Perceptions and Use of the Athletic Training Milestones in Education: A Report from the AATE Research Network

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ABSTRACT

The Athletic Training Milestones (AT Milestones) were developed as an evaluation tool to capture the breadth and depth of athletic training knowledge, skills, and behavior. However, it is unclear whether athletic training programs are implementing this tool or how they are implementing it to gauge the clinical progression of students or residents in athletic training. We aimed to explore the perceptions and use of the AT Milestones among educators in athletic training programs. We used a cross-sectional, web-based survey with open-ended questions to collect data from athletic training programs on if and how they implement the AT Milestones at a programmatic level. We recruited program/residency directors from 352 athletic training programs in November 2021; representatives from 101 programs accessed the survey (28.7% access rate) and 89 completed the survey (88.1% completion rate). A rigorous, multi-phase consensual qualitative research approach was used to analyze the textual data. Of the 89 programs represented, 60.1% (n=54) indicated they did not use the AT Milestones, while 39.9% (n=35) did. Three themes emerged from the open-ended responses provided by program representatives who did implement the AT Milestones: modes of use, value-added, and frequency of use. Participants detailed how the AT Milestones were used as a student self-assessment measure, a tool to evaluate a student's clinical experience performance, and a measure to evaluate course performance. Participants described that the AT Milestones add value to the educational experience by providing a continuum, contributing to the programmatic framework, and promoting a standardized assessment structure. Finally, participants described the frequency of use of the AT Milestones across their programs, ranging from once a year to after the completion of every clinical rotation. Athletic training educators looking for a useful assessment tool to address student progression on a continuum should consider implementing the AT Milestones into their programmatic framework.

Content Focus
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INTRODUCTION

Competency-based education is an outcome-oriented process by which students are assessed on a continuum of behaviors or activities to determine their readiness for independent practice.[1] Although athletic training educators are trying to implement competency-based education, research suggests they are not actually doing so.[1–3] This failure of implementation may be caused by confusion about the actual definition of competency-based education or by the lack of awareness of tools to measure competence in athletic training.

The Athletic Training Milestones (AT Milestones)[4] were created by a group of athletic trainers to address the need for competency-based education in athletic training education. When developing the milestones, the AT Milestones development group considered the educational outcomes

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identified by the Accreditation Council for Graduate Medical Education for measuring performance in the 6 domains of clinical competency associated with medical education.[5] The Accreditation Council for Graduate Medical Education also provided a list of benefits associated with the development of a national framework for assessment that included the creation of comparison data across programs and professions to enhance the quality of education and improve the quality of patient care.[5] The creators of the AT Milestones mimicked this process by identifying 8 domains of practice for individual competencies and developing a 6-level continuum that ranged from "critical deficiency" to "expert."[4] A national framework for assessment in athletic training has the potential to generate data across athletic training education programs, allowing researchers to compare and assess the quality of education and development of athletic trainers along the continuum of their education, prior to credentialing, as well as throughout the lifespan of their career.

Recently, researchers assessed the validity of the AT Milestones and reported the tool had excellent content validity across items and scales.[6] Theoretically, widespread adoption and use of the AT Milestones could provide educators with a competency-based framework to assess student readiness for independent practice. Although the AT Milestones have been available for over five years, little data has been collected to determine how athletic training educators perceive this instrument or the extent of its use in athletic training programs. Therefore, the purpose of our study was to explore the perceptions and use of the AT Milestones among educators in athletic training programs.

METHODS

We used a cross-sectional, web-based survey design with open-ended questions to explore perceptions and use of the AT Milestones. Because of the open-ended survey items, textual data were analyzed using a systematic 4-phase consensual qualitative research (CQR) process described by Hill et al.[7,8] We used CQR for data analysis because of its rigorous consensus process, use of multiple researchers, and inclusion of auditors to ensure the credibility of the data and comprehensive representation of the participant's voice in findings.[7,8] The current study was deemed exempt by the A.T. Still University Institutional Review Board.

Participants

Educators were recruited from professional and post-professional degree and residency programs accredited by the Commission on Accreditation of Athletic Training Education (CAATE) at the time of the study (N=382). The survey was designed to be completed only once per program, so a single survey link was sent to each program or residency director. If the program had another faculty member who was better able to complete the survey about the AT Milestones, the director was asked to forward the survey link to that individual.

Instrumentation

Since no existing surveys were appropriate for the study, our research team developed a short, web-based survey using Qualtrics (Provo, UT). The survey included 10 demographic questions and 4 open-ended items (**Figure 1**). The open-ended items were intended to explore the perceptions and use of the AT Milestones within each athletic training program or residency. Because the survey used skip logic, only participants who indicated their program used the AT Milestones were asked to complete the open-ended items. After development, the survey was reviewed for face and content validity by three athletic training educators who were familiar with survey research design and the AT Milestones. Using an established validation process,[9] each individual was asked to assess the comprehension and readability of the survey items, evaluate the inclusivity of close-ended

survey item selection choices, and provide an estimation of the time to complete the survey. Based on the reviewers' feedback, no changes were made to the instrument. The survey was estimated to take approximately 10 to 15 minutes to complete, depending on the thoroughness of participant responses. Given the nature of the open-ended items in the survey, we determined a reliability analysis was unnecessary.

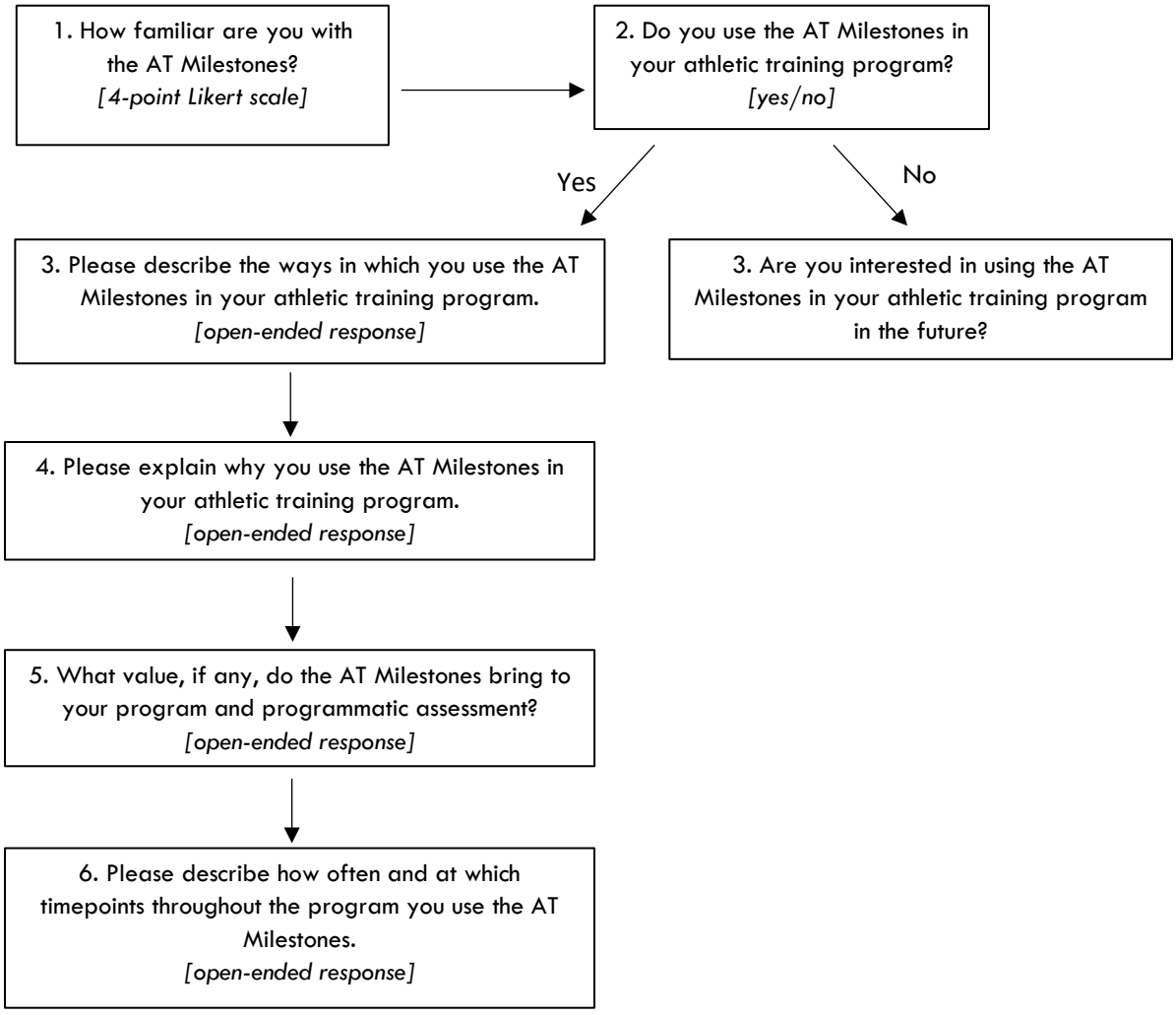

Figure 1. Flow of Open-Ended Survey Items

Procedures

We sent a recruitment email to each program or residency director of CAATE-accredited athletic training programs in November 2021 (**Figure 2**). The email included the purpose of the study, the number of items in the survey, the estimated time to complete it, a unique URL link to the web-based survey, and a request to have the most qualified individual in the program complete the survey. Individuals were given six weeks to voluntarily complete the survey; 2 reminder emails were sent during that period. Of the 382 identified programs, 24 duplicate email addresses were identified

and removed; 6 email addresses were identified as undeliverable. Therefore, the initial recruitment email was sent to 352 athletic training programs.

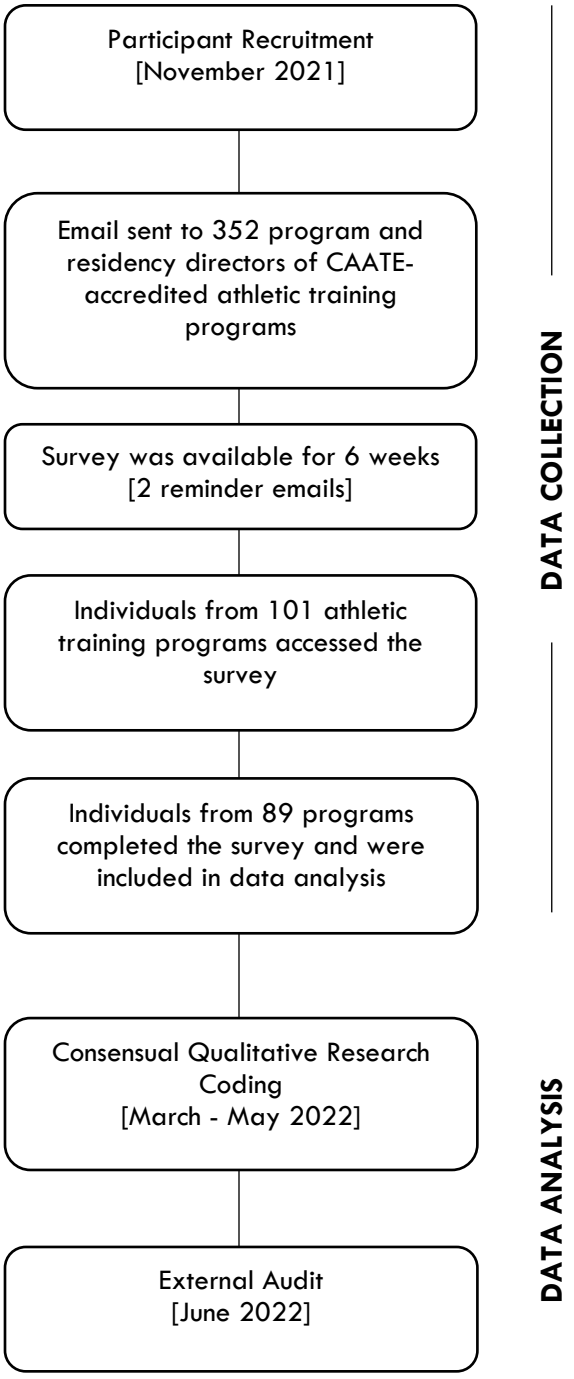

Figure 2. Study Procedures Flowchart

According to the guidelines of exempt research and best practices for survey research, participant consent was implied by their voluntary completion of any portion of the survey, and participants were not required to answer every question.[10,11]

Data Analysis

All responses were included in data analysis as long as the participant responded to at least one survey item. Because skip logic was used in the survey, the number of responses varied by item: the total number of items for each participant depended on previous responses. Further, because participants were not required to answer every survey item, some chose not to respond to particular items. Descriptive statistics (i.e., frequency, percentage, mean, and standard deviation) or close-ended survey items were analyzed using SPSS version 27 (IBM Corporation), and all open-ended survey items were analyzed using the CQR approach.[7,8]

To ensure consensus, the CQR approach uses a multi-analyst research team.[7,8] Therefore, we used a 5-person team to establish consensus and minimize potential researcher bias during data analysis. Three team members (CEWB, BEA, JMC) were involved in every phase of analysis, and the other two members served as internal (LEE) and external (BLV) auditors.

During the first phase of data analysis for open-ended survey items, the 3 team members independently reviewed responses from the first 15 participants and developed an initial codebook. The team met to discuss each individual's coding and compiled a consensus codebook of themes and categories.

To confirm the consensus codebook, each team member independently coded responses from the next 10 participants that completed the survey, and then the team met again to confirm the coding and establish consensus. Next, the 3 team members coded all remaining participant responses and

met to confirm all codes. After these first 3 phases of data analysis were completed, the internal auditor conducted a comprehensive review of the analysis and findings to establish the credibility of the identified themes and categories. After the internal audit review, two categories were collapsed to minimize redundancy, and one category was removed because of a lack of saturation. We used the Consolidated Criteria for Reporting Qualitative Research[12] to ensure study findings were comprehensively reported, and the external auditor reviewed all final findings to ensure the participant's voice was appropriately represented.

RESULTS

Of the 352 athletic training programs that sent recruitment emails, individuals from 101 (access rate=28.7%) programs accessed the survey. Individuals representing 89 (completion rate=88.1%) programs in 36 states (1 missing data) completed the survey and those responses were included in data analysis. The demographic characteristics of participants are presented in **Table 1**. The familiarity with the AT Milestones of respondents that do or do not use them in their program is presented in **Figure 3.**

Table 1. Participants' Demographic Information

Variable	n (%)	Mean ± SD
Age	89 (100)	44.3 ± 8.2
Years Certified as an AT	89 (100)	21.1 ± 7.8
Years of Clinical Practice	89 (100)	13.9 ± 7.9
Years as an Educator	89 (100)	15.3 ± 8.3
Years in Current Position	89 (100)	9.9 ± 7.5
Gender		
Woman	51 (57.3)	
Man	37 (41.6)	
Prefer not to respond	1 (1.1)	
Highest Degree Attained		
Bachelor's degree	0.0 (0)	
Master's degree	14 (15.7)	
Clinical Doctorate	12 (13.5)	
Academic Doctorate	62 (69.7)	
Professional Degree (e.g. MD, DO)	1 (1.1)	
Primary Role		
Program/Residency Director	81 (91.0)	
Clinical Coordinator	7 (7.9)	
Core Faculty Member	1 (1.1)	
Type of Athletic Training Program		
Professional program	77 (86.5)	
Post-professional degree program	3 (3.4)	
Residency program	5 (5.6)	
Both professional and post-professions programs	4 (4.5)	

Of the 89 completed surveys, 54 individuals indicated their program did not use the AT Milestones. These participants represented 50 institutions with a professional athletic training program, one institution with a post-professional athletic training degree program, two institutions with professional and post-professional athletic training degree programs, and one athletic training residency program. When asked whether they were interested in using the AT Milestones in the future, 18 (33.3%) reported they were interested, 4 (7.4%) were not interested, and 31 (57.4%) were unsure (1 missing data).

Thirty-five individuals from the 89 programs indicated their program used the AT Milestones. These participants represented 27 institutions with a professional athletic training program, two institutions with a post-professional athletic training degree program, two institutions with professional and post-professional athletic training degree programs, and four athletic training residency programs. Of the programs using the AT Milestones, the mean (SD) number of years using them was 2.2 (1.3) years.

Because their program used the AT Milestones, these respondents were asked to complete the four open-ended survey items. However, five did not provide responses; responses from seven participants were unclear and were removed from the analysis. Therefore, 113 open-ended responses from 30 respondents (a maximum of 4 responses per participant) were included in the qualitative analysis. Three themes were identified during the analysis: modes of use, value-added, and frequency of use.

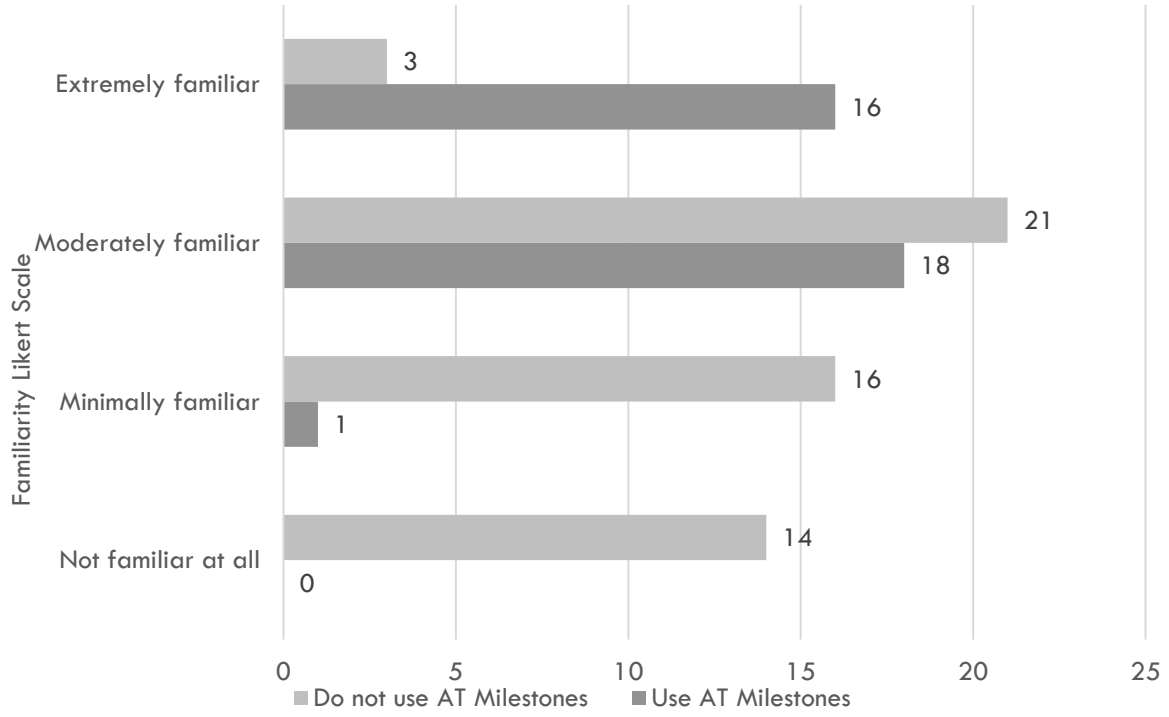

Figure 3. Respondents' Familiarity with the AT Milestones

Modes of Use

Participants identified a variety of ways the AT Milestones were used throughout their athletic training program. During data analysis, 3 categories were identified for this theme: self-assessment, clinical experience performance, and course performance.

Self-Assessment

Participants described using the AT Milestones in their program for student reflection and self-assessment. One participant from a professional program described how the AT Milestones were used to help students assess their own progress in the following way:

> *The AT Milestones help the students prepare for the program by introducing them to the general competency areas and specialty competency areas early on as they self-reflect on their own personal development. The document gives them a framework to guide them in their development and help them decide future employment practice settings.*

Likewise, another participant identified that their professional program used the AT Milestones as "a self-assessment tool for students during each semester of the professional program" and a third professional program participant shared that the AT Milestones were "introduced early to demonstrate how ATs [athletic trainers] can create and assess a professional development plan." Yet another indicated that the tool was integrated into their post-professional program because it "allows students to reflect as to where they feel they are on the various milestones and how they progress throughout their education."

Clinical Experience Performance

Participants described the ways the AT Milestones were used to assess clinical experience performance of students. Specifically, they described how the tool was used to determine student readiness for clinical progression or a need for remediation. One participant from a professional program shared: "We have a clinical competency committee that meets at the end of the year and scores each student on the [AT] milestones. If students are not at the predetermined level of skill, then remediation [activities are] assigned." Similarly, another professional program participant indicated the AT Milestones were used "at the end of the first year to assess student readiness for immersive experiences." Yet another professional program participant described how "The [AT] Milestones help guide clinical placement decisions based on identified deficiencies or areas in need of improvement during students' clinical progressions."

Participants also indicated the AT Milestones were incorporated as a part of the preceptors' assessment of students. One participant from a professional program wrote: "After the student completes their self-assessment, their current preceptor also evaluates the student using the AT Milestones to evaluate the student on their progression during the clinical experience." Another professional program participant indicated the AT Milestones "allow targeted feedback from preceptors to highlight students' strengths and weaknesses and how to improve." One professional program participant discussed the multifaceted approach their program used for the AT Milestones in the following way:

> *Our students perform self-assessments, the preceptors' complete assessments of the students, and the educator uses the AT Milestones to complete assessments of the students as well. Our intention is to use the milestones to see the students' progression over their time in the program as well as to assess the students from both the didactic and clinical aspects to identify areas of improvement.*

Course Performance

Participants also indicated the AT Milestones were used to assess course performance. One participant from a professional program indicated, "The AT Milestones are used in our clinical courses to assess students during our comprehensive practical exams." Another professional program participant described how the AT Milestones were used to evaluate students engaging with standardized patients. Specifically, the participant shared: "We use them to assess student performance with standardized patients at the end of the first year in the program to demonstrate readiness for the second year." Finally, one professional program participant discussed how they incorporated the AT Milestones for course evaluations:

> *We use the AT Milestones as criteria for our assurance of competence exams. We incorporate the competencies from the AT Milestones into our courses, when appropriate, as expectations of learning outcomes and identify the level we expect students to achieve.*

Value Added

The value that the AT Milestones added to athletic training programs was another identified theme. This theme also had 3 categories emerge during analysis: provides a continuum, contributes to the programmatic framework, and promotes a standardized structure.

Provides a Continuum

Several participants discussed how the AT Milestones provided a continuum for students that allowed them to see the trajectory of their professional growth. One participant from a professional program wrote: "We value the AT Milestones and how it will give students a solid framework to monitor their progress during didactic and clinical experiences as they transition to practice and begin to focus on their own professional development." Likewise, another professional program participant indicated: "I think it gives the students a more realistic representation of how they are progressing in the program with their knowledge and skills." One participant from a residency program remarked: "The AT Milestones bring great value to our program because it allows us to supplement our other measures. It gives us another measure to evaluate their knowledge and skills and allows students to measure their own growth."

Participants also described how the AT Milestones promoted conversation among stakeholders about the learning progress of students. One participant from a professional program indicated, "The [AT] Milestones provide an opportunity for students to reflect on their progress and to engage faculty and preceptors in conversations related to their personal assessment and clinical practice improvement." Another professional program participant summarized this aspect of the value of the AT Milestones in the following way:

> *We believe that the AT Milestones reflect the continuum of learning that is experienced by professional athletic training students, instead of the typical "met" or "not met" system that has been historically used. The AT Milestones also reflect holistic patient care, which is a central theme across our program.*

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Contributes to the Programmatic Framework

Participants also discussed how the AT Milestones contributed to their programmatic framework. One professional program participant wrote: "The AT Milestones are one of the major assessment tools we use to provide data for our assessment plan. Additionally, they help us demonstrate compliance with many of the CAATE curricular content standards." Similarly, another participant from a professional program indicated: "They serve as a roadmap for our programmatic outcomes sequencing." Yet another professional program participant described the value the AT Milestones provided to their programmatic framework in the following:

> *The AT Milestones bring the value of providing a framework to assess clinical competency. For years, we have had discussions regarding how well our students were progressing clinically, but we did not have a standardized way to measure and assess their progress. The AT Milestones helped fill that gap for us.*

Our participants also discussed how incorporating the AT Milestones across the program helped program administrators make data-informed decisions. One participant from a professional program shared the following:

> *The AT Milestones provide us with data to drive our decision-making. We review our programmatic framework and strategic plan annually and look at the data from all of our assessments to help us identify areas we are lacking or excelling in. We continually use data from the AT Milestones to improve the quality of what we are teaching.*

Likewise, another professional program participant wrote: "The AT Milestones provide us with objective data points for student and program assessment. These data help us make sure we are meeting our intended outcomes laid out in our programmatic framework and plan."

In some instances, participants highlighted their need to adapt the AT Milestones to fit their programmatic framework and assessment plan. One participant from a professional program explained: "We use some of the wording from the AT Milestones exactly but have also modified some to better align with the needs of our program." Similarly, another professional program participant described how they modified the scoring of the AT Milestones to match their programmatic outcomes. That participant wrote: "We borrowed heavily from the AT Milestones to make our own but adjusted the scores so that a '4' is 'ready to take the Board of Certification exam while a '5' is still considered 'aspirational'." Yet another professional program participant described how they used the AT Milestones as intended but also used them as a template for additional milestones. The participant indicated: "We use the [AT] Milestones as designed, but we also created new milestones for other skills outlined in our assessment plan, such as initiative, communication, and compassion."

Promotes a Standardized Structure

Several participants described how the standardized structure of the AT Milestones was valuable for their program. One participant from a professional program remarked that the primary reason they began to implement the AT Milestones was that: "[T]hey were already created, freely accessible, and provide the consistent language we were interested in for our assessment plan." Likewise, another professional program participant wrote: "The AT Milestones give us a great structure to build into our evaluations instead of 'winging it' and making something up on our own." One participant from a post-professional program discussed the value of the standardized structure

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by commenting: "The AT Milestones provide athletic training specific information on how students feel they are learning and progressing rather than just relying on our generic course evaluations."

Participants also indicated the standardized structure of the AT Milestones strengthened aspects of their program. One participant from a professional program wrote: "Our assessment plan has become more comprehensive. We can draw stronger connections between types of assessments and across the program because we use the AT Milestones within all of our didactic and clinical courses." Another professional program participant indicated: "It allows students to see that learning is a process rather than a discreet task. It also allows faculty members to step back from the details (i.e., can they perform a Lachman's [test]) and look at the learning process at a higher level (i.e., can they conduct an exam specific to a patient's complaints)." Lastly, one professional program participant described how the standardized structure of the rubric in the AT Milestones was valuable for their program in the following:

> *We like the way the AT Milestones are set up as a rubric rather than a simple Likert scale. We believe the rubric makes the evaluation process a bit more objective because the student, the preceptor, and the educator are able to see the criteria used to assign a score. It also facilitates discussions with students and allows us to help students create educational and clinical goals.*

Frequency of Use

For the third identified theme, participants discussed the frequency of use of the AT Milestones across their programs (**Figure 4**). Some participants described implementing the AT Milestones only during matriculation and again at the end of the program. One participant from a professional program wrote: "We use the AT Milestones at the beginning and end of the program for athletic training students. They incorporate it within their own personal goals and development strategies." One professional program participant described more frequent use of the AT Milestones: "We use the [AT] Milestones after our longer clinical rotations. Our students complete 3 of these longer rotations throughout the program. We also use the tool at the end of each year as a summative evaluation for all of our students."

One

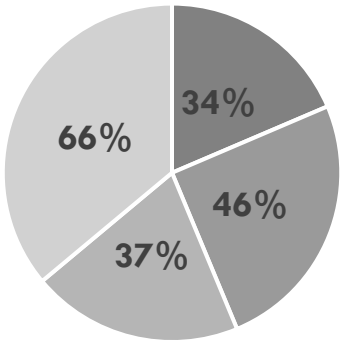

Figure 4. Percentage of Programs that Use the AT Milestones at Various Timepoints Throughout the Program

participant from a post-professional program described even more frequent use of the AT Milestones, specifying they used the tool twice per clinical rotation to assess student progression. That participant wrote: "Our preceptors complete the AT Milestones during every mid-rotation and

end-of-rotation assessment for each student to track how the student is progressing and if remediation is needed."

DISCUSSION

In the current study, we explored the perceptions and use of the AT Milestones among educators in athletic training. Our participants represented multiple program types, and more than half indicated that they did not use or, in some cases, were not familiar with the AT Milestones. Further, only a third indicated they were interested in using the AT Milestones in the future. For those participants who used the AT Milestones, 3 themes were identified during the analysis of our open-ended survey items. Participants identified a variety of modes of use that included self-assessment, clinical experience performance, and course performance. The AT Milestones also added value to programs that used them by providing a continuum, contributing to their programmatic framework, and promoting a standardized structure. Some participants also noted that they adapted the tool to meet the needs of their program better. Lastly, the frequency of use of the AT Milestones varied throughout the curriculum for each program. Some programs used them only at matriculation and program completion. Others used them after each course, clinical rotation, semester, or year in the program. As our findings suggest, there is high variability in how often programs choose to use the AT Milestones within a curricular or clinical progression, and, as such, there is limited discussion to be had surrounding this theme until such a time that the AT Milestones are more readily used throughout AT education.

To date, there are no evidence-based recommendations that exist regarding how frequently the AT milestones should be used to assess competence progression. While the AT milestones were not originally designed for high-frequency use (i.e., weekly, monthly), it is difficult to establish the appropriate timeline for implementation. In medical education, the milestones are considered to be a complex educational intervention, which includes several interacting components.[13] Therefore, individuals interested in implementing the AT Milestones should appreciate the complexity of truly assessing competence progression and, in turn, develop an implementation plan based on the intended goals of the AT Milestones as a comprehensive tool to assess progression over the continuum of professional development and time.

AT Milestone Familiarity and Awareness

Although our qualitative results indicated how the AT Milestones are used in athletic training education, a majority of our participants reported they did not use the AT Milestones at all. Further, 15% of those who responded to our survey reported they were not at all familiar with the AT Milestones. This result is concerning. The AT Milestones were introduced over 5 years ago and have been available to athletic training programs since that time.[4] However, our results suggested their widespread adoption and use have not yet been achieved. Historically, pedagogical practices change very slowly and the implementation of new practices may be considered risky by educators.[14] In such cases, the adoption of new practices may be overwhelming for educators, especially for practices that require a major overhaul of assessment methods and interpretation.[14]

Given these results, we propose examining the adoption of the AT Milestones using the diffusion of innovation theory, which involves 4 components for the widespread adoption of innovative practices.[15] Specifically, the 4 components address the actual innovation, how education about the innovation is communicated to interested parties, the necessary time for adoption of the innovation, and the system or stakeholders the innovation is intended for.[15] This theory specifies that the rate of adoption begins slowly with early adopters and that early adopters may influence the rate of

change in subsequent adopters.[15] Research suggests innovative practices in healthcare programs tend to be slowly adopted because of necessary changes in organizational culture.[16] Thus, at a minimum, adoption of the AT Milestones would require universal agreement across core faculty, associated and adjunct faculty, and preceptors. It would also require major modifications to programmatic assessment practices. As such, it is not surprising that there is not more widespread adoption of this tool. Based on our study results, we hypothesize that the profession is still in the early stages of the adoption process of the AT Milestones. Further, it is possible that education disruptions caused by the COVID-19 pandemic, which impeded assessment practices and professional development opportunities, affected the adoption of the tool across educational programs in athletic training. Therefore, to increase the adoption of the AT Milestones across athletic training education and practice, we should encourage the early adopters to provide clinical leadership and disseminate data that supports the use of the AT Milestones. We should also support the development of program-level infrastructure to migrate the AT Milestones into practice and provide additional resources and information to address and overcome the perceived risks associated with the adoption of innovative practices.[15,16]

Some of the participants in our study who used the AT Milestones described using them to assess the competency of students. Previous researchers[3] defined competency as "a continuum of contemporary professional practice abilities that minimally indicates a provider can provide safe and reliable care on a consistent basis without harm to a patient and maximally indicates expertise in a given ability within clinical practice." When considered this way, competence is not a binary achievement that one does or does not have; this concept is reflected in the scoring of the AT Milestones.[4] Although the AT Milestones can be an effective marker of students' or professionals' readiness for autonomous practice, we caution users from labeling learners as competent since the continuum of learning does not guarantee competence maintenance beyond skill acquisition and application, especially when the learner does not maintain their knowledge and professional practice ability throughout their career.[1–3] If the goal of adopting the AT Milestones is to embrace competency-based education practices, the athletic training profession will need to unlearn the traditional numeric systems that often fail to align with competency-based education and the binary competency assessment models that have commonly been used for educational assessment.

Modes of Use

For the identified modes of use theme, the 3 categories of self-assessment, clinical experience performance, and course performance illustrated how programs use the AT Milestones. According to Eva and Regehr,[17] self-assessment is a mechanism that healthcare providers use to recognize their strengths and weaknesses in clinical practice. Successful self-assessment of weaknesses can provide clinicians with the ability to address areas of reduced competence in clinical practice and determine appropriate learning goals for future clinical development. Successful self-assessment of strengths is also beneficial. Having a better awareness of strengths allows clinicians to practice with greater confidence and establish appropriately challenging learning goals that advance clinical practice. Further, effective self-assessment practices contribute to an individual's overall self-efficacy and self-concept. More specifically, self-efficacy refers to an individual's belief in their ability to manage a context-specific situation (e.g., an on-field cervical spine evaluation), whereas self-concept is the overall appraisal of one's abilities across many dimensions (e.g., performing a musculoskeletal evaluation of the neck). Because self-efficacy and self-concept are important aspects of the educational preparation of athletic trainers, using the AT Milestones to facilitate self-reflection in students may contribute to improvements in both.

Participants of the current study also indicated they used the AT Milestones to measure student performance in clinical and didactic settings. More specifically, the AT Milestones were used to assess student/resident performance in athletic training clinical experiences (e.g., preceptor evaluation of a resident's clinical performance) and in didactic courses (e.g., faculty evaluation of a student's performance of skills related to a course or course assignment). This use of the AT Milestones is supported by the CAATE in their *2020 Standards for Professional Athletic Training Programs*,[18] which identify multiple areas of use of the AT Milestones for overall assessment.

The AT Milestones use a 6-level performance scale ranging from critical deficiencies to expert levels. Within this framework, learning and progression over time can be assessed with serial application of the AT Milestones across a professional education program. This usage is especially valuable when considering current accreditation Standard 15, which specifies: "A program's athletic training clinical experiences and supplemental clinical experiences provide a logical progression of increasingly complex and autonomous patient-care and client-care experiences."[18] There is an expectation that programs facilitate progressively autonomous experiences, but recent findings suggest programs do not have effective measures for doing so.[19] The AT Milestones offer such a tool to demonstrate each student's progression over time and their incorporation of increasingly complex clinical skills. Another benefit of using the AT Milestones for assessment is that they can be mapped directly to the 2020 CAATE Core Competencies.[18] This particular usage could be beneficial for demonstrating each student's knowledge and skill performance of curricular content while simultaneously providing evidence of programmatic compliance with accreditation standards.

Value Added

The value-added theme identified in the current study highlighted several aspects of the AT Milestones that were valuable to athletic training programs. First, the comprehensive nature of the AT Milestones provided a continuum of assessment from novice to expert practice. This continuum allowed students to see the trajectory of their growth during their professional education program. It also allowed them to assess current levels of performance and determine areas for future development.

The AT Milestones also added value to the programmatic framework, likely because they are viewed as a more comprehensive, holistic, and global assessment tool. Further, their developmental nature means they can be used for global assessment of student performance across the entirety of the program. As such, data from the AT Milestones could be used to make evidence-based decisions on program development and delivery that focus on improving student outcomes. This type of evidence also contributes to a program's quality improvement efforts and may facilitate compliance with accreditation standards for program design and quality. Additionally, the standardized nature of the AT Milestones provides an assessment tool that can be used in different ways (self, clinical, and didactic performances) while still maintaining its value as a global assessment. Interestingly, although some programs valued the standardized structure of the AT Milestones, others identified a need to adapt them to fit their program better. For example, some adaptations involved altering the levels of performance, using a selection of competencies, or changing the competency descriptions. However, it is important to note that any adaptions or modifications to the AT Milestones, including the use of alternative scales or adjusting the criteria, could create a threat to the validity of the original tool.[6]

Competency-based education has been a goal for many athletic training educators, but the profession has long lacked a comprehensive, athletic training-specific tool to support the achievement of this goal. With the validation and early adoption of the AT Milestones, athletic

trainers now have a valid evaluation instrument available to them that can be used throughout their professional careers to ensure they are continuing to seek clinical competence.

Limitations and Future Research

As is true with all original inquiry, our findings should be interpreted with caution. Because of the self-reported design of the study, we assumed that participants answered questions thoroughly and accurately. Specifically, we employed this survey to explore the programmatic use of the AT Milestones. It is possible that faculty, preceptors, or clinicians affiliated with a program use the AT Milestones separately to evaluate athletic training students or residents, and that information would not have been captured in the current study. Future research should aim to capture the successful use of the AT Milestones along the progression of athletic training professional and post-professional education to aid others in adopting them. Future research should also determine and establish best practices for using the AT Milestones effectively within athletic training education. Lastly, as more programs adopt and use the AT Milestones, efforts should be made to create a universal data repository from which athletic training educational research questions might be answered.

CLINICAL APPLICATION

Based on the time of availability of the AT Milestones and the findings of our study, athletic training education is likely still in the early phases of adopting the AT Milestones. Early adopters of the AT Milestones should disseminate how the AT Milestones can be effectively used across the continuum of athletic training: from professional athletic training education to advanced practice to continuing professional development and growth. Additionally, those considering adopting the AT Milestones should eliminate the credence of a binary assessment model and instead focus on the continuum of competence progression.[3]

Athletic training educators using the AT Milestones within their respective programs highlighted the value they have added to their programs. Participants identified using the AT Milestones in multiple modes, including self-assessment, didactic, and clinical assessments. Our findings support the potential that the AT Milestones can be used programmatically in various valuable ways. Doing so would likely result in the increased emphasis on the AT Milestones in a program's framework and assessment plan and in demonstrating compliance with accreditation standards. Since the AT Milestones have been validated and are being successfully used in athletic training education, athletic training educators looking for a useful assessment tool to address student progression on a continuum of competency should consider implementing the AT Milestones into their programmatic framework.

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