



*Original Research*

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## **An Analysis of Confidence Levels in Athletic Training Students During the Coronavirus Pandemic**

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### ABSTRACT

*International Journal of Exercise Science* 16(3): 1284-1292, 2023. Background: The COVID-19 pandemic created a challenge to athletic training students, with many classes converted to online education, and many clinical experiences interrupted. These changes may have negatively affected the confidence level of athletic training students in their athletic training skills. Purpose: To determine if athletic training students' educational experiences during the COVID-19 pandemic have impacted their confidence levels in completing athletic training skills. Procedures: A cross-sectional design using an online survey of 56 athletic training students from 33 CAATE accredited athletic training programs was used. The survey consisted of questions about the percentage of online learning, didactically and clinically, during the pandemic and confidence levels for skills within the five athletic training domains. Descriptive statistics were calculated, and factorial ANOVAs were used to analyze the level of confidence by semester of clinical experience. Main Findings: Factorial ANOVA demonstrated lower perceived confidence levels for students who had more online clinical experience for the following domains: injury and illness prevention and wellness promotion, therapeutic intervention, and healthcare administration and professional responsibility. Confidence was also lower in correctly performing the clinical skills for evaluating spine and torso, developing and implementing a rehabilitation program for the lower extremity, and developing and implementing a rehabilitation program for the back. Principal Conclusion: Athletic training students who had large portion of their clinical and classroom experience online had perceived lower levels of confidence in performing clinical and administrative skills. Online learning may influence athletic training students' confidence level in performing athletic training skills.

**KEY WORDS:** Clinical education, didactic instruction, online learning

### INTRODUCTION

The training and education Athletic Trainers (ATs) receive enable them to be employed in settings where they treat any number of injuries and conditions, including catastrophic injuries (13). As a result, it is important for athletic training students (ATS) to be confident in their skills and abilities. With the help of athletic training educators, ATS have the opportunity to participate in a diversified clinical experience with multiple opportunities for clinical care (5, 15). Through these experiences, ATS increase their confidence through integration of theoretical

knowledge and repeated execution of clinical skills (18). Studies have shown increased clinical experience will lead to increases in confidence among healthcare providers (23). Increasing confidence in ATS can help prepare them for independent clinical care by allowing the students to visualize their own strengths and interests as clinicians based on varied clinical experiences which are crucial in developing the confidence in skills and abilities (3). The readiness for autonomy is apparent when ATS find their niche in clinical care, bolstering their confidence as they enter the profession.

During the coronavirus (COVID-19) pandemic, many schools and sport teams took drastic preventative measures including suspension or closures of school sports and sports clubs (19). The ATS were impacted severely as clinical sites were no longer open for athletic participation thus dampening the opportunity to practice the clinical skills necessary for their future careers (8, 24). Furthermore, some athletic training educators were forced to transition their classrooms online delivering all classroom and lab materials through video conferencing, virtual presentations, and recordings (12). These changes had the potential to impact confidence in ATS.

The purpose of this study was to explore the ATS' experiences during the COVID-19 pandemic and examine their confidence levels regarding their skills and abilities as an ATS. It was hypothesized that the ATS were affected by the COVID-19 pandemic resulting in a decrease in their confidence in skills and abilities.

## **METHODS**

### *Participants*

The participants in this study were students enrolled in a Commission on Accreditation of Athletic Training Education (CAATE) accredited professional Athletic Training Program (ATP) in the United States (US) in the 2020-2021 academic year as of Spring 2021. The exclusion criteria were ATS enrolled in ATPs which were seeking accreditation, on probation for noncompliance, or ATS enrolled in post professional or residency programs. All participants were required to consent to the study prior to completing the survey. If a participant did not consent, they were not given the study to complete. This research was carried out fully in accordance to the ethical standards of the International Journal of Exercise Science (21). Approval for the study was granted by the IRB office of the California State University, Long Beach.

Following IRB approval, 61 participants were recruited ( $n = 61$ ) from 33 ATPs. Five of the total number of participants did not complete the survey past consent and demographic information and therefore were excluded from the data analysis. Out of the 56 included participants, 39 ( $n = 39$ ) were from a bachelor's level ATP and 17 ( $n = 17$ ) were from a master's level; 20 ( $n = 20$ ) were male, 35 ( $n = 35$ ) were female and 1 ( $n = 1$ ) was other. The mean age was  $24 \pm 4.4$  years ( $n = 56$ ). The majority of the participants were from California ( $n = 16$ ) or North Carolina ( $n = 15$ ).

### *Protocol*

A novel cross-sectional survey instrument was created for this project. The survey included a demographic portion to provide background information of the ATS and their ATP. The segment included questions asking their gender, age, ethnicity, and program details (6, 9, 14, 22, 28). Additionally, questions asked their education history and how much of their athletic training clinical and athletic training didactic (classroom) education were online during the semester-based time periods being investigated.

The second half of the survey used questions to assess the level of ATS confidence based on the five domains of athletic training and previous studies of confidence (20). Each domain had four questions regarding the subject's confidence levels in correctly performing the clinical skills necessary for the domain. Each question consisted of asking their perceived levels of confidence at each of the following times: March 2020, August 2020, December 2020, Spring 2021. Examples of the questions include:

How confident are you in correctly performing the clinical skills for the domain of injury and illness prevention and wellness promotion? - In March 2020.

How confident are you in correctly performing the clinical skills for the domain of injury and illness prevention and wellness promotion? - In August 2020

The survey was piloted to 14 recent alumni from an ATP prior to survey roll-out to ensure the ease of readability and understanding of the survey. Feedback was received for one week, resulting in minor changes to the structure and wording of the survey for ease and understanding of the questions.

Prior to Institutional Review Board (IRB) approval, a total of 330 ATPs from across the United States were identified as meeting the study's inclusion criteria. Each program director from these institutions was sent an email asking for permission to allow recruitment and participation of their students in the ATP. From the original list of 330 ATPs, permission letters were obtained from 33 ATPs. Following IRB approval, an initial email was sent to all 33 ATPs program directors, containing a detailed explanation of the research, a summary of the project, the link for the survey and a request to distribute to the students. All direct communication with participants occurred between the program directors and participants. A follow up email was sent to the program directors two weeks after the initial email, and a third and final follow up email was sent to program directors just prior to the survey closing. The survey was available for a total of four weeks.

#### *Statistical Analysis*

Descriptive statistics (i.e., means, modes, standard deviations and percentages) were used to describe the demographics of the study participants. Factorial ANOVAs were also performed to investigate if levels of confidence were affected by the number of semesters of clinical experience, the length of time the ATS were enrolled in their ATPs, and how much their clinical and classroom experience was online. Groups were created based on their online experience

percentage of 0 to 100%. The low levels of online experience ranged from numbers 0 to 39.99%, medium levels ranged from 40.00 to 79.99%, and high levels ranged from 80.00 to 100.00%. Post hoc tests were performed using Tukey's HSD tests comparing the three groups to each other to determine which of the groups within the factorial ANOVAs had statistical significance. The a priori  $\alpha$  was set at  $p = 0.05$ . Statistical analysis was performed with IBM SPSS Version 27.

## RESULTS

The baseline number of participants for the analyses was  $n = 56$ , however, this varied by the number of respondents per question. At the time of the survey in Spring 2021, ATS had completed a mean of 4.5 semesters of their ATP, with a mode of 3 semesters while the required number of semesters of clinical experience required by the ATP was a mean of 5.2 with a mode of 6. The percentage of time exposed to online clinical experience and didactic education from prior to March 2020 through Spring 2021 is outlined in Table 1.

**Table 1.** Student Online Experience prior to March 2020 through Spring 2021

How much of your athletic training clinical experience was online?	Semester Mean $\pm$ SD
Prior to March 2020 ( $n = 18$ )	4.4% $\pm$ 11.9
March 2020 to July 2020 ( $n = 28$ )	64.46% $\pm$ 44.89
August 2020 to December 2020 ( $n = 32$ )	32.62% $\pm$ 39.49
Spring 2021 ( $n = 32$ )	24.28% $\pm$ 30.51
How much of your athletic training didactic (classroom) education was online?	Semester Mean $\pm$ SD
Prior to March 2020 ( $n = 20$ )	21.75% $\pm$ 33.6
March 2020 to July 2020 ( $n = 37$ )	95.45% $\pm$ 15.6
August 2020 to December 2020 ( $n = 42$ )	69.52% $\pm$ 34.8
Spring 2021 ( $n = 39$ )	45.48% $\pm$ 28.0

Students who completed more of their clinical experience online had a perceived lower confidence level in the Spring 2021 timeframe for the following domains: Domain 1. injury and illness prevention and wellness promotion ( $F = 4.138$ ;  $p = 0.027$ ); Domain 4. therapeutic intervention ( $F = 7.813$ ;  $p = 0.002$ ) and Domain 5. healthcare administration and professional responsibility ( $F = 5.711$ ;  $p = 0.009$ ) (See Table 2). In regards to skills within the individual domains, their confidence level was perceived as lower in correctly performing the clinical skills for evaluating spine and torso ( $F = 6.542$ ;  $p = 0.005$ ), developing and implementing a rehabilitation program for the lower extremity ( $F = 3.610$ ;  $p = 0.041$ ) and developing and implementing a rehabilitation program for the back ( $F = 4.714$ ;  $p = 0.018$ ) (See Table 3). Furthermore, from separate questions those who had increased online didactic education they had perceived lower levels of confidence in correctly performing the clinical skills necessary for developing and implementing a rehabilitation program for the lower extremity ( $F = 3.953$ ;  $p = 0.028$ ) and developing and implementing a rehabilitation program for the upper extremity ( $F = 4.158$ ;  $p = 0.024$ ).

**Table 2.** Online Clinical Experience and Confidence Level per Domain (Spring 2021)

Domain	Online Clinical Experience	Level of Confidence (Mean ± SD)	F-statistic	p value
Domain 1	High	1.500 ± 0.707*	4.138	*0.027
	Medium	2.500 ± 0.534		
	Low	2.700 ± 0.571*		
Domain 2	High	2.500 ± 0.000	1.289	0.292
	Medium	2.500 ± 0.534		
	Low	2.650 ± 0.587		
Domain 3	High	1.500 ± 0.707	2.653	0.089
	Medium	2.500 ± 0.756		
	Low	2.500 ± 0.513*		
Domain 4	High	1.500 ± 0.707*	7.813	*0.002
	Medium	2.250 ± 0.707*		
	Low	2.800 ± 0.410		
Domain 5	High	1.000 ± 0.000*	5.711	*0.009
	Medium	2.000 ± 0.756		
	Low	2.350 ± 0.489*		

\*level of confidence mean difference  $p > 0.05$

**Table 3.** Online Clinical Experience and Confidence Level per skill (TODAY)

	Online Clinical Experience	Level of Confidence (Mean ± SD)	F-statistic	p value
Evaluate lower extremity	High	2.500 ± 0.707	0.664	0.523
	Medium	2.875 ± 0.356		
	Low	2.800 ± 0.410		
Evaluate upper extremity	High	1.500 ± 0.707	2.016	0.154
	Medium	2.286 ± 0.487		
	Low	2.350 ± 0.587		
Evaluate spine and torso	High	1.000 ± 0.000*	6.542	0.005
	Medium	2.000 ± 0.577		
	Low	2.211 ± 0.419*		
Implement rehabilitation for lower extremity	High	2.000 ± 0.000	3.610	0.041
	Medium	2.375 ± 0.744		
	Low	2.800 ± 0.410		
Implement rehabilitation for upper extremity	High	2.000 ± 1.414	0.834	0.446
	Medium	2.289 ± 0.755		
	Low	2.550 ± 0.605		
Implement rehabilitation for back	High	1.000 ± 0.000*	4.714	0.018
	Medium	2.000 ± 0.577		
	Low	2.211 ± 0.535*		
Implement rehabilitation using	High	2.000 ± 1.414	0.281	0.758
	Medium	2.429 ± 0.786		

therapeutic modalities	Low	2.400 ± 0.681		
Operate and maintain AT facility	High	2.500 ± 0.707		
	Medium	2.000 ± 0.534	0.491	0.617
	Low	2.050 ± 0.686		

\*level of confidence mean difference  $p > 0.05$

In regards to interaction between the clinical and classroom experience, the perceived confidence levels in correctly performing the clinical skills needed for operating and maintaining an athletic training facility was higher for those with a greater amount of clinical experience up to December 2020 and the total number of semesters in which an Athletic Training Student was enrolled ( $F = 3.813$ ;  $p = 0.032$ ). Confidence levels among participants for correctly performing the clinical skills in the domain of immediate and emergency care (Domain 3) was significantly lower for students whose both clinical and classroom experience was primarily online ( $F = 3.800$ ;  $p = 0.027$ ). (See Table 2)

## DISCUSSION

The findings indicate that increased amounts of clinical experience and a higher total number of semesters enrolled in the ATP positively influence ATS' confidence levels in correctly performing the skills necessary in each athletic training domain. These findings support high or positive levels of confidence when participating in more clinical experiences. More clinical experiences offer more responsibility, reflections, and autonomy, promoting positive levels of confidence as an ATS, enhancing the transition to professional practice (27). Previous research suggests this is because ATS will be able to experience a diverse set of clinical experiences and enjoy having these opportunities (4, 6, 7, 17). The variety in clinical experiences allows the ATS to be better prepared for the transition to working as an AT (6, 7). The breadth of clinical experiences help ATS to be successful through hands-on preparation as well as promoting positive confidence levels towards the real life experiences with more opportunities to see the various responsibilities performed (6, 17). Developing higher or positive levels of confidence is more apparent the longer an ATS is in a program, illustrating the importance of clinical experiences.

The total number of semesters an athletic training student was enrolled in an ATP, the amount of online clinical experience, and the number of semesters of clinical experiences a participant received up to December 2020 had an impact on the confidence levels of ATS in Spring 2021. Students with more perceived confidence with managing and operating an athletic training facility had completed more classroom and clinical experience than those who had less confidence. Those students who had a greater portion of their classroom and clinical experience online had a lower level of perceived confidence in Spring 2021 in performing skills of emergency care. Clinical experience and total time in the ATP were important in preparing the student with the clinical skills necessary as an AT while improving their confidence over the course of their education, as seen in the literature (7, 11, 12, 15).



In the current study, confidence levels were affected by the disruptions to classroom and clinical experiences as a result of the COVID-19 pandemic as ATS demonstrated lower levels of confidence in correctly performing the clinical skills having performed a portion of their clinical experience online. Previous research suggests the low levels of confidence seen among participants in our study could be due to the lack of opportunities for patient interactions at the clinical sites as a result of the closure of sports and schools (1, 2, 10, 16, 25). The limited clinical interactions caused athletic training educators and athletic training clinical preceptors to change the learning platform to adapt to the then current situation (12). This adaptation could have limited the diversity of clinical experiences due to the school and sport closures as the clinical education is a significant contributor to the professional preparation as an AT (27). The lack of diversity among clinical rotations and the disruption of sport because of COVID-19 diagnoses among athletes and teams led to the potential for a decrease in potential patient encounters. Having less encounters with patients would be a potential contributor to lack of confidence in skills such as rehabilitation, where the ATS would only be able to make a theoretical plan as part of course work but would not be able to implement a plan. In addition, skills that are considered more invasive and related to emergency care, such as rectal thermometry, could not be practiced in an online environment (26). Hands-on experiences, active preceptors, and a variety of clinical settings are found to be contributors to the success of clinical education (27). This study echoes previous research as the COVID-19 pandemic affected clinical experiences for the students in healthcare education leading to a perceived lower level of confidence in clinical skills (24).

*Limitations:* The current study had some limitations, specifically the number of participants in the study, and the number of participants answering certain questions. Some questions were limited to a smaller sample size, affecting statistical significance and the study was underpowered. Furthermore, small sample size prevented post hoc tests on some of the statistics, causing a limitation on finding out and in which groups the difference is occurring. Additionally, the participants were from across the country and as the COVID-19 pandemic affected students differently in different areas, the responses may not be generalizable to ATPs as a whole. Some students may have been subject to additional clinical experiences to compensate for the lack of experiences from March 2020 through Spring 2021.

Another limitation is the absence of a pre- and post- tests of students, asking the students to remember how they felt in months prior and during the COVID-19 pandemic. Due to the unpredictability of the COVID-19 pandemic, pre- and post- tests were not able to be performed to gain a more complete picture of the relationships between clinical experiences and the influence on confidence levels of ATS. As a result, the survey asked the ATS how they felt in specific months prior to their current semester, creating snapshots that may not be truly representative of their confidence levels during the COVID-19 pandemic. To compensate for the lack of accuracy, questions regarding their confidence levels in their current semester were developed and implemented.

*Conclusions:* Increased clinical experience and a greater number of total semesters enrolled in an ATP had a positive influence on the confidence levels of ATS during the COVID-19 pandemic when examined separately. When online clinical and classroom experience are increased there

can be a negative influence on the confidence levels of ATS. Those with low amounts of clinical experiences had low levels of confidence compared to those with a higher number of clinical experiences. Furthermore, the current study demonstrated low levels of confidence in ATS who had a large portion of their clinical and classroom experiences online compared to the ATS who had a smaller portion of their clinical and classroom experiences online.

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