

1992

# Athletes attitudes and judgements of injured athletes' rehabilitation adherence

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ATHLETES' ATTITUDES AND JUDGMENTS OF INJURED  
ATHLETES' REHABILITATION ADHERENCE

by

Linda L. Hoisington

An Abstract

of a thesis submitted in partial fulfillment  
of the requirements for the degree of  
Master of Science in the Division  
of Health, Physical Education,  
and Recreation at  
Ithaca College

September 1992

Thesis Advisor: Dr. A. Craig Fisher

## ABSTRACT

This study investigated athletes' rehabilitation (rehab) adherence attitudes and judgments and assessed the factors that influence injured athletes' adherence to athletic injury rehab programs. A comparison was made to athletic trainers' (ATs') attitudes and judgments examined in a previous study. Athletes from Colgate University, Cornell University, and Ithaca College completed a questionnaire directed towards the attitudes and judgments of athletes concerning successful and unsuccessful adherence strategies they experienced in their rehab programs. The injury rehab questionnaire consisted of 60 statements deemed relevant to injury rehab adherence. The statements were categorized into seven scales: trainers' influence, environmental influences, athletes' personality, pain tolerance, self-motivation, goals and incentives, and significant others. An analysis of questionnaire item responses revealed the following as factors important to injury rehab: (a) good rapport and communication between ATs and the injured athletes, (b) explanation and justification of the rehab regimen, (c) convenience and easy accessibility of the rehab facility, (d) rehab sessions planned around the student-athletes' busy schedules, (e) understanding of

expected pain during rehab, (f) belief on the part of injured athletes that their programs are worth attending, (g) athletes' self-motivation, (h) personal supervision and regular monitoring, (i) knowledge of long-term benefits reinforced by need for realization of immediate results, (j) contraindication of threats/scare tactics, and (k) support from significant others. Athletes reported a caring AT attitude, honest approach (e.g., prognosis and pain), encouragement, goal setting, and monitoring progress as successful adherence strategies. Threats/scare tactics and rehab without monitoring were reported as unsuccessful strategies.

ATHLETES' ATTITUDES AND JUDGMENTS OF INJURED  
ATHLETES' REHABILITATION ADHERENCE

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A Thesis Presented to the Faculty of  
the Division of Health, Physical  
Education, and Recreation  
Ithaca College

---

In Partial Fulfillment of the  
Requirements for the Degree  
Master of Science

---

by  
Linda L. Hoisington  
September 1992

Ithaca College  
Division of Health, Physical Education, and Recreation  
Ithaca, New York

CERTIFICATE OF APPROVAL

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MASTER OF SCIENCE THESIS

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This is to certify that the Master of Science Thesis of  
Linda L. Hoisington

submitted in partial fulfillment of the requirements for  
the degree of Master of Science in the Division of  
Health, Physical Education, and Recreation at Ithaca  
College has been approved.

Thesis Advisor:

Committee Member:

Candidate:

Chairman, Graduate  
Programs in Physical  
Education:

Dean of Graduate  
Studies:

Date:

September 9, 1992

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## ACKNOWLEDGMENTS

The investigator would like to extend a sincere appreciation to everyone involved in the completion of this thesis.

1. To Dr. A. Craig Fisher, for his professional expertise, capacious time, interminable patience, and heartening humor throughout the completion of this study.

2. To Dr. Deb Wuest, for her support and commitment to me and this study.

3. To Maxine Leftwich, a former academic advisor and esteemed friend, without whose encouragement this degree would never have been pursued.

4. To my colleagues and all friends who cared enough to not allow me to walk away from this opportunity.

## DEDICATION

I dedicate my thesis to my mother, who has always been wise enough to know that "all a parent can give a child is roots and wings."



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## Chapter 1

### INTRODUCTION

It is common knowledge that in today's world, sports are a big business, and that holds true even at the youngest levels of participation. Every conceivable facet of sport has evolved into an intricate science, including such areas as nutrition, player body-types, athletic clothing, protective equipment, playing surfaces, coaching techniques, amount of time given to rehearsing a given task, etc. Consideration is given to the minutest of details so that an athlete can jump one quarter inch farther or higher or can complete a race one hundredth of a second faster.

Notwithstanding the significance of the aforementioned variables, there is another factor not to be overlooked, namely the prevention of injury. Because injury usually translates into time lost from participation, substantial losses are incurred not only by the athlete but by fellow teammates and coaches, as well as the athletic program/organization represented by the athlete. Consequently, extensive effort is expended to appropriately condition, strengthen, instruct, discipline, and drill the athlete to minimize the potential for injury.

Unfortunately, regardless of all the measures taken to preclude injury, it still remains inherent in sport participation. Therefore, a successful recovery becomes essential for return to participation. With focus given to seemingly every aspect of performance, why is it that there still remains some mystery regarding how an athletic trainer (AT) ensures a successful injury rehabilitation (rehab) in terms of facilitating an athlete's adherence to a prescribed program?

In respect to how much attention has been directed to other concerns about performance enhancement, it may come as a surprise that, to date, a scant number of empirical studies have investigated adherence to injury rehab programs among athletes (Duda, Smart, & Tappe, 1989; Fisher, Domm, & Wuest, 1988; Fisher, Mullins, & Frye, in press; Tuffey, 1991; Wiese & Weiss, 1987).

This investigation is a follow-up to the Fisher et al. (in press) study that examined the attitudes and judgments of ATs to this, as yet, little pursued question of injury rehab adherence. Their results yielded the following essentials to enhanced injury rehab adherence from the ATs' perspective: (a) good rapport and communication between the AT and the injured athlete, (b) explanation of the injury and intended rehab

regimen, (c) convenience and accessibility of the rehab facility, (d) rehab sessions planned around the injured athlete's busy schedule, (e) belief on the part of the injured athlete that the program has some efficacy, (f) personal supervision and regular monitoring, (g) need for injured athlete to see immediate results, and (h) support from significant others.

Indeed, ATs seem to have some specific insights about how best to improve rehab adherence; however, they provide solely the professional side of the equation versus the injured athletes who are the actual recipients of all the ATs' "bag of tricks." It then seems only appropriate that providing responses from the athletes' point of view concerning effective rehab adherence techniques would aid in providing a more certain and complete answer.

#### Scope of Problem

The purpose of this study was to assess the attitudes of athletes concerning the rehab of athletic injuries and their judgments about selected facets of their rehab. Exercise rehab adherence is an important step in returning athletes to competition. Athletes' degree of adherence to their rehab programs may determine how quickly athletes can return to competition

or if they can return at all. It is important for ATs to understand the complexity of adherence and strategies to enhance endurance.

The subjects included former injured athletes ( $N = 108$ ) from Colgate University, Cornell University, and Ithaca College, hereafter referred to as athletes. They received a questionnaire containing 60 statements about factors of injury rehab adherence. These factors included trainers' influence, environmental influences, athletes' personality, pain tolerance, self-motivation, goals and incentives, and significant other. The athletes were then asked to provide brief statements regarding athletic training techniques/strategies and athlete-AT interactions that were or were not helpful in the enhancement of their own rehab adherence.

An analysis of questionnaire item responses assessed the percentage of athletes' agreement and disagreement with each statement.

#### Null Hypothesis

There will be no substantial differences between athletes' responses to injury rehab adherence factors and those of ATs reported earlier.

#### Assumptions of Study

1. The athletes had sufficient experience in



athletic injury rehab to relate to the statements provided on the questionnaire.

2. The questionnaire statements were representative of significant factors of athletic injury rehab adherence.

3. The questionnaire was answered truthfully by athletes.

4. Having graduated, any loyalty to the ATs, sport programs, or institutions would not affect athletes' ability to respond to the statements presented in the questionnaire.

5. Administering the questionnaire by mail did not affect the outcome of the study.

#### Definition of Terms

1. Adherence is the degree (both quantitative and qualitative) to which athletes work at their rehab.

2. Athletic trainer (AT) refers to a professional involved in the field of sports medicine whose major concerns are prevention and treatment of sport injuries.

3. Environmental conditions are the conditions that surround the injured athletes and rehab facilities that can affect atmosphere.

4. Goals and incentives are what athletes and/or ATs want to accomplish and how the injured athletes are

encouraged to achieve the particular goals.

5. Nonadherence is having little or no commitment to injury rehab programs.

6. Pain tolerance is the athletes' capacity to endure pain during their rehab programs.

7. Rehabilitation (rehab) is the program designed to return athletes to their preinjury condition.

8. Self-motivation is the capacity of an individual to be able to motivate and reinforce oneself to perform a given task.

9. Support from significant others is the assistance provided to athletes from people closely associated with them (e.g., ATs, athletes, coaches, family, and friends) during rehab.

#### Delimitations of Study

The following delimitations were made:

1. This study involved only athletes from Colgate University, Cornell University, and Ithaca College.

2. Only selected dispositional and situational variables were considered as rehab factors.

#### Limitations of Study

The following limitations were made:

1. The results apply only to athletes similar to those in the present study.

2. Results are limited by the degree to which the selected rehab adherence questions addressed relevant aspects of injury rehab.

## Chapter 2

### REVIEW OF LITERATURE

In many areas of medical care in the United States, the failure of patients to adhere to prescribed treatment agendas has limited the care effectiveness, according to Pomerleau (1979). For example, high drop-out rates have been noted in all the major clinical studies with post-myocardial infarction patients (Oldridge, 1982). Typically, within 6 months to a year after start-up of an exercise program, a 40% to 50% drop-out rate may be anticipated (Dishman, 1981, 1986; Dishman & Gettman, 1980; Ice, 1985). Even among participants who do continue, attendance and compliance with the prescribed frequency, intensity, and duration of activity can fluctuate from about 30% to 80% (Oldridge, 1982).

A similar behavior of nonadherence is reportedly observed in competitive athletes as well (Domm, 1985; Fisher et al., 1988; Weiss & Troxel, 1986). This might be somewhat surprising considering rehab adherence is decisively relevant before an injured athlete is authorized for return to play. However, if potentially life-threatening conditions are not sufficient motivation, why then would the ability to participate in sport (in most situations, a pastime) be conducive to

adherence?

An immediate concern in addressing the question about lack of adherence would be the methodological problems of having no standardization of terms (e.g., compliance, adherence, retention, maintenance, involvement, dropout, attrition), method, or measurement (Dishman, 1986; Oldridge, 1982, 1985; Wankel, 1985). It has been noted by Oldridge (1982) that several investigators do not even specify the definitions they utilized. Vague or inconsistent definitions or total reliance on self-report make it difficult to form any generalizations or to draw many conclusions from much of the literature.

In the attempt to determine patient/athlete adherence, there has also been little effort to systematically document the joint relationship between psychological and physiological variables affecting adherence (Blumenthal, Williams, Wallace, Williams, & Needles, 1982). Particularly, not a great deal of research has addressed the effectiveness of psychological principles in the context of injury rehab (Wiese, Weiss, & Yukelson, 1991), even though it is commonly recognized that the role of psychology is of categorical significance to injury management.

### Athletes' Incentives

Yukelson (1986) proposed that, in order to initiate a successful injury rehab program, reasons for sport participation must first be considered. Maehr and Braskamp (1986) described five prominent incentives for sport involvement as follows: (a) task involvement defined as mastery of the task, (b) ego involvement, which entails making comparisons and exhibiting superior athletic ability, (c) power, which is the incentive to establish leadership and authority in the athletic context, (d) recognition, which accentuates the recognition and encouragement one receives for sport participation, and (e) affiliation, which indicates that the social aspects of sport involvement are important. The lure of these five incentives then becomes the subjective goals or provocation for involvement in a particular activity (Duda et al., 1989).

### Psychological Responses to Athletic Injury

If athletes pursue sport involvement for any of the above reasons (likely to be a combination of them if not all of them), then it is no surprise that some writers theorize that injured athletes exhibit signs of the grief response as projected by Kubler-Ross (cited in Pedersen, 1986; Rotella & Heyman, 1986; Tuffey, 1991).

Danish (1983) noted that "goals are dreams acted upon." Certainly involvement in the five incentives for sport could be identified as personal dreams with various athletic goals established in order to realize those dreams. Therefore, when the opportunity for attainment of the dreams is unexpectedly removed by the occurrence of injury, it becomes easily understood why a highly stressful situation would likely ensue. Sometimes this manifests itself in a profound reaction from the athlete.

Selye (1956) defined stress as a nonspecific response of the body to any demand made upon it to adjust. In the event that an athlete experiences injury, the injury itself becomes a stressor in that it creates a considerable demand and constraint on the body to adapt. Passer (1982) developed a stress model describing the process of stress characterized by four stages: (a) the situation or stressor, (b) the cognitive appraisal or one's ability to cope with the demand, (c) the emotional response, which is a product of the cognitive appraisal of the stressor, and lastly (d) the consequences or what the response of the athlete will be. In regard to rehab program adherence, the response or exhibited behavior of the athlete is the decisive

factor whether or not there is a successful recovery and return to competition. So why does adherence to designed tasks for purposes of affecting a desired outcome sometimes appear so arduous?

#### Nonadherence Factors

As suggested by Oldridge (1985), the most significant problem in using patient characteristics as predictors of exercise behavior is that human behavior is innately unpredictable. To further complicate the issue, Meichenbaum and Turk (1987) pointed out that people hold a variety of beliefs about their health and about the potential efficacy of any treatment execution. Occasionally, the beliefs are based on misconceptions and/or erroneous information added to feelings of fear, guilt, and fatalism. The situation becomes unfortunate because satisfaction is closely related to the degree to which patients' beliefs and expectations have been met and so sets the stage for nonadherence.

In reviewing the medical and exercise adherence literature, perhaps the above circumstances help explain the complexity of the entire adherence question (Meichenbaum & Turk, 1987). Most of the findings can be categorized into four areas: (a) patient related, (b) personnel related, (c) facility related, and (d) program



related.

Oldridge (1982, 1985) noted that those who are smokers, have blue-collar occupations, have adopted a sedentary life-style, experience angina, are under more psychological distress, have excess body fat, claim exercise interferes with their jobs, have a high-risk health profile, and perceive that they receive inadequate attention from their therapists are all less inclined to adhere to a specific exercise regimen.

Buffone, Sachs, and Dowd (1984), Ice (1985), and Oldridge (1982, 1985) have addressed how critical it is to adherence that the exercise facility be easily accessible. Dubbert, Rappaport, and Martin (1987), Ice, and Sallis (1986) found that exercise intensity seems to be inversely related to adherence. This suggests that even though an exercise facility may be very conveniently located, adherence might still be negatively influenced should the perceived exercise demand be too great.

After researching a variety of short-term adherence programs, Wankel (1985) suggested that further investigation needs to be directed to long-term effectiveness. That belief is supported by the fact that Dishman (1986) has observed incongruities in a number of areas. For example, he proposed that removing stated

barriers to exercise will not necessarily assure an increase in adherence. Also, correlates of exercise adherence for one sample in one setting do not necessarily predict behavior in other samples and settings. Ice (1985) claimed that researchers need to remember that patients are indeed products of heredity and environment. It appears that, until more research is conducted, there will be a disparity in adherence interventions according to whether a barrier is genuine or perceived or is only a rationalization or excuse for nonadherence (Dishman, 1986).

As the transition into literature pertaining to injury rehab adherence is made, most barriers and/or stressors seem to fall into categories of situational or intrapersonal. According to Scanlan and Passer (1978, 1979), the major considerations are as follows: (a) type of sport, (b) time of season in which the injury occurred, (c) pressure from significant others, (d) accompanying anxiety, (e) level of self-esteem, self-motivation, and success expectation, (f) negative self-talk patterns, (g) emotions, (h) somatic complaints, and (i) inability to cope with injury. Fisher et al. (1988) also found that there is often a reduced tolerance for pain in nonadherers. In a follow-up study by Fisher et al. (in

press), it was further discovered that a barrier is created with the reduction of any of the following: (a) rapport and communication between the AT and the injured athlete, (b) explanation of the injury and rehab regimen, (c) convenience and accessibility of the rehab facility, (d) rehab sessions planned around the athletes' busy schedules, (e) athletes' belief 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. It is perhaps noteworthy that, in the sport arena as well as the medical/exercise domains, support from significant others seems to be of great import.

#### Discernments of Athletic Trainers

Two recent studies have surveyed ATs about issues that are or are not beneficial to athletic injury rehab. One examined primarily psychological questions and the other investigated more general concerns; however, similar findings surfaced.

In both studies (Fisher et al., in press; Wiese, Weiss, & Yukelson, 1991), quite high in priority was the support from coaches and the assurance that the injured athlete was still considered part of the team or the athletic family. Yet, both investigations found peer

support only moderately relevant. There was a near unanimous concurrence in the Fisher et al. (in press) research concerning the pertinence of support from ATs towards their athletes' rehab.

Therefore, it appears reasonable that ATs were in complete agreement about the importance of rapport between their athletes and themselves in ensuring commitment to rehab (fisher et al., in press). It may realistically be assumed that included in a healthy rapport would be ATs' positive reinforcement and able communication skills, both of which were identified by Wiese et al. (1991) as precursors to successful rehab.

Convenience and accesssibility of the rehab setting encourages athletes' adherence according to most of the ATs in the Fisher et al. (in press) survey. However, not only does the facility itself need to be readily accessible but, because of the irregularity of student-athletes' daily schedules, flexibility is required of both the facility and the ATs.

The ATs questioned by Wiese et al. (1991) identified some personality traits that ATs considered to be significant in distinguishing between athletes coping most versus least successfully with injury: (a) positive attitude, (b) mental toughness or determination,

(c) high self-esteem or self-confidence, and (d) emotional maturity. On the other hand, Fisher et al. (in press) discovered that ATs did not reveal strong feelings one way or the other whether personality of the injured athletes is at all important. They did, however, suggest that the trait of pessimism could be disastrous to the injured athlete and that an unrealistic assessment of how much effort is required to complete the rehab program is detrimental.

Associated with the notion of effort appraisal might also be pain tolerance. Less than half of the ATs in the Fisher et al. (in press) study agreed that initial existing pain decreased the potential for adherence, and there were also mixed results about the consequences of anticipated pain. However, there was consensus that athletes need to be cognizant of expected pain during rehab if they are to adhere to their programs. That acknowledgment demonstrates that pain is closely associated with one's beliefs and expectancies because, as noted by Hotchkiss (1981), pain is an individual process that varies from person to person. Individual processes, such as remembering past experience, emotion, and attention, may influence the individual's perception of pain and how that individual

reacts to pain. ATs in the Wiese et al. (1991) study did not feel that a high pain tolerance level was necessary for coping with injury.

In reference to injury rehab, pain is employed as a useful guide in the goal-setting process. Both studies concluded that setting reasonable objectives with a focus on short-term goals helps to develop a realistic timeline to full recovery. If appropriate goal setting is being practiced, possibly the hope for intrinsic motivation would be promoted (Anshel, 1990).

Again, both studies agree that self-motivation reinforces rehab adherence, but yet the ATs in the Fisher et al. (in press) study strongly felt that the external motivation derived from ATs is quite advantageous. The same pool of ATs were divided on whether athletes will adhere in an AT's absence, and they did not feel that the ability of the athlete to perform the workouts independently was conducive to adherence. The Wiese et al. (1991) study encouraged ATs to at least try to understand individual reasons for motivation.

The Wiese et al. (1991) investigation also indicated that the athletes should be willing to listen to the AT as well as to learn about the injury and rehab

techniques. The ATs considered a high level of sport ability and academic performance to be of little or no consequence. In facilitating coping for athletes, ATs should encourage positive self-thoughts and offer a variety of rehab exercises. Teaching relaxation and visualization techniques seems to be less important in the opinion of the ATs surveyed by Wiese et al. (1991). Additionally, ATs should be willing to learn more about: (a) using a positive and sincere communication style, (b) enhancing self-confidence, (c) understanding stress/anxiety, (d) reducing depression, (e) enhancing listening skills, (f) teaching concentration skills, and (g) teaching emotional control strategies.

Lastly, a resounding finding in the Fisher et al. (in press) study was that threats from ATs are the least successful adherence strategy.

In reference to the injury rehab adherence literature, a number of potential strategies are illustrated.

#### Strategies to Enhance Adherence

While an apparent concern about injury rehab adherence has been demonstrated, it has been noted by DePalma and DePalma (1989), Dishman (1986), and Duda et al. (1989) that it is perhaps dubious to generalize the

major findings from studies on exercise/medical treatment adherence to the athletic injury rehab setting. Additionally, it cannot be assumed that the same social psychological factors that predict adherence among the general populace would necessarily apply to rehab among the athletic population. However, there may be at least one common thread across all treatment adherence.

Fisher (1990) maintained that self-confidence is the key to rehab adherence with the components of self-confidence being competence, control, and commitment.

The support for self-confidence is also advocated by Wiese et al. (1991) in that they encouraged ATs to acquire improved skills for affecting self-confidence in their injured athletes. As the strategies for adherence enhancement are examined, one may easily ascertain how self-confidence measures may be incorporated.

#### Goal Setting

As pointed out by Fisher et al. (in press), it is important for athletes to realize, or at least perceive, rapid progress during their rehab process, and hardly anything better affords that opportunity than goal-setting. The process of goal-setting should involve three stages (Gould, 1986; Weiss & Troxel, 1986). Initially, realistic goals should be established through



collective efforts of the AT and the athlete and the goals should be specific, measurable, and written down. Secondly, strategies for goal attainment should be instituted because achievement provides a feeling of accomplishment and a sense of control (e.g., self-confidence) over recovery. Lastly, goals should be periodically evaluated and redefined as necessary. "The ability to systematically set and attain goals may separate the athletes who will return to competition within their prescribed timeframe from those who will not, and may be one potential determinant of the likelihood of rehabilitation adherence" (DePalma & DePalma, 1989, p. 219).

#### Relaxation and Imagery

A second strategy to aid rehab might be relaxation and imagery as a method of reducing stress and anxiety associated with an injury (Rotella & Heyman, 1986). Also, mastery rehearsal may be implemented by mentally practicing physical and performance skills. Feltz and Landers (1983) supported the use of mastery rehearsal in enhancing physical performance, thereby allowing the athlete to maintain a level of competence (e.g., self-confidence).

### Self-talk

Self-talk is also considered a facilitator (it could, then, just as readily be a detractor) of performance (Tuffey, 1991). The AT should monitor athletes' inner dialogues and direct them toward self-enhancing thoughts (Wiese & Weiss, 1987; Wiese et al., 1991) versus the tendency to dwell on negative or irrational thoughts regarding themselves, their injury, or their return to competition (Weiss & Troxel, 1986). According to Rotella & Heyman (1986), what athletes say to themselves following injury has an influence on subsequent behavior.

### Contracting

Fisher (1990) explained that contracting is a formal mutual agreement, usually in writing, in which rewards and penalties are assessed relative to particular behaviors. This approach is often successful because it places social pressure on the decision-maker and because failure to adhere produces a certain amount of self-disapproval.

### Tailoring

Friedman and Litt (1987) advocated that ATs should design rehab programs to best serve injured athletes' perceived characteristics. Because each injury is to

some degree unique and as individually different as each athlete, there is no ideal agenda to be subscribed to. Consequently, if reasonable requirements are made and met, the level of self-confidence is again heightened.

#### Support from Significant Others

As previously indicated, social support is unequivocally related to the success of the rehab process (Fisher et al., 1988; Mullins, 1991, Rotella & Heyman, 1986; Weiss & Troxel, 1986; Wiese & Weiss, 1987). This support may be provided from a wide range of individuals, including parents and other family members, close friends, coaches, teammates, and ATs. Too, the concept of peer modeling falls within this strategy of enhancement. This provides opportunity for the athlete to discuss thoughts and concerns with another who has experienced a similar injury and is perhaps now healthy. This "similar other" can understand and empathize with the injured athletes (Weiss & Troxel, 1986).

#### Athlete Education

Patient education is crucial in providing information to athletes concerning their injuries. Weiss and Troxel (1986) suggested that the AT furnish the athlete with the rationale for treatment, the nature

of the injury, realistic expectations of the rehab process, and the analogy of injury management skills to sport skills. Haynes (1984) cautioned that increasing one's knowledge about his/her particular condition does not assure adherence; however, in doing so, unnecessary apprehensions are dissipated. In addition, education serves as the primary factor in initiating adherence.

#### AT-Athlete Interaction

The attitude of ATs toward athletes' rehab and the effectiveness with which they convey that attitude to the injured athletes is a critical determinant of treatment adherence (Fisher et al., in press; Weiss & Troxel, 1986). This is consistent with the proposal of Wiese and Weiss (1987) that motivation and communication are both fundamental to the injury rehab process. Kane (1982, 1984) pointed out that the AT not only sees the athlete on a regular basis, but is aware of the injury situation, the psychological make-up of the athlete, and the athlete's coping skills. Trust, confidentiality, non-judgmental listening, and empathy are all traits the AT should already have established. Therefore, much of the communicative ground work has already been laid. Add to that Yukelson's (1986) belief in being an active listener or one who is able to perceive what is not said

as well as what is verbally expressed, and the AT finds her/himself in an ideal position to implement a successful rehab. The bottom line is development of good rapport with the athletes (Wiese & Weiss, 1987).

#### Summary

In the minds of ATs, injury rehab adherence remains complex because they invest time and energy preparing and affecting rehab agendas only to be confronted with the tendency for some athletes to fade out of their prescribed treatment programs.

Many variables (personal and situational) that lead to greater treatment adherence have been offered to assist ATs in differentiating adherers from nonadherers. Barriers to adherence behaviors have also been identified and need to be understood and counteracted in order to promote adherence to treatment programs. Once these barriers are removed, the ATs can introduce steps towards increasing adherence levels of injured athletes in their programs.

Information obtained concerning adherence and the individual athlete can be utilized to develop and implement specific strategies for the enhancement of adherence to injury rehab programs. Effective strategies will increase adherence and, thereby, return injured athletes to their preinjury condition.

## Chapter 3

### METHODS AND PROCEDURES

The following chapter deals with methods and procedures utilized in this investigation. Selection of subjects, testing instruments, methods of data collection, scoring of data, treatment of data, and summary are included.

#### Selection of Subjects

The subjects in this study were 108 male and female collegiate athletes. Their names were provided by ATs from Colgate University, Cornell University, and Ithaca College. The athletes were selected based on two criteria: (a) they sustained an injury during competition that necessitated a rehab process of at least 3 months in duration, and (b) they graduated from their respective institutions since spring 1980.

The athletes were requested to provide demographic information, to respond to 60 statements, and to provide attitudes and judgments on four open-ended questions regarding what athletic training techniques/strategies or athlete-AT interactions were or were not beneficial in the enhancement of their own rehab treatment adherence.

### Testing Instruments

The instrument used to assess the athletes' attitudes concerning the rehab of athletic injuries and judgments concerning injured athletes' adherence to their rehab was a questionnaire containing 60 statements plus four open-ended questions dealing with most successful and least successful rehab adherence strategies (see Appendix A). The statements were categorized into seven factors deemed relevant to injury rehab adherence based on a review of literature: trainers' influence, environmental influences, athletes' personality, pain tolerance, self-motivation, goals and incentives, and significant others. Athletes read each statement and recorded their degree of agreement or disagreement on a 5-point Likert scale.

### Method of Data Collection

Each athlete received a packet by mail comprised of an introductory letter explaining the purpose of the investigation, the 60-statement questionnaire plus the four open-ended questions, an answer sheet, and a stamped return envelope. The responses were accumulated over a 3-month period of time.

### Scoring of Data

Athletes' responses were recorded on computer

answer sheets. A data file was created from computer scoring.

#### Treatment of Data

An analysis of item responses was completed to assess what percentage of athletes agreed or disagreed with each statement on the 5-point scale utilized. Most successful and least successful rehab adherence strategies were tabulated.

#### Summary

Male and female athletes ( $N = 108$ ) from Colgate University, Cornell University, and Ithaca College were asked to provide demographic information and to respond to a rehab adherence questionnaire consisting of 60 statements. Subjects provided their degree of agreement or disagreement to each statement on a 5-point scale. They were also asked to provide judgments concerning the most successful and least successful rehab adherence strategies. Data were analyzed by analyzing item responses and tabulating most and least successful rehab adherence strategies.



## Chapter 4

### ANALYSIS OF DATA

The overall purpose of this investigation was to assess the factors that influence injured athletes' adherence to sport injury rehab programs. Attitudes and judgments of athletes concerning successful and unsuccessful adherence strategies and AT-athlete interactions were examined. The results of the investigation are presented in this chapter. The chapter is divided into the following sections: (a) subjects, (b) analysis of questionnaire item responses, (c) successful/unsuccessful adherence strategies/interactions, and (d) summary.

#### Subjects

Subjects included male and female athletes from Colgate University, Cornell University, and Ithaca College. Of the 108 questionnaires mailed out, 37 were returned. Eight questionnaires were undeliverable, and follow-ups with potential respondents indicated that there were problems with the accuracy of the mailing lists and with the mail forwarding process. One returned questionnaire was not completed because the respondent did not meet the injury criterion. Therefore, the return percentage of completed questionnaires from those that

were delivered was 36%. The sample consisted of 34 males (94%) and 2 females (6%).

#### Analysis of Questionnaire Item Responses

An analysis of item responses was completed to assess the degree to which athletes agreed or disagreed with each statement on the 5-point scale; strongly disagree, disagree, not sure, agree, and strongly agree. Response 3 (not sure) was to be used if the subject could not make a better assessment. This analysis of the questionnaire item responses provides data pertaining to which adherence items are viewed as more or less significant by athletes. Subjects' responses are revealed in Table 1.

In regard to ATs' influence in injury rehab adherence, athletes indicated the importance of communication and good rapport. Athletes were in total concert in respect to their need to be informed why particular rehab methods were selected, but interestingly less (67% agreement) inclined to require explanations about the nature of injury. Athletes reported that they were more apt to adhere to their rehab if the AT is demanding (75% agreement), but having a good relationship with their ATs is even more requisite for adherence (89% agreement).

Preeminent are accessibility and convenience of the

Table 1

Analysis of Questionnaire Item Responses

Scale/Item Number	<u>Response Percentage</u>				
	SD	D	NS	A	SA
<b>Trainers' Influence</b>					
1	2	28	8	39	22
2	3	19	11	58	8
3				58	42
4		6	6	42	47
5	14	53	22	8	3
6	3	8	14	58	17
7		6	22	67	6
8		39	19	36	6
9		17	11	61	11
<b>Environmental Influences</b>					
10		11	11	61	17
11	8	56	14	14	8
12		19	17	53	11
13	11	47	6	33	3
14			3	72	25
15				67	33

(table continues)

Scale/Item Number	<u>Response Percentage</u>				
	SD	D	NS	A	SA
16		8	8	61	22
17	8	42	11	33	6
Athletes' Personality					
18	14	50	31	6	
19	11	33		44	11
20	3		14	67	17
21		3	19	72	6
22		50	14	33	3
23	6	56	25	11	3
24	8	64	17	11	
25		31	11	36	22
Pain Tolerance					
26	3	50	17	31	
27	17	67	14	3	
28	8	61	17	14	
29	11	47	17	25	
30		3	3	69	25
31	8	53	14	25	

(table continues)

Scale/Item	<u>Response Percentage</u>				
	SD	D	NS	A	SA
<b>Self-motivation</b>					
32		22	17	53	8
33		3	3	64	31
34			3	69	28
35			3	53	44
36		14	17	56	14
37	6	58	22	14	
38		6	6	59	31
39		3		61	36
40		25	14	56	6
41		6	3	42	50
42			3	58	39
43	3	8	3	47	39
44	8	31	8	42	11
<b>Goals and Incentives</b>					
45	3	39	22	25	11
46	8	53	17	19	3
47		6	11	69	14
48		6		72	22

(table continues)

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Scale/Item Number	<u>Response Percentage</u>				
	SD	D	NS	A	SA
49	3	25	14	47	11
50		19	14	53	14
51	22	36	14	28	
52	25	31	17	28	
53	25	69	6		
54		3	19	56	22
55	17	64	14	3	3
Significant Others					
56		3	3	56	39
57		3	3	47	47
58	19	47	19	11	3
59				61	39
60		39	22	39	

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Note. Abbreviations used: SD = Strongly Disagree,  
D = Disagree, NS = Not Sure, A = Agree, SA = Strongly  
Agree.

rehab facility and flexibility of session planning when evaluating environmental issues. The athletes were in 100% agreement that the training room be accessible and 97% certain that planning rehab sessions around their schedules would promote adherence. Athletes had a mixed response about the duration of sessions, but 64% indicated that having to rehab in a crowded room may reduce the likelihood of participation.

Athletes were not in agreement about personality being the most important factor in rehab adherence; however, they did indicate that if an athlete is generally found to be a pessimist, then that becomes detrimental to adherence. Also, 61% expressed concern about the probability of an injured athlete remaining involved in rehab if they experienced "depression" because of the injury or disappointment in the rate of rehab progress. Obviously, pessimism and depression may negatively influence the outcome of rehab. On the other hand, athletes indicated (78% agreement) that a false sense of productivity may also be destructive, so ATs should frequently offer realistic appraisal of effort.

Pain is apparently not as significant a deterrent because 69% of the athletes indicated that they would not lessen their commitment to rehab should their rehab be

consistently painful. An even greater number (83% agreement) reported they would not discontinue rehab when they first experience the onset of pain. Athletes did, however, accede (94% agreement) that those who understand the quantity and quality of expected pain during rehab are more likely to adhere to their injury rehab programs. Pain appraisal, then, seems very important.

Athletes agreed (97% agreement) that they are more likely to adhere if they feel that they will benefit from their rehab. Analogous to that, unless athletes believed in the efficacy of their program, they will not adhere to their rehab (95% agreement). Athletes also reported that personal supervision (97% agreement) and monitoring of athletes by ATs (89% agreement) can promote adherence. In fact, 97% of the athletes stated that the mere presence of an AT enhanced their work ethic. This is supported by a report of only 14% indicating that, if athletes can do their rehab alone, they are more apt to adhere. Lastly, there is 92% agreement amongst athletes that willpower of the injured athlete is directly related to adherence.

While long-term benefits of rehab do not supercede the importance of short-term goals (36% agreement), adherence is enhanced with the knowledge of long-term benefits (94% agreement). Achievement of short-term goals



are profitable for adherence because 83% of the athletes reported they need to see immediate results.

Athletes unanimously indicated that injured athletes are more likely to adhere to their rehab programs if coaches support their efforts. Support from ATs was also substantially specified (95% agreement) as was the need to feel a part of the team (94% agreement) to enhance injury rehab. Even though athletes reported the need for team membership, last in priority for desirable support was that of teammates (61% agreement).

#### Successful/Unsuccessful Adherence Strategies/Interactions

Successful and unsuccessful strategies/interactions athletes have experienced or considered are revealed in Tables 2-5. The most often cited successful strategy/interaction was having had an AT with a caring attitude. The AT taking a honest approach with the athlete along with being encouraging, establishing rehab goals, and monitoring progress were all mentioned as helpful methods for adherence enhancement, but appear somewhat secondary to the caring AT attitude. Nothing significant was reported as unsuccessful.

There also were no resounding suggestions concerning what might have been successfully utilized; however, a small number indicated that it would have been beneficial

Table 2

Successful Rehab Strategies or AT Interactions

Strategies/Interactions	<u>N</u> of Responses*
Caring AT Attitude	15
Honest Approach (prognosis, pain)	9
Encouragement	7
Goal Setting	7
Monitor Progress	5
AT Personality	2
Flexible Scheduling	1
Fast Beginning	1
Presence of Audience	1
Trust in AT	1
Explanation of Rehab	1
Personalize Treatment	1
Set Specific Schedules	1
Equipment Availability	1
Convenient Rehab Location	1
AT Presence During Rehab	1

\*Not all athletes offered a response; some offered multiple responses.

Table 3

Unsuccessful Rehab Strategies or AT Interactions

Strategies/Interactions	<u>N</u> of Responses*
None	28
Lack of AT Interaction	1
Unknowledgable AT	1
Student AT Given Too Much Responsibility	1
No Set Specific Schedule	1
Not Monitoring Progress	1
Negative Feedback	1
Electrical Stimulation	1
No Assistance with Pain Appraisal and Ability to Return to Play	1

\*Not all athletes offered a response; some offered multiple responses.

Table 4

Rehab Strategies or AT Interactions That Might Have Been Successful If Utilized

Strategies/Interactions	<u>N</u> of Responses*
None	16
Detailed Explanations	5
More Attention	4
More AT Supervision	3
Pain Appraisal	2
More Motivation	2
Outside Rehab Arrangements	2
Reinforce Adherence	1
Recognize Time Demands	1
Goal Setting	1
Additional Rehab Sessions	1
Start Rehab Earlier	1
Better Equipment Availability	1

\*Not all athletes offered a response; some offered multiple responses.

Table 5

Rehab Strategies or AT Interactions That Would Not Have  
Been Successful If Utilized

Strategies/Interactions	<u>N</u> of Responses*
Threats/Scare Tactics	21
Rehab Alone	5
Uncaring AT Attitude	3
Unscheduled Appointments	2
AT Pressure	1
Recommendation to Rest	1
Comparison with Others	1
Commitment Questioned	1
Pep Talk	1
Conservative Approach	1
No Opportunity for Participation	1
Pessimistic AT	1
Unchallenging Goals	1
Lack of Progress	1
Lack of Personalized Attention	1
Rotating ATs During Rehab	1

\*Not all athletes offered a response; some offered multiple responses.

to have had more detailed rehab explanations. While athletes did not have much to offer about what might have worked, they did know that threats/scare tactics would not have been useful for rehab adherence. A few disclosed that, had they been asked to perform rehab alone, rehab adherence would have been impaired.

#### Summary

An analysis of responses to the 60 questionnaire items assessed the percentage of agreement or disagreement for each item. Tables 2-5 provide information concerning successful and unsuccessful strategies/interactions athletes have experienced or considered.

## Chapter 5

### DISCUSSION OF RESULTS

This investigation assessed attitudes and judgments of athletes concerning factors influencing injured athletes' adherence to athletic injury rehab with the objective being to compare the findings collected from athletes with those collected previously from ATs. Discussion focuses on the following topics: (a) trainers' influence, (b) environmental influences, (c) athletes' personality, (d) pain tolerance, (e) self-motivation, (f) goals and incentives, (g) significant others, and (h) summary.

#### Trainers' Influence

The important items under ATs' influence included good AT-athlete rapport and constructive communication, particularly information about the injury and details of the rehab methods. Also, there was some indication given by athletes that a need existed for greater demands from the ATs.

Athletes confirmed (89% agreement) ATs' earlier report that good AT-athlete rapport is fundamental for rehab adherence (Fisher et al., in press). Certainly, the need for therapist sensitivity is demonstrated throughout the exercise, injury, and medical rehab

literature (Gillet, 1988; Kane, 1982, 1984; Oldridge, 1982, 1985; Weiss & Troxel, 1986; Wiese & Weiss, 1987).

Many uncertainties are immediately associated with injury (e.g., extent of injury, possibility of surgery, rehab requirements, prognosis for recovery, and social ramifications) that are, at best, disconcerting for the athlete. If rapport has already been established, as described by Kane (1982, 1984) and Wiese and Weiss (1987), the AT is in an optimal position to help alleviate some of the concerns. In the Fisher et al. (in press) study, ATs reported the significance of explaining the nature of the injury as well as the recommended rehab agenda for purposes of adherence. However, whereas ATs thought it more important to discuss the injury with the athletes, athletes unanimously agreed on the necessity of knowing the purpose of the rehab design. Perhaps this suggests that athletes realize they cannot change what has already transpired. Therefore, ATs should concentrate their educational efforts on affecting what ensues. To further support this notion, athletes asserted (97% agreement) that ATs who justify each particular exercise in a rehab program have greater success with athlete adherence.

The importance of communication/education as a necessary step in instituting rehab adherence can hardly



be emphasized enough (Weiss & Troxel, 1986; Wiese & Weiss, 1987; Wiese et al., 1991), as revealed by both athletes and ATs. In fact, education was reported by ATs in the Fisher et al. (in press) study to be the most successful rehab adherence strategy. However, as powerful as it might be, education is no guarantee of adherence (Haynes, 1984; Meichenbaum & Turk, 1987) because there is no necessary direct relationship between what individuals believe about themselves and the plans of action they pursue (Fisher, 1990).

Unlike what may be suspected, good rapport does not conflict with ATs being demanding in their rehab efforts. In actuality, athletes reported a need (75% agreement) for AT demands to facilitate adherence. In the Fisher et al. (in press) study, ATs recognized that placing demands on athletes was influential, but they perhaps did not perceive to what degree that might hold true.

#### Environmental Influences

As anticipated from the literature review (Buffone et al., 1984; Oldridge, 1982, 1985; Wankel, 1985), convenience of the program and accessibility of the rehab setting are critical factors of rehab adherence.

In a previous study (Fisher et al., in press), ATs recognized the effect of facility accessibility on rehab

adherence, but athletes agreed unanimously that ready access to the training room was imperative. Because accessibility is vital, it is understood why both athletes and ATs identified a need for transportation when necessary.

Not surprisingly, athletes and ATs agreed that flexibility in planning rehab workouts around the schedule of student-athletes was crucial. Oldridge (1982, 1985) claimed that, the more inconvenient the scheduling of the program, the less likely individuals would remain committed.

Oldridge (1985) also reported that, as rehab sessions increase in duration, clients are less likely to remain involved. This was reinforced by 56% of the ATs surveyed in the Fisher et al. (in press) study. However, only 36% of the athletes felt duration might influence adherence. Perhaps this is evidence of athlete trust in AT and program efficacy.

Wanzel and Danielson (cited in Buffone et al., 1984) discussed overcrowding as a deterrent to adherence. Likewise, 64% of the athletes confirmed that a crowded training room would inhibit their participation in rehab. Nevertheless, fewer (39% agreement) indicated that, for those who do show up under crowded conditions, less

effort would be expended on rehab. In a prior study (Fisher et al., in press), ATs conveyed similar findings but to a different degree (56% agreement and 43% agreement, respectively).

As already mentioned, student-athletes maintain a consuming schedule, so it would be discouraging to find a crowded training room environment as they might realize that they would be caught in the "hurry up and wait" syndrome. Too, the majority of people recognize that the most difficult part of taking on a new task of any nature is initiating it. And, perhaps when injured athletes arrive to find a crowded room, they are intimidated, adding to the already existing feelings of inadequacy produced by the injury. Parallel to that supposition is that 78% of the athletes agreed that, unless the injured athlete feels comfortable with the training room environment, attendance at rehab sessions will suffer. In the Fisher et al. (in press) study, 88% of the ATs agreed about the comfortable nature of the training room. Conceivably, ATs had a strong reaction because many of them recognize that athletes contend with many daily demands and so make a deliberate effort to provide in the training room a place of escape and solace. The expectation might then be that a businesslike atmosphere

in the training room would be inappropriate for adherence enhancement, as was validated by both athletes (64% agreement) in the present study and ATs (63% agreement) in the Fisher et al. (in press) investigation.

#### Athletes' Personality

In this study, there was little consensus (58% agreement) among athletes concerning personality being the most important factor in rehab adherence just as it was for ATs (55% agreement) in the Fisher et al. (in press) study. Dishman (1986), Friedman and Litt (1987), and Meichenbaum and Turk (1987) all revealed that personality-based predictions of future action are not equitable across settings where behavioral demands vary widely. However, Meichenbaum and Turk proposed two exceptions--personal expectancies and beliefs.

Both athletes (83% agreement) in the current investigation and ATs (87% agreement) in the Fisher et al. (in press) study concurred that a general pessimistic belief would predispose treatment dropout, which was corroborated by the Wiese et al. (1991) investigation. The maintenance of a positive attitude was one of the three most significant criteria they proposed to enhance rehab adherence.

Apparently, both athletes in this study (14%

agreement) and ATs in the Fisher et al. (in press) investigation (15% agreement) were able to distinguish depression as a transient condition because they did not consider it to be a rehab deterrent. This in no way denigrates the relevance of the Kubler-Ross model of grief to injury rehab (Pedersen, 1986; Rotella & Heyman, 1986; Tuffey, 1991), but it does suggest that athletes' emotions (e.g., personality states) are not as debilitating as the more permanent beliefs and expectations.

If the athletes were on a downward spiral emotionally because of a temporary depressed state, it might become necessary for ATs to intercede with a realistic appraisal of effort. Athletes in this study and ATs (Fisher et al., in press) were aware of the potential for athletes needing an AT "reality check" (78% agreement). Similarly, athletes and ATs concurred that, if ATs fail to make injured athletes cognizant of how hard they are working on their rehab, adherence will be reduced.

While literature would lead us to expect the self-motivated individual to be a more willing adherer (Dishman, 1986; Ice, 1985; Oldridge, 1985), only half (56% agreement) the athletes in this study indicated that

those athletes who initiated and pursued their rehab with minimal direction would adhere better. Therefore, one might deduce that, no matter how self-directed athletes might be, they still require guidance and reassurance. This impression is further validated in later discussion.

### Pain Tolerance

Pain, of some degree, is almost certainly associated with injury rehab and has the potential to be a dynamic influence of the degree of adherence. Pain is a complex issue because, as Hotchkiss (1981) observed, pain is an individualized process and individual psychological processes (e.g., memory, emotion, and attention) influence the individual's perception of pain. Because pain is an individual commodity, it then becomes apparent why beliefs and expectations about pain could result in great disparity when being appraised by any two people.

Somewhat surprisingly, athletes reported that pain was less a deterrent to rehab adherence than ATs revealed earlier (Fisher et al., in press). Specifically, pain expectancy, pain prior to the initiation of rehab, pain during the athletes' initial rehab session, the experience of pain onset, and pain during the course of rehab did not seem to deprecate the quantity/quality of adherence to the extent indicated by ATs (Fisher et al.,

in press). In substantiating the posture taken by athletes in this study, Fisher et al. (1988) reported that sports injury rehab adherers tolerated pain and discomfort better than nonadherers.

Conceivably, the athletes' response could be another dimension of the AT-athlete rapport. As addressed earlier in the discussion, ATs are in a position to answer the questions confronting injured athletes. Also, athletes are counting on the experience of the ATs to interpret the unknowns of pain. Perhaps athletes are willing to tolerate pain in rehab because they know the pain will be controlled by the AT. Therefore, because the AT can define the tolerable level of pain or, in other words, clarify the difference between "good" and "bad" pain, then athletes indicated they are able to commit to an injury rehab. Both athletes in this study (94% agreement) and ATs in the Fisher et al. (in press) study (97% agreement) claimed that athletes who understand the quantity and quality of pain expected during rehab are more likely to adhere to their rehab. The athletes wanted their expectancies confirmed not only in preparation for rehab, but also during the rehab process. This is supported by the fact that, with realistic appraisal of pain provided by ATs during

sessions, adherence is more likely.

### Self-motivation

Self-motivation is a disposition to persist at tasks and to be reinforced more by one's own ideas and goals than by those of others (Dishman, 1984). Therefore, it is argued, self-motivated individuals are better equipped to persist in their rehab without external encouragement and guidance (Weiss & Troxel, 1986).

It seems only reasonable that, for individuals to maintain self-motivation in any sort of treatment protocol, there must first be a belief in the efficacy of the program (Duda et al., 1989). This obviously holds true for athletes as 95% agreed that injured athletes are more likely to adhere if they feel their rehab is worth going through. The same question addressed in a different way indicated that there was 97% agreement that adherence was the product of athletes feeling they will benefit from their rehab. The same issues were supported slightly stronger (96% agreement and 100% agreement, respectively) by ATs in the Fisher et al. (in press) study.

Athletes in this study, as compared to ATs surveyed in the Fisher et al. (in press) inquiry, indicated that perhaps ATs do not demonstrate sufficient confidence in



athletes' self-motivation. This is evidenced by 92% athlete agreement that adherence to injury rehab programs is directly related to injured athletes' willpower, whereas only 78% of ATs (Fisher et al., in press) reported it to be true. According to Duda et al. (1989), the concepts of willpower, self-motivation, and self-control are all enmeshed into one's belief systems and so there seems to be a positive relationship between self-reliance and health or health-related behaviors.

ATs (Fisher et al., in press) agreed (55%) that rehab is a high priority for injured athletes, but athletes revealed themselves to be more motivated by reporting 78% agreement. Also, more than half (53%) of the ATs (Fisher et al., in press) viewed return to competition as a motive for adherence enhancement, compared to a response rate of 22% for athletes in this investigation. Similarly, ATs (Fisher et al., in press) strongly (90%) considered pep talks necessary for rehab adherence, but only 67% of the athletes acknowledged that requirement. While it may be correct that ATs do not extend enough credit to athletes regarding self-motivation, the discrepancy in opinion may arise from the actuality that motivation is part of the ATs' job. This fact may cloud ATs' ability to see that attribute having

origin anywhere else. That may be why only 40% of ATs (Fisher et al., in press) indicated that, once rehab exercises have been prescribed, athletes generally initiate and pursue their training room sessions even if the AT is not present, as opposed to 61% of athlete agreement with this statement.

However, the above statement could also be interpreted to substantiate the earlier inference that approval from ATs is desired even if athletes perceive they do not need it. It has been demonstrated throughout this investigation that AT support is crucial to rehab adherence. Athletes resolutely stated that adherence is improved not only when athletes are monitored and supervised by ATs but also by the mere presence of an AT in the rehab setting (Buffone et al., 1984; Friedman & Litt, 1987). Curiously, ATs in the Fisher et al. (in press) study were less inclined to agree. Nevertheless, athletes and ATs (Fisher et al., in press) were in agreement (68%) about the improbability of athletes acting independently and adhering to their programs, which certainly seems to impact self-motivation arguments in injury rehab adherence. Self-motivation may, however, be more germane to exercise rehab adherence, as noted by Blumenthal et al. (1982), Dishman (1984), and Oldridge

(1985). Possibly, the implication to these findings is that ATs should be guarded about expecting an athlete to engage in unsupervised rehab.

Lastly, ATs (Fisher et al., in press) and athletes in this current survey were in accord that athletes who succeed at their sport primarily through hard work are more likely to adhere to injury rehab than athletes who succeed through their athletic talent. The explanation to this claim could be two-fold: (a) rehab becomes a neutralizer because athletic talent no longer matters and, (b) for those who work hard to achieve success, rehab is just an additional step in the work ethic towards attainment of established goals. In other words, adhering athletes tend to personalize effort attributions (Anshel, 1990). Again, the significance of one's belief system and expectancies to the rehab question is in the forefront.

#### Goals and Incentives

Literature is replete with the effectiveness of goal setting as a means to ensure rehab adherence (DePalma & DePalma, 1989; Ice, 1985; Wankel, 1985; Wiese & Weiss, 1987). And, in the Fisher et al. (in press) study, ATs ranked goal setting as the second most successful strategy utilized to achieve injury rehab adherence.

Athletes and ATs (Fisher et al., in press) alike agreed (36%) that long-term goals are not nearly as efficacious toward enhancing adherence as short-term goals (DePalma & DePalma, 1989). However, athletes agreed even more strongly than ATs about the imperative nature of the long-term benefits. The emphasis on being able to project a beneficial net outcome was discussed earlier in regard to program efficacy and is another manifestation of the importance of beliefs and expectancies as predictors of adherence.

Analogous to the advantage of short-term goals would be the requisite of seeing immediate results of rehab programs (DePalma & DePalma, 1989; Fisher, 1990; Tuffey, 1991). Nothing succeeds like success; therefore, as incremental goals are accomplished, injured athletes are propelled toward long-range goals and benefits. Therefore, treatment adherence is enhanced (DePalma & DePalma, 1989; Meichenbaum & Turk, 1987).

Although literature suggested that pep talks are incentives for adherence enhancement (Dubbart et al., 1987; Ice, 1985), athletes indicated that pep talks are not necessarily applicable for them, as previously explained. Once more, possibly athletes were wise enough to recognize that focus should be on what to do

(e.g., 100% agreement for needing justification of rehab details) rather than on what has happened to them. A little more than half (58%) of the athletes agreed that adherence is enhanced when feedback to the injured athlete focuses on positive aspects of the rehab, regardless of the actual progress; whereas 86% of the ATs (Fisher et al., in press) agreed. Perhaps the reason ATs took a stronger position was again because they interpret motivation as being an integral aspect of their professional responsibilities.

Indications are that athletes felt they could be dealt with more rationally and realistically than ATs might think. Although athletes indicated pep talks are unnecessary, neither do they want to be approached in a laissez-faire manner. Only 28% of the athletes indicated that being threatened or subjected to scare tactics would be effective for their adherence enhancement. Consequently, ATs should perhaps elect to use the negative strategies only as a last resort lest they inadvertently create a contraindicated reaction from the injured athlete.

#### Significant Others

Support from significant others is cited throughout the literature as an essential component to treatment

adherence (Buffone et al., 1984; Mullins, 1991; Oldridge, 1982, 1985; Wankel, 1985; Wiese et al., 1991). Obviously, the definition of that support varies across the different treatment domains. Because significant others usually are those with whom the most time is spent, that status in the sport arena is often relegated to coaches, teammates, and ATs (Pedersen, 1986).

Fascinatingly, the sole item in this study on which athletes and ATs (Fisher et al., in press) agreed 100% was the importance of coach support. When compared to a 22% agreement by athletes that return to competition was a significant variable for rehab adherence, the apparent implication is that fewer athletes are concerned about missing playing time than receiving the attention and consideration of coaches. Because coaches seem to be a focal point, perhaps they should be more aware of the reverence conferred upon them by their athletes. It seems that, when an athlete appears on the injured list, yet another opportunity is afforded to exercise the coaching responsibility of caring about the athletes who have made a commitment to their programs.

As projected by both athletes and ATs (Fisher et al., in press), and ranked closely behind the importance of interest from coaches, was the need for athletes to

remain a part of the team (family) even though temporarily removed by injury (Weiss & Troxel, 1986). Curiously though, the relevance of teammate support was reported to be significantly lower by both athletes (61% agreement) in this study and ATs (58% agreement) surveyed by Fisher et al. (in press). Does that finding then signify that the coach equals the definition of team in the minds of athletes, or does it simply mean that athletes recognize that coaches are the final authority on designating who the team members are?

Lastly, athletes in this investigation and ATs (Fisher et al., in press) alike felt quite solidly (95% agreement and 98% agreement, respectively) that ATs' support is fundamental for rehab adherence. And, as evidenced in the literature and in this study, perhaps the bottom-line message for ATs in directing or managing the whole adherence scenario is development of good rapport with the athletes (Wiese & Weiss, 1987).

The concept of a support system is easily one expression of beliefs and expectancies for the injured athlete. Therefore, if all constituents of the support network utilize their opportunity to make a constructive contribution, the athletes can access the emotional strength needed to take on the task of rehab and persist to completion.

### Summary

Established AT-athlete rapport seems to be the crux of successful injury rehab adherence, as reported by both groups surveyed. Once that condition exists, a starting point is available for advancement towards the desired objective.

To enhance the process of rehab, there are helpful implements for ATs such as providing detailed explanations of the rehab agenda and justification for each of the components. Associated with that suggestion is ATs and athletes together creating attainable goals in order that athletes can experience frequent improvement. If athletes hold credence in the program, realize progress, and are given an accurate assessment of anticipated pain, they indicated that their commitment to rehab would not lessen.

Athletes stated that adherence was directly related to their willpower, but ATs reported a considerably weaker response. If it is true that this discrepancy exists because motivational support is part of the ATs' professional responsibility, then perhaps the AT environment is not the optimal setting in which to test athletes' self-motivation.

There was agreement about the role of significant others (primarily coaches and ATs) to ensure commitment



to rehab. Also, athletes and ATs alike agreed that injured athletes need to still feel part of the team, but yet do not particularly look to teammates for support.

Although it had been hypothesized that there would be no significant differences between responses of athletes and ATs about injury rehab adherence factors, this study revealed that those involved in a partnership are not always in agreement. To provide objective solutions, all points of view should be examined.

## Chapter 6

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### Summary

This study was undertaken to assess the factors that influence injured athletes' adherence to sport injury rehab programs from the athletes' perspective. Attitudes and judgments of athletes concerning successful and unsuccessful adherence strategies and AT-athlete interactions were examined. A comparison was then made with the responses provided by ATs in a previous investigation.

Of the 108 questionnaires mailed out, 36 were returned. Athletes were asked to respond to 60 statements concerning factors considered relevant to rehab adherence and to provide judgments pertaining to successful and unsuccessful adherence strategies and AT-athlete interactions.

An analysis of questionnaire item responses was completed to assess the degree to which athletes agreed or disagreed with each statement. This analysis revealed the following as factors significant to injury rehab adherence: (a) good rapport and communication between the ATs and the injured athletes, (b) explanation of the rehab regimen, (c) convenience and easy accessibility of

the rehab facility, (d) rehab sessions planned around the student-athletes' busy schedules, (e) an understanding of expected pain during rehab, (f) belief on the part of the injured athletes that the program is worth attending, (g) athletes' self-motivation, (h) personal supervision and regular monitoring, (i) knowledge of long-term benefits reinforced by the need for realization of immediate results, (j) contraindication of threats/scare tactics, and (k) support from significant others.

Successful strategies reported by athletes included a caring AT attitude, honest approach (e.g., prognosis and pain), encouragement, goal setting, and monitoring of progress. Fewer unsuccessful strategies were offered, but threats/scare tactics and rehab without monitoring were most often suggested.

### Conclusions

The results of this study yielded the following conclusions regarding injury rehab adherence from athletes' perspective.

1. Good rapport and communication between ATs and injured athletes are clearly essential. These factors are critical to a working partnership between the AT and the athlete.

2. Injured athletes need to understand the details of the rehab regimen. If ATs do not concentrate their educational efforts on explaining and justifying the specifics, athletes may be less inclined to adhere.

3. Rehab facilities need to be convenient and easily accessible.

4. Rehab programs need to fit into injured athletes' schedules to maximize attendance and adherence.

5. Pain is a moderate influence on injury rehab adherence, but becomes even less important with athletes' understanding the quality/quantity of expected pain.

6. Athletes need to feel they will benefit from their rehab and that rehab is worth the time and effort. Athletes who feel rehab is worthwhile will more likely reciprocate with a commitment to rehab.

7. Athletes' self-motivation is important and appears to be of greater magnitude than ATs suspect, but it is not likely sufficient to ensure adherence from all athletes.

8. Rehab sessions need to be supervised and monitored because athletes express a desire for AT care and guidance to enhance adherence.

9. There is a need for athletes to know the anticipated outcome of rehab; however, focus on short-

term goals is much more advantageous to motivate athletes to adhere to their programs.

10. Threats/scare tactics are questionable as a motivational strategy and often the use of them is problematic.

11. Injured athletes require support from significant others and, because ATs are cognizant of most interrelational dynamics in the athletic arena, ATs are in an ideal position to promote the appropriate interactions that provide encouragement.

#### Recommendations

The following recommendations for further study are made upon completion of this investigation:

1. The interaction between ATs and injured athletes should be observed to assess which behaviors are important to injury rehab adherence.

2. A study involving periodic questionnaires beginning at the onset of rehab and continuing over a period of time post-rehab should be administered to ascertain if athletes' attitudes and judgments vary with the passing of time.

3. More research should be pursued as to why athletes might be more willing to tolerate pain in a rehab setting than in a practice/competition setting.

4. The coach-athlete relationship should be examined to explore why coaches' support is perceived as most important to enhance rehab adherence.

5. A study of why injured athletes need to remain a part of the team to enhance adherence, but yet do not necessarily look to teammates for support, should be pursued.

6. A study should be pursued concerning rehab adherence at scholarship versus nonscholarship institutions.

## Appendix A

### ATHLETIC INJURY REHABILITATION ADHERENCE QUESTIONNAIRE

This questionnaire is designed to assess your attitudes concerning the rehabilitation of athletic injuries and your judgments concerning injured athletes' adherence to their rehabilitation. By adherence, we mean the degree (both quantitatively and qualitatively) to which athletes work at their rehabilitation. You are in a unique position to offer us the benefits of your experience, which we will be able to share with other athletes and athletic trainers.

THERE ARE NO RIGHT OR WRONG RESPONSES. RESPONSES ARE NO REFLECTION OF YOUR CHARACTER BUT YOU WILL REMAIN CONFIDENTIAL.

#### I. Background Information

Please provide the following information by filling in the appropriate number/circle on the answer sheet:

Sex

M - Male

F - Female

#### II. Rehabilitation Adherence Statements

Please read the following statements and assess your agreement or disagreement with them, using the following 5-point scale as your guide:

1	2	3	4	5
Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree

If, for example, you feel strong agreement about the point made in a statement, then fill in 5. If, on the other hand, you disagree somewhat with a statement, then fill in 2. Use 3 only if you really can't make a better assessment.

A. Athletic Trainers' Influence

1. The more experienced a trainer is, the more apt injured athletes are to adhere to their rehabilitation programs.
2. Athletes are likely to drop out of their rehabilitation programs if they are not given an explanation of their injuries.
3. It is necessary for trainers to provide detailed instructions of why certain rehabilitation exercises were chosen.
4. Good rapport between injured athletes and trainers is essential for rehabilitation adherence.
5. Injured athletes work harder on their rehabilitation with trainers of the same sex.
6. Athletes are more apt to adhere to their rehabilitation if the trainer is demanding.
7. Trainers who realistically apprise athletes of the likelihood of pain during rehabilitation sessions are more successful in getting athletes to adhere.
8. If the prescribed exercise program demands less than the athlete is willing to give, the athlete is less likely to adhere to the



1	2	3	4	5
Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree

rehabilitation.

9. If trainers fail to make injured athletes aware of how hard they are working on their rehabilitation, then adherence will be lessened.

B. Environmental Influences

10. Unless the injured athlete feels comfortable with the training room environment, attendance at rehabilitation sessions will suffer.
11. A strictly business atmosphere in the training room is more conducive to exercise rehabilitation adherence than an environment that promotes socialization.
12. If the training room is crowded, athletes are less likely to attend their rehabilitation sessions.
13. Athletes are more likely to drop out of rehabilitation if their programs take more than 30 minutes daily.
14. It is crucial to plan rehabilitation sessions around the injured athlete's schedule to promote adherence.
15. If the training room is easily accessible, athletes' attendance at their rehabilitation sessions will be greater.
16. When needed transportation is available, attendance at rehabilitation sessions will be greater and adherence will be enhanced.
17. When the training room is crowded, injured athletes who show up for their rehabilitation tend not to work as hard on their prescribed exercises.

1	2	3	4	5
Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree

C. Athletes' Personality

18. Introverts are less likely to stick to their rehabilitation than are extroverts.
19. Athletes who initiate and pursue their rehabilitation with minimal directions adhere better to their rehabilitation.
20. Injured athletes who tend to display a general pessimism (i.e., "nothing goes right for me") are more apt to drop out of rehabilitation.
21. Athletes who don't fool themselves with how hard they are working adhere to their rehabilitation programs.
22. Only those injured athletes who give an "all out" commitment to their rehabilitation can be described as adherers.
23. Injured athletes who experience "depression" because of either their rate of rehabilitation progress or their present condition are likely to adhere to rehabilitation programs.
24. Athletes who fear reinjury are likely to drop out of their rehabilitations.
25. Personality of the injured athlete is the most important factor in rehabilitation adherence.

D. Pain Tolerance

26. If athletes hurt prior to starting their rehabilitation exercises, then adherence to these prescribed exercises will be reduced.
27. During rehabilitation, athletes generally stop their workout when they first experience the onset of pain.
28. If the rehabilitation exercises are painful,

1	2	3	4	5
Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree

then athletes will lessen their commitment to their rehabilitation.

29. The higher the athlete's expectancy of pain from the rehabilitation exercises, the less likely that athlete will adhere.
30. Athletes who understand the quantity and quality of pain expected during rehabilitation are more likely to adhere to their rehabilitation.
31. Pain during the athlete's initial rehabilitation session decreases the chances of adherence.

E. Self-motivation

32. Athletes who feel that they are not making progress in their rehabilitation will tend to drop out.
33. Unless athletes feel it is worth going through rehabilitation, they will not adhere to their rehabilitation.
34. Trainers who justify each particular exercise in a rehabilitation program have greater success with athlete adherence.
35. Athletes are more likely to adhere if they feel that they will benefit from their rehabilitation.
36. Although many athletes physically attend their rehabilitation sessions, they don't necessarily work hard at their programs.
37. If athletes can do their exercise programs alone, then they are more apt to adhere.
38. Athletes are more likely to work at their

1	2	3	4	5
Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree

programs if trainers monitor them on a regular basis.

39. The mere presence of a trainer in the rehabilitation setting enhances the quality of the injured athlete's work.
40. Once rehabilitation exercises have been prescribed, athletes generally initiate and pursue their training room session even if the trainer is not necessarily present.
41. Adherence to exercise rehabilitation programs is directly related to the injured athlete's willpower.
42. When trainers personally supervise rehabilitation sessions, athletes work harder on their rehabilitation.
43. Athletes who succeed at their sport primarily through hard work are more likely to adhere to injury rehabilitation than athletes who succeed through their athletic talent.
44. Successful athletes (e.g., starters) are more likely to adhere to injury rehabilitation than unsuccessful athletes.

F. Goals and Incentives

45. Long-term benefits of rehabilitation are more important than short-term outcomes in getting athletes to adhere to their prescribed rehabilitation.
46. Athletes who cannot return to competition for the remainder of the season will be less faithful to their rehabilitation.
47. Athletes are more apt to adhere to rehabilitation programs when they see immediate results.

- | 1                    | 2        | 3           | 4     | 5                 |
|----------------------|----------|-------------|-------|-------------------|
| Strongly<br>Disagree | Disagree | Not<br>Sure | Agree | Strongly<br>Agree |
48. Knowledge of the long-term benefits of their rehabilitation programs tends to enhance athletes' adherence.
  49. Adherence is enhanced when feedback to the injured athlete focuses on positive aspects of the rehabilitation, regardless of the actual progress.
  50. Athletes need pep talks to encourage them to stick to their rehabilitation programs.
  51. Threats (e.g., "If you miss rehab, you don't play!") are effective in getting athletes to adhere to their prescribed rehabilitation.
  52. Scare tactics motivate injured athletes to adhere to their rehabilitation programs.
  53. Athletes will attend rehabilitation sessions only if nothing more pleasurable comes up during that time.
  54. Rehabilitation programs are a high priority for injured athletes.
  55. Injured athletes look for alternative activities as a means of missing their rehabilitation sessions.

G. Significant Others

56. Trainers' support of injured athletes' rehabilitation effort is essential for rehabilitation adherence.
57. Athletes who feel they're still an integral part of the team despite being injured are more likely to adhere to their rehabilitation programs.
58. When a number of trainers are involved in an athlete's rehabilitation, that athlete is less

1	2	3	4	5
Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree

likely to adhere.

59. If coaches are supportive of their injured athletes' rehabilitation efforts, then athletes will more likely adhere to their programs.
60. If teammates are not supportive of injured athletes rehabilitation efforts, then athletes will tend to drop out of rehabilitation.

Thank you for completing these 60 questions. On the next page, there are four open-ended questions that we would like you to address.

## ATHLETES' PERSONAL OPINIONS AND JUDGMENTS

Although the following questions will ask you about something that happened some time ago, please be as insightful as you can in responding. Your answers are really important in enhancing the success of future injured athletes' rehabilitation.

For you, what athletic training techniques/strategies or athletic trainer interactions helped most with your adherence to the rehabilitation treatment?

Were there any techniques/strategies or interactions that weren't employed that would have enhanced your adherence to the rehabilitation?

For you, what strategies/techniques or athletic trainer interactions simply did not work for you?

What strategies/techniques or interactions, had they been employed, would surely not have worked for you?

(Detach this sheet from the questionnaire and return it with the blue answer sheet.)

Again, thanks for your participation.

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