



---

June 2023

## Perceptions, Practices, and Barriers of Athletic Trainers in the Military Setting Using Patient-Reported Outcomes in Practice

Nicole M. Lee

*Indiana State University, nicoleputz@gmail.com*

Justin P. Young

*Indiana State University, jyoung85@sycamores.indstate.edu*

Lindsey E. Eberman

*Indiana State University, lindsey.eberman@indstate.edu*

Eric Post

*Indiana State University, eric.post@indstate.edu*

Kenneth E. Games

*Indiana State University, kenneth.games@indstate.edu*

Follow this and additional works at: <https://nsuworks.nova.edu/ijahsp>



Part of the [Other Public Health Commons](#), [Other Rehabilitation and Therapy Commons](#), and the [Sports Medicine Commons](#)

---

### Recommended Citation

Lee NM, Young JP, Eberman LE, Post E, Games KE. Perceptions, Practices, and Barriers of Athletic Trainers in the Military Setting Using Patient-Reported Outcomes in Practice. *The Internet Journal of Allied Health Sciences and Practice*. 2023 Jun 29;21(3), Article 23.

This Manuscript is brought to you for free and open access by the College of Health Care Sciences at NSUWorks. It has been accepted for inclusion in *Internet Journal of Allied Health Sciences and Practice* by an authorized editor of NSUWorks. For more information, please contact [nsuworks@nova.edu](mailto:nsuworks@nova.edu).

---

## Perceptions, Practices, and Barriers of Athletic Trainers in the Military Setting Using Patient-Reported Outcomes in Practice

### Abstract

**Purpose:** The majority of athletic trainers (ATs) recognize the importance of patient-reported outcomes (PROs) in clinical practice but encounter unique barriers that limit their implementation. There are no studies that have investigated PROs in the military setting. The purpose of this study was to explore the perceptions, practices, and barriers to implementing PROs in the military setting. **Methods:** We used a cross-sectional, web-based survey design. Emails were sent to 365 potential participants and 67 were eligible to participate (response rate=18.4%, years practicing in military setting=5.9 ± 5.8years). Participants were invited to complete a web-based survey regarding the uses, benefits, and problems with PROs. Dependent variables for all participants were endorsements of perception, practice, and barrier statements with PROs. ATs who reported using PROs in clinical practice were asked the criteria they use for selecting the measures, whereas ATs who reported not using PROs were asked their reasons for not using them. **Results:** Most ATs in the military setting reported not using PROs (59.6%, n=31/52). The most commonly cited reason for using PROs was documenting the status, progress, or outcomes of patients (41/52, 78.8%). Improving communication with the patient (54/57, 94.7%) was the most frequently endorsed benefit of PROs, while time for patients to complete (28/54, 51.9%) was the most common problem. The ease of understanding for patients was the most common criterion used to select individual measures (17/21, 81.0%). The most frequent reason for not using PROs were time for patients to complete and lack of a support structure (13/31, 41.9%). **Conclusions:** Less than half of ATs in the military setting use PROs in their clinical practice. Further research should investigate the mindset, motivation, and methods necessary for implementation to develop successful strategies for widespread implementation of PROs across practice settings in AT.

---

### Author Bio(s)

Nicole M. Lee, DAT, LAT, ATC is graduate of the Indiana State University Doctorate in Athletic Training and currently practices athletic training in Florida.

Justin P. Young, DAT, LAT, ATC is a doctoral graduate assistant for the Doctor in Athletic Training program at Indiana State University and is currently completing his PhD in Curriculum and Instruction at Indiana State University.

Lindsey E. Eberman, PhD, LAT, ATC is a professor and program director of the Doctorate in Athletic Training program at Indiana State University.

Eric Post, PhD, LAT, ATC is an associate professor and program director of the Master in Athletic Training program at Indiana State University.

Kenneth E. Games, PhD, LAT, ATC is a professor and director of clinical education for the Doctorate in Athletic Training program at Indiana State University.



**The Internet Journal of Allied Health Sciences and Practice**

*Dedicated to allied health professional practice and education*

**Vol. 21 No. 3 ISSN 1540-580X**

---

## Perceptions, Practices, and Barriers of Athletic Trainers in the Military Setting Using Patient-Reported Outcomes in Practice

---

Nicole M. Lee  
Justin P. Young  
Lindsey E. Eberman  
Eric Post  
Kenneth E. Games

Indiana State University

United States

---

### **ABSTRACT**

**Purpose:** The majority of athletic trainers (ATs) recognize the importance of patient-reported outcomes (PROs) in clinical practice but encounter unique barriers that limit their implementation. There are no studies that have investigated PROs in the military setting. The purpose of this study was to explore the perceptions, practices, and barriers to implementing PROs in the military setting. **Methods:** We used a cross-sectional, web-based survey design. Emails were sent to 365 potential participants and 67 were eligible to participate (response rate=18.4%, years practicing in military setting=5.9 ± 5.8years). Participants were invited to complete a web-based survey regarding the uses, benefits, and problems with PROs. Dependent variables for all participants were endorsements of perception, practice, and barrier statements with PROs. ATs who reported using PROs in clinical practice were asked for the criteria they use for selecting the measures, whereas ATs who reported not using PROs were asked their reasons for not using them. **Results:** Most ATs in the military setting reported not using PROs (59.6%, n=31/52). The most commonly cited reason for using PROs was documenting the status, progress, or outcomes of patients (41/52, 78.8%). Improving communication with the patient (54/57, 94.7%) was the most frequently endorsed benefit of PROs, while time for patients to complete (28/54, 51.9%) was the most common problem. The ease of understanding for patients was the most common criterion used to select individual measures (17/21, 81.0%). The most frequent reason for not using PROs were time for patients to complete and lack of a support structure (13/31, 41.9%). **Conclusions:** Less than half of ATs in the military setting use PROs in their clinical practice. Further research should investigate the mindset, motivation, and methods necessary for implementation to develop successful strategies for widespread implementation of PROs across practice settings in AT.

**Keywords:** evidence-based practice, outcome measures, armed forces

---

## INTRODUCTION

Throughout the last decade, there has been an increased push for the implementation of patient-reported outcomes (PROs) during routine patient care.<sup>1-5</sup> Furthermore, the athletic training profession has emphasized that clinicians should align their decision-making with an evidence-based approach, integrating the scientific research, their clinical expertise, and the patient's values and preferences.<sup>2,5-7</sup> PROs play an important role in capturing the patient's values and preferences, and by providing the patient's perspective of their overall disablement as result of an injury or illness.<sup>2</sup> Healthcare providers such as physicians, psychologists, physical therapists, and nurses have advocated for the use of standardized outcomes measures;<sup>1,8,9</sup> however, athletic trainers (ATs) are relatively new to the implementation of PROs.<sup>1,4,8,10,11</sup> Current research identifies ATs' implementation of PROs in the secondary school and college/university practice settings at the high school and collegiate level, but no research has investigated the use of PROs among ATs working in the military practice setting.<sup>3,4,12,13</sup>

Active duty service members appear to be at greater risk for a diagnosis of osteoarthritis and hip osteoarthritis specifically in comparison to the general population.<sup>14</sup> Therefore, over the last several years, ATs have been increasingly employed by the various Armed Forces to assist in the health and welfare of both active duty soldiers and their dependents.<sup>15,16</sup> As healthcare providers, ATs provide preventative services, emergency care, clinical examinations and diagnosis, therapeutic intervention, and rehabilitative care.<sup>17</sup> In the military setting the return to activity criteria is altered to return to duty, so it is imperative that healthcare providers understand the patient's perspective of their health, especially when it relates to their ability to safely perform the tasks needs to execute the mission. Therefore, ATs in this practice setting should be implementing a variety of evidence-based practices, such as the implementation of PROs.<sup>3,13,18</sup>

The majority of secondary school and collegiate athletic trainers recognize the importance of PROs and understand the beneficial role they play in the patient's plan of care.<sup>3,12,18</sup> However, concerns regarding the perceived increased time demands of implementation of PROs has resulted in low adoption by ATs in the secondary school and college and university settings.<sup>1,3,18-20</sup> To our knowledge, no studies have explored the implementation of PROs with ATs practicing in the military setting. A better understanding of how ATs function in the military with regard to their implementation of PROs is essential to determine the appropriate use of ATs and their skillset in the military. Therefore, the purposes of this study were to 1) to identify the familiarity of ATs working in the military setting with information related to PROs and their use of these measures in clinical practice; and 2) to compare the perceived application, benefits, and problems of PROs between ATs who reported using PROs and those who did not.

## METHODS

### Study Design

This study was deemed exempt by the Indiana State University Institutional Review Board. We used a cross-sectional design to assess the knowledge and practices of ATs working in the military setting by distributing an e-mail with a survey link to members who were Board of Certification (BOC) certified and listed the military/government/law enforcement as their employment setting.

### Participants

We used the 2019 Board of Certification database statistics to identify 365 BOC-certified ATs who listed the military, government, and/or law enforcement as their employment setting. The e-mail invitation to participate in this study was delivered to 365 of the addresses provided by the BOC, and 95 respondents opened the survey (access rate = 26.0%). ATs were excluded if they had not worked in the military setting within the last year or if they were dual licensed and practicing in the military as their other healthcare credential such as a physical therapist, physician assistant, physician, nurse, etc. Sixteen participants were eliminated for this exclusion criteria and twelve participants did not consent to participate. Therefore, 67 participants completed the study resulting in a response rate of 18.4%. Respondents were  $39 \pm 9$  years old, with most indicating BOC certification for an average of  $14 \pm 9$  years and practicing in the military setting for  $6 \pm 6$  years. Complete demographic data are presented in Table 1.

### Procedures

Using e-mail addresses provided by the BOC, we supplied ATs working in the military setting with information about our study and a hyperlink to the survey instrument, which was housed in a secure, web-based survey system (Qualtrics Inc, Provo, UT). Upon opening the hyperlink, the participant was presented an electronic informed consent. The study instrument remained active for a 4 week period from July 2020 until August 2020; reminder emails were sent once a week for 3 weeks.

### Instrument

We used a previously validated survey instrument to investigate the perceived benefits of and barriers to the use of PROs.<sup>3</sup> The instrument itself was not modified; however, the demographic section of the larger instrument was modified to collect information from participants relevant to their military practice setting. The survey presented all participants with 49 questions; 2 additional

items were available to those who indicated they were not currently using PROs in clinical practice, and 1 additional item was provided to those who were currently using PROs.<sup>3</sup> The instrument was organized into demographics (n=15), familiarity with patient outcomes (n=6), use of PROs in clinical practice (n=7), benefits of PROs (n=8), and problems with using PROs (n=13).<sup>3</sup>

**Table 1.** Demographic Characteristics of Respondents

Demographic Characteristic	Mean $\pm$ SD
Age, years	39.67 $\pm$ 9.60
Time certified by Board of Certification, years	14.11 $\pm$ 8.78
Time practicing in the military setting, years	5.92 $\pm$ 5.76
Frequency, n (%)	
Position Classification	
Contractor (CTR)	44 (65.7)
Government Civilian/GS Position	17 (25.4)
Active Duty Military	
Other	2 (3.0)
Missing Data	3 (4.5)
	1 (1.5)
Branch of the Military <sup>a</sup>	
Air Force	19 (28.4)
Army	24 (35.8)
Navy	16 (23.9)
Marines	19 (28.4)
Coast Guard	3 (4.5)
Other	1 (1.5)
Military population <sup>a</sup>	
Active Duty	60 (89.6)
Reservists	17 (25.4)
Retired Military/Tricare Clinic	5 (7.5)

The familiarity items addressed the degree to which the participants were familiar with clinician-rated outcomes, PROs, the disablement model, and patients' perceptions of their own injuries. We also asked participants if they had been exposed to clinician-rated outcomes and PROs and by which modes of education they had been first exposed (e.g., professional education, post professional education, continuing education, evidence-based continuing education, literature, or colleagues) or if they had not been exposed. Participants indicated whether they understood the differences between the outcome measures and the roles of outcomes in evidence-based clinical practice. They were then asked if they currently used PROs in their clinical practice. Those who answered *yes* were asked the criteria for selecting PROs and the specific tools used. Those who answered *no* were asked the reason for not using PROs and whether they planned to implement PROs in their practice. The core content of the questionnaire included a statement about PROs and asked participants to rate their level of agreement or familiarity with the statement. For the familiarity statements, a 5-point Likert-style scale measured how familiar the respondent was with the statement presented (5 = *extremely familiar*, 4 = *very familiar*, 3 = *moderately familiar*, 2 = *slightly familiar*, 1 = *not at all familiar*). For the statements on the uses and benefits of and problems with PROs, the participant indicated his or her level of agreement (5 = *strongly agree*, 4 = *agree*, 3 = *neither agree nor disagree*, 2 = *disagree*, 1 = *strongly disagree*).

### Data Analysis

The dependent variables were the endorsements of statements regarding familiarity with, uses and benefits of, and problems with PROs. Familiarity questions were considered endorsed when participants selected a rating of *extremely familiar*, *very familiar*, or *moderately familiar*. Benefits and problems with PROs questions were considered endorsed when participants selected a rating of *agree* or *strongly agree*.

Descriptive statistics were used to record demographic data by age, years certified as an AT, years of practicing in the military setting, gender (male, female, non-binary, prefer not to say, prefer to self-describe), highest degree earned (bachelor's, master's, clinical doctorate, research doctorate), employment status (contractor, government civilian, active duty military, other), additional healthcare credentials (RN, PT, PA-C, MD, DO), branch of military (Army, Navy, Marines, Coast Guard, Air Force), military population (active duty, reservists, retired military), type of military setting (Sports Medicine and Rehabilitation Team clinic, special warfare units, college academy, Veteran Affairs medical center, Reserve Officers' Training Corps training, entry-level training facility, advanced-specialty training facility). Descriptive statistics were also used to identify whether or not the participants used

PROs in clinical practice, and the frequency with which participants agreed with the benefits and barrier statements. We used Chi-Square ( $\chi^2$  test) analyses to compare users and non-users of PROs on the benefits and problems. All data analysis was completed using SPSS (version 22; IBM Corp, Armonk, NY) with the level of significance set at  $P < .05$ .

## RESULTS

Participants who completed the applications and benefits of PROs sections of the survey had a high rate of endorsement, with answers of either *agree* or *strongly agree* for all the statements presented (Tables 2 and 3). Detailed data on the endorsed uses of PROs are included in Table 2, while further details on the endorsed benefits of PROs are found in Table 3. The most commonly endorsed uses of PROs were documenting the status, progress, or outcomes of patients (41/52, 78.8%), demonstrating effectiveness to administration (40/52, 76.9%), examining change in patient health status to determine effectiveness of a treatment (39/52, 75.0%), and communicating with other healthcare providers and referral sources (38/52, 73.1%). The most frequently endorsed benefits of using PROs were improving communication with the clinician and patient (54/57, 94.7%), helping to direct the plan of care (52/57, 91.2%), helping to motivate and encourage the patient (51/57, 89.5%), and improving communication between the physician and other providers (51/57, 89.5%). There were no significant differences identified between users and non-users on the perceived benefits for PRO use ( $p > .05$ ).

**Table 2.** Perceived Uses of Patient-Reported Outcomes

Benefit	Mode <sup>a</sup>	Endorsement, n (%)	Frequency of the mode, n (%)	Mean $\pm$ SD
Answer clinical questions through traditional research approach	Agree	27 (51.9)	19 (28.4)	3.54 $\pm$ 0.92
Demonstrate effectiveness to administration through patient outcome documentation	Agree	40 (76.9)	32 (47.8)	3.90 $\pm$ 0.66
Compare patient outcomes of different conditions within a setting	Agree	31 (59.6)	24 (35.8)	3.62 $\pm$ 0.87
Examine change in patient health status to determine effectiveness of a treatment	Agree	39 (75.0)	28 (41.8)	3.88 $\pm$ 0.83
Examine average change in patient health status to determine effectiveness of individual clinician	Agree	33 (63.5)	21 (31.3)	3.77 $\pm$ 0.92
Document the status, progress, or outcomes of patients by individual clinicians	Agree	41 (78.8)	31 (46.3)	3.96 $\pm$ 0.69
Communicate with other health care providers and referral sources	Agree	38 (73.1)	29 (43.3)	3.88 $\pm$ 0.70

**Table 3.** Perceived Benefits of Patient-Reported Outcomes

Benefit	Mode <sup>a</sup>	Endorsement, n (%)	Frequency of the mode, n (%)	Mean $\pm$ SD
Direct plan of care	Agree	52 (91.2)	33 (49.3)	4.21 $\pm$ 0.70
Improve communication; clinician and patient	Agree	54 (94.7)	28 (41.8)	4.39 $\pm$ 0.65
Improve communication; physician and other providers	Agree	50 (87.8)	32 (47.8)	4.19 $\pm$ 0.64
Patient feels evaluation was thorough	Agree	51 (89.5)	27 (40.3)	4.30 $\pm$ 0.71
Increase efficiency of evaluations	Agree	44 (77.2)	29 (43.3)	4.00 $\pm$ 0.78
Focus choice of interventions	Agree	47 (82.5)	30 (44.8)	4.11 $\pm$ 0.72
Better patient outcomes	Agree	50 (87.7)	27 (40.3)	4.26 $\pm$ 0.72
Motivate and encourage patient	Strongly Agree	51 (89.5)	26 (38.8)	4.33 $\pm$ 0.72

<sup>a</sup> Level of Agreement: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, 5 = *strongly agree*

Participants also had the opportunity to respond to statements regarding the perceived problems with using PROs (Table 4). The most frequent problems were the amount of time for patients to complete (28/54, 51.9%), the amount of time to score and analyze (26/54, 48.1%), confusion to patients (19/54, 35.2%), and questions that are not relevant for their population (18/53, 34.0%). We did not identify any significant differences between users and non-users on the perceived problems for using PROs ( $p > .05$ ).

**Table 4.** Perceived Problems of Patient-Reported Outcomes

Benefit	Mode <sup>a</sup>	Frequency of the mode, n (%)	Mean ± SD
Confusion to patients	Neither Agree nor Disagree	20 (29.9)	2.93 ± 0.80
Difficult for patients	Disagree	20 (29.9)	3.09 ± 0.88
Require too high of reading level	Disagree	31 (46.3)	3.57 ± 0.86
Written in English	Disagree	21 (31.3)	3.83 ± 0.93
Not culturally or ethically sensitive	Neither Agree nor Disagree	23 (34.3)	3.31 ± 0.91
Makes patients anxious	Neither Agree nor Disagree	22 (32.8)	3.09 ± 0.94
Too much time for patients to complete	Agree	22 (32.8)	2.56 ± 0.93
Too much time to score or analyze	Agree	20 (29.9)	2.61 ± 0.94
Information is too subjective	Neither Agree nor Disagree	22 (32.8)	3.06 ± 0.81
More effort than they are worth	Neither Agree nor Disagree	24 (35.8)	3.11 ± 0.82
Do not help direct plan of care	Disagree	26 (38.8)	3.54 ± 0.88
Difficult to interpret	Disagree	24 (35.8)	3.37 ± 0.81
Questions are not relevant for my type of patient	Agree, Neither Agree nor Disagree, Disagree	15 (22.4)	3.08 ± 1.10

<sup>a</sup> Level of Agreement: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, 5 = *strongly agree*

When asked whether participants used PROs in clinical practice, only 52 participants responded. Less than half reported using PROs in their clinical practice (n=21/52, 40.4%), whereas a majority (n=31/52, 59.6%) indicated that they were not using PROs. Participants who were not using PROs were presented with a list of possible reasons and asked to choose all that applied. The most frequent reasons for not using PROs were the amount of time it takes for patients to complete (13/31, 41.9%), lacking a supportive structure (13/31, 41.9%) and the amount of time it takes clinicians to analyze the results (10/31, 32.3%) (Table 5). In an opened ended portion of this question, participants were given the opportunity to state other reasons for not using PROs. A total of 10 comments were categorized into common themes: those cited most often were no time or resources (n = 3/10, 30%), not applicable or required in the military setting (n = 3/10, 30%), and “not exactly sure why we don’t use them” (n = 2/10, 20%).

**Table 5.** Reasons for not Using Patient-Reported Outcomes (n=31)

Reason	Respondent Selection, No. (%)
Confusion to patients	2 (6.5)
Difficult for patients to complete	6 (19.4)
Makes patients anxious	2 (6.5)
Too much time for patients to complete	13 (41.9)
Too much time to analyze, calculate, and score	10 (32.3)
Provide information that is too subjective to be useful	3 (9.7)
Require more effort than they are worth	6 (19.4)
Do not contain information that helps direct plan of care	4 (12.9)
Difficult to interpret (don’t know norms, minimal clinically important difference, how a score related to severity)	4 (12.9)
Do not contain questions relevant to the type of patients I see	9 (29.0)
Do not get completed at discharge so not useful in determining patient response to treat	8 (25.8)
Require training I do not have	2 (6.5)
Require a support structure that I do not have	13 (41.9)
Only useful for research purposes	1 (3.2)

Respondents most frequently indicated that they were extremely familiar with clinician-rated outcomes (mode = 5) and were moderately familiar with PROs (mode = 3). In addition, respondents strongly agreed that they knew the difference between the measures (mode = 5). However, participants were not familiar at all with the disablement model (mode = 1) or how the disablement model and the patient’s perception of his or her injury were related (mode = 1). They agreed that PROs are a component of evidence-based medicine (mode = 4). Few of the participants had never been exposed to clinician-rated outcomes or PROs in any way, respectively (n = 3, 4.5%) and (n = 4, 6.0%). Other participants indicated they had been exposed to both clinician and PROs through various sources but pre-dominantly through evidence-based practice continuing education courses (clinician-rated outcomes = 49, 73.1%; PROs = 43, 64.2%) (Table 6).



**Table 6.** Sources Where Participants Have Gained Exposure to Clinician and Patient-Related Outcomes

Source	Measure	
	# Clinician-Rated Outcomes	# Patient-Rated Outcomes
Undergraduate athletic training programs	29	26
Graduate athletic training programs	25	21
Continuing education sessions	43	38
Literature sources	41	40
Evidence-based practice continuing education sessions	49	43
Colleague or coworker	34	36
Not been exposed	3	4

The 21 respondents who were currently using PROs in clinical practice were presented with a list of criteria for selecting measures and asked to choose all that applied. The criteria chosen most frequently were the easiness for patients to understand (17/21, 81.0%), easiness for clinicians to understand (14/21, 66.7%), and evidence shown to be valid and reliable (14/21, 66.7%) (Table 7).

**Table 7.** Criteria Used to Select Patient-Reported Outcomes from Those Who Used Then (n=21)

Reason	Respondent Selection, No. (%)
Can be completed quickly	13 (61.9)
Easy for patients to understand	17 (81.0)
Easy for clinicians to understand/interpret scores	14 (66.7)
Shown to be valid and reliable	14 (66.7)
Seem to be the most common used in athletic training	6 (28.6)
Useful for a variety of purposes: research, quality assurance, patient evaluation	12 (57.1)
Can be analyzed electronically	6 (28.6)
Most appropriate for types of conditions seen in my practice setting	10 (47.6)

## DISCUSSION

The primary objective of our study was to explore the perceptions, practices, and barriers to implementing PROs in the military settings. ATs are newly integrated into a massive healthcare system, and it is important they are providing components of patient-centered care. While previous authors have investigated the use of PROs in athletic training, our study is the first to focus on the military setting. Little is known about the job duties of ATs working in the military setting, especially as it relates to patient-load, so our survey presented questions on the uses, benefits, and problems with PROs to all participants.<sup>3,16</sup> However, there was a wide range of patient populations, so it was difficult to determine how patient load effected the outcome of using PROs in clinical practice.

### Use of PROs in the Military Setting

Less than half (40.4%) of ATs who responded to our survey indicated they use PROs in clinical practice. This level of adoption is higher than in previous research in secondary school and college and university athletic training practice settings, where the adoption rate was between 15-26%.<sup>3,13,18</sup> A possible contributing factor for increased implementation of PROs may attribute to education level of our participants, as a majority of the participant held a master's degree (44/66, 67%). While our study indicated a larger proportion of participants using PROs, previous studies have indicated ATs in other settings continue to struggle to consistently implement patient-oriented evidence.<sup>3,4,12,13</sup>

More than half of ATs working in the military setting (59.6%) indicated they do not use PROs in their clinical practice, and this may be attributed to the demographic make-up of our respondents. A majority of our participants have been a certified AT for at least 14 years. The "Athletic Training Education Competencies" had no requirements regarding evidence-based practice or patient-centered care until the 5<sup>th</sup> edition mandated this content in 2012.<sup>21</sup> Our findings suggest that a majority of ATs working in the military setting relied primarily on evidence-based practice continuing education courses to become familiar with different types of clinician-rated outcome and patient outcomes, but few were exposed during their clinical education. In addition, our respondents described a low level of familiarity with disablement models and how they relate to patient perceptions of injury, which is similar to previous work.<sup>3</sup> With practicing clinicians continuously indicating their unfamiliarity with the disablement model, it would seem logical to include mandated continuing education to train them in this essential aspect of patient-centered care.



### **Perceived Uses of PROs**

Our survey presented statements indicating how PROs could be used in their clinical practice to better understand how ATs working in the military setting perceive their use in clinical practice. Most respondents recognized the role that PROs can play in documenting the status, progress, or outcomes of patients, demonstrating effectiveness to administration, examining change in patient health status to determine effectiveness of a treatment, and communicating with other healthcare providers and referral sources. These results are familiar to previous studies,<sup>2,4,7</sup> where a majority of using PROs included communication with other healthcare providers, examination of practice effectiveness, and documentation of patient progress and outcomes. A majority of athletic training professionals and other allied healthcare providers understand the uses of PROs in their clinical practice, however less than half ATs working in the military setting are implementing them into their practice.

### **Perceived Benefits of PROs**

In an effort to understand how ATs working in the military setting perceived the benefits of PROs in patient care, our survey presented statements illustrating how these measures could benefit their clinical practice. All of the perceived benefits were endorsed by ATs working in the military setting, with the greatest benefits including improving communication with the clinician and patient, helping to direct the plan of care, helping to motivate and encourage the patient, and improving communication between the physician and other providers. These results mirror previous findings consistent in athletic training<sup>3,18</sup> and physical therapy.<sup>22</sup> This study indicated the greatest involvement of implementing PROs in clinical practice compared to other settings and all of the benefits were either strongly agreed or agreed with each statement. Because ATs working in the military setting recognized the perceived benefits more than other ATs in different settings, it would be suggested that more than half should use PROs in their clinical care. However, this was not true based on our results so ATs working in the military setting need to better understand the effect of an injury on a patient's daily life. Clinicians can use the information gathered in PROs to move beyond the clinical outcomes and start focusing their treatment goals directly to the patient's activities of daily living<sup>2,4,22,23</sup> and sport and/or job specific duties. In addition, patients can understand how their injury is affecting both their professional and personal activities, leading to an increase in patient compliance and motivation.<sup>23,24</sup>

### **Perceived Barriers to Using PROs**

Similar to previous studies, ATs working in the military setting clearly recognize how PROs can be used in clinical practice and the benefits they provide in patient care; however, the greatest barrier to their implementation is time. While all other problems were either analyzed as neither agree nor disagree or disagree, the top two perceived problems ATs working in the military setting agreed on were too much time for patients to complete and too much time for clinician to score or analyze, which directly mirror the results in three previous investigations<sup>3,4,7</sup> across all AT settings. There is a fear of adding increased workload to an already busy day, which may suggest why less than half of ATs working in the military setting are currently implementing PROs into their practice. In addition, resistance to change may be correlated to continuation of evidence-based practice, where the ATs are only being introduced to the implementation on their own self-directed learning, not through educational requirements.

### **Limitations**

Athletic trainers working in the military practice setting compose less than one percent of all certified athletic trainers.<sup>25</sup> This made systematically identifying the target population difficult. To mitigate this challenge, we chose to recruit through the credentialing agency of athletic trainers as opposed to the professional membership organization. We believe this strategy was effective and our sample size is similar to that of previous research studying athletic trainers practicing in the military setting.<sup>16</sup> Another notable characteristic of our data collection, is that this study took place during the COVID-19 pandemic and the response rate could have been affected by the altered job duties of ATs working in the military setting during the COVID-19 pandemic.

### **Recommendations for Future Research**

Future research should look at implementation strategies focusing on time management and organizational support. Time constraints continue to be the greatest barrier for implementing change in healthcare professions and further research should investigate the different strategies for implementation, which should also include essential components of organizational support. Essential components of organizational support may include clear guidelines for implementing PROs, policies guiding PRO use, and adequate resources such as training for calculating interpreting scores.<sup>26</sup> In addition, investigating different components of mindset, motivation and strategies for widespread implementation may yield insight as to decreasing resistance to change.

### **CONCLUSIONS**

A majority of ATs working in the military setting surveyed recognized the uses and benefits of PROs in their clinical practice and this may have led to the highest amount of implementation as 59.6% of ATs working in the military setting use PROs in their clinical practice. For the ATs working in the military setting who do not use PROs, time constraints were the greatest problems in using PROs, although they strongly agreed or agreed with all the benefits and uses. The barriers continue to remain the same across

multiple practice settings in AT. Therefore, understanding how different components of mindset, motivation and methods of widespread implementation may yield insight to an increase of implementation of PROs across all practice settings in athletic training.

## REFERENCES

1. Obremesky WT, Higgins TF, Bettger JP, Vrahas MS, Lundy DW. Use of Patient-Related Outcomes After Orthopaedic Trauma: Helpful or Not So Much? *J Orthop Trauma*. 2018;32 Suppl 1:S48-S51.
2. Valier ARS, Bacon CEW, Lam KC. Disablement Model and Health-Related Quality of Life Classification for Patient-Reported Outcomes Measurement Information System (PROMIS) Instruments. *J Athl Train*. 2018;53(12):1206-1213.
3. Coulombe BJ, Games KE, Eberman LE. The Use of Patient-Reported Outcome Measures: Secondary School Athletic Trainers' Perceptions, Practices, and Barriers. *J Athl Train*. 2019;54(2):142-151.
4. Lam KC, Marshall AN, Valier ARS. Patient-Reported Outcome Measures in Sports Medicine: A Concise Resource for Clinicians and Researchers. *J Athl Train*. 2020;55(4):390-408.
5. Basch E, Barbera L, Kerrigan CL, Velikova G. Implementation of Patient-Reported Outcomes in Routine Medical Care. *Am Soc Clin Oncol Educ Book*. 2018;38:122-134.
6. Eberman LE, Neil ER, Nottingham SL, Kasamatsu TM, Bacon CEW. Athletic Trainers' Practice Patterns Regarding Medical Documentation. *J Athl Train*. 2019;54(7):822-830.
7. Simon JE, Valier ARS, Kerr ZY, Djoko A, Marshall SW, Dompier TP. Changes in Patient-Reported Outcome Measures From the Time of Injury to Return to Play in Adolescent Athletes at Secondary Schools With an Athletic Trainer. *J Athl Train*. 2019;54(2):170-176.
8. Kazis LE, Miller DR, Skinner KM, et al. Patient-reported measures of health: The Veterans Health Study. *J Ambul Care Manage*. 2004;27(1):70-83.
9. Stover AM, Tompkins Stricker C, Hammelef K, et al. Using Stakeholder Engagement to Overcome Barriers to Implementing Patient-reported Outcomes (PROs) in Cancer Care Delivery: Approaches From 3 Prospective Studies. *Med Care*. 2019;57 Suppl 5 Suppl 1:S92-S99.
10. Burr SK, Fowler JC, Allen JG, Wiltgen A, Madan A. Patient-reported Outcomes in Practice: Clinicians' Perspectives From an Inpatient Psychiatric Setting. *J Psychiatr Pract*. 2017;23(5):312-319.
11. Kohan EM, Hill JR, Schwabe M, Aleem AW, Keener JD, Chamberlain AM. The influence of mental health on Patient-Reported Outcomes Measurement Information System (PROMIS) and traditional outcome instruments in patients with symptomatic glenohumeral arthritis. *J Shoulder Elbow Surg*. 2019;28(2):e40-e48.
12. Valier AR, Lam KC. Beyond the Basics of Clinical Outcomes Assessment: Selecting Appropriate Patient-Rated Outcomes Instruments for Patient Care. *Athl Train Educ J*. 2015;10(1):91-100.
13. Lam KC, Harrington KM, Cameron KL, Valier ARS. Use of Patient-Reported Outcome Measures in Athletic Training: Common Measures, Selection Considerations, and Practical Barriers. *J Athl Train*. 2019;54(4):449-458.
14. Cameron KL, Driban JB, Svoboda SJ. Osteoarthritis and the Tactical Athlete: A Systematic Review. *J Athl Train*. 2016;51(11):952-961.
15. National Athletic Trainers' Association. Military. <https://www.nata.org/professional-interests/emerging-settings/military>. Accessed August 29, 2020.
16. Radzak KN, Sedory EJ, Hooper M, Kasamatsu TM. Defining Athletic Training in the Military Setting: A Survey Investigation Into Professional Characteristics, Preparation, and Barriers in Clinical Practice. *J Athl Train*. 2020;55(5):522-531.
17. Association NAT. Athletic Training. <https://www.nata.org/about/athletic-training>. Accessed August 29, 2020.
18. Valier ARS, Jennings AL, Parsons JT, Vela LI. Benefits of and Barriers to Using Patient-Rated Outcome Measures in Athletic Training. *J Athl Train*. 2014;49(5):674-683.
19. Hambly K, Griva K. IKDC or KOOS: which one captures symptoms and disabilities most important to patients who have undergone initial anterior cruciate ligament reconstruction? *Am J Sports Med*. 2010;38(7):1395-1404.
20. Driban JB, Morgan N, Price LL, Cook KF, Wang C. Patient-Reported Outcomes Measurement Information System (PROMIS) instruments among individuals with symptomatic knee osteoarthritis: a cross-sectional study of floor/ceiling effects and construct validity. *BMC Musculoskelet Disord*. 2015;16:253.
21. Athletic Training Education Competencies. National Athletic Trainers' Association Web site. Accessed September, 2020.
22. Jette DU, Halbert J, Iverson C, Miceli E, Shah P. Use of standardized outcome measures in physical therapist practice: perceptions and applications. *Phys Ther*. 2009;89(2):125-135.

- 
23. Swinkels RA, van Peppen RP, Wittink H, Custers JW, Beurskens AJ. Current use and barriers and facilitators for implementation of standardised measures in physical therapy in the Netherlands. *BMC Musculoskelet Disord.* 2011;12:106.
  24. Hatfield DR, Ogles BM. Why some clinicians use outcome measures and others do not. *Adm Policy Ment Health.* 2007;34(3):283-291.
  25. Certification Bo. BOC Certified AT Demographics. [https://bocatc.org/system/document\\_versions/versions/231/original/at-demographics-20201026.pdf?1603741438](https://bocatc.org/system/document_versions/versions/231/original/at-demographics-20201026.pdf?1603741438). Accessed November, 2020.
  26. Duncan EA, Murray J. The barriers and facilitators to routine outcome measurement by allied health professionals in practice: a systematic review. *BMC Health Serv Res.* 2012;12:96.
-