

# Athletic Trainers' Skills in Identifying and Managing Athletes Experiencing Psychological Distress

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**Context:** Athletic trainers (ATs) commonly use psychological skills during sport rehabilitation. However, little is known about their ability to accurately implement these skills.

**Objective:** To assess ATs' skills in identifying psychological symptoms, selecting appropriate strategies, and making referral decisions for athletes experiencing various degrees of psychological distress.

**Design:** Cross-sectional study.

**Setting:** Participants were recruited using the National Athletic Trainers' Association professional member database.

**Patients or Other Participants:** Of the 2998 ATs who were selected randomly, 494 (16.5%) partially completed the questionnaire and 326 (10.9%) completed the entire survey (mean age = 34.7 ± 10.8 years, mean years of experience = 11.3 ± 9.9).

**Main Outcome Measure(s):** Using the Web-based questionnaire created for this study, we collected ATs' demographic information and assessed their perceptions about responsibilities as ATs, psychosocial competencies, training in sport psychology, and referral behaviors. Additionally, respondents

were asked to identify symptoms, match psychological strategies (eg, goal setting, imagery, progressive muscle relaxation), and make referral decisions for athletes in 3 case vignettes.

**Results:** The ATs demonstrated high accuracy in identifying symptoms and making referral decisions but struggled in selecting appropriate psychosocial strategies for athletes. Stepwise regression analyses revealed that ATs who had had specific coursework in sport psychology were able to more accurately identify symptoms ( $t = 3.01, P < .01$ ), and those ATs with more experience reported lower accuracy scores for their intended course of action ( $t = -2.25, P < .05$ ).

**Conclusions:** Our analogue research design provided new insights into ATs' knowledge and use of sport psychology in practice. The results highlighted the importance of coursework focusing on applied areas of sport psychology in the training of ATs.

**Key Words:** injury psychology, psychosocial strategies, assessment

## Key Points

- The athletic trainers accurately identified the presence and absence of psychological symptoms in athletes and frequently referred athletes to other providers.
- The athletic trainers understood their responsibilities and felt competent implementing many psychological techniques with injured athletes during rehabilitation. However, they struggled when asked to choose appropriate psychosocial strategies.
- Adding practical experiences during coursework on psychological strategies may help athletic training students learn to navigate applied situations with athletes.

Certified athletic trainers (ATs) play a primary role in facilitating an athlete's rehabilitation after a sport-related injury. Understandably, ATs view the identification of physical problems and development of rehabilitation plans as being of primary importance to their work alongside athletes. However, the importance of considering an athlete's psychological concerns during the rehabilitation process has also gained significant empirical attention since Rotella and Heyman<sup>1(p343)</sup> remarked, "the future will demand that injury rehabilitation include both physical and psychological components." Recent numbers provided by the National Institute of Mental Health<sup>2</sup> allow us to conservatively estimate the rate of mental illness in Americans aged 18–25 years at 15% to 20%. These data did not address athletic participation or other related variables, but given the documented relationship between injury and mental health, it is likely that injured athletes experience mental illness.<sup>3</sup> Specifically,

ATs may encounter a variety of situations that warrant the referral of an injured athlete to a mental health professional, including psychopathologic symptoms (eg, eating disorders, mood disorders, depression), adjustment difficulties, or rehabilitation setbacks.<sup>3–6</sup> Often, signs of distress or impaired functioning may not be obvious; thus, ATs should become familiar with the subtle signs commonly associated with adaptive and maladaptive rehabilitation while securing a vast referral network.

The national governing body responsible for certifying ATs, the Board of Certification, has also recognized the importance of psychosocial concerns in patients with athletic injuries by identifying a set of psychosocial competencies for entry-level ATs.<sup>4</sup> Athletic trainers are required to demonstrate proficiency in 8 content areas set forth by the National Athletic Trainers' Association (NATA; Table 1). One such competency, Psychosocial Strategies and Referral (PS), dictates that entry-level ATs

**Table 1. Athletic Training Educational Competencies**

Content Area	Description <sup>a</sup>
Evidence-based practice	Practitioners incorporate the best available evidence, their clinical skills, and the needs of the patient to maximize patient outcomes. An understanding of evidence-based practice concepts and their application is essential to sound clinical decision-making.
Prevention and health promotion	ATs develop and implement strategies and programs to prevent the incidence and/or [lessen the] severity of injuries and illnesses and optimize their clients'/patients' overall health and quality of life.
Clinical examination and diagnosis	ATs must possess strong clinical examination skills in order to accurately diagnose and effectively treat their patients.
Acute care of injury and illness	ATs must be knowledgeable and skilled in the evaluation and immediate management of acute injuries and illnesses.
Therapeutic interventions	ATs must assess the patient's status using clinician- and patient-based outcome measures and use therapeutic interventions designed to maximize the patient's participation and health-related quality of life.
Psychosocial strategies and referral	ATs must recognize clients/patients exhibiting abnormal social, emotional, and mental behaviors and be able to intervene and refer these individuals as necessary.
Health care administration	ATs must function within the context of a complex health care system and display an understanding of risk management, health care delivery mechanisms, insurance, reimbursement, documentation, privacy, and facility management.
Professional development and responsibility	ATs maintain current competence in the constantly changing world of health care while embracing the need to practice within the limits of state and national regulation using moral and ethical judgment.

Abbreviation: ATs, athletic trainers.

<sup>a</sup> Adapted with permission.<sup>7</sup>

must possess theoretical knowledge and psychological strategies to recognize abnormal social and emotional behaviors exhibited by clients.<sup>7</sup> Also, ATs must appreciate the role of mental health in injury and recovery and be able to intervene or refer individuals to optimize rehabilitation. The Commission on Accreditation of Athletic Training Education (CAATE) allows flexibility in how program directors fulfill these required educational competencies. As a result, some accredited programs offer coursework that focuses primarily on the basic theoretical aspects of human behavior (ie, general psychology) yet may lack emphasis on practical applications of sport psychology techniques (eg, imagery, relaxation training, referral).<sup>8,9</sup> Because of this variability in training models, some ATs may not be receiving the best possible training to fulfill their responsibilities, as outlined by the NATA, which may influence their overall competence or confidence in this area.

Research<sup>10</sup> regarding athletic training education programs revealed that PS received the lowest instructional emphasis rank overall; the majority (61%) of the designated subcompetencies (ie, counseling principles, referral, psychosocial strategies) were taught in other athletic training core courses, rather than in a designated course addressing these content areas. Furthermore, this instruction appeared to be more passive than practical or interactive, as lecture was the primary mode of delivery.<sup>10</sup> When psychosocial strategies were appropriately taught in educational workshops, ATs described greater skill use and overall knowledge and positive attitudes in this content area.<sup>8,10,11</sup> In addition, a recent evaluation<sup>8</sup> demonstrated that just more than half of sampled ATs had taken a formal sport psychology course, a slight increase from previously conducted research.<sup>12</sup> Despite the reported increase, ATs still expressed a clear desire to increase their knowledge and overall understanding of PS. From a practical standpoint, ATs reported various psychosocial symptoms in athletes and making frequent referrals to mental health

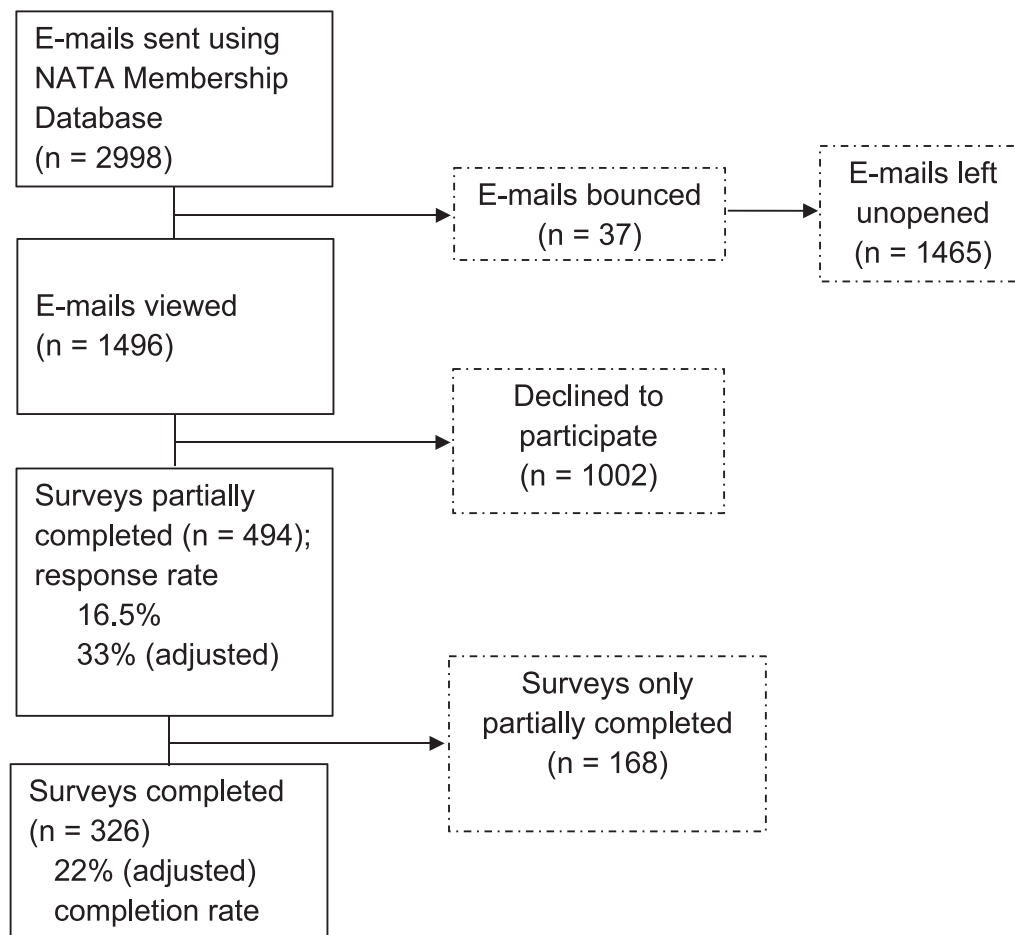
practitioners, such as counselors, psychologists, and sport psychology consultants. However, due to the retrospective nature of these studies, it remains unclear whether ATs can appropriately recognize various symptoms of psychological distress, pair the proper strategy with the presenting psychological concern, or appropriately refer athletes requiring more specialized care.

Therefore, the primary purpose of our study was to expand the literature in the area of psychology of injury by assessing ATs' skills in identifying symptoms, matching strategies with stressors experienced by athletes, and making referral decisions. The following main research questions were addressed: (1) Compared with a panel of experts, are ATs able to correctly identify psychological symptoms in athletes and make correct referral decisions based on information presented in case vignettes? (2) Compared with a panel of experts, are ATs able to correctly match psychosocial strategies for athletes based on psychological symptoms presented in case vignettes? and (3) How do factors such as years of experience, perceived competency, and sport psychology coursework relate to an AT's ability to accurately identify psychological symptoms, select appropriate strategies for athletes presented in case vignettes, and make referral decisions? We hypothesized that ATs' perceived competency, age, years of experience, and sport psychology coursework would positively predict their ability to (1) accurately identify symptoms, (2) select strategies, and (3) make referral decisions in all 3 cases. These results will be discussed in relation to previously published data and to the NATA competencies to understand the current skill levels of working ATs in the area of psychosocial strategies.

## METHODS

### Participants and Recruitment

After receiving approval from the West Virginia University Institutional Review Board for the Protection



**Figure.** Study-sampling process. The sampling process was the result of 3 recruitment e-mails sent over a 3-week period. Each recruitment e-mail included an invitation to participate and information about the study, confidentiality, and the time commitment for participation. Abbreviation: NATA, National Athletic Trainers' Association.

of Human Subjects, we contacted potential participants via e-mail, informed them of the nature of the study, and invited them to complete the Web-based questionnaire posted on Qualtrics (Qualtrics, LLC, Provo, UT). Survey research collected via an Internet site is a viable method of collecting data for scientific purposes.<sup>13,14</sup> Dillman<sup>14</sup> also noted many potential benefits of Web-based methods, such as easier access to participants, more flexibility for participants to retrieve the survey information, less intrusion from the researchers, and greater likelihood of participant anonymity.

As outlined by Dillman<sup>14</sup> and Creswell,<sup>15</sup> we used a step-by-step procedure to communicate with all potential participants. These steps consisted of (1) sending an e-mail to all randomly selected participants, including a description of the study, consent information, and a link to the Web-based questionnaire; (2) 1 week later, sending a reminder e-mail to all ATs who had not completed the questionnaire; and (3) after 1 additional week, sending a final e-mail notice to all who had not completed the survey. Each e-mail included a description of the study and goals and a link to the Web-based questionnaire. Participants gave their consent by choosing to complete the questionnaire.

Using this method of recruitment, participation was solicited from 2998 certified ATs randomly selected from

the 2014 NATA membership database. Of the 2998 e-mails sent, 1496 (49.8%) were opened and viewed, and of those, 494 recipients (33.0%) accepted the invitation to participate. Of those who began the Web-based questionnaire, 326 respondents (21.8%) completed the entire survey and 168 (11.2%) completed part of the survey, for an adjusted response rate of 33.0% (see Figure).

### Validation

A panel of experts ( $n = 5$ ) was assembled to determine the appropriate symptom identification, course of action, and psychosocial strategy for each case vignette. Experts were selected based on their experience and reputation in applied sport psychology, as well as their vast publication records in respected academic journals in the area of psychology of injury. All members of the expert panel held doctoral degrees in areas related to sport and exercise psychology; 4 were certified consultants with the Association for Applied Sport Psychology, 2 were fellows of the Association for Applied Sport Psychology, 2 were licensed psychologists, and 1 was an AT. Each expert was given a copy of the survey and asked to respond to all questions pertaining to the 3 case vignettes (ie, whether they believed a particular symptom was present and their intended course of action). In some cases, experts provided written feedback containing justification for the chosen response. After

compiling all responses, we assigned a *correct* label when at least 4 experts (80%) agreed on a particular response. Any question that did not reach the criterion for agreement was subjected to a second round of expert review. Only 2 rounds were required to achieve agreement on all questions.

**Pilot Testing.** Before recruiting participants, we performed extensive pilot testing of the survey materials, as suggested by Lackey and Wingate.<sup>16</sup> First, cognitive interviews were conducted with athletic training students (ATSS;  $n = 3$ ). During pretesting, cognitive interviews are widely used to identify items that are not clear to respondents in the manner intended by the survey developers.<sup>17</sup> The ATSS were instructed to complete the survey and encouraged to “think out loud.” This method helped us to understand how they might interpret and understand each question and to anticipate and identify potential errors of interpretation. Minor changes were made to the survey based on the 3 cognitive interviews. Second, a small group of experts ( $n = 5$ ) in sport psychology, counseling psychology, athletic training, and survey design provided qualitative feedback on the content and structure of the survey. Third, a group of graduate students in sport and exercise psychology ( $n = 14$ ) and athletic training ( $n = 13$ ) participated in pilot testing of the survey. For this piloting process, we asked participants to provide feedback regarding the clarity of the questions, grammar, flow, completeness, ease of responding to questions, and length. Minor changes were made based on the feedback from all 3 phases of the piloting process.

## Instrumentation

**Case Vignettes.** Three vignettes (Appendix) were developed, each depicting a different athlete competing at the collegiate level who was experiencing difficulty rehabilitating from a sport injury. Vignettes were modeled (eg, approximate length, depth of descriptive information, use of language) on previously developed vignettes in injury psychology research.<sup>18,19</sup>

After providing basic background information, we supplied a description of the injury using appropriate language (eg, “Oscar is a soccer player who sustained a grade 3 ankle sprain while attempting to land from a header.”). Additionally, each vignette offered information regarding the athlete’s initial response to injury (eg, devastation, relief), timeline (eg, how long since the injury, the projected recovery period), rehabilitation behaviors (eg, adherence, physical appearance), psychological factors (eg, affect, motivation, effort), and social factors (eg, coach and teammate support). Each vignette described a different level of symptom severity (low: Stanley; moderate: Toby; high: Oscar) so we could determine whether ATs were able to effectively identify symptoms relating to adaptive versus maladaptive responses to injury. The vignettes were presented to ATs in random order. The portrayal of symptoms in the case vignettes followed accounts outlined in the *Diagnostic and Statistical Manual of Mental Disorders*, 5th edition,<sup>20</sup> for stress, anxiety, adjustment disorder, and depression. Symptoms included irritability, apathy, frustration, loss of motivation, social withdrawal, excessive worry, suicidal thoughts, and alcohol and drug use or abuse.

**Symptom Rating.** Participants were asked to indicate, using *yes* or *no*, the presence of symptoms depicted in each of the vignettes. The list of symptoms was created to purposefully include explicit (eg, suicidal thoughts) and more ambiguous (eg, difficulty adjusting to the injury) symptoms. For each case vignette, respondents could accumulate a maximum of 7 points for accuracy based on the responses from the expert panel. For the analysis, total accuracy points were summed across all 3 cases and averaged (out of 7).

**Recommendations for Best Course of Action.** Next, participants were asked to identify their intended course of action for each athlete depicted in the vignettes. Participants were given 4 options to choose from: (1) take no action; (2) monitor closely but make no referral; (3) consult with a supervisor; or (4) make an immediate referral. Respondents were given 1 point if they chose the correct course of action. Total accuracy was calculated by summing scores from all 3 case vignettes, with a maximum possible score of 3.

**Recommendations for Referral.** An AT who chose to refer the athlete was then asked how likely he or she was to select a specific referral source: (1) sport psychology professional, (2) medical supervisor (head AT, team physician), or (3) mental health professional (counselor or psychologist). We chose to list these professionals based on their relative availability to the vast majority of ATs and on previous research using similar methods.<sup>18</sup> Results from this question were not included in the analysis because of large discrepancies in access to and protocols for referring to these professionals. For example, what would be considered protocol in one workplace (eg, referral to senior or supervising AT) might not be the case in another.

**Implementing Psychological Strategies.** Finally, participants were asked to indicate (*yes* or *no*) whether they believed specific psychosocial strategies were helpful for each athlete based on the information presented in the case vignette. We chose possible strategies based on those used in previous research<sup>8,12,21</sup> and in the CAATE educational competencies. They consisted of changing self-talk, encouraging effective communication, facilitating the athlete’s understanding of the injury, setting goals, helping athletes develop focus cues, providing emotional support, teaching deep breathing, teaching healing imagery, teaching performance imagery, teaching progressive muscle relaxation, and using active listening. For each case vignette, respondents could accumulate a maximum of 11 points for accuracy based on the responses from the expert panel. For analysis, we calculated the average accuracy points across all 3 case vignettes to create an overall accuracy score out of 11 possible points.

**Perceived Roles of ATs.** Using a *yes*, *no*, or *not sure* format, participants were asked to respond to 6 statements regarding the roles of ATs: (1) identifying possibly harmful responses to injury, (2) assessing and diagnosing physical injuries, (3) facilitating psychosocial referral, (4) explaining the best course of action to the athlete and coach, (5) providing counseling to athletes for personal concerns, and (6) administering psychosocial strategies to facilitate physical recovery from injury. These statements were derived from the NATA consensus agreement<sup>4</sup> and represent the “minimum requirements for a student’s professional education.”<sup>7</sup>

**Perceived Competency Implementing Psychosocial Strategies.** Participants used a 4-point Likert scale (1 = *not at all competent*, 4 = *very competent*) to indicate their perceived level of competency for a number of basic psychosocial strategies: changing self-talk, encouraging effective communication, facilitating the athlete's understanding of the injury, setting goals, helping athletes develop focus cues, providing emotional support, teaching deep breathing, teaching healing imagery, teaching performance imagery, teaching progressive muscle relaxation, and using active listening. These strategies were based on the NATA educational competencies and considered knowledge and skills that all entry-level ATs should possess and have the ability to implement. For analysis, we calculated the average rating across all competencies to create an overall competency score (maximum value of 4).

**Education and Training Relevant to PS.** Using a multiple-response format, participants indicated whether they had received training in sport psychology or the psychology of injury (or both) at the undergraduate or graduate level (or both). Although the question specifically asked ATs to include any coursework they had taken in these areas, it is possible that many respondents interpreted this question as asking whether they had been exposed to each topic during their education. For analysis, responses were combined into 1 variable; participants received 1 point for taking a specialized course at any level, for a maximum score of 4.

**Demographic Information.** Participants provided basic demographic information regarding their age, sex, race or ethnicity, highest academic degree earned, current certifications, number of years as an AT, type of sport they currently work with, and current employment setting as an AT (eg, high school, university, professional, private).

## Data Analyses

The quantitative analysis consisted of 2 steps. Regarding the first and second research questions of the study, we compiled descriptive statistics to summarize participants' ability to accurately identify psychological symptoms, match psychosocial strategies based on symptoms presented in the 3 case vignettes, and make referral decisions. These descriptions included a summary of their responses and an assessment of their relative accuracy compared with the responses of the expert panel.

The third research question asked how factors such as years of experience, perceived competency, and coursework in sport psychology related to an AT's accuracy in symptom identification, strategy matching, and intended course of action. Stepwise regression models were used to evaluate this research question.

## RESULTS

### Demographics

The average respondent to the Web-based questionnaire was  $34.7 \pm 10.8$  years old and reported  $11.3 \pm 9.9$  years of experience in the field. Of the 326 respondents, 191 (58.6%) were women, 132 (40.5%) were men, and 3 (0.9%) did not disclose their sex. Most ATs were employed in the high school (35.3%) or university setting (33.9%). A

**Table 2. Participants' Demographic Information<sup>a</sup>**

Variable	n (%)
Mean age = $34.7 \pm 10.8$ y	326 (100)
Ethnicity	326 (100)
White/Caucasian	292 (89.6)
Hispanic/Latino	15 (4.6)
Asian/Pacific Islander	5 (1.5)
Multiracial	4 (1.2)
American Indian/Alaskan Native	2 (0.6)
Black/African American	1 (0.3)
Sex	325 (100)
Female	191 (58.6)
Male	132 (40.5)
Undisclosed	3 (0.9)
Experience, mean = $11.3 \pm 9.9$ y	313 (100)
Highest education level	327 (100)
Bachelor's degree	101 (30.8)
Master's degree	205 (63.2)
Doctorate	17 (5.1)
Other	4 (1.2)
Psychosocial strategies coursework	326 (100)
Sport psychology: undergraduate	231 (70.8)
Sport psychology: graduate	135 (41.3)
Psychology of injury: undergraduate	222 (68.0)
Psychology of injury: graduate	111 (34.0)
Work setting	327 (100)
High school	109 (35.3)
College/university	111 (33.9)
Clinic/private practice/hospital	47 (14.4)
Amateur/professional team	14 (4.3)
Other	24 (7.3)

<sup>a</sup> Not all respondents answered all questions.

majority of the respondents (63.2%) reported having a master's degree, and 68% of the ATs had at least taken an undergraduate course in the psychology of injury. Additionally, as many as 41.3% of respondents reported taking a graduate course in sport psychology and 34.0% reported taking a graduate course in the psychology of injury (see Table 2).

### Perceptions About Psychosocial Competencies

Participants perceived their responsibilities as ATs as varying in importance (Table 3). For instance, 97.3% of respondents believed that facilitating psychological referral was a major responsibility of all ATs when the athlete exhibited personal distress. In addition, more than 90% of respondents thought it was the AT's responsibility to recognize adaptive and maladaptive psychological responses during injury rehabilitation. However, only 43% of respondents thought it was their responsibility to implement psychosocial strategies of any kind with an athlete experiencing distress. This low number may be due to the overall lack of applied sport psychology training or the belief that ATs should focus mostly on the physical aspects of rehabilitation.

Additionally, on a 4-point scale, ATs in the sample rated their overall ability to implement selected psychosocial strategies as competent ( $3.15 \pm 0.74$ ) and perceived themselves as most competent in facilitating the athlete's understanding of the injury ( $3.77 \pm 0.47$ ), goal setting

**Table 3. Athletic Trainers' Perceptions of Responsibilities and Sport Psychology Competencies<sup>a</sup>**

Category	Item	n	%			Mean ± SD
			Yes	No	Not Sure	
Athletic trainers' responsibilities						
	Incorporating treatment for physical recovery	400	98.3	0.8	1.0	
	Facilitating psychological referral	400	97.3	0.8	2.0	
	Explaining course of action to athlete/coach	400	93.0	4.0	3.0	
	Recognizing psychological responses	399	91.2	2.3	6.5	
	Implementing psychological interventions	400	43.0	41.3	15.8	
	Providing counseling to athletes	400	36.0	46.8	17.3	
Athletic trainer's perceived competencies (1 = <i>Not at all competent</i> , 4 = <i>very competent</i> )						
		384				
	Facilitating athlete's understanding of injury					3.77 ± 0.47
	Goal setting					3.73 ± 0.56
	Encouraging effective communication					3.70 ± 0.54
	Using active listening					3.65 ± 0.55
	Providing emotional support					3.40 ± 0.69
	Changing self-talk					3.33 ± 0.67
	Teaching deep breathing					2.75 ± 0.93
	Teaching progressive muscle relaxation					2.72 ± 0.92
	Helping athletes develop focus cues					2.59 ± 0.92
	Teaching healing imagery					2.51 ± 0.97
	Teaching performance imagery					2.49 ± 0.93

<sup>a</sup> Not all respondents answered all questions.

(3.73 ± 0.56), encouraging effective communication (3.70 ± 0.54), and using active listening (3.65 ± 0.55). In contrast, ATs rated themselves as least competent in teaching and implementing performance imagery (2.49 ± 0.93) and healing imagery (2.51 ± 0.97), developing focus cues (2.59 ± 0.92), and teaching progressive muscle relaxation (2.72 ± 0.92).

**Accuracy in Identifying Symptoms, Matching Psychosocial Strategies, and Making Referrals**

Respondents correctly identified psychological symptoms as presented in the 3 case vignettes. When we compared their responses with those of the expert panel, ATs responded well in recognizing symptoms in the low (5.98 ± 1.00; maximum score = 7), moderate (6.03 ± 0.65), and high (6.75 ± 0.82) categories. Overall, ATs averaged 6.27 ± 0.49 on total symptom identification across all participants and all 3 case vignettes.

When asked to choose their intended course of action from among 4 choices, most ATs chose correctly (97.3% and 89.7%) for the patients with low-level and high-level symptoms, respectively. However, fewer than half of the ATs (38.3%) chose the appropriate course of action for the patient with moderate symptoms: 61% of respondents overreferred this athlete, choosing to consult with a supervisor/mental health professional (59%) or immediately refer the athlete to a mental health professional (2%).

Finally, ATs appeared to have some difficulty when choosing appropriate strategies for each athlete presented in the case vignettes. Specifically, compared with responses established from the expert panel (maximum score = 11), ATs responded moderately well to symptoms in the low (8.80 ± 1.43) and moderate (7.91 ± 1.38) categories yet averaged a score of 5.42 ± 1.62 in the high category. Closer examination of the data for the high category was revealing: the majority of ATs identified every strategy as

helpful for this athlete, whereas the expert panel identified only 4 as helpful.

**Predictors of Accuracy**

We hypothesized that ATs' perceived competency, years of experience, and sport psychology coursework would positively predict their ability to (1) accurately identify symptoms, (2) match psychosocial strategies, and (3) make referral decisions. Three separate stepwise multiple regressions were conducted to test this hypothesis. In each analysis, we entered perceived competency, years of experience, and sport psychology coursework as predictors. In the first regression, with symptom accuracy as the outcome, the model was significant:  $F_{1,297} = 9.03, P < .01$ . Closer examination of the  $\beta$  weights revealed that exposure to sport psychology courses was the only significant predictor of ATs' accuracy in diagnosing symptoms ( $\beta = 0.17, t = 3.01, P < .01$ ), accounting for 3.0% of the variance in accuracy scores. Thus, ATs who reported specific coursework in sport psychology were able to more accurately identify symptoms in the 3 patients.

A second stepwise multiple regression included the ATs' recommended course of action as the outcome variable. The model was significant:  $F_{1,308} = 8.39, P < .01$ . The  $\beta$  weights within the model revealed that years of experience as an AT was the only significant predictor of ATs' accuracy in recommending the best course of action ( $\beta = -0.16, t = -2.90, P < .01$ ), accounting for 2.7% of the variance in accuracy scores. Contrary to our hypotheses, this small effect indicated lower accuracy scores as experience increased. Follow-up stepwise regression analyses on ATs' recommended course of action for Toby (moderate symptoms) demonstrated a significant model,  $F_{1,308} = 5.08, P < .05$ . Closer examination of the findings indicated that years of experience was the only significant predictor ( $\beta = -0.13, t = -2.25, P < .05$ ), accounting for 1.6% of the variance in accuracy scores. Those with more

experience as an AT had slightly lower accuracy scores for their intended course of action.

A third stepwise multiple regression, with ATs' strategy recommendations entered as the outcome variable, resulted in a nonsignificant model. Because ATs did much worse in choosing recommended strategies for Oscar (high level of symptoms), follow-up stepwise regression analyses on ATs' recommended strategies for Oscar revealed a significant model:  $F_{1,305} = 13.04$ ,  $P < .001$ . Closer examination of the model showed that exposure to sport psychology coursework was the only significant predictor ( $\beta = -0.20$ ,  $t = -3.61$ ,  $P < .001$ ), accounting for 4.1% of the variance in strategy scores. Overall, these results reflect a negative association between sport psychology coursework and the ATs' accuracy in identifying appropriate psychosocial strategies.

## DISCUSSION

### Identifying Psychological Symptoms

With nearly 500 ATs completing at least part of the Web-based survey, these findings represent the largest sample of ATs with advanced training in PS to date. The ATs in the current sample provided mixed responses regarding their perceived competencies relating to psychological aspects of sport injury. Overall, these findings are consistent with those of previous researchers<sup>22,23</sup> who found that ATs generally felt competent and frequently used goal setting, motivation, and self-talk, yet they reported feeling unprepared to implement many of the more advanced mental skills, such as imagery and relaxation training. A recent evaluation<sup>21</sup> of psychological skill implementation may help us to interpret the observed variance in skill competency. Specifically, Zizzi et al<sup>21</sup> used the perceptions of ATs, coaches, and psychologists to establish a hierarchy of psychological skills. Many of the same psychological skills that our respondents felt least competent in implementing were characterized as requiring high levels of specialized training. It is possible that mastering the implementation of certain psychological skills (eg, focus, imagery, self-talk) remains outside the scope of a single undergraduate- or graduate-level course in sport psychology, and therefore, these skills may not be appropriate for entry-level ATs to use. Thus, should the NATA and CAATE decide to revise the educational guidelines for PS, they might consider adjusting the psychological skills that ATs are expected to implement by excluding the more advanced skills. Additionally, established athletic training education programs could increase active learning techniques (eg, role playing, case studies, practical training) to supplement existing course content and improve the overall learning experience for ATs or perhaps offer continuing education workshops in implementing more complex psychological skills.

The ATs demonstrated relatively high accuracy in identifying symptoms for all 3 case vignettes. Furthermore, symptom identification varied little, and respondents correctly identified at least 4 of 7 symptoms in all case vignettes. These patterns of high accuracy appear to result from the aforementioned training in sport psychology, especially because this variable was the only significant predictor in symptom identification. Our findings seem to

contrast with those of earlier investigators<sup>24,25</sup> who concluded that ATs had difficulty identifying clinically meaningful emotional disturbances in injured athletes. However, those authors used correlations to compare athlete self-reports of psychological symptoms with ATs' observations of behavioral indicators of distress, making comparison with the current findings difficult. Also, all available research investigating this question was published before the NATA added the PS competency to the educational guidelines<sup>7</sup> in 1999, which suggests that previously sampled ATs had significantly fewer opportunities to take courses in sport psychology. One might surmise that ATs will continue to improve in these areas, given the current availability of sport psychology coursework at the undergraduate and graduate levels at many institutions housing accredited AT programs.

### Referral Decisions and Intervention Strategies

Despite their accuracy in identifying symptoms, these ATs appeared to struggle when choosing appropriate psychosocial strategies for each athlete. Of particular concern was the low level of accuracy in choosing strategies for the athlete with a high level of symptoms (Oscar). Many ATs believed all 11 strategies would be helpful for Oscar, even though the expert panel identified only 4 as correct. However, most ATs (90%) chose the correct course of action for him: immediate referral. Thus, it is possible that ATs recognized the severity of this athlete's symptoms and simply believed all strategies could be of some help to him. Although their accuracy in choosing strategies was low, it is encouraging that they would refer this athlete to a mental health professional rather than attempt to implement the strategies themselves. Furthermore, ATs were also mostly accurate in deciding how to proceed with Stanley (low-level symptoms), but more than half (61%) overreferred Toby (moderate-level symptoms), choosing to consult with a supervisor or immediately refer him to a mental health professional. It is possible that ATs were unsure of how to proceed with Toby and, therefore, chose to err on the side of caution by taking the more conservative approach to refer and ensure that no potentially serious problems were overlooked.

Regression analyses indicated interesting trends in the prediction of ATs' intended course of action. Less experienced ATs were slightly more accurate in deciding the best course of action for all patients, particularly the athlete with moderate symptoms. These results are contrary to results of studies on procedural decision making in health professions (eg, physiotherapy, nursing). Smith et al<sup>26</sup> reported that more experienced physiotherapists, when evaluated by a supervisor, adopted an approach to decision making that was more specific, refined, and ultimately, more accurate than did those with less clinical experience. Furthermore, Phillips et al<sup>27</sup> concluded that novice physical therapists often chose to follow protocol and guidelines derived from university-based teachings, whereas experts were more likely to view a situation broadly and critically apply rules and norms based on previous experience. Thus, more experienced ATs in this study may have felt limited because of the restricted options provided in the questionnaire and were unable to make more creative (yet still correct) procedural decisions. Additionally, the survey and

written case vignettes may have favored the younger ATs who had been exposed to this type of evaluation in their courses more recently. Finally, it is possible that younger ATs were more likely to work in school settings rather than private clinics, where access to mental health professionals is more readily available. Future researchers should attempt to explore and understand this relationship more closely by asking ATs to explain the process they use to arrive at a procedural decision or by testing ATs' decision making in live or video scenarios to more closely mimic real-world conditions.

The absence of sport psychology coursework as a predictor in decision making was interesting but not entirely surprising. Stiller-Ostrowski and Ostrowski<sup>23</sup> reported that even formal sport psychology courses tend to be predominantly theory driven and lack practical emphasis and application of sport psychology concepts within the athletic training realm. Scherzer<sup>28</sup> recommended that courses should focus on educating students about referral procedures and protocols, yet few actually do. As a result, even highly trained ATs may struggle to make appropriate decisions.

### Limitations

Our study had a number of limitations that should be noted when interpreting the findings. First, the questionnaire was disseminated using e-mail addresses that were provided by the NATA membership database. Thus, although distribution via e-mail may have reached more prospective participants, it may have also influenced the scope of the sample who took the survey. Specifically, ATs who do not use e-mail regularly or do not have an updated e-mail address in the NATA database were less likely to participate, perhaps leading to the low overall response rate. Additionally, many participants completed all survey questions relevant to the research questions but chose not to respond to basic demographic information (eg, the sport they work with). These ATs were placed in the *partially completed* portion of total participants. However, countering this limitation is the fact that the sample of respondents represents the largest pool of ATs with training and interest in PS to date. Also, none of the recruitment e-mails included any information about sport psychology in the subject heading, thus limiting the possible response bias. Second, the responses compiled by the panel of experts may not represent actual correct responses to the questions relating to symptom identification, intended course of action, and strategy choice. Rather, they represented the consensus of this particular group of professionals. However, given the experience level of each member of this panel, it is conceivable that many other experts would respond similarly. Third, respondents were asked to respond to questions relating to 3 male athletes with various psychological symptoms. Although this depiction was intentional, ATs might have responded differently if the case vignettes had described female athletes. Future authors should not only explore this possibility but also investigate the AT's sex as a variable. Finally, the questionnaire relied on ATs to self-report responses (eg, perceived competencies, referral behaviors, perceptions of sport psychology), which may have influenced the accuracy of the results and the conclusions drawn from them.

### CONCLUSIONS

The ATs in our study reported making frequent referrals for athletes with various psychological concerns, possibly because they were mindful of the psychological aspects associated with sport injury and deemed them important to the recovery process. Particularly encouraging is the fact that they appeared to have the knowledge to accurately identify the presence or absence of psychological symptoms in athletes. Additionally, the ATs had a relatively strong understanding of their responsibilities and felt competent in implementing many psychological techniques with athletes during rehabilitation. However, ATs struggled when asked to choose appropriate psychosocial strategies, which could be explained by the theoretical nature of most sport psychology courses. Therefore, a case could be made for adding practical experiences during PS coursework to ensure that ATs are capable of navigating applied situations with athletes.

### Future Directions

Although our study provided insight into ATs' accuracy in symptom identification, intended course of action, and matching of psychosocial strategies, a number of important questions have emerged that merit further research. Specifically, although ATs did well in deciding the best course of action for athletes, we did not explore how ATs came to their decisions. Thus, future investigators may use a qualitative approach to obtain valuable insight into the decision-making process and supplement our results. Also, given the highly trained nature of the current sample, future researchers could include a more diverse sample of participants. For instance, researchers may want to recruit ATs from conferences or conventions who may have less sport psychology coursework and training. Furthermore, due to our use of case vignettes, it is possible that some of the information was obvious (ie, "Toby is visibly frustrated") and therefore led to high accuracy in the ATs' responses. Future authors may use other methods, such as videos, that require ATs to detect more subtle behavioral cues. Finally, an assessment of injured athletes' perceptions of ATs' use and knowledge of sport psychology could provide valuable insight and significantly increase our understanding of this important area of research.

### Appendix. Case Vignettes

#### Stanley

Stanley is a starting sophomore soccer player and leading scorer at a respected National Collegiate Athletic Association (NCAA) Division 1 institution. While sprinting hard toward a ball, he suffered his second grade-2 hamstring strain. His first strain had occurred during his sophomore year in high school, from which he fully recovered. After his initial evaluation, Stanley is told that he will not require surgery but will likely miss the first 4–6 weeks of the season. During the days immediately following his injury, you notice that Stanley seems somewhat discouraged but follows through with his rehabilitation protocol as instructed. He attends each session and usually arrives on time, despite his limited



mobility on campus. You have also heard from his teammates that he regularly attends practice and is fairly upbeat, despite seeming somewhat frustrated with his new role on the team. A few weeks following his injury, you explain to Stanley that he is progressing more slowly than predicted and that he should prepare himself for an extra week away from play. Though initially upset by the news, he seems to recover quickly and become comfortable with his lack of progress and new timeline.

### Toby

Toby is a starting junior soccer player and leading scorer at a respected NCAA Division I institution. After jumping up to head a ball during a preseason match, Toby landed awkwardly and suffered a grade-3 ankle sprain on his dominant foot. After his initial evaluation, the doctors, as well as the head athletic trainer (AT), informed Toby that he would likely be sidelined for at least 5–6 weeks but would not require surgical repair to his ankle. Since his freshman year, you have known Toby to be an outgoing, cheerful, and upbeat person. However, since hearing his prognosis, Toby appears discouraged, because he worked the entire summer to become season ready. For the first weeks following your initial assessment, you notice that Toby is often 5–10 minutes late to rehab appointments, rarely engages in small talk, and generally seems sad. He still completes all his exercises and stretches as instructed but is visibly frustrated with his rehabilitation timeline and lack of progress early on. You’ve also noticed that, even though he attends team practice, he normally sits on the bench and doesn’t say much.

### Oscar

Oscar is a starting junior soccer player and leading scorer at a respected NCAA Division I institution. During the first match of the season, Oscar suffered a grade-3 ankle sprain on his dominant foot while attempting to jump over an opponent. He described hearing a “pop” when he landed. After his initial assessment, the doctors, as well as the head AT, informed Oscar that he would likely miss 5–6 weeks but would not require surgery on his ankle. After hearing the news, Oscar was visibly upset and immediately left the room on his crutches. For the following 3 weeks, Oscar misses many appointments, and when he shows up, he is visibly fatigued and lacks the ability to focus on his rehabilitation. You also notice that he has lost a significant amount of weight during the short period of time since his injury. He no longer shows up to practice, refuses to talk about soccer or his injury, and spends most of his time alone in his apartment. You’ve also heard him discuss quitting soccer altogether and leaving college. His teammates have also shared with you that he frequently talks about “wishing he was not around” and “losing his purpose in life,” statements that are frequently coupled with severe intoxication.

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