wider variety of clinical sites.¹² Similar to past literature, we also found a correlation between the number of clinical sites and first time BOC passing rate ($r=0.390$, $p=0.007$). Different environments such as high schools, hospitals, and colleges may allow students to gain a broader perspective of different athletic training practices. A wide variety of clinical site experiences allows students to observe different clinician's philosophies, variable budgets, exposure to different and new equipment, and also decrease the student to preceptor ratio, which may create an environment more conducive to student learning.¹³ A variety of clinical rotations enhances understanding and ability to apply content knowledge associated with educational competencies and clinical proficiencies.¹⁴ Programs with the ability to outreach to a wider variety of clinical sites should encourage students to explore these options to increase their knowledge of athletic training. By increasing the number of clinical site options a program may increase the chance of first time success on the BOC.

Our variable response rate of 8-14% has made it difficult to generalize our results regarding predictors of success on the NATABOC beyond the current participants. Response rate varied due to the number of respondents who did not complete questions regarding our outcome measure of BOC pass rate. Not surprising, more mature PDs averaged more years of teaching experience than their younger counterparts with a significance of <0.01 and a correlation coefficient of 0.876 ($n=52$).

The number of accredited ATEPs has increased from 82 in 1999¹⁵ to the 363 that we included in our study. Increasing demand for AT educators has also caused an influx of “junior faculty” who take on administrative roles earlier in their career. In one study Perrin is quoted saying, “I can think of no other academic discipline in which junior faculty are placed in administrative roles of this magnitude while at the same time being expected to launch scholarly agendas of teaching and research worthy of promotion and tenure.”¹⁶ Little research has been published assessing the successes and failures of these junior faculty members; however, common themes occur across editorials and life-work balance articles. Themes such as mentoring systems and movement away from tenure-track positions have shown to be more successful and less strenuous on program administrators. One study suggests that institutions with formalized mentoring programs in PT programs were more likely to be successful with promotion and/or tenure. They also found a significant relationship between promotion success at institutions requiring student involvement in faculty-developed research projects.¹⁷ An article by Perrin suggested that academic leaders should consider creative and alternative academic appointments for young (and even seasoned) PDs and that the PD’s research program should focus on curriculum and instruction by utilizing the students as the director’s population and laboratory.¹⁶ Although these alternative academic appointments have not shown to enhance student success, having the PDs and other faculty engage in pedagogical research with their own students may lead to increases in student success.

In our study, 63.5 percent of the respondents (PDs) were female, which is more than 15% higher than the percentage of PD respondents in previous studies.¹⁸ 48% of current PDs are female, causing some speculation as to our response rate of 63.5% female. Our respondents’ possession of a doctoral degree (53.8%) is similar to past research;¹⁸ however, 66% of the

females possessed a doctorate compared to only 31.6% of males. No previous study has analyzed percentages of males and females with regards to terminal degrees. In a study done by Peterson all of the respondents were PT faculty, 64.9% were female and of all respondents 72% possessed a doctoral degree.¹⁷ Studies have suggested that females tend to be more helping and altruistic, especially in nurturing situations that resemble helping family.^{19,20} Our initial contact with the PDs consisted of a formal letter expressing this as a thesis project; women may have felt more obligated to assist us with their data because of their more altruistic tendencies.^{19,20} We are unsure if the delineation of genders among PDs is an accurate representation of the sample.

We did not investigate the relationship between faculty members who also had clinical responsibilities at their respective institutions and how that may influence student success. Furthermore, we did not investigate the number of years as a certified athletic trainer in comparison to the number of years of teaching experience. Thus, an assessment regarding the relationship between “real-world” clinical experience and its role influencing student success did not occur but may have increased the richness of the data and should be investigated in the future. To date, research suggesting that prior clinical experience before transitioning to academia plays a role in student success does not exist. However, information on faculty member’s prior experiences to teaching may be crucial to understanding how faculty clinical experience is integrated into curriculums and courses. Students gain motivation and better understanding through the use of real-life scenarios and authentic experiences in the classroom setting.¹⁴ The role of clinical education and use of authentic experiences in the classroom may play a vital role in student success on the BOC. Student success on the BOC could also be related to the number of hours of clinical experience and student preceptors, but this information could not be interpreted due to the lack of responses.

Although we were unable to identify a relationship between number of faculty and first-time passing rate, there are examples in literature where a small student to faculty ratio typically results in better educational outcomes.¹³ Previous research indicates that the number of full-time faculty, faculty with terminal degrees and years of teaching experience are predictors on the National Physical Therapy Examination-Physical Therapy Assistant.¹² Currently student to faculty ratio that predicts student success in AT is lacking. The ratios in our study indicated a 1:4 faculty to student ratio, which may suggest that small class size and a more individualized teaching method may be beneficial to student success. One study suggests that there is no significance in PA programs with respect to the number of faculty with doctoral degrees and total number of full-time faculty to be predictors of success on the Physician Assistant National Certifying Examination.¹³ Of the 1,095 full-time faculty, only 19% possessed a doctoral degree. Results did indicate that PA student to faculty ratio was a predictor of student success (1:5.7), as well as programs conferring a master's degree (91% of all programs conferred a master's degree) with a mean number of full-time faculty of 7.8 and a mean of 44 students per program. Previous literature in other allied health professions has found positive correlations between programs that award masters' degrees to their students and passing rates. Our current study included institutions with entry-level master's programs; however, we did not evaluate the difference in passing rates between entry-level master's and bachelor degree programs due to low number of responses.

GPA has been found to be a predictor of exam success for other allied health care professions such as nursing, physical therapy, and physician assistant.²¹⁻²⁴ Prior to the educational reform in 2004, researchers in AT identified the same pattern of GPA as a predictor of BOC success.^{21, 23} In 2004, academic variables were the strongest predictors of first-time

success on the overall NATABOC Certification Examination and its component sections. In our study, we did not find a significant correlation between student GPA and BOC success. Our results may indicate this because of the recent changes to the BOC. Future research may find the exact reason for this change in predictive variables.

Limitations

Formatting changes on the board of certification exam within the last ten years could account for variance in passing rates. The combination of entry-level masters' and undergraduate programs together is unique to the athletic training profession and could be a limiting factor when comparing passing rates across other allied health care professions. The limited number of responses increases difficulty in identifying connections between program and faculty characteristics and success on the BOC.

Conclusion

The variety of clinical sites a program offers moderately correlates with first time pass rate on the BOC and therefore should be explored as a critical component in athletic training educational curriculum. Athletic training students should have a diverse clinical experience to allow for increased practice and application opportunities, thereby providing more knowledge and skill acquisition and improved scores on the BOC. The number of students in the program did not affect BOC passing rates and therefore program size should be viewed as a function of institutional and faculty capacity and effectiveness but not necessarily ability of students to pass the BOC. We did not find a relationship between faculty characteristics and BOC pass rate indicating that perhaps ability to disseminate information and instruct students may not be correlated to specific faculty characteristics such as age, degree or experience. Thus,

employment of faculty should be based on institutional needs and fit but perhaps not pre-identified characteristics desired to improve passing rates.

Other health-care professions continue to have a higher pass rate on their individual certification exams. To improve BOC passing rates an assessment of student success should be further investigated with a greater number of respondents and the addition of faculty experiences prior to education. As new accreditation standards and competencies are added to athletic training education, continued assessment of student success and variables that enhance students' outcomes is warranted.

Table 1. Questionnaire Items

Section	Item	Response Type	
Institution	Carnegie Classification	Multiple Choice	
	Athletic Division	Multiple Choice	
	ATEP Location	Multiple Choice	
	Admission Standards	Fill in the Blank	
	ATEP Accreditation	Drop Down	
	Type of Program	Multiple Choice	
	BOC First Time Pass Rate	Fill in the Blank	
	Overall BOC Pass Rate	Fill in the Blank	
Program director and faculty	Age	Fill in the Blank	
	Gender	Multiple Choice	
	Terminal Degree	Multiple Choice	
	Athletic Training Experience	Drop Down	
	Program Director Experience	Drop Down	
	Teaching Experience	Drop Down	
	Time Breakdown	Percent Scale	
	Number of Faculty	Drop Down	
	Male/Female Faculty	Fill in the Blank	
	Faculty Degrees/Credentials	Fill in the Blank	
	Faculty Teaching Experience	Drop Down	
	Breakdown of Faculty responsibilities	Percent Scale	
	Clinical education	Clinical Coordinator	Multiple Choice
		Clinical Education	Drop Down
Clinical Hours		Fill in the Blank	
Number of Clinical Sites		Drop Down	
Type of Clinical Sites		Multiple Choice	
Number of ACIs total		Drop Down	
Number of ACIs at home Institution		Drop Down	
Clinical Staff Teaching responsibilities		Fill in the Blank	
Use of GAs		Multiple Choice	
Number of GAs		Drop Down	
Program outcomes	Credit Hours for Graduation	Fill in the Blank	
	Pre-professional Semesters	Drop Down	
	ATEP Semesters	Drop Down	
	Students Enrolled Total	Drop Down	
	Internship	Multiple Choice	
	GPA Requirements	Percent Scale	
	Maximum Number of Students	Drop Down	
	Students Enrolled Last Year	Drop Down	
	Students Graduated	Drop Down	
	Time Spent Preparing for BOC in class	Fill in the Blank	
	Percent of Students who Sit for Exam within One year	Fill in the Blank	

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