

Abstract: Certified athletic trainers (ATCs) in District 2 (n=187) of the National Athletic Trainers' Association (NATA) were asked to complete a questionnaire that assessed the attitudes and judgments of ATCs concerning numerous factors presumed to influence sport injury rehabilitation. Gender and experience differences in ATCs' attitudes and judgments about rehabilitation adherence were examined. Successful and unsuccessful adherence strategies also were reported. The questionnaire consisted of 60 statements that were categorized into seven scales: athletic trainer's influence, environmental influences, athlete's personality, pain tolerance, self-motivation, goals and incentives, and significant others. There were no significant differences for either gender or experience of ATCs on any of the seven scales. An analysis of questionnaire item responses revealed the following as factors ATCs deemed important to injury rehabilitation: a) good rapport and communication between the ATC and the injured athlete, b) explanation of the injury and rehabilitation regimen, c) convenience and accessibility of the rehabilitation facility, d) rehabilitation sessions planned around the athletes' busy schedules, e) athletes' beliefs that the program is worth pursuing, f) personal supervision and regular monitoring, g) need for injured athletes to see immediate results, and h) support from significant others. ATCs reported education, goal setting, encouragement, monitoring progress, and support systems as successful strategies.

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Athletic Trainers' Attitudes and Judgments of Injured Athletes' Rehabilitation Adherence

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Threats and rehabilitation without monitoring were reported as unsuccessful strategies.

Exercise rehabilitation programs are designed to return athletes to normal function after injuries have occurred. Certified athletic trainers (ATCs) are trained to evaluate and assist athletes with their rehabilitation. Success or failure of athletes to return to competition does not depend solely on the nature of the rehabilitation (ie, its type, intensity, frequency, duration). Arguably, the key factor influencing the effectiveness of the rehabilitation process is injured athletes' commitment to their programs and the ability of ATCs to enhance that commitment.

Factors that enable or encourage athletes to maintain their rehabilitation programs are important to ATCs in making their rehabilitation programs effective. ATCs ponder why some injured athletes adhere, while others do not, and what they might do to maximize the necessary commitment. More important, however, is the frustration felt by ATCs when athletes under their supervision give less attention and effort to their rehabilitation than ATCs do.

In an excellent treatise on adherence across a multitude of domains, Meichenbaum and Turk¹¹ revealed the complexity of the adherence issue.

They claimed there are more than 200 variables that influence people's commitment to their prescribed treatments. Fortunately, a simplifying formula has been proposed to integrate all of these complicating variables.⁷ Athletic injury treatment adherence can be understood in terms of: a) injured athletes' characteristics (eg, self-motivation), b) conditions surrounding the rehabilitation setting (eg, accessibility), and c) ATC-athlete interactions (eg, supportive attitude).

Much of the insight about sport injury rehabilitation adherence essentially has been derived from other related areas (eg, exercise adherence, cardiac rehabilitation adherence, psychotherapeutic treatment adherence). There are limited empirical data on athletes' adherence to their rehabilitation programs^{6,8}; therefore, investigations into this important area appear justified.

This study examined ATCs' attitudes and judgments about a myriad of factors presumed to influence sport injury rehabilitation adherence in the hopes of validating the limited information that currently exists. Gender and experience differences in ATCs' attitudes and judgments were examined to assess and generalize the findings. ATCs also were requested to provide rehabilitation adherence strategies that they have found to be successful and unsuccessful.

Methods

In February 1988, we mailed the Athletic Injury Rehabilitation Adherence Questionnaire and a letter of explanation to 505 randomly selected certified ATCs in District 2 of the NATA. The questionnaire consisted of 60 statements to which the ATCs were asked to judge their agreement on a five-point Likert scale from "strongly agree" to "strongly disagree" and two open-ended questions that allowed ATCs to offer their most and least successful rehabilitation adherence strategies. The statements were categorized into seven scales derived from previous investigations and literature reviews^{8,11}: athletic trainer's influence, environmental influences, athlete's personality, pain tolerance, self-motivation, goals and incentives, and significant others. Examples of statements are shown in Table 1.

Descriptive statistics on the demographics of ATCs were assessed to provide information concerning gender, age, experience, and level of employment. An analysis of item responses was completed to assess what percentage of ATCs agreed with each state-

ment. Scale differences by gender and experience were assessed by analysis of variance (ANOVA). Successful and unsuccessful rehabilitation adherence strategies were tabulated.

Results and Discussion

Of the 505 questionnaires mailed, 187 (37%) were returned. The sample revealed the following characteristics: 87 (47%) were females and 100 (54%) were males; mean age was 30.2±7.4 years; 36 (19%) had 0-2 years post-bachelor's degree athletic training experience, 108 (58%) had more than two, but less than 10 years' experience, 42 (23%) had more than 10 years experience, and one (.5%) did not complete the experience category. Five (3%) were not employed in the athletic training field, 56 (30%) were employed in high schools, 76 (41%) in colleges/universities, 33 (18%) in sports medicine clinics, and 17 (9%) in other areas.

There were no gender ($F[1,184]=1.97, p>.05$) or experience ($F[2,183]=1.57, p>.05$) differences on any of the scales; therefore, the questionnaire results are independent of these vari-

ables and are presented for the entire sample.

Athletic Trainer's Influence

All respondents (100%) agreed that rapport between themselves and injured athletes is essential in getting the athletes to commit to their rehabilitation programs. When ATCs are open, honest, supportive, respectful, and considerate of injured athletes' feelings and needs, the likelihood of enhanced rehabilitation adherence is greater.^{11,14} There is so much uncertainty associated with an injury (eg, pain, recovery) that consideration of the athlete's frame of mind seems paramount, especially in the early stages of treatment.

Both explanation of the injury (170 [91%] in agreement) and the rehabilitation regimen (155 [83%] in agreement) were deemed important factors in getting the athlete's cooperation for the rehabilitation program. Injured athletes need to understand the nature and extent of the injury, the realities of the rehabilitation plan, and the prognosis for recovery (146 [78%] agreed that injured athletes need to be realistically apprised of the likelihood of pain; 133 [71%] agreed that rehabilitating athletes need to understand the effort needed). There is ample evidence that too little information and/or understanding of prescribed health care directions predispose limited treatment adherence.¹² ATCs need to be mindful of the role they can play in disseminating important information and translating medical terminology to rehabilitating athletes.

Environmental Influences

Convenience and accessibility of the rehabilitation setting facilitates injured athletes' adherence in the minds of 178 (95%) of the ATCs. This supports evidence from previous research, which indicates reduced adherence is more likely for patients who find it difficult to be on time, who perceive the facility to be inconveniently located, and who encounter parking difficulties.¹ Only 52 (28%) of the ATCs concurred that a businesslike atmosphere is necessary for the rehabilitation facility. On the other hand, crowded conditions appear to impact athletes' attendance at their

Table 1.—Sample Statements from the Athletic Injury Rehabilitation Adherence Questionnaire

Scale	Statement
A. Athletic Trainer's Influence	2. Athletes are likely to drop out of their rehabilitation programs if they are not given an explanation of their injuries.
B. Environmental Influences	15. If the training room is easily accessible, athletes' attendance at their rehabilitation sessions will be greater.
C. Athlete's Personality	20. Injured athletes who tend to display a general pessimism (ie, "nothing goes right for me") are more apt to drop out of rehabilitation.
D. Pain Tolerance	31. Pain during the athlete's initial rehabilitation session decreases the chances of adherence.
E. Self-motivation	41. Adherence to exercise rehabilitation programs is related directly to the injured athlete's willpower.
F. Goals and Incentives	47. Athletes are more apt to adhere to rehabilitation programs when they see immediate results.
G. Significant Others	59. If coaches are supportive of their injured athletes' rehabilitation efforts, then athletes will more likely adhere to their programs.

rehabilitation sessions (112 [56%] agreed), but do not necessarily affect athletes' motivation to work at their rehabilitation (only 80 [43%] agreed).

Most ATCs agreed (172 [92%]) that it is crucial to plan rehabilitation sessions around injured athletes' schedules in order to ensure attendance. Student-athletes have extremely busy schedules; therefore, it is necessary to fit the program to the athlete, rather than the athlete to the program.⁴ Flexibility of both the ATC and the rehabilitation facility, when possible, seems warranted.

Athlete's Personality

Respondents offered conflicting judgments as to whether personality of the injured athlete is the most important factor in rehabilitation adherence (103 [55%] agreed; 67 [36%] disagreed; 17 [9%] were uncertain). Even with agreement or disagreement, the judgments did not represent strong feelings. Patient factors have not been useful predictors of adherence/nonadherence behavior in other domains, with the exception of patient satisfaction and beliefs.^{1,9} It is, therefore, not surprising that ATCs in this study agreed that injured athlete pessimism is disastrous (163 [87%] agreed), as is an unrealistic assessment about how much effort it will take to complete the rehabilitation program (144 [77%] agreed). Although it has been argued elsewhere that no default personality can be located to predict adherence or nonadherence,¹³ perhaps it might be more productive to look in the direction of self-efficacy, self-expectation, and self-appraisal.

Pain Tolerance

It is evident that pain and discomfort normally are associated with injury rehabilitation and, perhaps equally as obvious, that a certain magnitude of pain might cause an interruption or even cessation of the rehabilitation program. Less than half (86 [46%]) of the ATCs agreed that pain during the initial rehabilitation session decreases the likelihood of injured athletes adhering to their exercise prescription. Results were as mixed for the significance of the anticipation of pain as well. However, there was unanimous agreement that injured athletes need to understand the

quantity and quality of pain to be expected during their rehabilitation if they are to adhere to their programs.

Athletic trainers need to assist rehabilitating athletes with their interpretation of pain in such areas as: a) when the onset of a certain level of pain signals the stoppage of an exercise, and b) when the pain has to be managed so as not to delay rehabilitation. Also, ATCs might devote more time and effort to pain reduction techniques during the initial phases of rehabilitation. Reducing pain through TENS or cryotherapy, thus making the rehabilitation a less painful experience, might well increase adherence to the rehabilitation program. Pain is such an individual process² that each injured athlete must be considered separately, so that pain does not negatively interfere with the rehabilitation program.

Self-motivation

Self-motivation is the capacity to motivate oneself to perform a given task. Self-motivated individuals are better able to work toward their goals without external guidance and reinforcement.¹⁴ ATCs identified certain aspects of self-motivation as relevant to injury rehabilitation adherence.

Athletic trainers were unanimous in their agreement that rehabilitation would be enhanced if injured athletes believed they would benefit from their rehabilitation programs. That seems to be a significant precursor to the self-motivated state and has been reinforced in other health care areas.^{10,11} However, ATCs were not willing to concede that external motivators are wasted effort. Regular monitoring (178 [95%] agreed) and supervision (172 [92%] agreed) by ATCs seem to be essential to rehabilitation adherence. Even the mere presence of an ATC (159 [85%] agreed) assists the process.

And, although there is reasonably high agreement that rehabilitation adherence is related directly to injured athletes' willpower (150 [(80%) agreed]), ATCs were split on whether athletes would comply with their prescribed rehabilitation exercises even if ATCs are not present. Furthermore, ATCs disagreed (150 [80%]) that, if injured athletes can perform their

rehabilitation workouts on their own, they are more likely to adhere. This latter point seems to raise some concern about the practice of prescribing rehabilitation homework for injured athletes.

Much attention has been directed to the importance of self-motivation as an important factor in enhancing exercise adherence,⁵ but it seems apparent that ATCs feel that motivation can be given a boost through their efforts. The latter seems to be the more reasoned position, because not all injured athletes who come for rehabilitation will possess the degree of self-motivation necessary to perform the prescribed exercises either to ATCs' or their own satisfaction.

Goals and Incentives

Athletic trainers did not agree (67 [36%]) that long-term benefits are more important than short-term outcomes in promoting treatment adherence, although the knowledge of the long-term benefits certainly aids the adherence process (155 [83%] agreed). Injury rehabilitation is a difficult process in which athletes can be overwhelmed by the thought of long-term recovery.¹⁴ Some of the negative affect can be reduced by encouragement (168 [90%] agreed), focusing on positive aspects (161 [86%] agreed), and seeing immediate results (170 [91%] agreed). Setting and attaining short-term goals on the way to long-term goal realization can serve as a real confidence builder. We, along with others, strongly urge ATCs to consider the application of this motivational strategy to their treatment regimens.^{3,7}

There seems to be a certain incentive value to the rehabilitation process because ATCs disagreed (133 [71%]) that injured athletes will search for reasons to miss their sessions and that they will attend only if nothing more pleasurable comes up (148 [79%] disagreed). It appears too simplistic to believe that treatment adherence hinges on whether the athlete will be able to return to competition that same season; only 99 (53%) of the ATCs supported that belief.

Threats and scare tactics (eg, "If you miss rehab, you don't play.") offer an interesting dichotomy because 71 (38%) agreed that they are effective, 80

(43%) disagreed that they work, and the remainder were not sure. Perhaps it is as simple as this: Threats and scare tactics work for some ATCs, and they use them, but they do not work for others because they either do not use them or they do not believe they are effective motivators.

Significant Others

ATCs were almost unanimous in their agreement that their support of their injured athletes' rehabilitation efforts is essential. Likewise, coaches' support and the feeling that injured athletes' sense they are still part of the team received overwhelming agreement. However, not all ATCs agreed that teammates' support was crucial (110 [59%] agreed, 47 [25%] disagreed, and 30 [16%] were not sure).

The rehabilitation literature is replete with findings that reinforce the importance of social support.^{9,11,14} Recognition of this fact seems to point to an obvious conclusion. ATCs are in the unique position to orchestrate this social support, almost like the point guard on a basketball team or the quarterback of a football team. ATCs

know the personalities of coaches and injured athletes and the salient details of the rehabilitation program (eg, appointment times, progress, frustrations). All that is needed is sensitivity and a little creativity to plan and implement a social support system.^{7,14,15}

Table 2 reveals the successful and unsuccessful adherence strategies that ATCs offered. Although we were hopeful of learning about some creative approaches that we had not considered yet, such was not the case. Perhaps the last part of a questionnaire is not the place for creativity, or perhaps strategies to enhance sport injury rehabilitation adherence are in their infancy stage of development.

Nonetheless, it is readily apparent that ATCs believe that education is an important phase of the rehabilitation process, probably an essential first step.¹¹ ATCs recognize that they can be effective agents in the rehabilitation process by helping athletes set goals, encouraging them, and monitoring their progress.

Noting again the dichotomy surrounding threats. ATCs reported that threats are the least successful ad-

herence strategy, yet the threat to withdraw sport participation appears on the list of successful strategies. There is certainly something individualistic about the use and effectiveness of threats that demands greater attention.

There is further reinforcement for the point made earlier about leaving injured athletes on their own to pursue their rehabilitation. More than 25% of the ATCs surveyed reported that unsupervised rehabilitation simply does not work. If unsupervised rehabilitation is deemed a necessary aspect of any athlete's rehabilitation program, then it seems that more attention needs to be addressed to some of the motivational strategies mentioned elsewhere.⁷

Conclusion

Although the task of promoting greater rehabilitation adherence from injured athletes seems like an onerous task, we believe that ATCs have no alternative. Because your goal is to be effective sports medicine specialists and return injured athletes to normal function, we urge you to recognize the barriers that prevent rehabilitation adherence and try to eliminate as many of them as you can. On a more positive vein, we encourage you to create the kinds of rapport and implement the strategies that will increase your chances of being even more effective.

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Table 2.—Successful and Unsuccessful Rehabilitation Adherence Strategies (n=187)

Strategies	# of Responses*	%
Successful Strategies		
Provide Education about the Injury and Rehabilitation	74	40%
Assist with Goal Setting	59	32%
Offer Encouragement	47	25%
Monitor Progress	39	21%
Provide a Support System	34	18%
Establish ATC-Athlete Rapport	21	11%
Personalize the Treatment	20	11%
Withdraw Sport Participation	14	7%
Offer a Variety of Treatments	10	5%
Set Specific Schedules	9	5%
Be Firm	6	3%
Make the Athlete Responsible	6	3%
Unsuccessful Strategies		
Use Threats	52	28%
Have the Athlete Rehabilitate Alone	51	27%
Offer No Explanation	6	3%

*Not all ATCs offered a response; some offered multiple responses.

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