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Patient satisfaction among injured high school and college athletes and its association with rehabilitation adherence and compliance

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Abstract

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Joni L. Cramer Roh

Patient satisfaction is an important measure for quality of care and has been observed for several decades (DiPalo, 1997; Merkouris, Ifantopoulos, Lanara, & Lemonidou, 1999; Wolf, Putnam, James, & Stiles, 1978; Zyzanski, Hulka, & Cassel, 1974). Based on theory, patient satisfaction has been suggested to be a means for patient attendance and quality of effort during rehabilitation, which would then impact the recovery rate (DiPalo, 1997; Press, 1994). Recently, patient satisfaction athletes received from their sports medicine professional (i.e., athletic trainer, physiotherapist) in the athletic training rooms and clinics have also been explored (Albohm & Wilkerson, 1999; Taylor & May, 1995; Unruh, 1998). However, the sample selection, instrumentation, and methodology used were questionable. The primary focus of this study was to investigate the sociodemographic variables associated with patient satisfaction. A secondary focus was to investigate concurrent and prospective relationships between patient satisfaction and rehabilitation adherence (attendance) and compliance (quality of effort). Prior to any patient satisfaction analyses, alpha and test-retest reliabilities and concurrent and construct validities were completed which demonstrated acceptable psychometric levels for the Medical Interview Satisfaction Scale for Athletic Trainers (MISSAT). Thirty-seven acutely injured high school and college athletes completed the MISSAT for the respective athletic trainer one-week and one-month post injury. Each respective athletic trainer completed the Sport Injury Rehabilitation Adherence Scale (SIRAS) for each injured athlete one-week and one-month post injury. In general, injured athletes reported relatively high patient satisfaction ratings. Patient satisfaction ratings remained relatively stable over time. Two way (gender x injury severity) ANOVA revealed female injured athletes were significantly more satisfied with their athletic trainer than their male counterparts regardless of injury severity. Chi square analysis indicated that female injured athletes were more likely to be treated by female athletic trainers (gender concordant). Multiple regression analyses indicated greater patient satisfaction scores one-week post injury did predict greater patient compliance, but not patient adherence scores one-month post injury. Further, after controlling for injury severity, regression analyses indicated that the affective subscale and the behavior subscale scores one-week post injury were related to rehabilitation compliance one-month post injury, which accounted for 33% and 47%, respectively.

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CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

Introduction

Theories and models derived from job satisfaction and consumer literature have been applied to the medical environment (Sitzia & Wood, 1997; Williams, 1994). Patient satisfaction has been identified as an important measure of quality of care (Merkouris, Ifantopoulos, Lanara, & Lemonidou, 1999). Since the advent of managed care, interest in patient satisfaction has increased, and it has been considered one of the core outcome measures of health care because of its impact on effectiveness and efficiency of a health care program (DiPalo, 1997; Sitzia & Wood, 1997). Many health care plans have incorporated primary care physicians, who have not only treated the patient, but also, played a key role in granting (or denying) access to other medical providers. In other common plans, patients may not have had a personal physician; rather they were required to see whomever was available on the day of their clinic visit. Thus, patients have been greatly concerned with the kind of care received under the financial restraints of modern health service delivery (DiPalo, 1997; Sitzia & Wood, 1997).

Since managed health care has been on the rise in the United States, it is important that patients trust their physicians and are satisfied with the care they have received (DiPalo, 1997; Sitzia & Wood, 1997). For example, patients who are more satisfied with their medical care, have shown greater compliance, healed quicker, complained less, have had more trust in the care provider, and have been less likely to engage in litigation (DiPalo, 1997; Press, 1994).

There has been an intuitive appeal to believe that patient satisfaction would be easy to assess and would largely mirror health provider (i.e., physician) perceptions. Yet, studies have routinely reported that physicians' assessment of patient satisfaction may vary greatly from patients' actual satisfaction with an office visit (Merkel, 1984; Suchman, Roter, Green, & Lipkin, 1993). Discrepancies between doctor and patient ratings of an office visit may have arisen for a number of reasons (e.g., external factors to the physician-patient interaction, such as cost of care or scheduling difficulty, may be factored into the patient satisfaction score). However, the assessment and definition of patient satisfaction has been identified as the primary obstacle in furthering the literature and clinical practice devoted to patient satisfaction.

Because patient satisfaction is a complex construct, researchers have moved from unidimensional to multidimensional conceptualizations of patient satisfaction (DiPalo, 1997; Sitzia & Wood, 1997; Wolf, Putnam, James, & Stiles, 1978). For example, patient satisfaction may include assessment of cognitive elements (e.g., how well the patient understood their diagnosis and treatment regimen), affective components (e.g., did the patient feel cared for as a person rather than as a medical problem), and behaviors that care providers may have exhibited during an examination. Similarly, the object of patient satisfaction ratings has varied from direct care providers (e.g., physicians, nurses, and auxiliary staff), to the ease of navigating the myriad of administrative requirements, to the perceived cleanliness of the facility (Batchelor, Owens, Read, & Bloor, 1994; Buhrlen-Armstrong, de Jager, Schochat, & Jackel, 1998; DiPalo, 1997; Hall & Dornan, 1988; Keith, 1998; Kohlmann & Raspe, 1998; Merkouris et al., 1999; Sitzia & Wood, 1997; Wolf et al., 1978). However, patient ratings of their physician during an office

visit have become the focus of patient satisfaction literature. The Medical Interview Satisfaction Scale (MISS) was developed specifically to assess patients' perception of the physician-patient interaction that occured during an office visit (Willson & McNamara, 1982; Wolf et al., 1978). It has been used to assess patients' thoughts, feelings, and reactions to physician behavior.

Athletic Trainers as Health Care Providers

Similar to physicians, certified athletic trainers (ATC) have provided a great deal of direct health care to injured athletes on a day-to-day basis. When an athlete has been injured, the ATC usually has been the first health care provider to evaluate and assess the injury. They have also provided treatment and rehabilitation programs to return the athlete to the pre-injury state in the shortest period of time (Arnheim & Prentice, 1993). In fact, some authors have stated that ATCs have been the primary care givers for injured athletes (Arnheim & Prentice, 1993; Larson, Starkey, & Zaichkowsky, 1996).

However, beyond the degree of medical training, there are important differences between ATCs and physicians that must be considered when evaluating the ATC-injured athlete interaction. These differences have been particularly pronounced for ATCs working in an educational setting (e.g., colleges and universities). Unlike other health care providers, athletic trainers have treated all athletes at educational institutions at no charge. This has been due to the fact that the institution has employed the ATC, and all athletes (regardless of social economic status) have had access to the same medical personnel and equipment. Rehabilitation sessions have not been limited by policy provisions, as they would be in traditional managed care. Therefore, economic status has not been a determinative issue as to whether an athlete has been attended to. However, it

is true that injured athletes may not have had a choice as to who provided their athletic training rehabilitation sessions. Furthermore, athletic trainers generally have made the initial referrals to other health care providers rather than having been the recipient of a referral for follow-up care as in the case of physical therapists. However, if the athlete did not trust the ATC or had a poor relationship with the ATC, then the athlete may have been less likely to comply with the treatment and therapy programs, possibly delaying recovery. Athletes may have also failed to follow-up with referrals given to them by the ATC. Therefore, similar to physicians, it has been important for the ATC to have had a good rapport with the athlete.

Although a literature search revealed over 200 research studies related to patient satisfaction in the medical literature, there were surprisingly very few specific to ATCs and patient satisfaction ratings (Albohm & Wilkerson, 1999; Taylor & May, 1995; Unruh, 1998). Additionally, the few published studies that have evaluated ATCs and patient satisfaction ratings had significant methodological shortcomings. For example, single-items may have been used to assess patient satisfaction. Yet, patient satisfaction is best thought as a multidimensional concept. Ratings have been obtained only once, typically after the completion of the rehabilitation process, or questions have been phrased more as to whether the athlete "agreed" or "disagreed" with the behaviors of the athletic trainer rather than how satisfied they were with the care they received (Albohm & Wilkerson, 1999; Kernohan, Dodd, Dowey, & McConnell, 1993; Taylor & May, 1995; Unruh, 1998). The limitations mentioned, detract from the ability to determine whether athletes were satisfied at the onset of injury or became more or less satisfied as they spent more time with the health care provider. For example, in one particular study patients

who participated in health maintenance organizations (HMOs) initially reported the lowest levels of patient satisfaction, yet patient satisfaction levels increased the longer the patients stayed in the HMO (DiPalo, 1997). The following sections address the variables commonly associated with greater patient satisfaction ratings and patient compliance.

Variables Associated with Patient Satisfaction

In general, most studies have been correlational in nature and have concluded that patient satisfaction has been associated with a variety of sociodemographic variables. In general, women have reported a greater degree of satisfaction with their physician than men (Hulka, Kupper, Daly, Cassel, & Schoen, 1975; Like & Zyzanski, 1987; Pascoe, 1983). Asian and Latino, but not African American patients, were significantly less satisfied than whites were with the care they received (Cooper-Patrick et al., 1999; Hulka et al., 1975). Furthermore, race concordance between the physician and patient was positively associated with patient satisfaction. That is, African American patients reported greater satisfaction when their physician was African American than when their physician was Caucasian (Cooper-Patrick et al., 1999).

Other sociodemographic variables positively associated with patient satisfaction included age, socioeconomic status, and marriage, whereas educational level has been inversely associated with patient satisfaction (Hall & Dornan, 1990; Hulka et al., 1975; Like & Zyzanski, 1987; Pascoe, 1983). Finally, the quality of interaction with the physician, specifically, time spent with the physician was positively associated with patient satisfaction ratings (Chung, Hamill, Kim, Walters, & Wilkins, 1999; Like & Zyzanski, 1987). However, the patient samples used in these studies have not necessarily been representative of the general population, and they have not included people with

athletic injury. For example, the populations sampled in the studies above included elderly patients (Hall, Milburn, & Epstein, 1993; Hall, Milburn, Roter, & Daltroy, 1998), Mexicans (Comstock, Hooper, Goodwin, & Goodwin, 1982), students in psychology, and military personnel and their families (Mangelsdorff, 1979).

To benefit the sports medicine departments, clinics, and injured athletes, the quality of care injured athletes have received from their athletic trainer should be measured. Few studies have evaluated injured athletes' satisfaction with certified athletic trainers (ATC), physiotherapists, or physical therapists (Albohm & Wilkerson, 1999; Fick, Xakellis, & Gjerde, 1992; Kernohan et al., 1993; Taylor & May, 1995; Unruh, 1998). Similar to other patient satisfaction studies, investigations with ATCs as treatment providers have used a variety of measurements and definitions of patient satisfaction, but most have reported favorable satisfaction ratings of ATCs (Albohm & Wilkerson, 1999; Kernohan et al., 1993; Unruh, 1998). Variables that have been associated with patient satisfaction included severity of injury, perceived importance of sport, and gender. However, assessments were unidimentional, irregularly administered during the rehabilitation process, and the data were collected in the United Kingdom. Therefore, it is difficult to determine whether athletes have been satisfied with the health care provided by athletic trainers, especially in the United States. For example, in a national study, a one-item patient satisfaction measure indicated that patients who received care from an ATC were very satisfied (3.89 on a 4-point scale) with their care and with the person who cared for them (Albohm & Wilkerson, 1999). However, this questionnaire was taken only once, at the end of the rehabilitation session, so it is possible that only satisfied patients returned questionnaires.

In contrast to findings with other patient samples, male athletes reported significantly greater satisfaction with treatment than did female athletes (Taylor & May, 1995). In the same study, athletes who were injured more than 28 days and rated the level of importance of sport participation highest had significantly higher levels of satisfaction than athletes with less severe injuries (Taylor & May, 1995). However, even though patient satisfaction was assessed immediately following the patient visit, patients were asked to return the responses by mail with the return date unspecified. Therefore, the average number of days that passed from the date of service to the return of the questionnaire was unknown. An additional limitation of patient satisfaction research with injured athletes has been that patient satisfaction measures were issued singly at the exit of a rehabilitation session or at some unspecified time following the completion of a rehabilitation program. By the time the assessment was taken, the athlete had recovered and may have reported more favorable responses because of the completion of the therapy process than would have been reported ealier. Additionally, longitudinal changes in patient satisfaction have not been assessed. A longitudinal study would be useful in determining whether there is a change in the patients' perceptions as treatment and rehabilitation continues as has been suggested in other patient satisfaction literature (DiPalo, 1997). Therefore, it is unclear from these studies whether changes in patient satisfaction ratings occurred throughout the recovery process and whether patients would have indicated less favorable ratings at the onset of therapy than at the conclusion.

Patient Satisfaction as a Determinant of Patient Compliance

It has also been suggested that patient satisfaction should not only be used as an outcome measure but also as a contributor to other outcomes (i.e., compliance) which

may influence the patient's recovery process (Merkouris et al., 1999). Specifically, those who were more satisfied with their care were more likely to comply with rehabilitation regimens (Sanazaro, 1985), and in turn, had a better recovery progression (Treacy, Barron, Brunet, & Barrack, 1997).

It has been documented that as many as 30-75% of the patients who received medical care were non-compliant with some aspect of treatment and particularly with treatments that required a relatively high degree of patient self-care behavior (Comstock et al., 1982; Imanaka, Araki, & Nobutomo, 1993; Klein, 1980; Taylor & May, 1996). Treatment of athletic injuries routinely required a high degree of patient self-care (e.g., completion of home exercises). The outcome of this type of research may have a very important practical application. If the care provider can influence patient satisfaction and patient satisfaction can be used as a determinant of compliance, then it would be helpful to the health care provider to determine whether or not the patient was satisfied.

Because the definition of patient compliance may vary greatly, several instruments have been used to measure patient compliance. Adherence and compliance have often been used synonymously throughout the literature. However, some researchers have described adherence and compliance as two different concepts (Brewer, 1998; Brewer, Daly, Van Raalte, Petitpas, & Sklar, 1999). For example, "adherence" is the ratio of the number of rehabilitation sessions attended to the number of rehabilitation sessions scheduled, whereas, Brewer, Van Raalte, Petitpas, Sklar, & Ditmar (1995) have operationalized "compliance" as the quality of effort based on the summation of three items rated on a 5-point Likert scale by the health care provider (e.g., athletic trainer). The three items were considered as a measure of quality of effort, which asked the health

care provider to measure the athlete's intensity of effort on rehabilitation exercises, frequency of following the athletic trainer's advice, and the receptivity to changes in the rehabilitation program (Brewer et al., 1995). Because attendance and adherence have been used synonymously, when they are related but have distinct constructs, this can create a problem with interpretation of results.

Two specific studies evaluated the link between patient satisfaction and adherence/compliance. Safran et al. (1998) evaluated patient satisfaction and patient compliance with adult patients (N = 7204) in the Commonwealth of Massachusetts. A single item measured patient satisfaction; adherence was measured by a ratio of seven behavioral risks discussed by the physician and the patient's behavior as a result of the advice. Patients' satisfaction was positively associated with both trust in their physician and adherence. The researchers suggested that it was possible that patient satisfaction could lead to trust which in turn could lead to increased compliance. The cross-sectional study design prevents one from drawing the conclusion that trust in the physician caused patient satisfaction or adherence. However, a prospective relationship between a predictor and an outcome is the first condition that must be satisfied to support a cause-effect relationship.

Conversely, other researchers (DiMatteo, Hays, & Prince, 1986) have not found a link between patient satisfaction scores and treatment compliance. The results of this study may have been due to the range of illnesses (e.g., a cold to cancer) for which the patient was seen and the calculation of noncompliance. For example, over a 6-month period, noncompliance was based on the number of canceled appointments in each month and was divided by the number of patients the physician was scheduled for that month.

The study did not clearly indicate when research measurements were taken throughout the patient's phase of recovery (e.g., early, middle, or late). Additionally, whether the severity of the illness (i.e., life-threatening illness) was accounted for was not indicated. Therefore, there are questionable methods for this study and the design is unclear.

Specific to athletic injury, there has been no reported study linking patient satisfaction with patient adherence and compliance. However, before patient satisfaction and patient adherence and compliance could be examined with injured athletes, it was important to address whether the same demographic factors associated with patient satisfaction ratings in the general satisfaction literature hold true for athletic injury.

The Problem

Statement of the Problem

The purposes of the study were fourfold. The primary focus of this study was to investigate the degree to which demographic factors (gender and injury severity) were associated with patient satisfaction and if patient satisfaction changed over time. A second aim was to investigate the concurrent relationships between patient satisfaction and rehabilitation adherence and rehabilitation compliance at one-week and one-month post injury. The third aim was to investigate the prospective relationship between patient satisfaction and rehabilitation adherence and rehabilitation compliance. The fourth aim was to investigate the prospective relationship between patient satisfaction ratings of athletic trainers at one-week post injury and patient satisfaction ratings of athletic trainers at one-month post injury.

Scope of the Study

The participants included 37 injured male and female high school and college athletes. The high school athletes attended local high schools in Monongalia County in north central West Virginia. The college athletes attended either West Virginia University [National Collegiate Athletic Association (NCAA) Division I] or California University of Pennsylvania (NCAA Division II). This study involved a descriptive research design. Data were collected by experienced graduate students in the Sport Psychology program at West Virginia University under the direction of an ATC and a licensed psychologist.

A two-way (gender x injury severity) ANOVA was used to measure differences in patient satisfaction ratings. Bivariate Pearson product moment correlations were conducted to evaluate the association between (1) rehabilitation adherence and patient satisfaction, and (2) rehabilitation compliance and patient satisfaction. Multiple regressions were used to predict (1) rehabilitation adherence, and (2) rehabilitation compliance at one-month post injury based on the patient satisfaction scores at one-week post injury. Correlations and repeated measures ANOVAs were also used to determine the degree to which patient satisfaction scores deviated from one-week to one-month post injury.

The Sport Injury Rehabilitation Adherence Scale (SIRAS)(Brewer et al., 1995; Daly, Brewer, VanRaalte, Petitpas, & Sklar, 1995) was used to measure rehabilitation adherence and rehabilitation compliance. A modified version of the MISS (Wolf et al., 1978) was used to determine the degree of patient satisfaction with their athletic trainer. The MISS was based on a scale to measure patient perceptions of physician behavior

(Wolf et al., 1978). Therefore, modifications to MISS items included substituting "athletic trainer" for "doctor" and "injury" for "illness". Additionally, one item ("I was satisfied with the doctor's decision about what medicines I needed to take") was deleted due to the non-applicability for athletic trainers. The modified version of the MISS for athletic trainers was termed MISSAT.

Basic Assumptions

1. The athlete's responses to the items on MISSAT accurately reflected their satisfaction with the athletic trainer responsible for the athlete's rehabilitation program.
2. The MISSAT was a reliable and valid measure to determine accurate patient satisfaction scores of athletic trainers, responsible for the athlete's rehabilitation program.
3. The SIRAS (Brewer et al., 1995; Daly et al., 1995) was a reliable and valid measure to determine accurate rehabilitation adherence and rehabilitation compliance data.
4. The athletic trainers have kept adequate records of appointments scheduled and appointments attended.

Limitations of the Study

1. The athletes in the study represented only the college population at West Virginia University, or California University of Pennsylvania, and the high school students from the local high schools in Monongalia County in North Central West Virginia. This limited external validity, especially to other regions of the country and other athletic populations (e.g., elite and recreational athletes).

2. The MISSAT has not been used to measure patient satisfaction with ATCs, which limited external validity.
3. The MISSAT has not been administered to injured high school or college athletes and so its usefulness with these populations was uncertain.
4. The athletic injuries are not all the same thus limiting internal validity.
5. Different injuries and different treatments may influence differences with patient satisfaction scores.
6. Volunteers may have more favorable results than non-volunteers.
7. Younger aged athletes may have other constraints such as relying on an adult to drive them to a rehabilitation session.

Definition of Terms

1. Adherence: the ratio of the number of rehabilitation sessions attended to the number of rehabilitation sessions scheduled (Brewer et al., 1995).
2. Compliance: the summation of three SIRAS items rated on a 5-point Likert scale by the athletic trainer. The items ask the athletic trainer to measure the athlete's intensity of effort on rehabilitation exercises, frequency of following the athletic trainer's advice, and the receptivity to changes in the rehabilitation program (Brewer et al., 1995).
3. Injured athlete: athletes that have sustained an athletic injury that prevented their return to athletic competition and practice for at least one-week.
    a. **Non-season ending**: individuals incurring an acute injury that has kept them out of practice and competition for at least 7 days, but were allowed to return

within one month. Examples include, but are not limited to: (1) first or second-degree sprains/strains, and (2) meniscus injuries.

b. Season ending: individuals incurring an acute injury that kept them out of practice or competition for at least one month and prevented them from returning during the remainder of the season. Examples of injuries in this category include, but were not limited to: (1) anterior cruciate ligament (ACL) tears, (2) fractures/dislocations, and (3) third degree sprains/strains. It is important to note that if athletes were required to have surgery or sustained an injury within the last one to two weeks of the season they will not immediately be categorized into the season ending injury group.

4. Patient Satisfaction: the summation of the 25 items on the MISSAT with relatively greater scores indicating greater patient satisfaction.

Significance of the Study

Previous studies of athletes' satisfaction with athletic trainers have measured satisfaction at the end of the rehabilitation process, thus limiting the information of whether patient satisfaction ratings change over time (Albohm & Wilkerson, 1999; Unruh, 1998). Additionally, based on the general patient satisfaction literature, it has been recommended that patient satisfaction should not only be used as an outcome measure, but should also be used as a contributor to other outcomes. Simply stated, if patients' expectations were met (satisfied), would they be more likely to get involved with their therapy process and respond better to therapeutic interventions (Merkouris et al., 1999)? No reported athletic literature has used patient satisfaction as a contributor to rehabilitation adherence or compliance. Therefore, this study was conducted to

investigate the variables associated with patient satisfaction ratings as well as to investigate the satisfaction scores as an antecedent to rehabilitation adherence and compliance.

The results of this study could extend the literature related to injured athletic populations and their recovery (Fisher, 1990; Fisher, Scriber, Matheny, Alderman, & Bitting, 1993b). In particular, the results of this investigation could uncover the factors that influence injured athlete's satisfaction ratings of their health care provider, specifically athletic trainers. Further, the results could identify patient satisfaction as one contributing factor to patient adherence and compliance. Considering that patient satisfaction may be modifiable, the findings of this study could potentially contribute to the enhancement of patient adherence and compliance, which could lead to the enhancement of overall recovery.

CHAPTER II

SELECTED REVIEW OF LITERATURE

Introduction

Patient satisfaction has always been a major concern for the medical community, and since the advent of managed care, interest has increased (DiPalo, 1997; Merkouris et al., 1999; Sitzia & Wood, 1997). Patient satisfaction has been used to measure the quality of care provided by physicians, nurses, hospitals, clinics, emergency room departments, and treatment programs in the United States of America and in the United Kingdom (Buhrlen-Armstrong et al., 1998; DiPalo, 1997; Keith, 1998; Kohlmann & Raspe, 1998; Merkouris et al., 1999; Sitzia & Wood, 1997). Since patient satisfaction is complex, several definitions and multidimensional instruments have been developed to reflect an individual's evaluation of their health care (DiPalo, 1997; Sitzia & Wood, 1997; Wolf et al., 1978).

Patient Satisfaction has been examined from two primary perspectives: (1) patient satisfaction as an outcome (i.e., quality of care), and (2) patient satisfaction as a determinant to other outcomes (i.e., treatment compliance) (Sitzia & Wood, 1997). It has been suggested that patient satisfaction is a critical and valid measure of quality of care. It has also been suggested that patient satisfaction has been related to better medical outcomes including enhancement of trust, compliance, and better healing (DiPalo, 1997; Press, 1994). Satisfied patients have also been found to complain less, and are less likely to engage in litigation (Press, 1994). Therefore, patient satisfaction should be considered as an important outcome variable that may influence or mediate other health-relevant outcomes.

Specifically, this chapter reviewed the literature pertaining to: (1) models and theories of patient satisfaction and compliance, (2) measurement scales of patient satisfaction, (3) correlations of patient satisfaction; (4) patient satisfaction in the medical population; (5) patient satisfaction in the athletic population; and (6) patient attendance/patient adherence/patient compliance

Models and Theories of Patient Satisfaction and Compliance

Research typically has been conducted to test theories to explain the phenomenon of particular constructs. Patient satisfaction and compliance have not been unique to this process. In 1982, Linder-Pelz proposed the value-expectancy model that was based on job satisfaction to explain patient satisfaction. Essentially, patient satisfaction (attitude) is the sum product of belief strength (e.g., how strongly one believes) and attribute evaluations (e.g., access, efficacy, cost, convenience, etc.) of health care. For example, the patient would rate each attribute using two measures. First, the patient decided to what degree they believed in the attribute. Second, the patient positively or negatively rated that attribute. Finally, the two scores were multiplied together and the product summed, providing a patient satisfaction score (attitude) (DiPalo, 1997; Pascoe, 1983; Williams, 1994). Linder-Pelz conducted a study using 125 patients visiting a primary care clinic for the first time. Data incorporated health care values, expectations, and sense of entitlement to care. Unfortunately, no support was found for the value-expectancy model (Pascoe, 1983; Williams, 1994). Researchers have attributed the lack of support to both methodological (e.g., mixing items and scale references) and fundamental (e.g., multiplication of determinants that may be independent to one another) problems (Pascoe, 1983).

Alternative models constructed to explain patient satisfaction adapted from the expectancy model are; the discrepancy theory, fulfillment theory, and equity theory (Pascoe, 1983; Williams, 1994). The discrepancy theory suggested that satisfaction was the result of what the individual desired compared to what the individual actually experienced. Essentially the calculation required the individual to rate the percentage of an outcome received based on the amount of what the individual expected (Pascoe, 1983; Williams, 1994). For example, the ratio between the patient's desires and the patient's experiences indicated the greatest patient satisfaction when these desires were equal. Conversely, the less the desires met in proportion to the desires expected, would indicate that patients were least satisfied. For example, if an individual had an insurmountable number of expectations and only a few were met, then this would indicate that the patient was not satisfied. Whereas, if an individual had a reasonable number of expectations and the same expectations as mentioned above were met, then this would indicate that the patient was satisfied. The problem with this measure is that the quality of the expectations was not considered in the calculation. For instance, if patients had very low expectations and did not receive a high quality of care, yet all expectations were met, then this would indicate that the patient was very satisfied. The fundamental flaw with this theory was that the desires met may be of greater importance than the desires expected, yet this was not considered for the patient satisfaction calculation.

The fulfillment theory defined satisfaction as the difference between rewards desired and rewards received. For example, patients who have greater desires met than expected would have positive patient satisfaction scores, whereas patients who had less desires met than expected would have negative patient satisfaction scores. The

fundamental problem with this theory was that if individuals had equal expectations and experiences, then the patient satisfaction score was zero indicating no satisfaction at all. Furthermore, individuals who had as many experiences as expectations indicated that the person is not satisfied, when in fact the person is just expecting more (Pascoe, 1983).

The equity theory defined satisfaction as a social comparison process of perceived equity. Basically, did the perceived balance of inputs and outputs of one patient equal the perceived balance of inputs and outputs of another patient? Based on the literature, it is uncertain exactly how this comparison was measured (Williams, 1994). However, it appears that this theory was trying to adjust for those patients with either very high or very low expectations and the number of expectations met.

In general, little to no support was found for the value-expectancy model and its alternatives (Williams, 1994). For example, two independent studies reported correlations between expectations and satisfaction, but the variance explained has been low (8-10%) (Williams, 1994). These data suggested that the expectations and values of the patient were related to patient satisfaction. However, it was believed that to explain the patient satisfaction phenomenon, more was involved (Hall & Dornan, 1988; Sitzia & Wood, 1997; Williams, 1994).

Basically, the models that have been identified describing patient satisfaction have empirical support, but they only accounted for a small degree of variance in patient satisfaction. Therefore, the researcher did not find one specific patient satisfaction theory or model superior to another. However, the findings clearly suggested that expectations and perceptions may play a role in determining patient satisfaction and these experiences may be somewhat independent of actual ones received.

Compliance Models

As researchers investigated the physician-patient relationship and the influence of the relationship on the patient's health behavior (compliance), models of compliance emerged. One of the first models designed to describe and predict patient behavior was termed the Health Beliefs Model (HBM). The HBM has been described as a "value-expectancy model" (Becker & Maiman, 1975; Willis & Campbell, 1992). The HBM contains three major elements: (1) individual perceptions (e.g., perceived susceptibility to disease, perceived severity of the disease); (2) modifying factors consisting of internal or external stimulus that triggers the appropriate health behaviors (e.g., demographic variables, social variables, psychological variables, media messages that influence perceived threat of the disease, cues of action); and (3) likelihood of action based on the person's evaluation of the recommended health behavior (e.g., perceived benefits, perceived barriers, likelihood of taking recommended preventative health action) (See Figure 1) (Becker & Maiman, 1975; Willis & Campbell, 1992). Technically, the perceptions of the person's susceptibility and seriousness of a disease influenced the perceived threat, which in turn influenced the likelihood of taking recommended preventative health action (perceived benefit) (Becker & Maiman, 1975). Simply, the HBM considered the social and psychological factors that affected compliance (Wilson, 1995).

Numerous studies evaluated a variety of preventive health behaviors and sick role behaviors that have substantially supported the HBM through empirical research (Ley, 1982; Willis & Campbell, 1992). Specifically, the "perceived barriers" element was the most consistent and favorable theoretical dimension supported for both the preventive

health behaviors and the sick role behavior studies (Becker & Maiman, 1975; Willis & Campbell, 1992; Wilson, 1995). That is, the greater the perceived barriers the less likely a person engaged in health care behavior. "Perceived susceptibility" contributed the most to preventive health behaviors. For example, perceived susceptibility to disease was positively correlated with the level of compliance with physician recommendations (e.g., obtain screenings for cancer and heart disease) and the engagement in preventive health actions (e.g., immunizations) reported (Becker & Maiman, 1975; Willis & Campbell, 1992). "Perceived benefits" contributed most to the sick role behavior. For example, positive correlations were found with the level of compliance and the belief that the screening was accurate and could lead to a better prognosis of cancer (Becker & Maiman, 1975). Although the HBM had been adopted to predict exercise behavior and received some empirical research in the area of preventive health behavior, athletic injury rehabilitation was related more to individuals who needed to return to their preinjury state as soon as possible.

Furthermore, a majority of the research used retrospective data, which limited the notion of accurately predicting exercise behavior (Ley, 1982). The model has been cited with three specific downfalls. First, the focus on avoiding illness does not address other issues that may have motivated one to exercise other than for health reasons (e.g., enjoyment). Second, the focus was on one specific reason that affected one behavior rather than multiple behaviors that occurred regularly over time. Third, the HBM best predicted whether a person would engage in detection-type health behavior (i.e., complete a medical screening) rather than ongoing health-promotion type behaviors. Because athletic injury rehabilitation often requires ongoing behavior (i.e., completing

home exercises or treatments such as icing) the ability of the HBM to predict athletic injury rehabilitation compliance may be limited (Willis & Campbell, 1992).

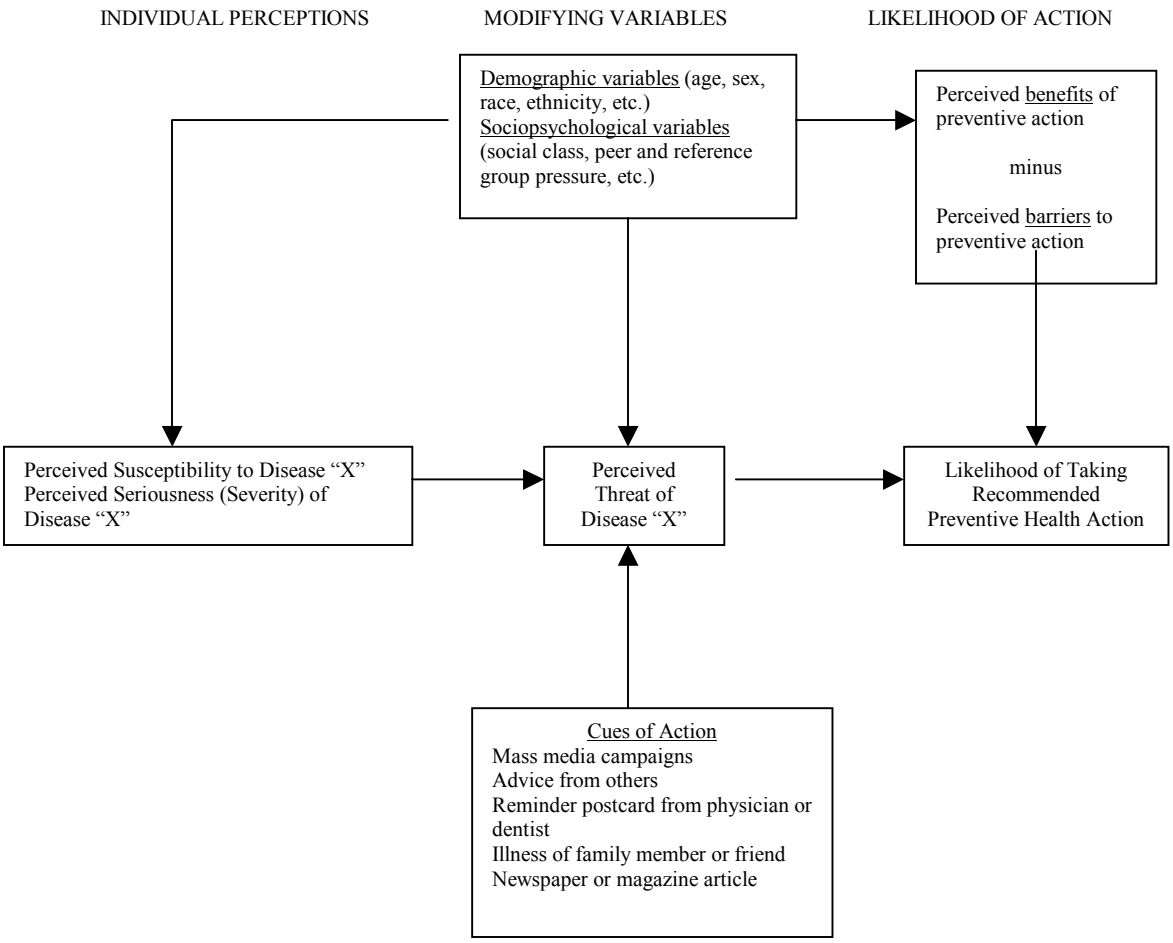

Figure 1. The "Health Belief Model" as a predictor of preventive health behavior (Becker & Maiman, 1975).

Derived from his Social Learning Theory, the Health Locus of Control (HLOC) model was first introduced by Rotter (Wilson, 1995). The HLOC referred to the concept that health is controlled by the patient, chance, or powerful others, which may influence compliance behaviors (Chen, Neufeld, Feely, & Skinner, 1999). An individual who believes the outcomes are based on the behaviors one has employed (e.g., taking an

active role in treatment) has an "internal locus of control." On the other hand, an individual who believes the outcomes are based on luck, chance, or powerful others (e.g., the physician didn't tell me when to start rehabilitation) has an "external locus of control" (Wilson, 1995). Typically, individuals had a combination of these beliefs; however, most individuals have fallen closer to one end of the scale. In a cross-sectional design study, individuals who had a stronger belief in the internal locus of control initially had fewer problems with treatment; however over time they became more frustrated and noncompliant when the individual could not control their disease (Wilson, 1995). This study showed some support for the HLOC relationship with compliance behaviors.

The Model of Human Occupation (MOHO) included similar HBM and the HLOC concepts, but was considered more comprehensive because it accounted for the interests of the individual, the patient's roles, and reported physical capacity housed within three specific subsystems (See Figure 2) (Chen et al., 1999). The patient's values and interests (volition subsystem) were believed to correspond to the perceived benefits in the HBM, and the personal causation element in the MOHO correlated to the HLOC. Additionally, the patient's roles (habituation subsystem) and the reported physical capacity (performance subsystem) were expected to influence the patient's behavior (Chen et al., 1999). Simply, volition, habituation, and performance were believed to determine occupational behavior (e.g., rehabilitation compliance). Empirical evidence has shown support for the volition subsystem, but not any support for the habituation or the performance subsystem, as a predictor of compliance in hand therapy (Chen et al., 1999). Thus, some support was found for the MOHO when Chen et al. (1999) specifically evaluated the predictive factors that influenced the compliance with home

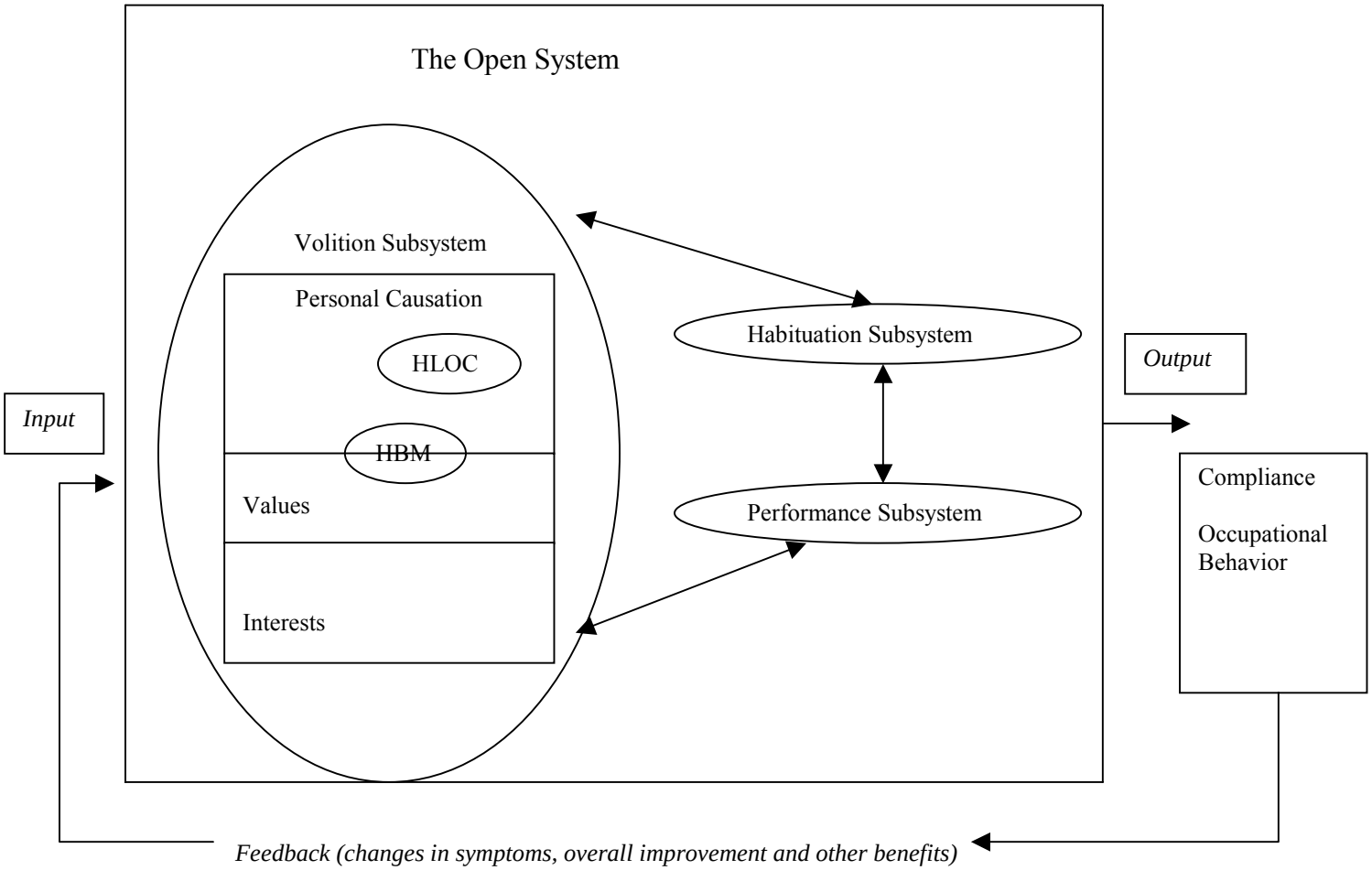

Figure 2. The Model of Human Occupation (Chen et al., 1999).

exercise programs. The subjects consisted of adults (N = 102) with upper extremity impairment who were recommended to complete a home exercise program at least 1 week prior to the investigation. The variables selected were specific to three models believed to be relevant to compliance, particular to occupational therapy: (1) the Model of Human Occupation (MOHO), (2) the Health Beliefs Model (HBM), and (3) Health Locus of Control (HLC). A 19-item health beliefs survey was used to measure the components of the HBM (e.g., perceived severity, benefits, barriers and self-efficacy). The HLC was measured on the 18-item Multidimensional Health Locus of Control Scale developed by Wallston (Chen et al., 1999). An interest in activities and perceived

physical capacity was measured with the Modified Activity Profile questionnaire. Compliance was measured according to a self-report of home exercises completed daily. A comparison was made with the therapist's recommendations recorded on the patient's chart. A percentage was calculated for the number of exercises completed and the number of exercises recommended by the therapist. Individuals were categorized into low (0-33%), moderate (34-66%) or high (67-100%) compliance groups. The patient was asked to rate how satisfied they were with the therapist's treatment on a 6-point Likert scale (1 = very dissatisfied, 5 = very satisfied). Using a Spearman rank order correlation, perceived self-efficacy was significantly correlated with compliance ($r = .30$, $p < .05$). Furthermore, a stepwise regression analysis indicated that both perceived self-efficacy and internal Health Locus of Control significantly contributed to compliance behaviors ($p < .01$). Additionally, patients with higher perceived self-efficacy about their home exercise also reported lower perceived barriers and higher perceived benefits associated with treatments. Investigations of the MOHO are rather new and complex (Chen et al., 1999). Limited support has been found for the MOHO, and what support has been found encompasses the characteristics of the HLOC and the HBM models. Although promising, further study and empirical support is necessary before it can be adopted as the leading model of compliance.

Specific to injured athletes, three models have evolved: (1) the Personal Investment Theory (PIT) (Brewer, 1998; Duda, Smarth, & Tappe, 1989), (2) the Protection Motivation Theory (PMT) (Brewer, 1998), and (3) the Cognitive Appraisal Model (CAM) (Lazarus & Folkman, 1984). The motivationally-based Personal Investment Theory (PIT) suggested that psychosocial variables that affect the athlete's

motivation would influence adherence behaviors (Brewer, 1998; Duda et al., 1989). Specifically, personal incentives (e.g., task involvement, ego involvement, social incentives, extrinsic rewards), sense of self-beliefs (e.g., perception of competence, self-identity, self-reliance), and perceived options (e.g., perception of behavioral alternatives) are the major motivational concepts that are believed to influence adherence (Duda et al., 1989). Support for all of the components have been found. Specifically, four variables that indicated the best prediction of rehabilitation adherence included the efficacy of the treatment (perceived option), social support for rehabilitation (sense of self), self-motivation (sense of self), and task involvement in sport (personal incentives) (Duda et al., 1989).

The Protection Motivation Theory (PMT) implied that adherence is influenced by the severity and susceptibility of the health threat, the ability to avoid the threat, and the belief of one's ability to complete the health behavior (Brewer, 1998; Taylor & May, 1996). Supporting the PMT, Taylor and May (1996) found that athletes in the United Kingdom who have greater perceived threats of injury severity and susceptibility of retarded rehabilitation at the initial appointment were more likely to be non-compliant at follow-up; whereas, those who had stronger beliefs in the treatment efficacy, a higher value attached to rehabilitation, and a greater perception to complete the rehabilitation exercises were more compliant.

Of the models specific to athletic injury, the Cognitive Appraisal Model (CAM) and its variations had the most empirical support for all of the elements in the model (Daly et al., 1995; Udry, 1997; Wiese-Bjornstal, Smith, Shaffer, & Morrey, 1998). The CAM and its variations were developed to account for individual differences. In general,

the CAM suggested that injured athletes have personal and situational factors that influence their cognitive appraisals (e.g., primary, secondary) of injury, which in turn affect their emotional (mood states) and behavioral (adherence to rehabilitation programs) responses (Brewer, 1994; Brewer, 1998; Wiese-Bjornstal et al., 1998). Specifically, personal (i.e., injury severity, personality, pain) and situational (i.e., level of sport, environment) factors will affect the perception of the injury as a threat (primary cognitive appraisal) and the coping resources to deal with the threat (secondary cognitive appraisals), which in turn affects the behavioral (adherence to rehabilitation) and emotional (tension, anger, depression) responses. Working together, the cognitive appraisals, emotional, and behavioral responses will influence the recovery outcome (Wiese-Bjornstal et al., 1998; Wiese-Bjornstal, Smith, & LaMott, 1995). Figure 3 is a depiction of a variation of the CAM, known as the model of psychological response to sport injury.

One particular study evaluated the feasibility of cognitive appraisal models in the context of rehabilitation of sport injuries (Daly et al., 1995). Male and female recreational and competitive athletes that had to undergo either an arthroscopic or open knee surgery qualified for the study. Additionally, the athletes had to have already completed one week of therapy and have at least one week of rehabilitation appointments remaining. When the subjects came to their scheduled appointment they were asked to complete a brief questionnaire to measure mood disturbance (Profile of Mood States) and the secondary cognitive appraisal construct. After one week of rehabilitation, the physical therapist completed the Sports Injury Rehabilitation Adherence Scale (SIRAS) questionnaire to measure patient adherence and compliance. Specifically, an inverse

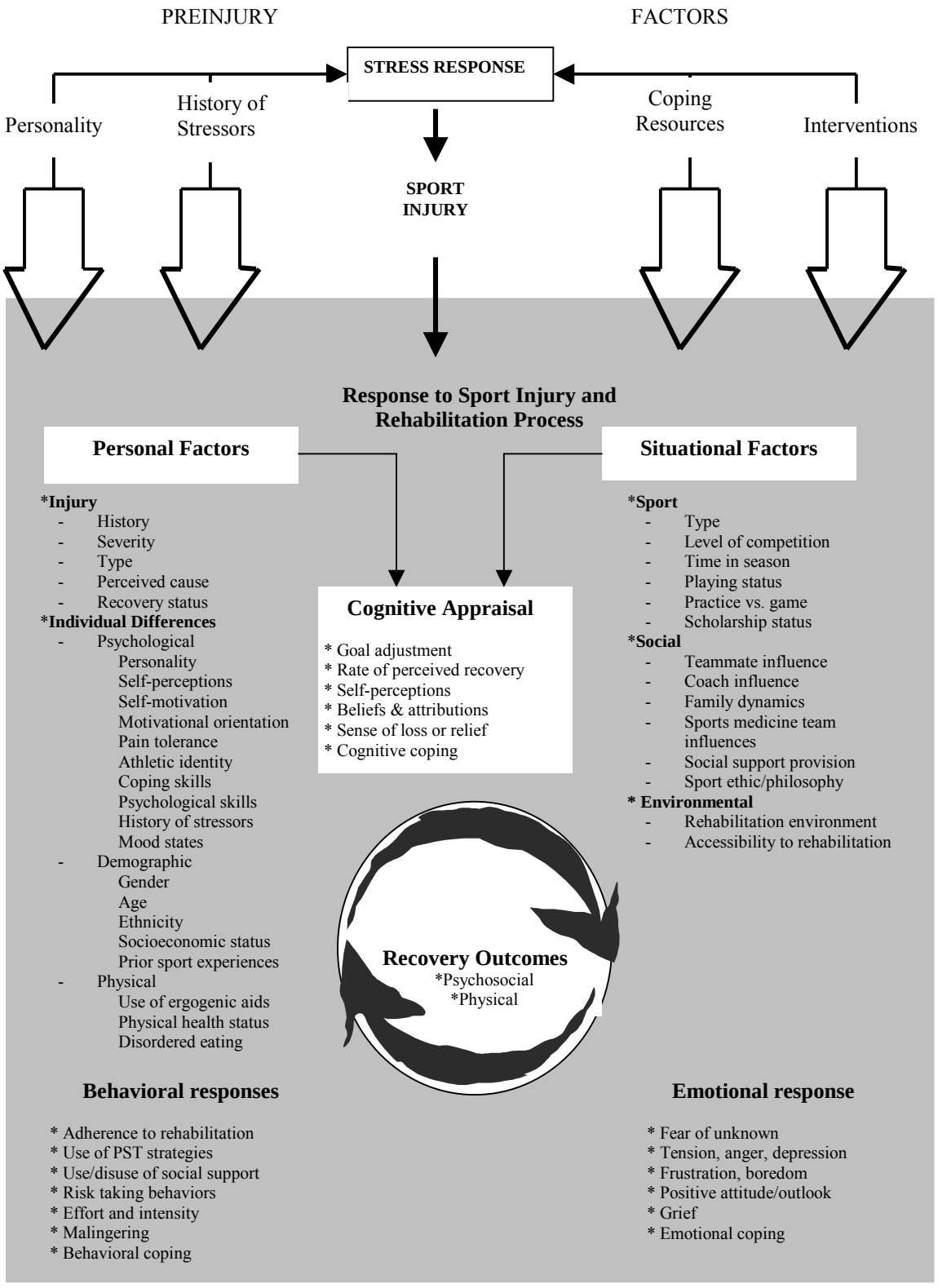

Figure 3. Adapted model of psychological response to sport injury (Wiese-Bjornstal et al., 1998).

correlation occurred between mood disturbance and the adherence at the rehabilitation sessions. Also, an inverse correlation occurred between secondary cognitive appraisals and adherence at the rehabilitation sessions (Daly et al., 1995). Findings suggested that a negative relationship exists between adherence and cognitive appraisals and emotional responses (mood disturbances). Therefore, if one has a large degree of perceived threat, limited coping strategies to deal with the threat and elevated levels of mood disturbance, then that individual is less likely to adhere. The results of the Daly et al. (1995) study appeared to support the cognitive appraisals, in addition to the emotional, and behavioral responses.

Also using a homogenous injury group (ACL knee surgery), Udry (1997) evaluated the influence of social support and coping strategies used among injured athletes during rehabilitation following knee surgery. To qualify for the study, male (n = 15) and female (n = 10) subjects had to agree that the primary reason for the surgery was to return to sport or physical activity, and the subjects had to be old enough to drive to rehabilitation sessions. The subjects completed the following questionnaires at 3, 6, 9, and 12 weeks post surgery: (1) Coping with Health and Injury Problems (CHIP); (2) the shortened Profile of Mood States (POMS); and (3) the Social Support Inventory (SSI). Adherence scores were obtained throughout a 12-week rehabilitation period from the participating sports medicine clinic. Multiple regression analyses revealed that instrumental coping (e.g., gather information about the injury) 9 weeks post surgery was a positive predictor of adherence 12 weeks post surgery (Udry, 1997). As previously mentioned, the CAM suggested that primary (i.e., how threatening the injury is perceived) and secondary (i.e., the coping recourses available to handle the threat)

cognitive appraisals may influence the individual's emotion (mood) and behavioral (adherence to rehabilitation programs) responses (Wiese-Bjornstal et al., 1998). Although, Udry (1997) measured coping strategies, mood disturbance, and social support, she was only able to confirm that coping resources (secondary cognitive appraisals) are prospectively related to rehabilitation adherence as proposed in the cognitive appraisal model.

Measurement Scales of Patient Satisfaction

There are a number of scales used to measure patient satisfaction with treatment programs, recovery, medical professionals, or facilities (Hulka et al., 1975; Mangelsdorff, 1979; Taylor & May, 1995; Ware & Snyder, 1975; Wolf et al., 1978). Construction of the first valid and reliable patient satisfaction questionnaires in the medical population can be attributed to Ware and Snyder (1975) and Hulka et al. (1975). Hulka et al. (1975) attempted to develop an instrument to measure the patient's attitude toward physicians and medical services. The instrument was designed to measure three distinct components of care: (1) the professional and technical competence of the physician, (2) personal qualities of the physician, and (3) accessibility and convenience of care, including cost. Acceptable split-half correlations were reported for professional and technical competence (0.75), and for personal qualities (0.86), but the internal consistency was low for the accessibility and convenience of care (0.68) scales. Hulka et al. (1975) reported adequate reliability measures using a pretest sample, however, the specific development and analysis of results were not indicated. The final instrument included 42 items with 14 items in each content area.

Taking into consideration previous methods used to develop a valid and reliable questionnaire, Ware and Snyder (1975) used factor analysis to develop a standardized patient satisfaction rating instrument. During the early construction of the various attitudinal indices, a Factored Homogeneous Item Dimension (FHID) was used to include *a priori* logical criteria and an empirical test. The FHID is a method used with personality research to analyze a group of scale items having common content that was developed from logic and statistical criteria. Items are validated through this process and can be used as a single score when used in subsequent statistical analyses. The FHID process is especially helpful when using multivariate analyses because it allows the single score to be used without losing explained variance (Ware & Snyder, 1975).

After careful review of previous satisfaction questionnaires, Ware and Snyder (1975) devised a standardized rating instrument to measure patient satisfaction across 22 dimensions. Each item was measured on a 5-point Likert type scale ("strongly agree" to "strongly disagree"). In their reliability and validity study, Ware and Snyder (1995) asked adults ($\underline{N}$ = 433) to complete the self-administered questionnaire during a 1-hour health-related interview. The average time to complete the questionnaire was 15 minutes. The sample was comprised of predominantly white (88%) men ($\underline{n}$ = 105) and women ($\underline{n}$ = 328), between 16-83 years of age living in the Midwest. The sample was a representative of the area surveyed; yet it was different from the national norm. Through FHID validation, 56 of the 70 items were retained for further study. For example, item groupings relative to the availability of resources (3), continuity of care (3), financial aspects of medical care (2), and comprehensiveness of care (2) met the FHID validation criteria. Two additional item groupings that were retained for higher-order factor

analysis included the humaness and quality of care. Ultimately, four factors were extracted and accounted for nearly 75% of the variance. The factors were physician conduct, physician availability, continuity/convenience of care, and access mechanisms (e.g., cost, insurance, payment, and access to the emergency room). It is important to note that some overlap between the factors existed (Ware & Snyder, 1975).

The Patient Satisfaction Questionnaire (PSQ) was constructed by factor analysis statistics from the responses of military personnel (Mangelsdorff, 1979). First, nineteen items were developed by a group of physicians, hospital administrators, nurses and behavioral scientists. The preliminary 19-item questionnaire was then administered to military sponsors and spouses (N = 3287) who attended a general medical clinic for an outpatient visit. Using this sample, a principal components factor analysis revealed 3 factors: (1) interest and courtesy, (2) convenience and physical facilities, and (3) auxiliary services, and waiting time.

A second questionnaire with 16 items was administered to 3272 military sponsors and spouses who attended a general medical clinic for an outpatient visit. Differentiation between the 16 and 19-item questionnaire was not described in the article. A principal components factor analysis was calculated for the 16 items and resulted in 3 factors with Eigen values greater than 1: (1) interest, courtesy, quality, and continuity, (2) nurse interactions, auxiliary services, adequacy and convenience, and (3) nurse services (Mangelsdorff, 1979). A final version of the questionnaire (19-item) was administered to 1610 military sponsors to assess attitudes toward: physicians, nurses, medical auxiliaries, professional interest, courtesy, quality of care, adequacy of information, and convenience of the clinic. The subjects answered all demographic questions prior to the visit with the

physician and the PSQ was administered directly following the physician visit. Each item was rated on a 5-point Likert scale. Factor analysis of the responses for the 1610 subjects identified three components with Eigen values greater than 1.0 and accounted for 67.7% of the total variance: (1) physician interactions, (2) non-physician interactions, and (3) auxiliary services. After varimax rotation the three variables accounted for 86.0, 7.7, and 6.3% of the variance, respectively. Internal consistency correlation coefficients were 0.94, 0.93, 0.87 for each component, respectively, and 0.972 for the overall scale. Validity was assessed using correlations with specific criterion items and ranged from 0.592 to 0.876 (Mangelsdorff, 1979). Like earlier versions of patient satisfaction, the PSQ considered services outside of the physician-patient interaction. Additionally, the samples were comprised of a specific group (military personnel) that may not be representative of the general population.

Using information from Hulka et al. (1975) and Ware and Snyder (1975), Wolf et al. (1978) developed the Medical Interview Satisfaction Scale (MISS). Unlike other satisfaction measurements, the MISS is a specific questionnaire for patients to evaluate an individual interview with the physician with whom they had an encounter. After careful review of the literature Wolfe and colleagues (1978) concluded that patients expect a positive interaction with the physician (e.g., comfort, providing information, and appears competent). If this expectation was not met, then the patient was less satisfied and was less likely to comply (Wolf et al., 1978). Therefore, Wolf et al. (1978) felt it important to devise a reliable and valid instrument to specifically measure the physician-patient interaction. Wolf et al. (1978) based their item development on previous studies, interviews with patients, and observation of consultations (Hulka et al., 1975; Ware &

Snyder, 1975). Sixty-three items were generated and categorized into three specific constructs: (1) cognitive (information and explanations given by the physician and the understanding of the patient's illness), (2) affective (patient's perceptions of the treatment relationship), and (3) behavioral (the professional behaviors, examination, competency and treatment the physicians use). For example, "after talking with the doctor, I know just how serious my illness is" is a cognitive item. "I really felt understood by my doctor" is an example of an affective item, and "the doctor was too rough when he examined me" is an example of a behavioral item (Wolf et al., 1978).

First, 50 patients in a screening clinic were asked to provide critical feedback on the appropriateness and clarity of the items. This procedure was used to validate the content of the questionnaire. Next, 135 patients receiving care in the screening clinic or health center completed the questionnaire. To discriminate between high and low scored items, a contrasting group method was performed for each construct and the total scale. Pearson product moment correlation calculations for each item and the total scale were used to calculate a correlation coefficient of each item and an average score of the remaining items in its domain and total scale (item-remainder correlations) to establish reliability (Wolf et al., 1978). For the final construction, 50 patients in the screening clinic who had first time visits were surveyed. Item-remainder correlations were calculated and 26-items were grouped into a cognitive subscale with 9 items, an affective subscale with 9 items, and a behavioral subscale with 8 items. Cronbach's alpha was calculated to be 0.87 for the cognitive subscale, 0.86 for the affective subscale, and 0.87 for the behavior subscale, and 0.93 for the total scale. Interscale correlations ranged from 0.62 to 0.76. Statistical analysis revealed that occupation (coded by the Hollingshead

Index) was the only sociodemographic variable significantly negatively correlated with satisfaction ($r = -0.33$, $p < 0.05$), specifically, affective satisfaction. However, data were only available for a small group ($n = 35$) of subjects (Wolf et al., 1978). It is unclear from the article how to interpret the negative correlation.

Differences between these scales are indicated by the specific sample under investigation. For example, Hulka et al. (1975), Mangelsdorff (1979) and Ware and Snyder (1975) used constructs to evaluate related areas (accessibility, cost continuity of care, auxiliary staff). In contrast, Wolf et al. (1978) devised a questionnaire exclusively for patients to evaluate their satisfaction with the physician during their visit, which were based on the [(Hulka et al., 1975; Ware & Snyder, 1975) findings.

Correlations of Patient Satisfaction

A number of variables believed to be associated with patient satisfaction have been measured in the medical population. The most common characteristics found to correlate with greater satisfaction ratings have included sociodemographic variables such as age, gender, race, and education (Chung et al., 1999; Cooper-Patrick et al., 1999; Hall & Dornan, 1990; Hall et al., 1998; Hall, Roter, Milburn, & Daltroy, 1996; Like & Zyzanski, 1987). Other variables correlated with patient satisfaction include retention of medical information by the patient, communication, empathy, personable behavior of the physician, and the inability of the patients' expectations being carried out (Ley, 1982).

Sociodemographic Variables

Cooper-Patrick et al. (1999) used a telephone survey to ask adult patients to complete a brief questionnaire. A self-defined race/ethnicity question, a 3-item physician participatory decision-making (PDM) style (the physician-patient interaction), and 6

patient factors (age, gender, self-rated perceived health, education, marital status, and length of patient-physician relationship) were the questions asked on the survey. Patient satisfaction was measured with **four** items. Patients (N =1816) had to be 18 years or older, insured by the managed care organization, and had to have visited their primary care physician within the pervious 2 weeks for depression. Patients evaluated male (n = 40) and female (n = 24) physicians of Anglo, African American, Asian, and Latino decent. Results from this collection indicated that individuals who were between the ages of 50-65, attended graduate school, had excellent self-report health status, knew the physician for more than 3 years, and were white were more favorable of the PDM style. Furthermore, patient satisfaction was highly associated with PDM style scores within all race/ethnicity groups. Although, race and gender concordance between the patient and the physician were significant and positively associated with patient satisfaction, the gender of the patient was not related to patient satisfaction. Asian and Latino, but not African American, patients were significantly less satisfied than whites with the physician's PDM style (Cooper-Patrick et al., 1999).

Based on the fulfillment model, Like and Zyzanski (1987) evaluated the social psychological factors believed to be associated with patient satisfaction with the clinical encounter. Adult patients (N = 144) completed two questionnaires (The Patients' Perceptive Interview (PPI) and the Patient Request For Services Schedule (PRFSS)) prior to a visit with a physician and one (Patient Services received Schedule (PSRS)) directly after the visit with the physician. The physician completed the Physician's Clinical Perspective Questionnaire (PCPQ) directly after the visit. The PPI is a 23-item survey that inquires about the patient's reason for the visit, expectations about the visit and

various sociodemographic variables. The PRFSS is a 27-item survey, which asked what services were needed from the physician, and the importance of each service needed. The PCPQ is a 23-item survey which included demographic information about the physician, the patient's chief complaints, methods used to treat the patient, the feelings toward the patient, and the physician's satisfaction with the encounter. After the visit with the physician, patients were asked to rank the degree of satisfaction received with the encounter by placing an "X" on a calibrated satisfaction line which ranged from 0-100% for 5 questions. No psychometric data is available for any of these instruments, and the authors simply report that they were newly constructed. Through statistical analysis (the specific method is not reported) items from 5 primary areas (patient sociodemographic, patient illness behavior, patient encounter, physician encounter, and health care system characteristics) were selected. In general, patients were highly satisfied with their visit to the physician's office. Statistical associations were measured by Pearson and point biserial correlations between various independent variables and patient satisfaction scores with the encounter. Patient satisfaction scores were significantly correlated with the physician's satisfaction with the encounter ($\underline{r} = 0.29$, $\underline{p} \leq .001$), physician's feelings about the patient ($\underline{r} = 0.27$, $\underline{p} \leq .001$), knowledge about the presenting problem derived from the media (information reviewed by the patient about their illness provided by the media) ($\underline{r} = 0.19$, $\underline{p} \leq .05$), and the number of days since first visit ($\underline{r} = 0.18$, $\underline{p} \leq .05$). Women were more satisfied than men ($\underline{p} \leq .05$). Patient satisfaction was inversely correlated with the amount of time desired with the physician ($\underline{r} = -0.19$, $\underline{p} \leq .05$) and with the number of patient requests ($\underline{r} = -0.18$, $\underline{p} \leq .05$). Six independent variables (gender, number of days between first and present visit and

existing patient knowledge about the presenting problem derived from the media, physician's feelings toward the patient, and desires met or not met) were entered into a hierarchical regression analysis. The results indicated that all 6 variables combined, accounted for 34% of the variance (Like & Zyzanski, 1987). Thus, there appears to be multiple predictors of patient satisfaction.

After construction of a patient satisfaction instrument, Hulka et al. (1975) completed a retrospective study that surveyed 1713 adults living in a Midwestern city. Demographic data included the following: (1) 21% were 60 years of age or older, (2) 90% were white, and (3) 62% were females which was relatively similar to the representation of the community. The instrument included 42 items with 14 items in each of the content areas (e.g., the professional and technical competence of the physician, personal qualities of the physician, and accessibility and convenience of care including cost). Scores obtained from the questionnaire revealed that ratings tended to be lower for cost and convenience of care, whereas professional competence and personal qualities were more highly rated. Using a distribution of satisfaction scores, individual scores that fell above the 75th percentile were considered as high satisfaction scores. Cross tabulations against satisfactions scores grouped in quartiles were used for the remaining analyses. Across all components of satisfaction, women (19.6-30%) were more satisfied than males (12.5-22.8%) and African American (12.5-19.6%) were less satisfied than Caucasians. Those who were 60 years of age or more had the highest percent (31.2) of high satisfaction scores for the personal qualities component only. Individuals who were from the upper middle class, based on occupation and education, were more satisfied than either the low social class or the high social class across all three

components of patient satisfaction. Other results indicated that individuals who are members of a large family (21.1%), live alone (20.7%), and do not have a regular physician (6.2%) tended to be least satisfied with their health care (Hulka et al., 1975).

A meta-analysis of 110 studies evaluated the sociodemographic variables associated with patient satisfaction with medical care (Hall & Dornan, 1990). The variables included in the analysis had to appear in at least 10 studies and included the following sociodemographic variables: (1) patient's age, (2) ethnicity, (3) sex, (4) social status, (5) income, (6) education, (7) marital status, and (8) family size. Patient satisfaction on 11 aspects of medical care and global satisfaction were used as a measure. Correlational analyses indicated that age ($\underline{p} < .01$) and education ($\underline{p} < .05$) were significantly related to greater satisfaction. Further analyses consisting of *a priori* weights to reveal a prediction of the grouping variable (age, ethnicity, and percentage of male patients in the sample) to the actual correlations obtained. Results across the eight sociodemographic variables indicated the following for the adult sample: (1) older and less educated patients tended to be more satisfied, (2) higher class patients tended to be more satisfied for white than black/Hispanic samples, (3) black/Hispanic men tended to be more satisfied than whites, (4) less educated patients tended to be more satisfied among the white than black/Hispanic samples, (5) patients with small family size tended to be more satisfied, and (6) whites tended to be more satisfied. Finally, results across the eight sociodemographic variables for the pediatric sample indicated higher income patients tended to be more satisfied (Hall & Dornan, 1990). In summary, data analyses revealed no gender differences, but the patient's age and education did have a significant bearing on the patient satisfaction relation. In general, people who were older, less

educated, had higher social status (occupational status), and were married tended to be more satisfied with their medical care (Hall & Dornan, 1990).

In an outpatient plastic surgery clinic, patients (N = 345) were asked to complete a 9-item Visit Specific Patient Satisfaction Questionnaire (VSQ) at the end of their physician visit (Chung et al., 1999). The instrument was used to evaluate the encounters between physician and the patient. It is noteworthy that three of the nine items were specific to the physician. The other 6 items were related to the facility. In a univariate analysis, age was positively associated with overall satisfaction. After adjusting for age and type of clinic, a multiple linear regression analysis found that the following four questions contributed most to patient satisfaction: (1) personal manner of the physician, (2) time spent with the physician, (3) length of time to get an appointment, and (4) explanation of what was done. Specifically, the quality of the patient-physician interaction and efficient clinic processes were the most significant predictor of patient satisfaction. Finally, age, gender, education, ethnic background, or type of clinic were not found to be significantly associated with overall patient satisfaction (Chung et al., 1999). Although some literature found significant patient satisfaction relationships with gender and age, Chung et al., (1999) was not able to support these findings.

Physician's Behaviors and Patient Health Status

Other variables that have shown to be correlated with patient satisfaction were characteristic of the physician's interaction with patients and the patient's health status (Comstock et al., 1982; Hall et al., 1996; Hsieh & Kagle, 1991; Willson & McNamara, 1982; Yarnold, Michelson, Thompson, & Adams, 1998).

In Mexico, Comstock et al. (1982) evaluated the caring skills of physicians (N = 15) and correlated them with patient satisfaction scores of 150 patients. Patient satisfaction was measured using an 8-item questionnaire. A technician trained to observe physician behaviors through a one-way mirror, evaluated physicians' verbal and nonverbal behavior. Verbal skills such as courtesy ($r = 0.36$, $p \leq .001$), information giving ($r = 0.34$, $p \leq .001$), listening($r = 0.27$, $p \leq .001$), and empathy($r = 0.19$, $p \leq .05$) were significantly correlated with patient satisfaction scores; whereas, non-verbal skills (eye contact, bodily positioning, physical appearance) were not significantly correlated with patient satisfaction. However, age of the patient was positively associated with global satisfaction ratings. Patient satisfaction ratings were unrelated to gender, and gender was unrelated to physician behaviors (Comstock et al., 1982).

In an experimental design, Willson and McNamara (1982) surveyed undergraduate psychology students (N = 127) and randomly assigned them to 12 experimental sessions. The focus of the study was to have the subjects differentiate between the levels of courtesy, but not confidence. The study was designed to determine whether the subjects would base their satisfaction ratings on the courtesy, rather than competence, of the physician, and if physician competency or courtesy would then influence subjects' compliance behavior. More women than men participated in the study, but no other demographic data were collected. Subjects completed an 18-item courtesy/competent identification scale, the 26-item Medical Interview Satisfaction Scale (MISS), and three general questions related to health care advice (overall satisfaction of the medical visit, intention to comply with the medical recommendations, and would the subject follow the doctor's orders) measured on a 5-point Likert scale. The surveys were

completed after viewing one of four video vignettes over three consecutive occasions. The video vignette contained actors that represented a male college-age patient presenting typical sore throat symptoms, a male middle-aged physician, and a female nurse.

Pilot testing of the video vignette showed 80% accuracy discrimination between courtesy and competence. The video vignette was randomized for each experimental group. Univariate ANOVAs indicated that students were accurate with ratings of the specific categories. The primary results indicated that courtesy had a significant effect on patient satisfaction (MISS), but no effect on compliance. However, manipulated competency produced significant effects on patient satisfaction (MISS) and on compliance items. Finally, the MISS was significantly correlated with the global satisfaction item ($\underline{r} = 0.77$, $\underline{p} < 0.0001$). Intercorrelations were reported between: (1) perceived courtesy and competence (0.48), (2) satisfaction and perceived courtesy (0.86), (3) satisfaction and perceived competence (0.60), and (4) satisfaction and perceived compliance (0.47) (Willson & McNamara, 1982).

The results clearly showed that there was a relationship between the physician's behaviors and patient satisfaction ratings. However the sample did not reflect a personal physician-patient relationship as the subjects were not being examined (hypothetically answered the compliance and satisfaction questions), nor were the medical personnel real (actors). Further, the article did not indicate whether the subjects were aware that the medical personnel and patient were actors.

In a retrospective study, medical personnel (physicians and nurses) competency was measured in the emergency room department. Competency of the medical

personnel was considered an adequate measure of patient satisfaction. Two emergency room (ER) departments in an academic hospital, and in a community hospital located in the Midwest of the United States of America were used as sample sites (Yarnold et al., 1998).

Patients (N = 1101), who had utilized the ER department at the academic hospital but had not been admitted, were mailed a two-page survey one week after their ER visit. The survey was a 16-item questionnaire that asked for the patient to rate the nurses (six items), doctors (seven items) and general areas (three items) using a 5-point Likert scale. Patients (N = 1631) who utilized the community hospital were asked to complete a telephone interview if they had been to the ER during the previous 2-4 weeks. The interview consisted of nine items with equal distribution throughout the nurse, physician, and general area ratings. Patients were asked to rate each question on a 4-point Likert-type scale. Adult patients were interviewed directly, the adult accompanying the pediatric patient was interviewed, and the caregiver who accompanied the patient was interviewed (Yarnold et al., 1998).

Data from each hospital was separated and a classification tree analysis (CTA) was employed to predict overall patient (dis) satisfaction. This method of statistical analysis was used to show a 'flowchart' of results based on specific decisions. The results showed a non-linear tree model for both hospitals that suggested overall patient (dis) satisfaction with care received in the ER was greatly predictable on the basis of patient-rated qualities of the staff, particularly of the nurses and physicians (Yarnold et al., 1998). Specifically, fair or worse ratings of the staff treating the patient as a person, very poor ratings of waiting time in the treatment area, and good or worse ratings of the

physician's concern for the patient's comfort during treatment were indicative of (dis) satisfied ratings. These results supported other findings indicating that a physician's, as well as a nurse's, behavior can impact the satisfaction rating of a service provided.

In a longitudinal study, Hall et al. (1993) examined causal paths that have not previously been investigated to understand how patient health status and patient satisfaction are related. Two specific causal paths of the health-satisfaction relationship that were of interest included: (1) whether the patient's perceived health at time one affects the patient's satisfaction at time two, or (2) whether the patient's satisfaction at time one determines the status of the health of the patient at time two (Hall et al., 1993). HMO-based elderly patients (N = 560) qualified for the study if they were: (1) over 74 years of age, or (2) between 70 and 74 years of age and had been identified by the physician as being "very likely" or " probably likely" to deteriorate or having "fair" or "worse" current overall health. Interviews were taken at baseline and 12 months later. One third of the subjects were assigned to one of the experimental groups to receive one of the following interventions: (1) consultation from a geriatrician specifically trained nurse and social worker, (2) special consultation from "second opinion" internist, or (3) received standard HMO services (control). The Sickness Impact Profile was used to measure functional ability. Four parts of the 51-item multidimensional instrument were used, and the four scales were highly correlated. The internal consistency for each scale exceeded 0.80. Self-perceived health was measured using six items from a previous self-perceived health survey developed for the Rand Health Insurance Study. Internal consistency was reported as 0.86 for these items. Satisfaction with providers was measured using 12 items, which were pilot-tested on 50 patients. Items were adapted

from other scales found in the literature. The internal consistency was calculated at 0.89. The total satisfaction score was used as the dependent measure. Multiple regression analysis was used to establish a model to identify any path that was significantly associated with satisfaction over time. Both functional ability and self-perceived health were associated significantly over time with satisfaction. Correlations between the health status and satisfaction at both time points and over time were significant ($\underline{r} \leq .25$, $\underline{p} \leq .01$). Specifically, the perception of one's health at time one was related to satisfaction at time one ($\underline{r} = 0.24$, $\underline{p} < .01$) and time two ($\underline{r} = 0.10$, $\underline{p} < .05$), and the functional ability at time one was related to satisfaction at time one ($\underline{r} = 0.11$, $\underline{p} < .05$) and time two ($\underline{r} = 0.08$, $\underline{p} < .05$). Tests for causal models showed a significant path over time from overall perceived good health status at time one to positive patient satisfaction at time two. However, there was not a significant path from patient satisfaction at time one to overall perceived health status at time two. What was not clear was whether there was a mediating affect through the physician's behavior (Hall et al., 1993).

After reviewing several studies that tried to identify a link between patient satisfaction and health care, Hsieh and Kagle (1991) summarized the findings and posited that a patient's expectations and the fulfillment of their positive expectations would be more favorable to patient satisfaction. Hsieh and Kagle (1991) then employed a cross-sectional design study to explore the relationships between patient's expectations, personal characteristics, health status, service delivery type, and patient satisfaction with health care.

Approximately 10% of the faculty and staff employed at a large Midwestern university were randomly selected to participate in the study. Subjects who lived within

a 50-mile radius and who had not retired qualified for the study. The sample was equally represented by gender, but ethnic minorities were underrepresented. A large majority of the subjects (94.3%) were full-time employees of the university. One third of the subjects were between 26-36 years of age (30.8%), and the majority were nonacademic staff (54.8%). A 63.5% return rate from 2 independent mailings was obtained ($\underline{N}$ = 401).

Patient satisfaction was measured using a six-dimensional satisfaction scale that was rephrased from the Patient Satisfaction Scale. Internal consistency for the amended scale was very good ($\underline{r}$ = 0.91). Patient expectation was measured with a similar six-dimensional anticipation scale that was also rephrased from the Patient Satisfaction Scale. Internal consistency was also very good ($\underline{r}$ = 0.87). Using factor analysis with an orthogonal rotation, four factors for each scale (satisfaction and anticipation) emerged and accounted for 61 % and 51.7% of the variance, respectively.

Results indicated that women were more satisfied than men, and nonwhite subjects tended to be more dissatisfied with the health resources available than white subjects. Age showed a significant curvilinear association with satisfaction. Specifically, extreme age groups were more satisfied with the physician's conduct and general satisfaction than middle age groups. Subjects who were considered to be in relatively poor health were less satisfied with accessibility and reported lower scores in general satisfaction than did other respondents. Further, subjects who were enrolled in the fee for service (FFS) plan reported higher levels of satisfaction with the physician's conduct than those who were enrolled in the prepaid group practice (PPG) plan. In summary, white women who were either very old or very young, and were considered to be in good

health appeared to be generally more satisfied (Hsieh & Kagle, 1991). These results were similar to the findings of Hall and Dornan (1990) and Hulka et al. (1975).

Previous studies (Hall et al., 1993; Hall, Roter, & Katz, 1988) have supported the importance of the physician-patient relationship and its influence on patient satisfaction among elderly Americans. However, whether the patient's health status has an effect on the physician's behavior has not been clearly supported. Therefore, Hall et al. (1996) conducted 4 independent studies to investigate the physician-patient relationship, specifically physician behavior, while delivering medical care to patients receiving physical and mental health care.

Study one consisted of predominantly white men and women (N = 100) waiting for an appointment. The average age of the patient was 62 years and they reported receiving treatment for a number of medical conditions. Internists (N = 50) represented the medical staff being evaluated. Study two consisted of predominantly white, female (58%) patients (N = 547) waiting for an appointment. The average age of the patient was 60 years and the medical condition was heterogeneous. Physicians (N = 127) represented the medical staff being evaluated. Study three consisted of predominantly white, female (76%) patients (N = 132) who had first visits to 22 rheumatologists for the symptoms of arthritis. Study four consisted of predominantly white, female (65%) patients (N = 649) waiting for an appointment. The average age of the patient was 48 years and the medical condition was not homogenous. All visits with the medical staff were audio taped. Each study was conducted in varying parts of the Eastern United States of America and in Canada.

Following each visit the patients were asked to complete mental health ratings and physical health ratings. In studies two, three and four physicians rated the physical health of the patients and in studies two and four physicians also rated the patient's mental health. Physicians rated their own satisfaction with the visit in studies two and four.

Communication of both the physician and the patient was measured using the Roter Interaction Analysis System (RIAS) to obtain a verbal measures score. The RIAS is an instrument used to categorize verbal utterances into content (e.g., laugh, social conversation, statements of empathy or concern). The RIAS coding categories were clustered into nine categories.

After controlling for the physician and patient background characteristics of all subjects in the four studies combined, significant correlations were reported. However, it is worth mentioning that the correlations were very low (0.02-0.18). In comparison to more healthy patients, less healthy patients (physical and mental) had more negative behaviors (negative statements), and physicians tended to have mixed interactions with the less healthy patients. For example, a positive association between positive statements made by the physician and sicker patients occurred, while, the physician's social conversation decreased with the sicker patients. Also, physicians disagreed more and used a more negative tone with less healthy individuals. Furthermore, physicians were less satisfied with the visits by less healthy individuals (Hall et al., 1996). Consequently, health status influenced physician-patient communication. The results of these combined studies suggested that a patient's health status could influence patient satisfaction, especially if a patient's health status influenced physician-patient communication, which in turn influenced patient satisfaction.

Later, Hall et al. (1998) investigated a direct model and a mediation model to explain patient satisfaction. Hall et al. (1998) used social conversation as a mediator of patient satisfaction in two independent studies. Simply stated, Hall et al. (1998) investigated whether a physician's communication (verbal and non-verbal cues) will influence the relationship between patient health status and patient satisfaction scores. If there was a significant influence, then a mediation affect has occurred. On the other hand, if there was no significance then no mediation affect occurred. Therefore, only a direct relationship between the patient's health status and patient's satisfaction is present, which would support previous findings (Hall et al., 1996).

In study one, first time visits by men and women (N = 114) patients who were diagnosed with rheumatologic diseases and 20 rheumatologists qualified for the study. The sample consisted predominantly (76%) of female patients. The Sickness Impact Profile was used to measure the physical and psychosocial health status of each subject. The Medical Interview Satisfaction Scale (MISS) was used to measure information-giving behaviors and humaness. All physician-patient interactions were audio taped thereby allowing the mediator variable (communication) to be analyzed by the Roter Interaction Analysis System (RIAS). A significant direct positive association between psychosocial health and patient satisfaction was identified. A marginally significant direct positive association between physical health and patient satisfaction was also recognized. Thus, patients who were in better health reported greater satisfaction. However, no significant associations between the patient's health and physician behavior path, or between the physician behavior and patient satisfaction path were found. These

findings suggested the style of communication did not mediate the relationship between patients' health status and their patient satisfaction ratings (Hall et al., 1998).

The second study completed by Hall et al. (1998) evaluated 649 males and females with a wide range of medical problems and internists as well as family physicians (N = 69) employed in private and HMO practices. The general health status was self-reported by the patients and included the following: (1) their general physical health, and (2) how much their overall health interfered with their daily living activities. Physicians also rated the patient's current physical condition. Emotional health was measured by three instruments: patients' self-reports, ratings of the patient's health made by the physicians, and by the patients' scores on the General Health Questionnaire. A 20-item questionnaire, which asked patients to evaluate their physician's technical competence, respect, and provision of information, was used to measure satisfaction. Internal consistency was 0.87. Communication was used as a mediator between the patient's health status and the patient satisfaction ratings for the analysis. RIAS and facilitative talk (addressing the patient's psychosocial concerns) were used to measure communication. Internal consistency was 0.93. Results from study 1 and 2 showed a significant direct path from psychosocial health status to patient satisfaction. Additionally, significant support was found for mediating affects of conversation for the psychosocial health status and the physical health status, but in study 2 only. Essentially, the patient's health status influenced the physician's communication (social conversation), which influenced the patient's rating of the physician's communication, which in turn influenced the patient satisfaction ratings (Hall et al., 1998).

Differences between study 1 and study 2 results may have been due to the sample selection (chronic disease vs. routine continuing care with HMO) and instruments used to measure satisfaction (MISS vs. 20-item questionnaire). Additionally, the physician saw the patients in study 1 for the first time, whereas the patients in study 2 were seen by their physicians for routine care. The length of time the patient has known the physician may explain why the physician's communication (social conversation) was found to have mediating affects on patient satisfaction in study 2, only. Furthermore, the physician's communication was the only variable tested to measure a physician's behavior as a mediator. Therefore, one should use caution when making reference to either one of these studies.

Other Correlates of Patient Satisfaction in the Medical Population

In the previous section, the review of literature pertained to sociodemographic variables and physician's behavior variables that have been reported to be associated with patient satisfaction ratings. However, there have been other variables reported to be associated with patient satisfaction ratings. This section will address the studies that have used other variables and that are believed to be associated with patient satisfaction ratings.

Patient satisfaction, along with the services provided have been earmarked by the Joint Commission for Accreditation of Health Care Organizations as an important and valid measure of quality of care (Merkouris et al., 1999). Inventories of the medical staff have been administered for decades to measure quality of care (DiPalo, 1997; Merkouris et al., 1999). Of special interest has been the satisfaction of patients while receiving care from a medical professional (Merkouris et al., 1999). For nearly 5 decades patient

satisfaction has been measured in the field of Nursing and has recently become identified as a valid and important index of care quality as well as a prerequisite for hospital license (DiPalo, 1997; Merkouris et al., 1999). Patient satisfaction is considered a way to measure the perceptions or feelings that the patients may have while being medically attended to for their injuries or illnesses (DiPalo, 1997; Sitzia & Wood, 1997).

Several studies have investigated the physician-patient relationship using communication as a measure of patient satisfaction (Hall et al., 1993; Hall et al., 1998; Hall et al., 1996). Similarly, Stiles, Putnam, Wolf, and James (1979) evaluated the physician-patient interaction, specifically verbal communication. Through cross-sectional design, Stiles et al. (1979) evaluated 50 patients ranging in age from 16-75 years and 19 physicians, primarily white males (90%). Interviews were tape-recorded and physical evaluations were completed. Following the interview, patients completed a 33-item patient satisfaction questionnaire. Each item was rated on a 5-point Likert type scale. The questionnaire was based on the MISS (Wolf et al., 1978). Communication /Interaction coding was based on taxonomy of classification consisting of 8 basic modes that can also be mixed. Three independent and trained coders coded the physician-patient interactions. Factor analysis was performed on the mode frequencies and extracted 2 factors accounting for 73.8% of the variance. Affective and cognitive domains were the two constructs of the questionnaire that were measured. Average scores were computed for each component. The affective domain evaluated the physician's warmth and patient's feeling of trust. The cognitive domain evaluated the information giving style of physicians and the patient's understanding of the information. Although, the correlations were relatively weak, patients who gave longer medical histories and provided

information in their own words had greater affective satisfaction scores ($r = 0.30$, $p < .05$). The provision of feedback by physicians was significantly correlated with cognitive satisfactions scores ($r = 0.31$, $p < .05$). These data suggest that the patient-physician interaction is important when measuring patient satisfaction (Stiles et al., 1979).

Based on previous reports indicating that less healthy patients are less satisfied with their health care (Hall et al., 1993; Hall et al., 1988), (Greenley, Young, & Schoenherr, 1982) evaluated psychologically distressed patients and their reports of (dis) satisfaction of health care. In a retrospective study, Greenley et al. (1982) distributed a 10-item questionnaire to acutely injured patients ($N = 204$) from 10 health, rehabilitation, and related social service agencies six weeks following their appointment with the physician. Three specific satisfaction measures (humaness – five items, competence – four items, and general quality of service – one item) were used. Psychological distress (moderate depression and anxiety) was measured using the Crandall and Dohrenwend 10-item psychological symptoms cluster of the Langner 22-item psychiatric screening. Sex, age, income, education and adult household role, were significantly related to psychological distress and satisfaction. Therefore these five variables were used as control variables throughout the multiple regression analyses. Overall, psychological distress was significantly correlated with humaness ($r = -0.10$, $p < .05$), competence ($r = -0.22$, $p < .05$), and general quality of service ($r = -0.22$, $p < .05$). Although the correlations were significant, they were weak and accounted for only 5% of the variance. Individuals across all 10-service organizations who are psychologically distressed and deny having emotional or personal problems are less satisfied with health care and related services (Greenley et al., 1982).

Nursing care evaluations have also become an important measure for a quality assurance program. In fact, it is believed that without a way for patients to report the care received by a nurse that a quality assurance program is considered inadequate (Merkouris et al., 1999).

Specific to an emergency room setting, Bruce, Bowman, and Brown (1998) evaluated the factors that influence patient satisfaction ratings. Specifically, nursing care, emergency department environment, auxiliary staff, and information received were measured using the Emergency Department Patient Satisfaction Survey. A 30-item questionnaire rated by a 3-point Likert-type scale, was distributed to 128 individuals who utilized the emergency room and were asked to evaluate the care received and to return the survey in the prepaid envelope provided. Non-urgent emergency room patients (N = 28) returned the surveys. Specific to nursing skill, high satisfaction scores were indicated for: (1) overall caring and compassion (75%), (2) skill with medications and treatment (74%), and (3) explanation given about care (71%). Specific to information given, the highest satisfaction scores included: (1) information related to medications (46%), (2) diagnosis (43%), and (3) self care (43%). Under the auxiliary service sector, the patients were primarily dissatisfied with the receptionist (7.7%). In general, patients were satisfied with the environment such as the comfort of the waiting room, cleanliness, quietness, and staff working together. Chi-square analysis revealed no statistical significant difference in satisfaction between male and female patients (Bruce et al., 1998). Similar to the physician population, it appears that patients are concerned about the information given and the overall care and compassion demonstrated by nurses, but

psychometric properties of the instruments used were not reported. Additionally, it is difficult to say what was considered as high satisfaction scores.

In summary, variables correlated with patient satisfaction in the general patient satisfaction literature have included race and gender concordance of physician and patient (Cooper-Patrick et al., 1999), gender of the patient (Hulka et al., 1975; Like & Zyzanski, 1987), socioeconomic status (Hall & Dornan, 1990; Hulka et al., 1975), and time spent with the physician (Chung et al., 1999; Like & Zyzanski, 1987). The population samples have included elderly patients (Hall et al., 1993; Hall et al., 1998), Mexicans (Comstock et al., 1982), students in psychology, and military personnel and families (Mangelsdorff, 1979). Other variables related to satisfaction ratings include physician-patient interaction, physician communication (Hall et al., 1993; Hall et al., 1998; Hall et al., 1996), and patient's health status (Greenley et al., 1982; Hall et al., 1993; Hall et al., 1998; Hall et al., 1996).

Patient Satisfaction in the Athletic Population

It has been suggested that in both the medical and athletic training literature that understanding the athlete's perception of medical professionals can aid in the improvement of quality of care (Fisher & Hoisington, 1993; Fisher, Mullins, & Frye, 1993a; Ware & Snyder, 1975). Due to increased interest in all managed care, outcome measures of athletic trainers and physiotherapists have also recently been evaluated (Albohm & Wilkerson, 1999; Taylor & May, 1995; Unruh, 1998). However, few of the studies have empirically evaluated athlete's satisfaction with health care providers (athletic trainers, physiotherapists, physical therapists) (Albohm & Wilkerson, 1999; Taylor & May, 1995).

One outcome measure of injured athletes' satisfaction with sports medicine professionals (certified athletic trainers and physicians) was evaluated by using broad criterion derived from the Role Delineation Study for athletic trainers (Unruh, 1998). A 50-item questionnaire was developed, piloted, and evaluated for internal consistency and content validity (Unruh, 1998). The correlation coefficient was reported as 0.8211 using a split-half test and a Cronbach's coefficient was reported as 0.90 for the entire test suggesting a strong measure of consistency. Thirty-five items addressed whether the athletes "agree" or "disagree" with the athletic trainer's and physician's behavior. The remaining14 items were "yes" or "no" questions relative to their understanding of procedures, the behaviors of the sports medicine staff, and their view of interaction with the sports medicine staff.

Men (n = 178) and women (n = 165) college athletes representing 18 NCAA Division I and II institutions participated in the study. The results indicated that men viewed the athletic trainer significantly more favorably than women. Furthermore, a significant difference existed between high profile (football, basketball, baseball) and low profile sports. Athletes who participated in high profile sports reported more favorable scores for the athletic trainer and the medical services provided. Finally, there were no significant differences found between the athletes participating at the NCAA Division I or Division II level. Using a one-way ANOVA, results revealed that women participating in low-profiles sports at both the NCAA Division I and Division II levels and women participating in low-profile sports at the NCAA Division II all had significantly lower cumulative mean scores compared to all other subgroups (Unruh, 1998). Although this empirical study suggested that satisfaction of the athlete was

measured, the measurement did not seem to correspond with satisfaction. For example, the questionnaire addressed whether specific behaviors of the athletic trainer and the physician (36 items) were carried out, instead of addressing whether the athlete was satisfied with the care received. Therefore it is assumed that the behaviors of the athletic training staff are correlated to patient satisfaction. Rather, the results of the study appeared to be an indicator of adherence to the competencies outlined by the NATA (Unruh, 1998).

A national survey conducted by the National Athletic Trainers' Association (NATA) collected data for 2 years to evaluate the services that athletic trainers provided to injured individuals in sports medicine clinics, high schools, colleges and universities, and industrial settings across the entire United States of America (Albohm & Wilkerson, 1999). The subjects included 4939 patients (male = 60%) who received 90% or more of their care from certified athletic trainers. The scale constructed contained 14 items representing health-related quality of life (HRQL) constructs. The constructs consist of 12 items representing the following factors: (1) functional outcomes (i.e., pre- and post-treatment status in sport, recreation, wellness and work activities), (2) physical outcomes (i.e., range of motion, pain relief), (3) general health status, (4) specific medical condition, and (5) psychosocial status (i.e., anxiety, confidence). Patient satisfaction was obtained by two items: (1) the overall satisfaction of the athletic trainer, and (2) the satisfaction of treatments provided by the athletic trainer. Items were measured on a 5-point Likert type scale with zero representing the lowest rating and four representing the highest rating. Each of the 12 items was measured at intake and at discharge by the patients and the certified athletic trainers (ATC), whereas the two items pertaining to

patient satisfaction were measured only at discharge. The instrument reportedly was validated over three consecutive 6-month trials; however, the specific psychometric data was not reported.

Certified athletic trainers and patients showed relatively similar ratings for pre and post treatment outcomes. The standard response mean (SRM) was used to measure the difference between the pre and the post treatment ratings for the patient ratings and the ATCs ratings. The results indicate that positive changes occurred across all factors. For example, functional outcomes (SRM = 1.49), physical outcomes (SRM = 1.49), and specific medical condition (SRM = 1.43) showed the greatest change. Conversely, the general health status (SRM = 0.89) and the psychosocial status (SRM = 0.56) showed the smallest change in outcomes. Patients had favorable satisfaction ratings with the treatments (3.87) and with the athletic trainer (3.89). Overall, patients who utilized care from ATC were satisfied with care received and their care provider (ATCs) (Albohm & Wilkerson, 1999). Based on when satisfaction scores were obtained, it is difficult to determine whether the patient had as favorable ratings of the ATC at the onset of rehabilitation.

Specific to treatments following a chronic or an acute knee injury, Kernohan et al. (1993) evaluated 52 men and 13 women that were seen in a sports injury clinic in Belfast, UK. The study was retrospective in design. The athletes were asked to complete a questionnaire measuring the patient's satisfaction of the treatment provided following the first visit with the physiotherapist. Specifics of the questionnaire (i.e., number of questions, types of questions, psychometric properties) were not reported in this article. The normative data indicated that 38% were generally dissatisfied, 29% were undecided,

and 35% were generally satisfied with the treatment received. However, a large number (62%) gave up the sport entirely after having received an injury specifically to the knee (Kernohan et al., 1993). The results from this study indicate a less favorable satisfaction with the treatment received compared to other sport related studies (Albohm & Wilkerson, 1999). However, the different levels of play (i.e., recreation, competition), different types of injuries (i.e., acute, chronic, sprain, strain, fracture, etc.), and report for therapy at different times post injury may affect the general satisfaction of the treatment. Furthermore, the study was a retrospective design and the subjects may have provided less favorable ratings once they realized that they had to retire from the sport.

In a study with athletes from England, patient satisfaction was measured more specifically with the Sports Injury Clinic Athlete Satisfaction Scale (SICASS) (Taylor & May, 1995). The SICASS evolved from the Medical Interview Satisfaction Scale (MISS) (Wolf et al., 1978), and was one of few established instruments in the medical field that had acceptable levels of reliability and validity measures. The SICASS was reworded to reflect a specific encounter with a physiotherapist in a sports injury clinic as opposed to an encounter with a physician. A panel identified 16 questions from a list of 26 questions, rated along a 5-point Likert scale, which represented the three dimensions (affective, behavioral, and cognitive) of the MISS. The panel selected questions they believed were most comprehensive and appropriate to evaluate physiotherapists instead of physicians. Other demographic information (age, sex, importance of sport, level of sport involvement, and injury type) was also included. Patients ($\underline{N}$ = 160) from five sports injury clinics in England were used in the analysis. An exploratory factor analysis identified three factors with Eigen values greater than 1, which were renamed as

perceived empathy, information given, and competence. Following varimax rotation, 13 items were retained. Perceived empathy (6 items), information given (4 items), and competence (three items) and accounted for 41.1, 7.7, and 5.8% of variance, respectively. The total scale reliability (Cronbach's coefficient $\alpha = 0.89$) was quite high as were the alphas for the perceived empathy ($\alpha = 0.87$), information given ($\alpha = 0.73$), and competence ($\alpha = 0.73$) subscales. The interscale correlations ranged from 0.32 to 0.58 suggesting moderate overlap and acceptable construct validity (Taylor & May, 1995).

In general, athletes were satisfied with the competence of the physiotherapist ($\underline{M} = 4.33$), perceived empathy ($\underline{M} = 3.95$), and information given ($\underline{M} = 3.95$). One-way ANOVAs revealed that men were significantly more satisfied than women and athletes who had been injured the longest (over 28 days) reported more satisfaction than athletes most recently (0-7 days) injured. Additionally, athletes who had moderate level of sport importance had significantly higher information giving satisfaction scores than athletes with a high level of sport importance (Taylor & May, 1995).

Using a retrospective study design, Fick et al. (1992), evaluated 78 men and women runners who participated in the Eastern Iowa races. The purpose of this study was to survey the choice of physician, the expectations of the treatment, and the satisfaction with the treatment received by runners. To qualify for the study the runners had to have had a previous running injury, be seen by a family physician, an orthopedic surgeon, or a podiatrist. The majority of the runners were male (60%). The subjects were asked to complete a 30-item questionnaire. Eleven of the items assessed demographic data and the remaining 19 items assessed patient satisfaction as measured on a 5-point Likert scale. Cronbach's alpha was reported at 0.86.

A Chi-square analysis indicated that athletes were equally satisfied with the care they received from orthopedic surgeons (71%), podiatrists (71%), and family practice physicians (68%). Overall, athletes were satisfied with their physician care and the specialty was not a concern for their satisfaction rating (Fick et al., 1992).

Similar to the medical literature, the reported athletic injury studies that have assessed patient satisfaction ratings have used varying measurements all reporting favorable results (Albohm & Wilkerson, 1999; Kernohan et al., 1993; Unruh, 1998). Variables that have been affiliated with patient satisfaction include severity of injury, and perceived importance of sport and gender. However, assessments were unidimensional, irregularly administered during the rehabilitation process, and the data were collected in the United Kingdom.

Patient Attendance/Patient Adherence/Patient Compliance

Non-compliance with medical treatment has been documented as a major problem in as many as 30-75% of patients receiving therapy (Comstock, et al., 1982; Imanaka, et al.,1993; Klein, 1980) . Furthermore, it has been suggested that those who are more satisfied with their care are more likely to comply with rehabilitation regimens (Merkouris et al., 1999; Sanazaro, 1985), and in turn, recover more progressively (Treacy et al., 1997).

Often patient adherence has been used synonymously with compliance. Likewise, patient attendance and adherence have been used synonymously. The mixing of terminology has made the interpretation of adherence and compliance difficult. However, the athletic literature has technically defined the measurement of a frequency goal (i.e., attending all sessions) as adherence (Brewer et al., 1995), whereas, compliance

(i.e., meeting levels of intensity, duration, and listening to advice) is the measurement of the quality of effort (Brewer, 1998; Brewer et al., 1999). Therefore, it is possible that one may adhere to treatment without being compliant.

Through literature review, Cameron (1996) highlighted the social and psychological factors to influence patient compliance that have been measured in previous research. Unfortunately, as noted by Cameron (1996), the literature related to compliance has used a variety of measures with unreported supporting psychometric data. The use of a variety of measures is due in large part to the specific compliance measured and the definition of compliance used. For example, compliance has included the number of treatments scheduled and kept, taking mediations, following regimens for specific diseases, adhering to exercise programs, and rehabilitation protocol (Brewer, 1998; Brewer, 1999; Cameron, 1996; Chen, 1999; Imanaka, et al., 1993; Klein, 1980).

The most consistent adherence and compliance studies in the medical field have evaluated medication-taking behaviors among chronically ill patients. For example, Nagy and Wolfe (1984) evaluated cognitive variables associated with compliance using chronic disease patients ($\underline{N} = 128$). Patients were interviewed two times. The first interview included demographic information, value of health to the patient, satisfaction with the treatment, social support, health locus of control beliefs, and perceived severity and long-term outlook. The second interview consisted of self-reported compliance to the medication and self-management procedures 6 months later. The predictor variables included socioeconomic status, three HLOC measures, perception of the medical problem, patient satisfaction, and social support. Compliance was the outcome variable measured by self-report, provider-report, on-time refills, and research response measures.

Stepwise multiple regression analyses revealed that patient satisfaction was significantly correlated with medication compliance and reported symptoms were significantly negatively correlated with self-management procedures (Nagy & Wolfe, 1984).

Sanazaro (1985) surveyed patients, by telephone, who were receiving care for a chronic condition. Sanazaro (1985) evaluated the patient's knowledge and understanding of their condition, the satisfaction with their care, and their compliance to treatment. Men (n = 91) and women (n = 110) were interviewed over the telephone to answer five content areas: (1) availability of physician, (2) patient's knowledge of prescribed drugs, (3) patient's knowledge of own condition, (4) patient satisfaction, and (5) compliance. The specific number of questions asked to represent each content area was not reported. Normative data indicated that patients felt their physician was readily available and patients knew the name of the medications and purposes, but they did not know the side effects. Surprisingly, only a little over half (57.7%) of the patients understood their condition. A large number of patients were satisfied with the explanation the physician gave for the condition (89.6%) and were satisfied with the physician answering questions (88.6%). Moreover, a high percentage of patients felt the physician took enough time (78.1%) and treated the patient as a person (79.6%). Finally, a large portion of patients (91%) reported compliance with the drug regimen. However, the compliance with a low-salt diet (39.2 %) and urine testing for sugar (55.2%) was quite low. Sanazaro (1985) suggested that patients were relatively satisfied with the physician, but were not compliant with their medical care, however correlations or regression were not conducted on these data. The low compliance rate may be due to the minimal number of patients understanding their condition.

In a prospective study design Wartman, Morlock, Malitz, and Palm (1983) evaluated the effects of patient understanding and satisfaction on compliance with drug regimen. Patients (N = 515) completed three instruments (a visit questionnaire, a provider form, an encounter form) at the time of the visit. One week after their visits, by a telephone interview, patients rated 4 satisfaction questions pertaining to the visit on a 4-point Likert scale and indicated the result of the visit (whether the injury/illness that they saw the physician one week earlier was better), and indicated whether medications were prescribed. Multiple discriminant analyses indicated that compliance was significantly negatively correlated with patients' satisfaction with questions answered ($r = -0.18$, $p < .001$), interest shown ($r = -0.16$, $p < .02$), and explanations given ($r = -0.13$, $p < .05$). Furthermore, in canonical correlational analysis, self-reported compliance with drug regimen was correlated with age ($r = 0.70$), presence of musculoskeletal problems ($r = .46$), patients' satisfaction with providers' answers to their questions ($r = -.45$), and prescription of psychotropic drug ($r = .35$). These results suggested that patients who were more compliant with their drug regimen are less satisfied with the patient-physician relationship. These results are contrary to other findings. However, the determination for compliance and noncompliance was not specified. Therefore, one should use caution when interpreting these results (Wartman et al., 1983).

Also specific to compliance with medication regimens, Imanaka et al. (1993) evaluated the effects of patient beliefs and satisfaction. Subjects selected for the study included 318 men and 332 women outpatients in seven general hospitals in Japan and ranged in age from birth to 93 years. Prior to leaving the hospital, subjects completed a questionnaire that pertained to their beliefs about their health condition and medication

regimen (4 questions). The attending physician rated the severity of illness for each participant. One month later, the same patients completed a questionnaire pertaining to medication compliance (3 questions) and patient satisfaction (12 questions). High compliance was defined as a score above 80% compliant and was used as the dependent variable in a multiple logistic regression analysis. Specifically, patients who reported higher satisfaction scores and were older were more likely to comply with medication. Additionally, greater self-efficacy ratings, lower perception of barriers, greater perceived threat ratings, a greater severity of illness rated by the physician, and male gender were significantly related to the rate of high compliance to medication use (Imanaka et al., 1993).

Making and keeping an appointment has also been used as a measure for compliance. For example, Goldman, Freidin, Cook, Eigner, and Grich (1982) used multivariate analysis to examine a wide range of factors that are believed to influence patient compliance. Specifically, 376 patients who had routine, return, and scheduled visits with physicians in a Boston hospital participated in the study. Patient satisfaction was measured, prior to the visit, using a general statement of quality of satisfaction with the physician and primary care center (PCC), 15 hypothetical statements, and whether the patient would recommend the PCC to a neighbor. Following the visit, patients rated general satisfaction, the physician, and the clinic. Physician-patient gender concordance was measured through pre and post questions by the patient and after the visit with the physician. Compliance was based on making and keeping an appointment during a six-month follow up period. Eighty-two percent of the appointments were kept and 18% were identified as no-shows. Age (i.e., younger), race (i.e., non-white), physician-

identified psychosocial problems, and history of late or missed prior appointments in the previous 12 months were the four factors identified by logistic regression to be associated with non-compliance. Furthermore, patient satisfaction was associated with future appointment keeping. For example, patients who were not satisfied with the index visit resulted in no-shows 6 out of 9 future appointments (Goldman et al., 1982). Although compliance measures refer to attendance in this study, it should be noted that this should be considered as an adherence measure.

Patient Satisfaction as an Influence on Rehabilitation Adherence and Compliance

The literature has reported that the physician-patient interaction is related to patient satisfaction (Bartlett et al., 1984; Hall & Dornan, 1988; Hall et al., 1993; Hall et al., 1998; Hall et al., 1996; Stiles et al., 1979). Furthermore, it has been alleged that patient satisfaction is related to patient compliance. DiMatteo et al. (1986) investigated the paths linking these concepts. Family practice residents (N = 57) completed self-report measures of personality: (1) Hogan Empathy Scale (HES); (2) Snyder Self-Monitoring Scale (SMS); and (3) Affective Communication Test (ACT). The short form of the Profile of Nonverbal Sensitivity (PONS) was used to measure the non-verbal decoding skill of the physicians. Ambulatory patients (N = 329) were asked to complete a patient satisfaction questionnaire. Patient satisfaction was measured with a 25-item survey specific to the visit. Each item was rated on a 5-point Likert scale. Patient Appointment Noncompliance (AN) was measured according to the number of cancelled appointments divided by the number of patients a physician was scheduled to see that month. Finally, the average number of patients the physician saw per clinic day measured the physician's workload/schedule density. The only variable that showed any

significant correlation to appointment noncompliance was audio-nonverbal decoding (r = -0.47, $p < .05$). Specifically, the less the physician's nonverbal communication the greater the noncompliance (DiMatteo et al., 1986).

The link between patient satisfaction and patient adherence and compliance has been demonstrated in the medical literature. For example, in a retrospective design, Bartlett et al., (1984) evaluated patient satisfaction and adherence of 56 patients who received care from an educational hospital. This visit was a follow up visit for an illness that had been previously diagnosed and treated. Patients were interviewed over the phone 1-2 weeks following their visit. Residents (N = 5) and their patients were videotaped during the evaluation session. The resident's communication skills and the amount of patient teaching were also evaluated as part of the influence on patient satisfaction, recall, and adherence. Interpersonal skills (IPS) were measured with 14 items. Items were measured on a 5-point Likert scale. Using a Pearson's product-moment correlation, intra-observer reliability was recorded as 0.77 and the inter-observer reliability was recorded as 0.52. Teaching was measured by the summation of statements (sentences) made by the physician that contained any instructional information relating to the patient's visit. Using a Pearson's product-moment correlation, intra-observer reliability was recorded as 0.94 and the inter-observer reliability was recorded as 0.71. Patient satisfaction was measured by an 8-item questionnaire. The items asked the patients to rate on a 5-point Likert scale the degree of satisfaction they had with information giving, quality of care, and the physician's interpersonal skills. The alpha reliability for the satisfaction items was 0.88. Patient's recall was measured on a percentage of correct responses to three questions. One correct response out of the three

questions would be calculated as 33% correct. Medicine taking adherence was measured by asking what medications that patient took the day prior to the phone interview. The calculations were based on the percentage of completeness. For example, if the patient was asked to take 4 pills, but only took 3, then the adherence score is 75%.

Significant, but weak to moderate correlations were found between the following: (1) race and interpersonal skills ($r = -0.24$, $p = 0.04$), (2) education level of patients and patient satisfaction ($r = -0.40$, $p = 0.03$), (3) complexity of treatment regimen and interpersonal skills ($r = -0.22$, $p = 0.05$), (4) complexity of treatment regimen and teaching statements ($r = 0.38$, $p = 0.01$), (5) perceived post-visit health status and patient satisfaction ($r = 0.37$, $p = 0.01$), and (6) perceived post-visit health status and adherence ($r = 0.37$, $p = 0.01$). These results may suggest that poorer interpersonal skills were demonstrated with black patients and with those who had more complex treatment regimens. Patients with a more complex treatment regimen were provided more teaching statements. Additionally, more educated patients were less satisfied. Patients were more satisfied if they felt better after the visit and those who felt better after their visit were more likely to adhere to the regimen (Bartlett et al., 1984). Of particular interest, Bartlett et al., (1984) reported that the observations between patient satisfaction and teaching statements demonstrated a hyperbolic form, which indicates that there is a curvilinear relationship. That is, satisfaction may go up with increasing teaching statements but level off as the number of statements may overwhelm the patient.

Bartlett et al. (1984) also found that patient satisfaction and/or recall mediated all the effects of the interpersonal skills and teaching statements on patient adherence. However, physician's communications did not have any direct effect on adherence.

These results suggest that adherence of medicine taking was influenced by patient satisfaction and recall of regimen, which in turn were determined by the quality of the physician's interpersonal skills and the summation of the teaching statements used by the physician.

Evaluating patient satisfaction and patient compliance with adult patients (N = 7204) in the Commonwealth of Massachusetts, Safran et al. (1998) concluded that trust was the most strongly associated variable with patients' satisfaction with: (1) their physician and (2) adherence. A single item measured patient satisfaction, and adherence was measured by a ratio of the seven behavioral risks discussed by the physician and the patient's behavior as a result of the advice. This was a cross-sectional study that prevents one from interpreting that trust in the physician can influence patient satisfaction or adherence during consecutive appointments.

Specific to cardiac patients and rehabilitation, Holm, Fink, Christman, Reitz, and Ashley (1985) examined six factors that were thought to be associated with patient compliance. During phase II of rehabilitation, 41 patients completed a questionnaire that consisted of sociodemographics, health beliefs (Compliance Questionnaire), locus of control (HLOC), patient satisfaction (developed by Counte), social support (Social Support Index), and self-motivation (Self-Motivation Inventory). Psychometric properties for these instruments had acceptable values. The Standardized Compliance Questionnaire (SCQ) measured compliance. Psychometric properties for the SCQ were not reported. Administration of the questionnaires was also not reported. Men (n = 39) and female (n = 2) patients ranged in age from 34 to 75 and represented the white (n = 29), black (n = 7) and Hispanic (n = 5) races. Correlations were completed for all six

constructs of health beliefs (general health motivation, severity, resusceptibility, efficacy, barriers, cues) and compliance (HLOC, patient satisfaction with the program and the staff, social support, and self-motivation). Although weak, significant positive correlations were reported between perceptions of severity of illness and general health motivation ($r = 0.31$, $p < 0.05$); between HLOC and general health motivation ($r = 0.40$, $p < 0.01$); between cues to taking health-related action and satisfaction with program staff ($r = 0.37$, $p < 0.05$); between program and staff satisfaction ($r = 0.62$, $p < 0.001$); and between perceptions of severity and resusceptibility ($r = 0.37$, $p < 0.02$). Inverse correlations between perceptions of resusceptibility and social support ($r = -0.25$, $p < 0.05$) and between perceptions of resusceptibility and self-motivation ($r = -0.27$, $p < 0.05$) were also reported (Holm et al., 1985).

In summary, the medical literature has evaluated compliance primarily as a means of keeping an appointment, taking medications, and following drug regimens. Specific to rehabilitation, the medical literature has failed to use measurements with reliable and valid psychometric properties, and have not indicated specific times for the administration and completion of questionnaires used.

Adherence and Compliance to Sports Injury Rehabilitation

Specific to athletic injury it has been suggested that over 200 variables may affect rehabilitation adherence and compliance (Fisher et al., 1993a). Specifically, the injured athletes' characteristics, the rehabilitation setting conditions, and therapist-athlete interactions have been the primary focus for determining the influences upon rehabilitation adherence and compliance (Fisher, 1990). Through literature review, it appears that self-efficacy (Duda et al., 1989), self-motivation, and pain tolerance (Fisher,

Domm, & Wuest, 1988) have been characteristics of injured athletes that are associated with adherence to rehabilitation programs. Additionally, athletes have reported that the comfort in the athletic training room facility and convenience of hours have been related to adherence (Fisher et al., 1988). Finally, athletes who receive external motivation and social support from the coaches while receiving treatment have enhanced adherence (Duda et al., 1989; Fisher et al., 1993a). Similar to the medical literature, the importance of the attitudes portrayed and the communication of the sports medicine therapist and the injured athlete are thought to influence adherence (Weiss & Troxel, 1986). Empirical studies, which have shown support for these findings, have been retrospective in nature and have primarily focused on adherence (Fisher & Hoisington, 1993; Fisher et al., 1993a).

Evaluating an athletic population, Daly et al. (1995) addressed the components that would influence rehabilitation adherence following a knee injury. Specifically, cognitive appraisals and emotional adjustment were the independent measures. Men (n = 19) and women (n = 12) post surgical knee patients who incurred a knee injury while participating in sports and who had received physical therapy in the clinic for at least one week, with at least 1 week of rehabilitation appointments remaining, were selected for the study. A one-item question rated on a 5-point Likert scale was used to measure cognitive appraisals (i.e., "my injury will be difficult to deal with"). The total mood disturbance (TMD) scores from the Profile of Mood States (POMS) measured the emotional adjustment. The POMS is 65 adjectives describing moods that are rated on a 5-point scale. Attendance ratios and therapist ratings on the Sports Injury Rehabilitation Adherence Scale (SIRAS) was used to measure adherence and compliance, respectively.

Five-point Likert type scales were used to rate the three areas of compliance: (1) intensity of completing the rehabilitation exercises, (2) frequency used to follow instructions and advice, and (3) receptivity to change the rehabilitation program during the previous week. Internal consistency was high ($\alpha = 0.81$). Patients who qualified for the study were asked to complete the POMS and the cognitive appraisal item (Daly et al., 1995, p. 24) at a regularly scheduled appointment time. The therapist completed the SIRAS approximately one week following the appointment.

No significant differences were found between recreational ($n = 14$) and competitive athletes ($n = 17$). Thus, these two groups were collapsed for further analyses. Intercorrelations revealed that cognitive appraisal was significantly inversely correlated with TMD ($r = -0.39$, $p < .05$) indicating that individuals who had lower levels of perceptions to cope with injury were coupled with higher levels of mood disturbance. Cognitive appraisals were also correlated with rehabilitation attendance ($r = 0.51$, $p < .05$) indicating that individuals who had higher levels of perceptions to cope with injury were coupled with a greater attendance ratio. TMD was significantly inversely correlated with rehabilitation attendance ($r = -0.37$, $p < .05$) indicating that lower levels of mood disturbance were associated with greater attendance ratio. Finally, the attendance ratio was significantly correlated with higher levels of rehabilitation adherence ($r = 0.49$, $p < .05$) (Daly et al., 1995). The results support the emotional (TMD), behavioral (attendance), and cognitive (cognitive appraisals) components of the CAM originally outlined by Lazarus and Folkman (1984) and later expanded by Wiese-Bjornstal et al. (1998).

Using the personal investment theory (PIT) as a guide, Duda et al. (1989) evaluated adherence ratings of 40 intercollegiate athletes who sustained a sport-related injury that required at least 3 weeks of rehabilitation. Administration of the questionnaires was not specified. Predictive variables that were evaluated included personal incentives, sense-of-self beliefs, and perceived options. Adequate psychometric data was available for all independent measures. Attendance, completion of the exercise protocol, and exercise intensity were the three specific indices used to measure compliance. Stepwise multiple regressions were used to evaluate the factors that influenced attendance, protocol completion, and exercise intensity. The results indicated that, (1) perceived social support was the best predictor of attendance ($R^2 = 0.23$), (2) belief in the efficacy of treatment and the athlete's knowledge of treatment were significant predictors of attendance which accounted for 36% of the variance, (3) social support for rehabilitation, self-motivation, and internal locus of control in rehabilitation significantly predicted exercise completion which accounted for 32% of the variance, (4) perceived physical ability, self-motivation and more perceived social support for one's rehabilitation significantly predicted exercise intensity which accounted for 32% of the variance, and (5) social support for rehabilitation, trait sport confidence, and self-motivation were significant predictors of adherence which accounted for 35% of the variance. Overall, adherence was significantly related to the athlete's perceptions concerning the efficacy of treatment and social support for injury rehabilitation, his own degree of self-motivation, and task involvement (Duda et al., 1989). Thus, these results supported the PIT and two components (personal factors and situational factors) of the CAM.

As a follow up to Duda et al. (1989), Lampton, Lambert, and Yost (1993) evaluated 31 subjects who injured their back, knee, shoulder or ankle and attended the sports medicine clinic for at least six weeks. Self-esteem and its influence on task and ego involvement as it relates to rehabilitation adherence were evaluated. Adherence scores consisted of missed appointments, rehabilitation effort rating, and rehabilitation progress rating and were obtained from the therapist completing the rehabilitation. The Self-Handicapping Scale (SHS), Task and Ego Orientation Questionnaire (TEOQ), Rosenberg Self-Esteem Scale (RSE), and Certainty of Self Esteem Scale (CSES) were the four self-report questionnaires used in the correlational study. Data analyses indicated there were no significant correlations between any of the adherence ratings and the other independent measures. Interestingly, rehabilitation effort and rehabilitation progress ratings were significantly correlated ($\underline{r} = 0.82$, $\underline{p} < .05$) but not with missed appointments. Additionally, univariate analysis did not indicate any significant main effects or interactions between the task and ego. On the other hand, patients who missed the most rehabilitation appointments tended to have high ego-involvement and low self-esteem scores (Lampton et al., 1993).

Using a homogeneous sample, Laubach, Brewer, Van Raalte, and Petitpas (1996) evaluated recreational ($\underline{n} = 18$) and competitive ($\underline{n} = 16$) athletes who were receiving rehabilitation for the knee following surgery at a rehabilitation clinic in the northeastern United States. Patients and therapists were interviewed 1 month following surgery. Adherence was measured using the Sport Injury Rehabilitation Adherence Scale (SIRAS) as the dependent measure. Both the therapist and the patient completed ratings of the recovery progress. The patient completed open-ended attributions measured on the

Revised Causal Dimension Scale (CDSII), and the therapists completed adherence measured on the SIRAS. Results indicated that subjects who perceived themselves as recovering rapidly tended to attribute their recovery to external factors. On the other hand, patients recovering rapidly according to the physical therapists' perceptions attributed the recovery process to internal and personal factors. Regression analyses also indicated that personal control and stability were significant predictors of patient adherence ratings (Laubach et al., 1996). Although the study was a cross-sectional design, the results showed an association of personal factors (internal) and situational factors (external) with cognitive appraisals (rate of perceived recovery) and adherence to rehabilitation. The findings from this study showed merit for the cognitive appraisal model and its variations (Daly et al., 1995; Wiese-Bjornstal et al., 1998).

Treacy et al. (1997) evaluated compliance between two groups (experimental and control) of patients who underwent arthroscopic ACL reconstruction and were required to undergo post operative therapy. A therapist directly supervised the control group during therapy, whereas, a therapist did not directly supervise the experimental group patients. The study was conducted in the southeastern part of the United States. Experimental ($\underline{n}$ = 39) and control ($\underline{n}$ = 30) patients who underwent ACL reconstruction and identified themselves as recreational or competitive athletes were selected for the study. All patients were prescribed a postoperative protocol that directed the athlete to attend 3 sessions per week for the first 3 months, followed by two sessions per week for the next 3 months, totaling 60 outpatient therapy sessions. The measurement of patient satisfaction and when patient satisfaction was measured is not indicated. Compliance groups were categorized based on the number of sessions attended. Individuals who attended 0-4

sessions were considered noncompliant (M = 1.7). Individuals who attended 5-24 were considered minimally compliant (M = 12).

Results indicated that individuals who were noncompliant were relatively satisfied with the surgery (79%) and had a 62% return rate to preinjury activities. Individuals who were minimally compliant were very satisfied with the surgery (100%) with a large percentage (94%) returning to preinjury activities. Finally, the control group (attending more than 95% of scheduled appointments over 6 months) was also very satisfied (97%) and had a large majority of return to preinjury activity (93%). Measurements of the satisfaction rating were not illustrated or described. However, a comparison between the cost of 12 visits ($1000) and 60 visits ($6000) over a 6-month period were significantly different ($p < 0.001$). This data suggests that patients who attended 12 visits or more (minimally compliant) benefited from the rehabilitation program more than the patients who attended less than 5 sessions (noncompliant), but not significantly different from the patients who attended 95% of all the sessions (extensively supervised control). Therefore, it was suggested that the number of rehabilitation sessions could be minimized without jeopardizing the rehabilitation process (Treacy et al., 1997). Specific procedures of data collection were not indicated, however, the article made reference to a retrospective review. Therefore, it is difficult to determine whether patients that were initially satisfied were more compliant, or whether patients that were more compliant were more satisfied with their care after the completion of the therapy process.

Fisher et al. (1988) also evaluated the adherence of men (n = 21) and women (n = 20) collegiate athletes who had been injured in sports that would require at least a 6-week

rehabilitation program. Injured athletes were categorized as adherent (n = 21) or nonadherent (n = 20) based on their rehabilitation records provided by the ATCs. Attendance and a comparison between the expected progress and actual progress were used as determinants of adherence. All athletes completed a 40-item Rehabilitation Adherence Questionnaire (RAQ), which measured perceived exertion (e.g., % work effort), pain tolerance (e.g., amount of pain experienced), self-motivation (e.g., feelings of worth completing or pursuing rehabilitation session), support from significant others, scheduling of appointments, and environmental conditions (e.g., training room comfort). The manner in which this was measured was not indicated. This survey reported face and logical validity. All other psychometric data was omitted. However, Brewer et al. (1999) completed a psychometric evaluation specific for the RAQ and found that the psychometric properties were weak. For example, the RAQ subscales lacked internal consistency and criterion-related validity. Furthermore, many items lacked content validity. Therefore, one must use caution when reading the remaining section of results.

A MANOVA revealed a significant group difference between adherent and non-adherent athletes. Comparatively, adherers reported significantly greater perceived exertion, greater pain tolerance, greater self-motivation, felt scheduling of rehabilitation fit their needs better, and environmental conditions were more comfortable than the non-adherers. Both the adherers and nonadherers reported relatively high levels of social support from others (Fisher et al., 1988).

In summary, studies specific to athletic injuries have not examined the longitudinal effects, included recreational athletic groups, used attendance measures as the primary compliance measure, and administered the questionnaire at the end of the

rehabilitation process. These methodological concerns need to be addressed in order to clarify which factors influence rehabilitation adherence and compliance among injured athletes.

Summary

Specific to patient satisfaction, the general literature supported a significant difference between race, gender, age, education, socioeconomic status, race and gender concordance, patient health status, the physician's behavior, and the time spent with the physician. In particular, white women who were older, healthier and found the physician to be courteous, competent, and able to communicate verbally reported more favorable patient satisfaction ratings (Chung, et al., 1999; Comstock, et al., 1982; Cooper-Patrick et al., 1999; Hall & Dornan, 1990; Hulka et al., 1975; Like & Zyzanski, 1987; Mangelsdorff, 1979; Pascoe, 1983). The athletic literature supported a significant difference among gender, importance of the sport, and duration of nonparticipation. Specifically, males, athletes injured the longest (over 28 days), and athletes who rated the importance of the sport as moderate reported more favorable patient satisfaction ratings (Taylor & May, 1995).

Relative to rehabilitation adherence and compliance in the general literature, patients who were older, white, and had favorable patient satisfaction ratings were more likely to keep future appointments (adherence) take the appropriate medications (compliance), and follow instructions (compliance) (Cameron, 1996; Chen, 1999; Imanaka, et al., 1993; Klein, 1980; Sanazaro, 1985). Patient adherence and compliance literature relative to the athletic population revealed situational factors (i.e., comfort in the training room, convenience of hours, social support from coaches, and external

motivation), personal factors (i.e., greater pain tolerance, personal control and stability), individuals with more coping strategies, and less mood disturbances were more likely to attend the scheduled rehabilitation sessions (Daly et al., 1995; Duda et al., 1989; Fisher, et al., 1988; Fisher & Hoisington, 1993; Fisher et al., 1993a; Weiss & Troxel, 1986).

Although similar variables (gender, age, and injury status) were examined in both the general and athletic literature, there were inconsistent findings and very few athletic injury studies. The differences found may be due to the sample selection (i.e., homogenous vs. heterogeneous), instrumentation (i.e., unidimentional vs. multidimensional), or methodology (i.e., end of rehabilitation session vs. throughout rehabilitation session) used. The following section was based on the previous empirical and anecdotal literature relative to patient satisfaction, rehabilitation adherence, and rehabilitation compliance and controlled for the procedures in question.

CHAPTER III

PROCEDURES

Introduction

The four purposes of this study were to determine: (1) the degree to which demographic factors (age, gender, and injury severity) were associated with patient satisfaction and whereas patient satisfaction changed over time; (2) the concurrent relationship between patient satisfaction ratings of athletic trainers and rehabilitation adherence and compliance at one-week and at one-month post injury; (3) the prospective relationship between patient satisfaction ratings of athletic trainers and rehabilitation adherence and compliance; and (4) the prospective relationship between patient satisfaction ratings of athletic trainers at one-week post injury and patient satisfaction ratings of athletic trainers at one-month post injury. The chapter is organized into the following six sections: (1) selection of subjects; (2) research design; (3) instrumentation; (4) administrative procedures; (5) research hypotheses; and (6) data analysis.

Selection of Subjects

The sample of this study consisted of 23 men and 14 women injured high school and college students ($\underline{N} = 41$). The high school athletes ($\underline{n} = 8$) attended local high schools in Monongalia County in north central West Virginia and the college athletes ($\underline{n} = 29$) attended either West Virginia University (NCAA Division I) or California University of Pennsylvania (NCAA Division II). All participants, who volunteered for the study, were provided an explanation of the study, a statement regarding the athlete's rights to participate in the study, and a letter of consent (See Appendices A and B). The letter of consent explained the purpose of the study and contained relevant information

pertaining to the study. Parents signed a letter of assent (See Appendix C) for high school students under the age of 18. All institutional policies and procedures pertaining to the treatment and care of human subjects were followed without exception. Assigned code numbers, rather than names, were used to protect the anonymity of participants' response to questionnaire and demographic data sheets. All assent and consent forms were filed separately from the questionnaires in a locked file.

Prior to the season, athletic teams and athletic trainers from area high schools and colleges were informed about the injury study and were asked to participate. At an orientation session, it was explained that not everyone would be contacted for further follow-up. Follow-up participants consisted of athletes who sustained an acute severe injury (i.e., spontaneous injury which prevented the return to practice and competition for at least one week). Athletes who met the criteria were approached by the attending athletic trainer and asked to continue their participation in the study. The sports medicine staff then contacted the research team when an injured athlete meeting injury criterion agreed to continue participation in the study. Each week a member from the research team contacted the athletic trainer in person or by phone to inquire if an athlete had sustained an injury meeting follow-up criteria.

Of the 48 athletes that met study follow-up criteria, 41 (85%) of the athletes agreed to participate in the study. Among the seven athletes refusing participation, four were college athletes and three were high school athletes. Because athletes with head injuries (i.e., concussions) were often prohibited from exercise or training, and because complete SIRAS information was not applicable to them, four athletes were omitted from the study leaving a final sample of 37 participants.

Demographic characteristics can be seen in Table 1. Injured athletes were further classified by injury severity into season ending (SE) and non-season ending (NSE) injury groups. NSE injury was defined as an acute injury that has kept the athlete out of practice and competition for at least 7 days, but was allowed to return within one month. Examples include, but are not limited to: (1) first or second-degree sprains/strains, (2) meniscus injuries, and (3) surgical injuries. SE injury was defined as an acute injury that kept the athlete out of practice or competition for at least one month and prevented return during the remainder of the season. Examples of the types of injuries in this category, but not limited to, include: (1) anterior cruciate ligament (ACL) tears, (2) fractures/dislocations, and (3) third degree sprains/strains. It is important to note that if athletes were required to have surgery or sustained an injury within the last one to two weeks of the season they were not immediately categorized into the season ending injury group for not being able to return to the sport prior to the end of the season. Two ATCs reviewed the medical histories of injured athletes and assigned them to either NSE or SE groups. Unanimous agreement between the two ATCs was present for all injured athletes' classifications.

Research Design

This study involved a descriptive survey design with concurrent and prospective assessments. The independent variables were (1) gender and (2) injury severity group. The dependent variable was patient satisfaction scores. A two way (gender x injury severity) ANOVA was used to determine group differences on patient satisfaction ratings. Pearson Product Moment correlations were used to determine the degree of association between (1) rehabilitation adherence and patient satisfaction, and (2)

rehabilitation compliance and patient satisfaction. Correlations and repeated measures ANOVA were also used to determine the degree to which patient satisfaction scores deviated from one-week to one-month post injury. Finally, a multiple regression analysis, controlling for demographic factors (age and race), was used to determine whether the criterion variables (rehabilitation adherence and compliance) at one-month could be predicted by patient satisfaction scores at one-week post injury.

Instrumentation

Adherence and Compliance. The Sport Injury Rehabilitation Adherence Scale (SIRAS) (Brewer et al., 1995; Brewer, 1994)(See Appendix D) was used to assess the athlete's rehabilitation adherence and compliance. Prior studies have documented the internal consistency, test-retest reliability, interrater reliability, factorial validity, and construct validity of the SIRAS (Brewer, 1994; Brewer, 1998; Brewer, VanRaalte, Petitpas, Sklar, & Ditmar, 1996; Daly et al., 1995; Laubach et al., 1996).

Rehabilitation adherence was measured by the number of sessions attended divided by the number of sessions scheduled. Further, three items rated along a 5-point Likert scale by the athletic trainer measured rehabilitation compliance (Brewer et al., 1995). The items were: (1) "…the intensity with which this patient completes the rehabilitation exercises during their appointments", (2) "how frequently does this patient follow your instructions or advice…" , and (3) "how receptive is this patient to changes in the rehabilitation program…" Relatively higher item ratings indicated a greater degree of compliance than did lower ratings. Brewer et al., (1995) recommended the summation of the compliance items to form a compliance score (alpha = 0.81). Significant

correlations between SIRAS scores and rehabilitation attendance ($r = 0.21$, $p < 0.05$) have been reported (Brewer et al., 1995; Daly et al., 1995).

Although the authors have suggested using the summation of the three SIRAS items to measure compliance ratings (Brewer et al., 1995; Daly et al., 1995), their samples have consisted of homogenous injury groups. The current sample was comprised of athletes with a variety of injuries. However, results from this study sample indicated significantly moderately high correlations between frequency and intensity ($r = 0.689$, $p < 0.01$), frequency and receptivity ($r = .706$, $p < 0.01$), and between intensity and receptivity ($r = 0.611$, $p < 0.01$). Internal consistency was relatively high (alpha > 0.86). These data indicated that the summation of the three SIRAS items were appropriate for this heterogeneous injury sample.

Patient Satisfaction. A modified version of the medical interview satisfaction scale (MISS) (Wolf et al., 1978) was used to determine patient satisfaction with athletic trainers. The MISS was a 26 item self-report measure of patient satisfaction with a health care provider. The instrument was comprised of cognitive (e.g., how the patient perceives the care), affective (e.g., what the patient feels about the care), and behavioral (e.g., what actions the care provider uses) subscales with nearly equal item distribution. The total scale reliability (Cronbach's coefficient $\alpha = 0.93$) was quite high as were the alphas for the cognitive ($\alpha = 0.87$), affective ($\alpha = 0.86$) and behavior ($\alpha = 0.87$) subscales. The interscale correlations ranged from 0.62 to 0.76 on 50 patients visiting a physician for the first time (Wolf et al., 1978).

The researcher made modifications to the MISS by substituting "athletic trainer" for "doctor" and "injury" for "illness". Additionally, one item ("I was satisfied with the

doctor's decision about what medicines I needed to take") was excluded due to the non-applicability of the item for athletic trainers. The MISS for Athletic Trainers (MISSAT) (See Appendix E) is a 25 item self-report questionnaire that measured injured athletes' satisfaction with athletic trainers. The MISSAT was composed of the three subscales: (1) cognitive, (2) affective, and (3) behavioral components of patient satisfaction. The cognitive, affective, and behavioral subscales were comprised of 9, 9, and 7 items, respectively. The three subscales combined were totaled for a total patient satisfaction score. Participants responded to each item of the MISSAT using a 5-point Likert scale and rated each item according to whether they; (5) strongly agree, (4) agree, (3) uncertain, (2) disagree, or (1) strongly disagree with the statement. If the item is negatively worded, then reverse scoring is administered (items 16, 17, 20, 22, 23, and 24).

MISSAT Alpha and test-retest reliabilities

Because modifications were made to an already existing scale, reliability and validity analyses were completed on a pilot study sample of 71 male and female athletes (See Table 2). An acceptable level of internal consistency of the MISSAT was found (i.e., Cronbach's α as 0.78, 0.79, 0.85, and 0.91 for the cognitive, affective, behavioral subscales and the total scale, respectively). Interscale correlations ranged from 0.62 to 0.80 suggesting a similar degree of overlap between scales as was found for the original MISS (Wolf et al., 1978). Furthermore, using a Pearson Product Moment correlation, the test-retest reliability ($N = 67$) for the MISSAT from one-week post injury to one-month post injury for the cognitive, affective, behavioral subscales and the total scale,

respectively, were as follows: (1) $r = 0.64$ ($p < 0.001$), (2) $r = 0.681$ ($p < 0.001$), (3) $r = 0.634$ ($p < 0.001$), and (4) $r = 0.730$ ($p < 0.001$).

Concurrent and Construct Validities

In addition to completing the MISSAT self-report, athletes were asked, "How satisfied have you been with the sports medicine staff?" Athletes responded to a 7-point Likert scale with the anchors ranging from (0) "not at all satisfied" to (6) "very satisfied". There were 39 subjects who responded to both measurements. The single-item measurement was correlated with the MISSAT subscales and total scores to examine concurrent validity. Statistical analyses indicated significant correlations between the one-item question and the MISSAT cognitive ($r = 0.47$, $p = .003$), affective ($r = 0.49$, $p = .001$), behavioral ($r = 0.46$, $p = .003$), and the total ($r = 0.56$, $p < .001$) scales.

Next, a panel of experts ($N = 5$) familiar with the psychology of sport injury was consulted regarding the item content of the MISSAT subscales. Three certified athletic trainers who have attended a psychology of sport injury workshop or class, and two psychologists with expertise in the psychology of athletic injury were each sent a copy of the MISSAT items. The items were randomly listed. The panel was asked to rate each item for its written clarity and ambiguity on a 5-point Likert scale and to designate which scale they believed the item would be best categorized according to the definition of each subscale provided (See Appendix F). The majority of the panel had agreement on 20 of the 25 items for categorization. The panel had disagreement on three affective and two behavioral items (Wolf et al., 1978). Overall, the results appeared to show panel agreement with 80% of all items on the scale. Additionally, the ratings demonstrated

acceptable levels of written clarity ranging from 3.80 to 4.80 on the 25 items. These results indicate that the MISSAT had acceptable content validity.

An exploratory factor analysis was considered to classify items of an instrument that may have subscales present. However, it has also been recommended that a factor analysis should not be used when the sample number is low (Fabrigar, Wegener, MacCallum, & Strahan, 1999; Ford, MacCallum, & Tait, 1986). Because this sample did not meet the minimum requirement (a ratio of 5 participants per item and not less than 100) a factor analysis was not used with this particular sample (Fabrigar et al., 1999; Ford et al., 1986).

Administrative Procedures

Following approval by the West Virginia University (WVU) Institutional Review Board for the Protection of Human Subjects (See Appendix G), the sports medicine staff at each participating institution was contacted prior to the first practice at each institution. The researcher met with the athletic training personnel and explained the study and eligibility criteria. The ATCs approached the athletes who met study eligibility criteria ($\underline{N} = 48$) and ascertained their willingness to participate in the study. Next, the researcher contacted interested athletes ($\underline{N} = 41$) and scheduled an interview. The researcher asked the athlete to complete the informed consent (See Appendices A and B) and the MISSAT. The directions for completing the questionnaire and any inquiries that the athlete had were explained by the researcher. The questionnaire took approximately 2 minutes to complete. Upon completion of the questionnaire, the researcher made an appointment for the one-month post injury follow-up, verified the contact number, and compensated the athlete $5.00 (See Appendix H) for each session the athlete completed.

Additionally, the researcher hand delivered the dated SIRAS to the sports medicine staff who was responsible for the injured athlete's rehabilitation program. The researcher asked the sports medicine staff member to return the completed SIRAS form as soon as possible and to report only on the days from the time of injury to the time of the interview. In order to maintain confidentiality, all SIRAS forms were returned in a sealed envelope or directly to the researcher. It should be noted that each sports medicine staff member received instructional sessions on how to use the SIRAS rating forms prior to the start of the study and again when they used the SIRAS for the first time. The researcher was also available for weekly consultation regarding completion of SIRAS forms.

Research Hypotheses

Based on previous empirical and anecdotal literature, the following hypotheses were generated.

1. Injured male athletes will be more satisfied with athletic trainers than injured female athletes.
2. Season ending injured athletes will be more satisfied than the non-season ending injured athletes.
3. There will be a positive concurrent correlation between rehabilitation adherence and patient satisfaction at each time point (e.g., one-week and one-month post interview).
4. There will be a positive concurrent correlation between rehabilitation compliance and patient satisfaction at each time point (e.g., one-week and one-month post interview).

5. Patient satisfaction scores at one-week post injury will be prospectively related to rehabilitation adherence at one-month post injury.
6. Patient satisfaction scores at one-week post injury will be prospectively related to rehabilitation compliance at one-month post injury.

Data Analysis

Preliminary analysis included descriptive statistics for the independent (gender and injury severity) and dependent variables (patient satisfaction, rehabilitation adherence, rehabilitation compliance). Preliminary correlations were also conducted to determine if race, school, or age should be used as covariates in subsequent ANOVAs or as control variables in multiple regression models. A two-way (gender x injury severity) ANOVA was used to measure significant differences among injured athletes satisfaction ratings based on (1) gender, and (2) injury severity. Pearson Product Moment correlations were conducted to evaluate the correlation between (1) rehabilitation adherence and patient satisfaction, and (2) rehabilitation compliance and patient satisfaction. Correlations were also used to determine the degree to which patient satisfaction scores deviated from one-week to one-month post injury. A multiple regression was used to predict (1) rehabilitation adherence, and (2) rehabilitation compliance at one-month post injury based on the patient satisfaction scores at one-week post injury.

Primary analyses for patient satisfaction were analyzed using the total MISSAT score because specific subscales of the MISS have not been evaluated as to their relationship to rehabilitation adherence or compliance. Supplemental analyses examined the association of specific subscales with rehabilitation adherence and compliance.

All analyses were adjusted for unequal cell sizes using the SPSS 10.0, Inc. statistical software program. To test the statistical significance of all hypotheses, the alpha level was set at .05.

CHAPTER IV

ANALYSIS OF DATA

The following chapter includes information on the sociodemographic variables associated with patient satisfaction and if patient satisfaction changes over time. Additionally, the relationships of patient satisfaction on rehabilitation adherence and compliance one-week and one-month post injury were analyzed. This chapter is divided into the following sections: (1) descriptive statistics; (2) hypotheses testing; and (3) additional findings.

Descriptive Statistics

A majority (62.2%) of the sample was comprised of male injured athletes with a mean age of 19.54 (SD = 2.27). Nearly three-fourths of the injured athletes were starters for their respective teams (e.g., football, basketball, soccer, volleyball, wrestling, and track) and over half of the injured athletes were Caucasian (59.5%). Additionally, the sample represented athletes with season ending (54.1%) and non-season ending (45.9%) injuries (see Table 1). Ninety-four percent (16) of the injured athletes were classified into the non-season ending (NSE) group returned to full participation one month following their injury. In contrast, only 5% (1) of the injured athletes in the season-ending (SE) group returned to full participation one month following their injury. A majority (47%) of the injured athletes classified in the NSE group were injured during the middle of their competitive season. Additionally, 29%, 18%, and 6% of the NSE group were injured at the beginning, end, and post season, respectively. In comparison, 30%, 25%, 25%, 15%, and 5% of the SE group were injured post, beginning, middle, end, and

pre season, respectively. Finally, 20% of SE group retired from football (3), basketball (1), and soccer (1) (see Table 3).

The pilot sample (N = 71) computed for MISSAT Cronbach's α as 0.78, 0.79, 0.85, and 0.91 for the cognitive, affective, behavioral subscales and the total scale, respectively. Although slightly lower, an acceptable level of internal consistency of the MISSAT for the current sample (N = 37) was also found (i.e., Cronbach's α as 0.70, 0.80, 0.80, and 0.88 for the cognitive, affective, behavioral subscales and the total scale, respectively).

In general, patient satisfaction scores (M = 4.38, SD = .41), adherence scores (M = .95, SD = .11), and compliance scores (M = 12.69, SD = 2.54) at one-week post athletic injury were similar to patient satisfaction scores (M = 4.33, SD = .56), adherence scores (M = .85, SD = .25), and compliance scores (M = 12.63, SD = 2.9) at one-month post injury (r's = .67, r's = .48, r's = .65, respectively, p's < .01) (See Table 4 and Table 5).

Preliminary analyses did not find race, age, or school statistically significantly correlated with any of the independent variables (gender, injury severity) or dependent variables (patient satisfaction, rehabilitation adherence, rehabilitation compliance) (See Table 5). Therefore, it was not necessary to use either of these factors as a control or covariate in subsequent analyses.

All regression models were checked for collinearity using tolerance and variance inflation factor (VIF) diagnostic tests available with SPSS 10.0 statistical analyses software. All tests for collinearity were satisfied, and no violations were found (e.g., tolerance was > .2 and VIF < 2.0) for all multiple regression analyses.

Hypotheses Testing

Hypotheses 1 & 2

Hypothesis 1 stated that injured male athletes would be more satisfied with athletic trainers than injured female athletes and hypothesis 2 stated that season ending injured athletes would be more satisfied than the non-season ending injured athletes. A two way (gender x injury severity) ANOVA was used to determine the significant differences among injured athletes' satisfaction based on (1) gender, and (2) injury severity at each time point (one-week post injury and one-month post injury).

Mean patient satisfaction for female athletes in the season ending group was $\underline{M}$ = 4.33, $\underline{SD}$ = .45 and $\underline{M}$ = 4.65, $\underline{SD}$ = .30 in the non-season ending group one-week post injury. Comparatively, mean patient satisfaction for male athletes in the season ending group was $\underline{M}$ = 4.37, $\underline{SD}$ = .32 and $\underline{M}$ = 4.26, $\underline{SD}$ = .50 in the non-season ending group at one-week post injury. No statistically significant differences were found between gender or injury severity groups at one-week post injury, and there were no significant interaction effects (See Table 6 and Figure 4).

Mean patient satisfaction for women athletes in the season ending group was $\underline{M}$ = 4.61, $\underline{SD}$ = .23 and $\underline{M}$ = 4.6, $\underline{SD}$ = .43 in the non-season ending group one-month post injury. However, mean patient satisfaction for male athletes in the season ending group was $\underline{M}$ = 4.17, $\underline{SD}$ = .58 and $\underline{M}$ = 4.23, $\underline{SD}$ = .67 in the non-season ending group were significantly lower than the female athletes $\underline{F}_{(1,31)} = 4.23$, $\underline{p} < .05$ one-month post injury. There were no significant injury group or injury by gender interaction effects (See Table 7 and Figure 5).

Conclusions: Hypothesis 1 and 2 were not supported at either post injury time point. However, in contrast to hypotheses, female athletes had significantly greater patient satisfaction one-month post injury than did male athletes (See Figure 5).

Hypotheses 3 & 4:

Hypothesis 3 stated that there would be a positive concurrent correlation between rehabilitation adherence and patient satisfaction at each post injury time point (e.g., one-

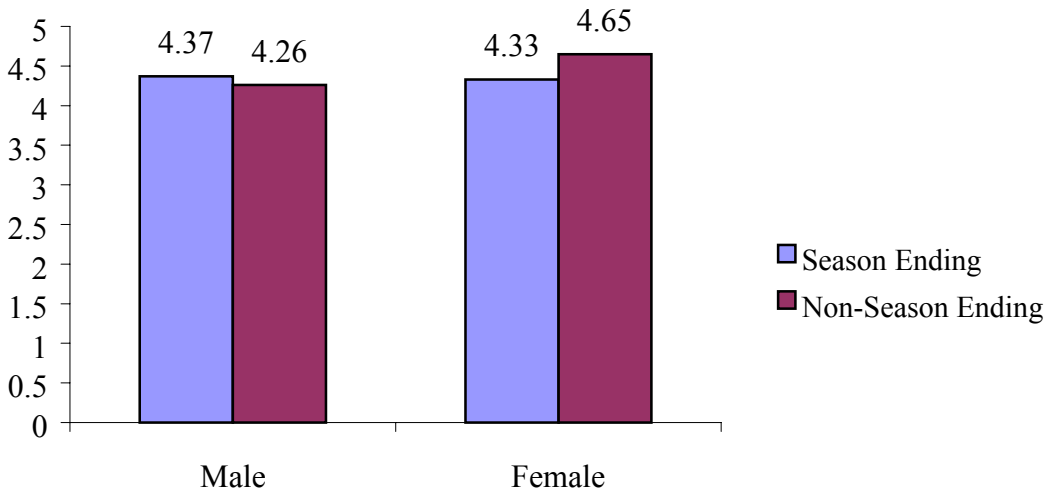

Figure 4. Mean Patient Satisfaction Scores for Male (N = 20) and Female (N = 12) Injured Athletes One-Week Post Injury

week and one-month post injury). Hypothesis 4 stated that there would be a positive concurrent correlation between rehabilitation compliance and patient satisfaction at each post injury time point (e.g., one-week and one-month post injury).

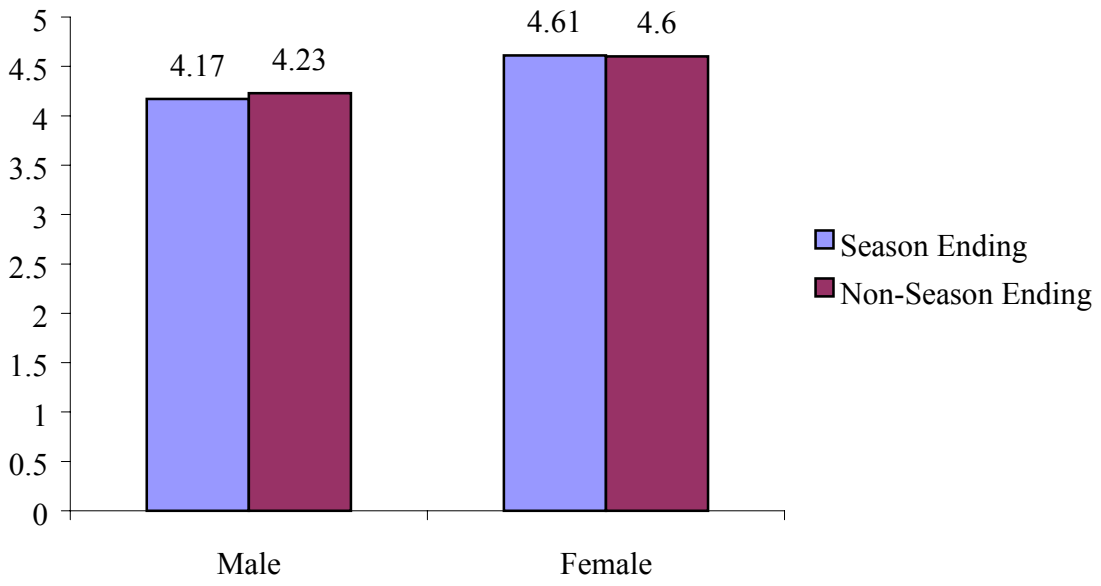

Figure 5. Mean Patient Satisfactions Scores for Male (N = 23) and Female (N = 12) Injured Athletes One-Month Post Injury

Pearson Product Moment correlations were used to evaluate the correlations between (1) patient satisfaction and rehabilitation adherence, and (2) patient satisfaction and rehabilitation compliance at each post injury time point (i.e., one-week and one-month post injury). The results indicated that patient satisfaction one-week post injury were significantly positively correlated with: (1) rehabilitation compliance ($r = .404$, $p < .05$) at one-week post injury, (2) patient satisfaction scores ($r = .669$, $p < .01$) one-month post injury, and (3) rehabilitation compliance ($r = .386$, $p < .05$) one-month post injury. Additionally, patient satisfaction one-month post injury was positively significantly correlated with rehabilitation compliance ($r = .347$, $p < .05$) one-month post injury.

Significant positive correlations were also found between: (1) rehabilitation adherence one-week post injury and rehabilitation adherence one-month post injury ($r =$

.483, $p < .01$), and (2) rehabilitation compliance one-week post injury and rehabilitation compliance one-month post injury ($r = .647$, $p < .01$) (See Table 5).

Conclusions: Hypothesis 3 was not supported at either post injury time point. However, hypothesis 4 was supported at each post injury time point. There was a positive concurrent relationship between patient satisfaction and rehabilitation compliance at each post injury time point (i.e., one-week and one-month). Thus, the results indicated injured athletes with higher satisfaction scores also had better quality of effort scores (compliance scores) at each time point.

Hypotheses 5 & 6:

Hypothesis 5 stated that patient satisfaction at one-week post injury would be prospectively related to rehabilitation adherence at one-month post injury and hypothesis 6 stated that patient satisfaction scores at one-week post injury would be prospectively related to rehabilitation compliance at one-month post injury.

The results of bivariate correlations reported above provided partial support for hypothesis 6 in that patient satisfaction at one-week post injury did predict compliance at one-month post injury. In contrast, bivariate correlations did not support hypothesis 5. However, it was important to determine if patient satisfaction could prospectively predict rehabilitation adherence and compliance when other variables were considered in combination.

Therefore, a multiple regression was used to predict rehabilitation adherence and rehabilitation compliance one-month post injury. Patient satisfaction, gender, and injury severity were used as predictor variables for patient adherence one-month post injury (dependent variable) and a multiple regression analysis revealed that there was no

significant association for the set of predictor variables on rehabilitation adherence one-month post injury ($F_{(3, 25)} = 1.76$, $p > .05$) (See Table 8). However, when patient satisfaction, gender, and injury severity were used to predict rehabilitation compliance one-month post injury then the results indicated that the set of predictors were significantly associated with rehabilitation compliance at one-month post injury ($F_{(3, 25)} = 4.74$, $p < .01$) and account for approximately 29% of the variance (See Table 9).

The most important predictor was injury severity, which accounted for 15% of the variance. There was a direct negative relationship between injury severity and rehabilitation compliance one-month post injury suggesting that rehabilitation compliance one-month post injury scores decreased by 2.404 points for the season ending injury group. Therefore, athletes who were out of participation for at least one month were 16% less compliant one-month post injury. Although patient satisfaction one-week post injury was only moderately significant, patient satisfaction one-week post injury accounted for 10% of the variance explained.

Conclusions: Hypothesis 5 was not supported, however hypothesis 6 was partially supported. Patient satisfaction, gender, and injury severity accounted for approximately 29% of the variance in rehabilitation compliance. Only injury severity contributed significantly to predicting rehabilitation compliance one-month post injury, patient satisfaction at one-week post injury was a moderately significant predictor of rehabilitation compliance at one-month post injury.

Additional Findings

In addition to the hypotheses testing, supplementary statistical analyses were performed. The researcher indicated that gender concordance between care provider and patient was important. Therefore, it is possible that results may be skewed if there were a difference in gender concordant pairs among athletes at different points in treatment. Chi-square analyses at one-week post injury indicated that among the injured female athletes, 53% were cared for by female ATCs (gender concordant pairs) and among the injured male athletes 47% were treated by male ATCs (gender concordant pairs) ($\chi^2_{(1, N = 31)} = 1.873$, $\underline{p} > .10$). However, at one-month post injury nearly three-fourths of the injured female athletes were treated by female ATCs, but only 42.9% of injured male athletes were treated by male ATCs ($\chi^2_{(1, N = 32)} = 23.938$, $\underline{p} < .05$). These results indicated that injured female athletes were more likely to be treated by female ATCs than were male athletes by male ATCs at the one-month post injury time point. This could explain why female injured athletes had greater patient satisfaction scores than male injured athletes did at one-month post injury.

Although not a specific focus of the study, data regarding relative rates of rehabilitation adherence and compliance are of interest to clinical sport psychologists and ATCs. For this reason, two supplemental analyses were done. First, adherence and compliance one-week post injury were moderately correlated with adherence and compliance one-month post injury, $\underline{r}$'s = .48 and .65, $\underline{p}$'s < .01, respectively, which suggested that athletes who are adherent and compliant early in rehabilitation tended to remain so at a later point. However, the correlation coefficient does not provide an indication of the relative rate of adherence and compliance over time. Therefore, an

additional analysis was done. Adherence scores were generally high, but repeated measures ANOVA indicated that there was a marginal statistical difference in rehabilitation adherence between one-week (M = 96%, SD = 10%) and one-month (M = 89%, SD = 23%) post injury $F_{(1,27)} = 3.02$, $p < .10$. In contrast, rehabilitation compliance scores were not statistically significantly different between one-week (M = 12.73, SD = 2.6) and one-month (M = 12.84, SD = 3) post injury. These results indicated that injured athletes maintained the quality of effort throughout rehabilitation, regardless of the number of appointments kept.

Similarly, because there was a gender difference in patient satisfaction was found at one-month post injury, it was important to establish that patient satisfaction remained relatively stable from one-week to one-month post injury, (M = 4.39, SD= .39) and (M = 4.34, SD= .58), respectively, $F_{(1,30)} = .412$, $p > .10$. The results suggested that the patient satisfaction scale is a consistent measure, and that the gender differences could not readily be classified as a spurious finding due to the instability of the measure. Patient satisfaction at one-week post injury was also highly correlated with patient satisfaction at one-month post injury, $r = .67$, $p < .01$.

Athletes who start for a team may feel they have more investments in sports (e.g., scholarship, draft for professional leagues) and may be more motivated to return to competition than athletes who do not start (non-starter). Consequently, an injured athlete's playing status (starter vs. non-starter) may influence rehabilitation adherence or compliance. Therefore, a multiple regression analysis, controlling for team playing status, injury severity, and patient satisfaction one-week post injury (predictor variables) was used to assess rehabilitation adherence and rehabilitation compliance one-month post

injury (criterion variables). Results indicated that the combined factors did not significantly contribute to rehabilitation adherence one-month post injury ($F_{(3,31)} = 2.202$, $p > .05$). However, the combined factors contributed significantly ($p < .01$) to rehabilitation compliance one-month post injury and accounted for 43% of the variance (See Table 10). Specifically, playing status ($p = .008$) and injury severity ($p = .023$) and patient satisfaction one-week post injury ($p = .021$) contributed significantly to predicting rehabilitation compliance one-month post injury.

The most important predictor of rehabilitation compliance one-month post injury was the team playing status with 15% of the variance explained. For example, rehabilitation compliance one-month post injury decreased by nearly 18% when the athlete was a non-starter. The second most important predictor for rehabilitation compliance one-month post injury was patient satisfaction ratings. Rehabilitation compliance increased by 15% when the athlete had favorable patient satisfaction ratings. The third most important predictor for rehabilitation compliance one-month post injury was injury severity. Rehabilitation compliance decreased by 12% when the athlete incurred a season ending injury.

Patient Satisfaction Subscale Analysis

Although overall patient satisfaction one-week post injury was not significantly related to rehabilitation adherence one-month post injury, the patient satisfaction affective subscale one-week post injury ($r = .428$, $p < .05$) and the patient satisfaction behavioral subscale one-week post injury ($r = .446$, $p < .05$) were correlated with patient adherence one-month post injury (See Table 11). The bivariate correlation suggested that there was a relationship between patient adherence one-month post injury and the

patient satisfaction affective and behavioral subscales, respectively. Multiple regression analysis using the patient satisfaction affective subscale one-week post injury was a significant predictor when the affective subscale and injury severity were used as predictor variables, which accounted for 17% of the variance (See Table 12). These results indicated that the athlete's perception of the rehabilitation relationship (affective subscale) during the first week following injury was associated with the number of therapy sessions the athlete attended one-month following injury.

With similar variance accounted for (18%), using the patient satisfaction behavioral subscale one-week post injury and injury severity, a multiple regression analysis reported a significant correlation with patient satisfaction behavioral subscale and patient adherence one-month post injury (See Table 13). Therefore, how the athletes' rated the professional behaviors, examinations, competencies and treatments the ATCs used (behavioral subscale) during the first week following injury, and the severity of the injury was important to the quality of effort the injured athlete put forth one-month post injury. Specifically, more severely injured athletes who had high ratings on the behavioral subscale of patient satisfaction at one-week post injury were associated with rehabilitation attendance (adherence) one-week post injury.

Bivariate correlations also indicated a positive relationship between patient compliance one-month post injury and patient satisfaction affective subscale ($\underline{r} = .462$, $\underline{p} < .05$) and patient satisfaction behavioral subscale ($\underline{r} = .608$, $\underline{p} < .01$), respectively. Multiple regression analysis using the patient satisfaction affective subscale one-week post injury was a significant predictor when the affective subscale and injury severity were used as predictor variables, which accounted for 33% of the variance (See Table

14). Therefore, the athlete's perception of the rehabilitation relationship (affective subscale) during the first week following injury and the severity of the injury was important to the quality of effort the injured athlete put forth one-month post injury. Specifically, less severely injured athletes who have high perceptions of their rehabilitation relationship with the ATC at one-week post injury were associated with rehabilitation quality of effort (compliance) one-week post injury.

The most important predictor for rehabilitation compliance one-month post injury was the behavioral subscale (professional behaviors, examinations, competencies and treatments ATCs used) one-week post injury with 47% of the variance explained when the patient satisfaction behavioral subscale one-week post injury and injury severity were used for predictor variables in a multiple regression (See Table 15). Therefore, how the athletes' rated the professional behaviors, examinations, competencies and treatments the athletic trainers exhibited were important to the quality of effort the injured athlete put forth one-month post injury. Specifically, less severely injured athletes who had higher ratings of the professional behaviors, examinations, competencies and treatments the ATCs used at one-week post injury were associated with rehabilitation quality of effort (compliance) one-month post injury.

Overall, patient compliance increased by 17% for less severely injured athletes who had favorable ratings of their relationship with the ATC during treatment (affective subscale). Additionally, patient compliance increased 27% for less severely injured athletes who had favorable ratings of the professional behaviors, examination, competency and treatment the ATCs used (behavioral subscale) for the patient.

Furthermore, patient adherence increased by only 1% for less severely injured athletes who had favorable ratings of their relationship with the ATC during treatment (affective subscale) and 2% increase who had favorable ratings of the professional behaviors, examinations, competencies and treatments the ATCs used (behavioral subscale) for the patient. These results suggest that patient satisfaction, specifically the behavioral subscale, one-week post injury was associated with patient compliance (quality of effort).

CHAPTER V

Discussion

This study focused on injured athletes' satisfaction with ATCs following an acute athletic injury. Additionally, the study evaluated the relationship of patient satisfaction with rehabilitation adherence and rehabilitation compliance. First, it was hypothesized that injured male athletes have higher patient satisfaction than injured female athletes. No support for this hypothesis was found. In contrast, injured female athletes were significantly more satisfied than injured male athletes with their athletic trainer one-month post injury. However, this finding must be qualified in that women athletes were more likely to be treated by women ATCs and patient satisfaction tended to be higher when patients and treatment providers were gender concordant. Second, it was hypothesized that season ending injured athletes would be more satisfied than the non-season ending injured athletes. No support for this hypothesis was found. Third, as hypothesized, patient satisfaction scores at one-week post injury were highly correlated with scores at one-month post injury. Next, it was hypothesized that there would be a positive concurrent correlation between rehabilitation adherence and patient satisfaction at each time point (e.g., one-week and one-month post interview) and a positive concurrent correlation between rehabilitation compliance and patient satisfaction at each time point (e.g., one-week and one-month post interview). Although there was no support for the hypothesis of concurring patient satisfaction and rehabilitation adherence at either time point (e.g., one-week and one-month), there was a positive concurrent relationship between patient satisfaction and rehabilitation compliance at each post injury time point (e.g., one-week and one-month). Finally, it was hypothesized that patient

satisfaction scores at one-week post injury would be prospectively related to rehabilitation adherence and rehabilitation compliance at one-month post injury. The hypothesized prospective relationship between patient satisfaction one-week post injury and rehabilitation adherence one-month was not supported. However, patient satisfaction one-week post injury was significantly associated with patient compliance one-month post injury, but the effect of patient satisfaction and compliance was lessened when gender and injury severity were controlled for in multiple regression analyses.

Similar to other athletic injury patient satisfaction studies, injured athletes generally reported high satisfaction scores with their ATC (Albohm & Wilkerson, 1999; Taylor & May, 1995; Unruh, 1998). Unlike other athletic injury patient satisfaction studies, injured athletes were highly satisfied at each post injury time point. However, injured female athletes were significantly more satisfied with the professional behaviors, examinations, competencies and treatments ATCs provided (behavior subscale) than their male counterparts at one-month post injury. This finding was somewhat inconsistent with the general patient satisfaction literature, which indicated that the gender of the patient was not related to patient satisfaction (Cooper-Patrick et al., 1999). Moreover, the finding is in contrast to Taylor and May's (1995) results that reported male athletes were more satisfied with their physiotherapists' competence than their female counterparts. However, the apparent inconsistency of these results with prior literature may be partially explained by the gender concordance between ATCs and injured athletes in this study.

The ATC and patient gender concordant pairs were analyzed by a Chi square analysis. The results indicated that there was a significant relationship between gender of the patient and gender of the ATC, but only at the one-month post injury time point.

Similar to the general medical literature regarding the importance of gender concordance between patient and treatment provider, the results suggested that gender concordance between ATCs and injured athletes might influence patient satisfaction with respect to rehabilitation of athletic injury (Cooper-Patrick et al., 1999).

After controlling for gender and injury severity, patient satisfaction one-week post injury was a marginally significant predictor of rehabilitation compliance one-month post injury (e.g., accounted for 29% of compliance variance). A positive association indicated that greater patient satisfaction scores one-week post injury would predict greater rehabilitation compliance scores one-month post injury. Further, while controlling for gender and patient satisfaction one-week post injury, injury severity was significantly inversely related to rehabilitation compliance at one-month post injury. Therefore, greater rehabilitation compliance at one-month post injury was associated with less severe injury [e.g., athletes categorized in the non-season ending (NSE) group 7 or more days, but less than one month, of non-participation]. It is possible that the non-season ending injured athletes were more likely to exercise with a positive quality of effort because they believed that, with hard work, they could soon return to competition, whereas the season ending injured athletes were more physically damaged, had more requirements, and knew their recovery may not occur for some time. Accordingly, the season-ending injured athletes had lower quality of effort ratings. However, further research regarding the beliefs of severely injured athletes is necessary to empirically support this position.

In contrast, no variable was significantly related to rehabilitation adherence one-month post injury, thus suggesting that overall patient satisfaction scores one-week post injury, gender, or injury severity did not have a positive association with rehabilitation

adherence one-month post injury. Considering the data on rehabilitation adherence and compliance together, the results suggested that compliance (e.g., quality of effort) rather than adherence (e.g., quantity of appointments) could have been more affected by psychosocial, demographic, and injury-related factors.

Because patient adherence and compliance were positively correlated one-month post injury ($r = .523$, $p < .01$), bivariate correlations between the patient adherence and compliance one-month post injury and each subscale of the MISSAT one-week post injury were investigated. Although there was not a correlation between overall patient satisfaction one-week post injury and patient adherence one-month post injury, supplemental analyses indicated that two specific patient satisfaction subscales (affective and behavior) one-week post injury were correlated with patient adherence one-month injury. Regression analyses further indicated that, while controlling for injury severity, how the athlete felt about the care received (affective subscale) and the professional behaviors, examinations, competencies and treatments the ATC used (behavior subscale) were related to the quantity of attendance (adherence) one-month post injury which accounted for 17% and 18% of the variance, respectively. Additionally, the affective subscale and behavior subscale, while controlling for injury severity, were related to the quality of effort (compliance) one-month post injury, which accounted for 33% and 47% of the variance, respectively.

These findings may suggest that how the injured athlete initially perceived the care (affective) from the ATC and the professional behaviors, examinations, competencies and treatments the ATC used (behavior) were more important than what the injured athletes were told by the ATC (cognitive) would later ensure the quantity of

appointments (adherence). This does not mean that being informed of the injury, treatment, or prognosis is not important, but it could mean that the information or explanation and how that information was delivered during the first week of rehabilitation was not enough.

These findings could have also suggested that the cognitive subscale actually detracted from the MISSAT overall ability to predict. This could be for several reasons. During the first week of rehabilitation there may be little variability in the athlete's cognitive comprehension of the injury or recovery process. Also, there may be error due to the fact of the various injuries (heterogeneous) included in the sample. Therefore, it could have been relatively easier (or harder) to explain some injuries and rehabilitation protocols than others, which would have been reflected in the cognitive score. Furthermore, if there was little internal consistency of the MISSAT and its subscales, then one might conclude that subscale instability was responsible for the discrepancy found. However, satisfactory internal consistency levels of the MISSAT (Cronbach's α .78, .79, .85, and .91 for the cognitive, affective, and behavior subscales, and total scale, respectively) were quite high. The fact that the cognitive subscale was not as stable as affective and behavior subscales suggested that the differences in correlation between adherence and affective subscale vs. adherence and cognitive subscale are genuine and not artificial from an unstable scale. Hence, the affective and behavior subscales seemed to be uniquely important and distinct from the cognitive subscale as far as predicting rehabilitation adherence and compliance.

Supplemental analyses also suggested team playing status may have affected compliance. After controlling for injury severity and patient satisfaction one-week post

injury, athletes who started on the team were more likely to have higher rehabilitation compliance scores one-month post injury than non-starters. In contrast, playing status was unrelated to rehabilitation adherence at one-month post injury. This finding is partially consistent with the position that starters may have believed that more was at stake for them than non-starters. However, starting status would be expected to have correlated with both rehabilitation adherence and compliance. Again, further research concerning the beliefs of injured starters and non-starters is necessary to support this position.

Interestingly, rehabilitation adherence and compliance have been used interchangeably in the general literature; yet have been measured differently (Bartlett et al., 1984; DiMatteo et al, 1986; Holm et al., 1985; Safran et al., 1998). However, rehabilitation adherence and compliance were not highly correlated with one another (r's = .269 and .523; p's > .10 and < .01 one-week and one-month post injury, respectively). This data may suggest that although rehabilitation adherence and compliance were related, there was evidence to support that rehabilitation adherence and compliance should be addressed as separate components. These results support the notion that just because a patient/injured athlete attended a rehabilitation session did not guarantee that they put a great deal of effort into their rehabilitation. In contrast, if a patient/injured athlete did not attend a rehabilitation session it did not guarantee that they did not put a great deal of effort into their rehabilitation. Intuitively, an ATC may feel that the quality of effort (compliance) may be more important to recovery than quantity of attendance (adherence), however if the patient does not attend their scheduled rehabilitation sessions,

then it could become difficult for the care provider (ATC) to provide assistance toward recovery.

Limitations and Implications of the Findings

In comparison to other athletic injury studies (Daly et al., 1995; Duda et al., 1989; Fisher et al., 1988; Lampton et al., 1993; Laubach et al., 1996), the sample size for this research study was small (N = 37). However, statistical significance was found using a variety of analyses for college and high school competitive athletes. Second, other studies of injured athletes' satisfaction with their health care provider (ATC or physiotherapist) have combined recreational and competitive athletes as samples (Albohm & Wilkerson, 1999; Taylor & May, 1995), taken patient satisfaction measures at one time point post injury (Albohm & Wilkerson, 1999; Taylor & May, 1995; Unruh, 1998), or surveyed athletes outside of the United States (Taylor & May, 1995).

Although age was not correlated with independent or dependent variables, because the same sample size was small, it cannot be ruled out the possibility that patient satisfaction and overall rehabilitation adherence and rehabilitation compliance would not be affected by age. Therefore, further research should continue to investigate this perception.

This study examined a heterogeneous injury group without jeopardizing the psychometrics of the patient satisfaction (MISSAT) or rehabilitation adherence and compliance (SIRAS) questionnaires that limited a threat to external validity (ecological) (Huck, Cormier, & Bounds, 1974). However, the sample for this study was specific to acutely injured athletes who were interviewed at two specific post injury time points (one-week and one-month). Other injury studies that evaluated patient satisfaction did

not control for acute or chronic injury (Albohm & Wilkerson, 1999; Taylor & May, 1995; Unruh, 1998), with surveys administered either at the end of the rehabilitation session (Albohm & Wilkerson, 1999) or directly following the first appointment with their physiotherapist (Taylor & May, 1995). Additionally, the latter did not specify the return date. Therefore, the survey could have been returned at any point during or following the athlete's therapy sessions (partial or full recovery of injury), whereas this study had specific time points following injury (one-week and one-month). However, it must be mentioned that a one-month post injury interview may not have been a suitable amount of time post injury for the season-ending injury group (out of participation for more than one month) because this was at the early stage of their recovery process.

Furthermore, to control for confounding variables that may be associated with combining recreational and competitive athletes as the sample group, the sample of this research study included only college and high school athletes. There was selection of sample biasing; therefore, the results limited the external validity of the study, especially to other regions of the country and other athletic populations. Although anytime volunteers are used, their responses may be different for people who choose not to participate. However, the likelihood of a volunteer effect was minimal because 85% of the athletes that met criteria participated in the one-week and one-month follow-up interviews.

The strengths of this study were the prospective study design, specific to an acutely injured college and high school athlete sample representing a variety of injuries.

Conclusion and Recommendations

In conclusion, there was support for gender differences in patient satisfaction ratings of the health care provider (ATC), which may have been explained by gender concordant pairs. Also, patient satisfaction appeared to be high among injured athletes and did not change significantly over time. However, the data was limited in that athletes were only assessed for one-month post injury. It is also possible that adherence and compliance may fluctuate on the basis of type of injury. Because this study used a heterogeneous injury group the data cannot be used to assess this possibility. Furthermore, patient satisfaction, athlete's playing status, and severity of injury appeared to have influenced rehabilitation compliance but not rehabilitation adherence. More specifically, injured athletes who were starters, had higher patient satisfaction scores, and had a NSE injury had greater rehabilitation compliance scores. Thus, these results suggested that personal factors (gender and injury severity) and situational factors (playing status and patient satisfaction) influenced rehabilitation compliance as proposed in the cognitive appraisal model of psychological response to sport injury (Daly et al., 1995; Wiese-Bjornstal et al., 1998).

With support of the cognitive appraisal model, it is important for the certified athletic trainer to understand each component and how they may influence rehabilitation adherence and compliance. For example, the way the injured athlete felt about the care received (affective subscale of MISSAT) and the way an ATC performed his/her duties (behavior subscale of MISSAT) during the rehabilitation session could have influenced the patient's quantity of attendance (adherence) as well as the overall quality of effort the athlete put forth (compliance), which in turn could have influenced recovery.

Research Recommendations

The researcher provided the following research and policy recommendations based on the conclusions. Implementations with respect to the results of this study warrant the following research recommendations:

1. The present study should be replicated using a larger sample size in order to generalize the results of this study to specific types of injuries;
2. The present study should be extended to 3 months or 1 year in order to follow up during the later stages of recovery for the season ending injured group;
3. Future research should analyze college athletes among the NCAA divisions throughout the United States in order to generalize acutely injured athletes' satisfaction with their health care provider (ATC);
4. Future research should analyze a larger sample of high school athletes in order to generalize acutely injured athletes' satisfaction with their health care provider (ATC);
5. Future research should prospectively analyze the total mood disturbance and coping resources and their influence on patient satisfaction, rehabilitation adherence and rehabilitation compliance using a heterogeneous injury group sample in order for all of the concepts of the model of psychological response to sport injury to be measured (Wiese-Bjornstal et al., 1998);
6. Future research should analyze patient satisfaction as a mediator variable on rehabilitation compliance; and
7. Future research should analyze the recovery outcome of injured athletes who are satisfied versus those who are not satisfied with their health care (ATCs).

Policy Recommendations

Implications with respect to the results of this study warrant the following policy recommendations:

1. Attendance (adherence) and quality of effort (compliance) should be measured separately;
2. Attendance (adherence) and quality of effort (compliance) should be accurately represented in the literature;
3. Definitions of attendance (adherence) and quality of effort (compliance) should be accurately taught in the athletic training environment;
4. ATCs should be informed and trained on concepts that are important in satisfaction ratings, which can influence the quality of effort (compliance) the injured athletes put forth during any rehabilitation program;
5. ATCs should be informed and trained on concepts that are important in satisfaction ratings, which can influence the attendance (adherence) of the injured athletes throughout any rehabilitation program; and
6. Increasing the knowledge of ATCs and students in accredited programs about patient satisfaction, rehabilitation adherence and rehabilitation compliance can be used as an intervention.

REFERENCES

Albohm, M., & Wilkerson, G. (1999). An outcomes assessment of care provided by certified athletic trainers. Journal of Rehabilitation Outcomes Measurement, 3(5), 51-56.

Arnheim, D. D., & Prentice, W. E. (1993). Principles of athletic training (9th ed.). St. Louis: Mosby.

Bartlett, E., Grayson, M., Barker, R., Levine, D., Golden, A., & Libber, S. (1984). The effects of physician communication skills on patient satisfaction; recall, and adherence. Journal of Chronic Disease, 37(9-10), 755-764.

Batchelor, C., Owens, D., Read, M., & Bloor, M. (1994). Patient satisfaction studies: Methodology, management and consumer evaluation. International Journal of Health Care Quality Assurance, 7(7), 22-30.

Becker, M., & Maiman, L. (1975). Sociobehavioral determinants of compliance with health and medical care recommendations. Medical Care, 13(1), 10-24.

Brewer, B., Van Raalte, J., Petitpas, A., Sklar, J., & Ditmar, T. (1995, September, 1995). A brief measure of adherence during sport injury rehabilitation sessions. Paper presented at The Association for the Advancement of Applied Sport Psychology, New Orleans, LA.

Brewer, B. W. (1994). Review and critique of models of psychological adjustment to athletic injury. Journal of Applied Sport Psychology, 6, 87-100.

Brewer, B. W. (1998). Adherence to sport injury rehabilitation programs. Journal of Applied Sport Psychology, 10, 70-82.

Brewer, B. W., Daly, J. M., Van Raalte, J. L., Petitpas, A. J., & Sklar, J. H. (1999). A psychometric evaluation of the rehabilitation adherence questionnaire. Journal of Sport & Exercise Psychology, 21(2), 167-173.

Brewer, B. W., VanRaalte, J. L., Petitpas, A. J., Sklar, J. H., & Ditmar, T. D. (1996). Internal consistency of multisession assessments of sport injury rehabilitation adherence (abstract). Journal of Applied Sport Psychology, 8, S161.

Bruce, T., Bowman, J., & Brown, S. (1998). Factors that influence patient satisfaction in the emergency department. Journal of Nursing Care Quality, 13(2), 31-37.

Buhrlen-Armstrong, B., de Jager, U., Schochat, T., & Jackel, W. (1998). Patient satisfaction in rehabilitation of musculoskeletal diseases--effect of patient characteristics, treatment, evaluation schedule and correlation with treatment outcome. Rehabilitation (Stuttgart), 37(Supplement), S38-S46.

Cameron, C. (1996). Patient compliance: recognition of factors involved and suggestions for promoting compliance with therapeutic regimens. Journal of Advanced Nursing, 24(2), 244-250.

Chen, C., Neufeld, P., Feely, C., & Skinner, C. (1999). Factors influencing compliance with home exercise programs among patients with upper-extremity impairment. American Journal of Occupational Therapy, 53(2), 171-180.

Chung, K., Hamill, J., Kim, H., Walters, M., & Wilkins, E. (1999). Predictors of patient satisfaction in an outpatient plastic surgery clinic. Annals of Plastic Surgery, 42(1), 56-60.

Comstock, L., Hooper, E., Goodwin, J., & Goodwin, J. (1982). Physician behaviors that correlate with patient satisfaction. Journal of Medical Education, 57(2), 105-112.

Cooper-Patrick, L., Gallo, J., Gonzales, J., Vu, H., Powe, N., Nelson, C., & Ford, D. (1999). Race, gender, and partnership in the patient-physician relationship. The Journal of the American Medical Association, 282(6), 583-589.

Daly, J. M., Brewer, B. W., VanRaalte, J. L., Petitpas, A. J., & Sklar, J. H. (1995). Cognitive appraisal, emotional adjustment, and adherence to rehabilitation following knee surgery. Journal of Sport Rehabilitation, 4, 23-30.

DiMatteo, M., Hays, R., & Prince, L. (1986). Relationship of physicians' nonverbal communication skill to patient satisfaction, appointment noncompliance, and physician workload. Health Psychology, 5(6), 581-594.

DiPalo, M. (1997). Rating satisfaction research: Is it poor, fair, good, very good, or excellent? Arthritis Care and Research, 10(6), 422-430.

Duda, J. L., Smarth, A. E., & Tappe, M. K. (1989). Predictors in rehabilitation of athletic injuries: An application of personal investment theory. Journal of Sport & Exercise Psychology, 11, 367-381.

Fabrigar, L., Wegener, D., MacCallum, R., & Strahan, E. (1999). Evaluating the use of exploratory factor analysis in psychological research. Psychological Methods, 4(3), 272-299.

Fick, D., Xakellis, G., & Gjerde, C. (1992). Expectations and satisfaction of runners with injury treatments. Family Practice Research Journal, 12(2), 141-146.

Fisher, A. C. (1990). Adherence to sports injury rehabilitation programmes. Sports Medicine, 9, 151-158.

Fisher, A. C., Domm, N. A., & Wuest, D. A. (1988). Adherence to sports-injury rehabilitation programs. The Physician and Sports Medicine, 16, 47-51.

Fisher, A. C., & Hoisington, L. L. (1993). Injured athletes' attitudes and judgments toward rehabilitation adherence. Journal of Athletic Training, 28(1), 48-54.

Fisher, A. C., Mullins, S. A., & Frye, P. A. (1993a). Athletic trainers' attitudes and judgments toward rehabilitation adherence. Journal of Athletic Training, 28(1), 43-47.

Fisher, A. C., Scriber, K. C., Matheny, M. L., Alderman, M. H., & Bitting, L. A. (1993b). Enhancing athletic injury rehabilitation adherence. Journal of Athletic Training, 28(4), 312-318.

Ford, J., MacCallum, R., & Tait, M. (1986). The application of exploratory factor analysis in applied psychology: A critical review and analysis. Personnel Psychology, 39, 291-314.

Goldman, L., Freidin, R., Cook, E., Eigner, J., & Grich, P. (1982). A multivariate approach to the prediction of no-show behavior in a primary care center. Archives in Internal Medicine, 142(3), 563-567.

Greenley, J., Young, T., & Schoenherr, R. (1982). Psychological distress and patient satisfaction. Medical Care, 20(4), 373-385.

Hall, J., & Dornan, M. (1988). Meta-analysis of satisfaction with medical care: Description of research domain and analysis of overall satisfaction levels. Sci Med, 27(6), 637-644.

Hall, J., & Dornan, M. (1990). Patient sociodemographic characteristics as predictors of satisfaction with medical care: A meta-analysis. Social Science & Medicine, 30(7), 811-818.

Hall, J., Milburn, M., & Epstein, A. (1993). A causal model of health status and satisfaction with medical care. Medical Care, 31(1), 84-94.

Hall, J., Milburn, M., Roter, D., & Daltroy, L. (1998). Why are sicker patients less satisfied with their *medical* care? Tests of two explanatory models. Health Psychology, 17(1), 70-75.

Hall, J., Roter, D., & Katz, N. (1988). Meta-analysis of correlates of provider behavior in medical encounters. Medical Care, 26(7), 657-675.

Hall, J., Roter, D., Milburn, M., & Daltroy, L. (1996). Patients' health as a predictor of physician and patient behavior in medical visits. Medical Care, 34(12), 1205-1518.

Holm, K., Fink, N., Christman, N., Reitz, N., & Ashley, W. (1985). The cardiac patient and exercise: A sociobehavioral analysis. Heart Lung, 14(6), 586-93.

Hsieh, M., & Kagle, J. (1991). Understanding patient satisfaction and dissatisfaction with health care. Health and Social Work, 16(4), 281-290.

Huck, S., Cormier, W., & Bounds, W. (1974). Reading statistics and research. New York: Harper Collins Publishers.

Hulka, B., Kupper, L., Daly, M., Cassel, J., & Schoen, F. (1975). Correlates of satisfaction and dissatisfaction with medical care: A community perspective. Medical Care, 13(8), 648-658.

Imanaka, Y., Araki, S., & Nobutomo, K. (1993). Effects of patient health beliefs and satisfaction on compliance with medication regiments in ambulatory care at general hospitals. Japan Jounal of Hygeine, 48(2), 601-611.

Keith, R. (1998). Patient satisfaction and rehabilitation services. Archives of Physical Medical Rehabilitation, 79(9), 1122-1128.

Kernohan, W., Dodd, F., Dowey, K., & McConnell, L. (1993). Patient assessment of treatment following knee injury. British Journal of Sports Medicine, 27(2), 131-134.

Klein, T. (1980). The problem of patient compliance. Headache, 20(1), 57-58.

Kohlmann, T., & Raspe, H. (1998). Measuring patient related outcome criteria in medical rehabilitation: how well do "indirect" and "direct" methods of measuring change agree? Rehabilitation (Stuttgart), 37(Supplement 1), S30-S37.

Lampton, C. C., Lambert, M. E., & Yost, R. (1993). The effects of psychological factors in sports medicine rehabilitation adherence. The Journal of Sports Medicine and Physical Fitness, 33, 292-299.

Larson, G. A., Starkey, C., & Zaichkowsky, L. D. (1996). Psychological aspects of athletic injuries as perceived by athletic trainers. The Sport Psychologist, 10, 37-47.

Laubach, W. J., Brewer, B. W., Van Raalte, J. L., & Petitpas, A. J. (1996). Attributions for recovery and adherence to sport injury rehabilitation. The Australian Journal of Science and Medicine in Sport, 28(1), 30-34.

Lazarus, R., & Folkman, S. (1984). Stress, appraisal, and coping. New York: Springer.

Ley, P. (1982). Satisfaction, compliance and communication. British Journal of Clinical Psychology, 21(Pt 4), 241-54.

Like, R., & Zyzanski, S. (1987). Patient satisfaction with the clinical encounter: Social psychological determinants. Social Science Medicine, 24(4), 351-357.

Mangelsdorff, D. (1979). Patient satisfaction questionnaire. Medical Care, 17(1), 86-90.

Merkel, W. (1984). Physician perception of patient satisfaction. Do doctors know which patients are satisfied? Medical Care, 22(5), 453-459.

Merkouris, A., Ifantopoulos, J., Lanara, V., & Lemonidou, C. (1999). Patient satisfaction: A key concept for evaluating and improving nursing services. Journal of Nursing Management, 7(1), 19-28.

Nagy, V., & Wolfe, G. (1984). Cognitive predictors of compliance in chronic disease patients. Medical Care, 22(10), 912-921.

Pascoe, G. (1983). Patient satisfaction in primary health care: A literature review and analysis. Evaluation and Program Planning, 6(3-4), 185-210.

Press, I. (1994). Patient satisfaction. Hospitals and Health Networks, 68(5), 60.

Safran, D., Taira, D., Rogers, W., Kosinski, M., Ware, J., & Tarlov, A. (1998). Linking primary care performance to outcomes of care. Journal of Family Practice, 47(3), 213-220.

Sanazaro, P. (1985). A survey of patient satisfaction, knowledge and compliance. The Western Journal of Medicine, 142(5), 703-705.

Sitzia, J., & Wood, N. (1997). Patient satisfaction: A review of issues and concepts. Social Science and Medicine, 45(12), 1829-1843.

Stiles, W., Putnam, S., Wolf, M., & James, S. (1979). Interaction exchange structure and patient satisfaction with medical interviews. Medical Care, 17(6), 667-681.

Suchman, A., Roter, D., Green, M., & Lipkin, M. (1993). Physician satisfaction with primary care office visits. Collaborative study group of the American Academy on physician and patient. Medical Care, 31(2), 1083-1092.

Taylor, A., & May, S. (1995). Development of a sports injury clinic athlete satisfaction scale for auditing patient perceptions. Physiotherapy Theory and Practice, 11, 231-238.

Taylor, A. H., & May, S. (1996). Threat and coping appraisal as determinants of compliance with sports injury rehabilitation: An application of protection motivation theory. Journal of Sport Sciences, 14, 471-482.

Treacy, S., Barron, O., Brunet, M., & Barrack, R. (1997). Assessing the need for extensive supervised rehabilitation following arthroscopic ACL reconstruction. The American Journal of Orthopedics, 26(1), 25-29.

Udry, E. (1997). Coping and social support among injured athletes following injury. Journal of Sport & Exercise Psychology, 19, 71-90.

Unruh, S. (1998). Perceptions of athletic training services by collegiate student athletes: A measurement of athlete satisfaction. Journal of Athletic Training, 33(4), 347-350.

Ware, J., & Snyder, M. (1975). Dimensions of patient attitudes regarding doctors and medical care services. Medical Care, 13(8), 669-682.

Wartman, S., Morlock, L., Malitz, F., & Palm, E. (1983). Patient understanding and satisfaction as predictors of compliance. Medical Care, 21(9), 886-891.

Weiss, M. R., & Troxel, R. K. (1986). Psychology of the injured athlete. Journal of Athletic Training, 21(2), 104-109, 154.

Wiese-Bjornstal, D., Smith, A., Shaffer, S., & Morrey, M. (1998). An integrated model of response to sport injury: Psychological and sociological dynamics. Journal of Applied Sport Psychology, 1(1), 46-69.

Wiese-Bjornstal, D. M., Smith, A. M., & LaMott, E. E. (1995). A model of psychologic responses to athletic injury and rehabilitation. Athletic Training: Health Care Perspectives, 1, 17-30.

Williams, B. (1994). Patient satisfaction: A valid concept? Social Science and Medicine, 38(4), 509-516.

Willis, J., & Campbell, L. (1992). Theoretical models of exercise behavior, Exercise Psychology (pp. 79-91). Champaign, zIL: Human Kinetics.

Willson, P., & McNamara, J. (1982). How perceptions of a simulated physician-patient interaction influence intended satisfaction and compliance. Social Science Medicine, 16(19), 1699-1704.

Wilson, B. (1995). Promoting compliance: The patient-provider partnership. Advances in Renal Replacement Therapy, 2(3), 199-206.

Wolf, M., Putnam, S., James, S., & Stiles, W. (1978). The medical interview satisfaction scale: Development of scale to measure patient perceptions of physician behavior. Journal of Behavioral Medicine, 1(4), 391-401.

Yarnold, P., Michelson, E., Thompson, D., & Adams, S. (1998). Predicting patient satisfaction: A study of two emergency departments. Journal of Behavioral Medicine, 21(6), 545-563.

Table 1

Demographics of Injured Sample

Category	Subcategory	N	Percentage of Sample
Gender	Male	23	62.2
	Female	14	37.8
Injury status	Season Ending	20	54.1
	Non-season Ending	17	45.9
Playing Status	Starter	27	73
	Non-starter	9	24.3
	Unknown	1	2.7
School	WVU	17	45.9
	CUP	12	32.4
	High School	8	21.6
Race	Caucasian	22	59.5
	Non-Caucasian	15	40.5
Sport	Football	14	37.8
	Basketball	10	27
	Soccer	7	18.9
	Volleyball	2	5.4
	Women's Track	1	2.7
	Men's Track	1	2.7

Table 2

Demographics of MISSAT Sample

Category	Subcategory	N	Percentage of Sample
Gender	Male	46	64.8
	Female	25	35.2
Injury Status	Control	31	43.7
	Season Ending	22	31
	Non-Season Ending	18	25.4
Playing Status	Starter	57	80.3
	Non-starter	12	16.9
	Unknown	2	2.8
Race	Caucasian	49	69
	African American	22	31
School	WVU	31	43.7
	CUP	21	29.6
	High School	19	26.8

Table 3

Time of Season Athletes Were Injured

Injury Severity	Season Injured	N	Percentage of Sample	Retired from Sport
Non Season Ending	Beginning	5	29.4	0
	Middle	8	47	0
	End	3	17.6	0
	Post	1	6	0
Season Ending	Beginning	5	25	2
	Middle	5	25	1
	End	3	15	0
	Pre	1	5	1
	Post	6	30	1

Note. Athletes who retired from their competitive sport represented Football (3), Basketball (1), and Soccer (1)

Table 4

Means and Standard Deviations (SD) of Age, Patient Satisfaction, Rehabilitation Adherence, & Rehabilitation Compliance

Category	Subcategory	N	Mean	SD
Age		37	19.54	2.27
Patient Satisfaction	One-Week Post Injury	32	4.38	.4125
	One-Month Post Injury	35	4.33	.5609
Adherence	One-Week Post Injury	31	.9499	.1068
	One-Month Post Injury	34	.8531	.2493
Compliance	One-Week Post Injury	31	12.6871	2.5366
	One-Month Post Injury	34	12.6324	2.9006

Note. Patient satisfaction: 1 (minimum) - 5 (maximum)
Adherence: 0 (minimum) - 1.00 (maximum)
Compliance: 3 (minimum) - 15 (maximum)

Table 5

Pearson Product Moment Correlations for Gender, Age, Race, School, Injury Severity, Patient Satisfaction, Rehabilitation Adherence and Rehabilitation Compliance One-Week (1W) and One-Month (1M) Post Injury

	1	2	3	4	5	6	7	8	9	10	11
1. Gender	-										
2. Age	.114	-									
3. Race	.190	.391*	-								
4. Injury Severity	.063	.150	-.012	-							
5. School	.131	-.716**	-.383*	-.145	-						
6. MISTOT 1W	-.207	-.220	-.127	-.066	.319	-					
7. ADHERE 1W	-.146	.036	.167	-.319	-.057	-120	-				
8. COMPLY 1W	-.264	.051	.093	-.432*	.104	.404*	.269	-			
9. MISTOT 1M	-.353*	-.201	-.167	-.084	.140	.669**	.031	.205	-		
10.ADHERE 1M	-.161	.038	-.259	-.282	-.015	.315	.483**	.544**	.054	-	
11.COMPLY 1M	-.331	.030	-.311	-.386*	.112	.386*	.167	.647**	.347*	.523**	-

* $p < .05$; ** $p < .01$

1. Gender
   0= female
   1= male

3. Race
   1= Caucasian
   2= minority

4. Injury Severity
   1= Non season Ending (NSE)
   2= Season Ending (SE)

5. School
   1= WVU
   2= CUP
   3= MHS
   4= UHS
   5= CBHS
   6= NMHS

6 & 9. MISTOT
   Total Satisfaction Scores
   1W= 1 Week Post Injury
   1M= 1 Month Post Injury

7 &10. ADHERE
   Attendance Scores
   1W= 1 Week Post Injury
   1M= 1 Month Post Injury

8 & 11. COMPLY
   Quality of Care Scores
   1W= 1 Week Post Injury
   1M= 1 Month Post Injury

Table 6

Two-way (gender x injury severity) ANOVA One-Week Post Injury

Source	df	Mean Square	F	Sig.	Eta Squared
Gender	1	.226	1.354	.254	.046
Injury Severity	1	8.694E-02	.521	.477	.018
Gender x Injury Severity	1	.349	2.089	.159	.069
Error	28	.167			

Note. The dependent variable is patient satisfaction one-week post injury

Table 7

Two-way (gender x injury severity) ANOVA One-Month Post Injury

Source	df	Mean Square	F	Sig.	Eta Squared
Gender	1	1.276	4.231	.048	.120
Injury Severity	1	5.881E-03	.020	.890	.001
Gender x Injury Severity	1	9.466E-03	.031	.861	.001
Error	28	.301			

Note. The dependent variable is patient satisfaction one-month post injury

Table 8

Regression of Rehabilitation Adherence One-Month Post Injury

Variable	B	SE B	β
Gender	-8.243E-03	.098	-.164
Injury Severity	-9.517E-02	.086	-.203
Patient Satisfaction			
One-week post injury	.156	.117	.257

Note. Dependent Variable: Adherence one-month post injury.
Predictor Variables: Patient Satisfaction one-week post injury, injury severity, gender
$R = .418$
$R^2 = .174$
Adjusted $R^2 = .075$
* $p < .05$

Table 9

Regression of Rehabilitation Compliance One-Month Post Injury

Variable	B	SE B	β
Gender	-1.371	1.135	-.207
Injury Severity	-2.404	.998	-.390*
Patient Satisfaction One-week post injury	2.474	1.352	.310**

Note. Dependent Variable: Compliance one-month post injury.
Predictor Variables: Patient Satisfaction one-week post injury, injury severity, gender
$R = .602$
$R^2 = .363$
Adjusted $R^2 = .286$
* $p < .05$
** $p < .10$

Table 10

Regression of Rehabilitation Compliance One-Month Post Injury

Variable	B	SE B	β
Playing Status	-2.629	.903	-.427**
Injury Severity	-1.804	.744	-.353*
Patient Satisfaction			
One-week post injury	2.355	.950	.362*

Note. Dependent Variable: Compliance one-month post injury.
Predictors: Patient Satisfaction one-week post injury, injury severity, playing status
$R = .702$
$R^2 = .493$
Adjusted $R^2 = .430$
* $p < .05$
** $p < .01$

Table 11

Pearson Product Moment Correlations for MISSAT One-Week (1W) Post Injury Subscales, Rehabilitation Adherence and Rehabilitation Compliance One-Month (1M) Post Injury

	1	2	3	4	5
1. MISSCG 1W	-				
2. MISSAF 1W	.540**	-			
3. MISSBE 1W	.341	.800**	-		
4. ADHERE 1M	-.101	.428*	.446*	-	
5. COMPLY 1M	-.097	.462*	.608**	.523*	-

Note.

1. MISSCG 1W = Cognitive Subscale of the MISSAT One-Week Post Injury
2. MISSAF 1W = Affective Subscale of the MISSAT One-Week Post Injury
3. MISSBE 1W = Behavior Subscale of the MISSAT One-Week Post Injury
4. ADHERE 1M = Attendance Scores One-Month Post Injury
5. COMPLY 1M = Quality of Care Scores One-Month Post Injury

*p < .05

**p < .01

Table 12

Regression of Rehabilitation Adherence One-Month Post Injury

Variable	B	SE B	β
Injury Severity	-9.770E-02	.081	-.209
Affective Subscale of Patient Satisfaction One-week post injury	.185	.077	.415*

Note. Dependent Variable: Adherence one-month post injury.
Predictors: Patient Satisfaction Affective subscale one-week post injury, and Injury Severity
$R = .476$
$R^2 = .227$
Adjusted $R^2 = .167$
* $p < .05$
** $p < .10$

Table 13

Regression of Rehabilitation Adherence One-Month Post Injury

Variable	B	SE B	β
Injury Severity	-8.878E-02	.081	-.189
Behavioral Subscale of Patient Satisfaction One-week post injury	.224	.091	.426*

Note. Dependent Variable: Adherence one-month post injury.
Predictors: Patient Satisfaction Behavioral subscale one-week post injury, and Injury Severity
$R = .484$
$R^2 = .234$
Adjusted $R^2 = .175$
* $p < .05$
** $p < .10$

Table 14

Regression of Rehabilitation Compliance One-Month Post Injury

Variable	B	SE B	β
Injury Severity	-2.477	.959	-.402*
Affective Subscale of Patient Satisfaction One-week post injury	2.568	.913	.437**

Note. Dependent Variable: Compliance one-month post injury.
Predictors: Patient Satisfaction Affective subscale one-week post injury, and Injury Severity
$R = .612$
$R^2 = .374$
Adjusted $R^2 = .326$
* $p < .05$
** $p < .01$

Table 15

Regression of Rehabilitation Compliance One-Month Post Injury

Variable	B	SE B	β
Injury Severity	-2.276	.857	-.369*
Behavioral Subscale of Patient Satisfaction One-week post injury	3.944	.962	.569**

Note. Dependent Variable: Compliance one-month post injury.
Predictors: Patient Satisfaction Behavioral subscale one-week post injury, and Injury Severity
$R = .710$
$R^2 = .504$
Adjusted $R^2 = .466$
* $p < .05$
** $p < .01$

APPENDIX A

Letter of Consent for College Athletes

School of Physical Education
West Virginia University
Athletic Coaching Education, Athletic Training, Physical Education,
Sport Behavior and Sport Management

CONSENT FORM

Psychological Distress and Coping Following Athletic Injury: Impact Upon Rehabilitation

Introduction: I, _____, have been invited to participate in this research study which has been explained to me by Dr. Perna or Dr. Stilger or their representative. This study is a joint effort between the West Virginia University (WVU) Athletic Training and Sport Psychology Programs and is supported by a WVU Faculty Senate Research Grant.

Purposes of the Study: The purposes of this study are to identify the role of psychological stress and to assess the extent and duration of psychological distress and its impact on rehabilitation among collegiate athletes experiencing an athletic injury.

Description of Procedures: I understand that, at pre-season, I may be asked to complete a 15-30 minute written survey packet asking about sources of stress in my life and how I cope with stress. If I become injured during the athletic season, athletic trainers will record and rate the severity of my injury and my compliance with injury rehabilitation. I may also be asked to complete four follow-up interviews which will occur approximately 1 to 2 weeks apart. The interviews will ask me about how I am feeling and how I cope with the demands of college athletics. Each interview will take about ½-hour to one-hour of time. I understand that I do not have to answer all of the questions, and that I am giving consent for the investigators to obtain information from my medical record regarding my health status . Approximately, 180 subjects will be entered in this study.

Risks and Discomforts: There are no known or expected risks from participating in the study.

Benefits: If I am asked to complete a follow-up interview, I understand that I will receive $20 for the four follow-up interviews associated with this study; if I do not complete all follow-up interviews, I will receive $5 for each follow-up interview performed before I left the study. If I am not selected to complete a follow-up interview, I understand that this study is not expected to be of direct benefit to me, but the knowledge gained may benefit future competitive athletes.

Contact Persons: For more information about this research, I can contact Dr. Frank Perna or Dr. Vincent Stilger at (304) 293-3295 Ex:273 or Joni Roh (412) 938-4562. For information regarding my rights as a research subject, I may contact the Executive Secretary of the Institutional Review Board at 293-7073.

Confidentiality: I understand that any information about me obtained as a result of my participation in this research will be kept as confidential as legally possible. I understand also that my research records, just like hospital records, may be subpoenaed by court order or may be inspected by federal regulatory authorities. In any publications that result from this research, neither my name nor any information from which I might be identified will be published without my consent.

Voluntary Participation: Participation in this study is voluntary. I understand that I am free to withdraw my consent to participate in this study at any time. Refusal to participate or withdrawal will involve no penalty or loss of benefits and will not affect my grades or class standing. I have been given an opportunity to ask questions about the research, and I have received answers concerning the areas I did not understand.

Upon signing this form, I will receive a copy, and I willingly consent to participate in this study.

WEST VIRGINIA UNIVERSITY
Institution Review Board for the
Protection of Human Research Subjects

JUL 02 1998

Approved

X __
EXP
H.S.

_____ _____
Signature of Participant Date

_____ _____
Signature of Investigator or Investigator's Representative Date

304 293 3295 ▫ FAX 304 293 4541 ▫ PO Box 6116 ▫ Morgantown WV 26506 6116

APPENDIX B

Letter of Consent for High School Athletes

School of Physical Education
West Virginia University
Athletic Coaching Education, Athletic Training, Physical Education,
Sport Behavior and Sport Management

CONSENT FORM

Psychological Distress and Coping Following Athletic Injury: Impact Upon Rehabilitation

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WEST VIRGINIA UNIVERSITY
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Protection of Human Research Subjects

JUL 02 1998

Approved

X __
EXP
H.S.

_____ _____
Signature of Participant Date

_____ _____
Signature of Investigator or Investigator's Representative Date

304 293 3295 ▫ FAX 304 293 4541 ▫ PO Box 6116 ▫ Morgantown WV 26506 6116

School of Physical Education
West Virginia University
Athletic Coaching Education, Athletic Training, Physical Education,
Sport Behavior and Sport Management

CONSENT FORM

Psychological Distress and Coping Following Athletic Injury: Impact Upon Rehabilitation

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WEST VIRGINIA UNIVERSITY
Institution Review Board for the
Protection of Human Research

JUL 02 1998

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_____ _____
gnature of Parent or Guardian Date

_____ _____
gnature of Investigator or Investigator's Representative Date

School of Physical Education
West Virginia University
Athletic Coaching Education, Athletic Training, Physical Education,
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WEST VIRGINIA UNIVERSITY
Institution Review Board for the
Protection of Human Research

JUL 02 1998

I willingly consent to my child's participation in this study.

_____ _____
Signature of Parent or Guardian Date

_____ _____
Signature of Investigator or Investigator's Representative Date

304 293-3295 ◻ FAX 304 293-4641 ◻ PO Box 6116 ◻ Morgantown WV 26506-6116

APPENDIX C

Letter of Assent for High School Athletes

School of Physical Education
West Virginia University
Athletic Coaching Education, Athletic Training, Physical Education,
Sport Behavior and Sport Management

ASSENT FORM

Psychological Distress and Coping Following Athletic Injury: Impact Upon Rehabilitation

Introduction: I, _____, have been asked to participate in this research study which has been explained to be by Dr. Perna, Dr. Stilger, or their representative.

Purposes of the Study: I have been told that the purposes of this study are to learn more about the physical and psychological effects of stress on athletic injury.

Description of Procedures: This study will be performed at Morgantown Physical Therapy Associates and the Out-patient Physical Therapy Department, West Virginia University Hospitals, and at my high school. Prior to the start of the athletic season, I will be given several lists of written questions to answer. It will take about 15-30 minutes to answer the questions. If I becomes injured during the athletic season, athletic trainers will record information about my injury. I may also be asked to complete three interviews which will take about ½-hour to one-hour to complete. I do not have to answer all of the questions.

Risks and Discomforts: Some of the questions may be difficult, and I may not enjoy trying to answer them.

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I willingly agree to be in this study.

_____ _____
Signature of Subject Date

_____ _____
Signature of Investigator or Investigator's Representative Date

304 293 3295 FAX 304 293 4603 P.O. Box 6116 Morgantown WV 26506 6116

School of Physical Education
West Virginia University
Athletic Coaching Education, Athletic Training, Physical Education,
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CONSENT FORM

Psychological Distress and Coping Following Athletic Injury: Impact Upon Rehabilitation

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WEST VIRGINIA UNIVERSITY
Institution Review Board for the
Protection of Human Research

JUL 02 1998

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gnature of Parent or Guardian Date

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School of Physical Education
West Virginia University
Athletic Coaching Education, Athletic Training, Physical Education,
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CONSENT FORM

Psychological Distress and Coping Following Athletic Injury: Impact Upon Rehabilitation

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WEST VIRGINIA UNIVERSITY
Institution Review Board for the
Protection of Human Research
JUL 02 1998

I willingly consent to my child's participation in this study.

_____ _____
Signature of Parent or Guardian Date

_____ _____
Signature of Investigator or Investigator's Representative Date

School of Physical Education
West Virginia University
Athletic Coaching Education, Athletic Training, Physical Education,
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ASSENT FORM

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I willingly agree to be in this study.

_____ _____
Signature of Subject Date

_____ _____
Signature of Investigator or Investigator's Representative Date

APPENDIX D

The Sport Injury Rehabilitation Adherence Scale (SIRAS)

Sport Injury Rehabilitation Compliance Scale (SIRAS)

Patient _____ Date:

Signature of Sport Medicine Staff

Since the date of injury:

How many appointments for this patient have been scheduled?

How many appointments has this patient attended?

1. Circle the number that best indicates the intensity with which this patient completes the rehabilitation exercises during their appointments.

1	**2**	**3**	**4**	**5**
Minimum Effort				Maximum Effort

2. How frequently does this patient follow your instructions or advice (circle)?

1	**2**	**3**	**4**	**5**
Never				Always

3. How receptive is this patient to changes in the rehabilitation program (circle)?

1	**2**	**3**	**4**	**5**
Very Unreceptive				Very Receptive

4. Is athlete currently participating in sport?

____NO

____Yes, modified/ limited (e.g. go as can) ____ Date returned to *modified* participation

____Yes, No restrictions: ____ Date returned to *full* participation

APPENDIX E

The Medical Interview Satisfaction Scale for Athletic Trainers

(MISSAT)

Read each statement and circle the number that best reflects how much you agree or disagree.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1. The athletic trainer told me the name of my injury in words that I could understand.	1	2	3	4	5
2. After talking with the athletic trainer, I know just how serious my injury is.	1	2	3	4	5
3. After talking with the athletic trainer, I have a good idea of what changes to expect in my health over the next few weeks and months.	1	2	3	4	5
4. The athletic trainer told me all I wanted to know about my injury.	1	2	3	4	5
5. The athletic trainer is very good at explaining the reasons for medical tests.	1	2	3	4	5
6. The athletic trainer told me how being injured will affect my ability to work/compete.	1	2	3	4	5
7. The athletic trainer has relieved my worries about being seriously injured.	1	2	3	4	5
8. The athletic trainer told me what the prescribed medicines would do for me.	1	2	3	4	5
9. I feel I understand pretty well the athletic trainer's plan for helping me.	1	2	3	4	5
10. The athletic trainer gave me a chance to say what was really on my mind.	1	2	3	4	5
11. I really felt understood by my athletic trainer.	1	2	3	4	5
12. After talking to the athletic trainer, I felt much better about my problems.	1	2	3	4	5
13. I felt that this athletic trainer really knew how upset I was about my pain.	1	2	3	4	5
14. I felt free to talk to my athletic trainer about private thoughts.	1	2	3	4	5
15. I felt this athletic trainer accepted me as a person.	1	2	3	4	5

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
16. I felt that this athletic trainer didn't take my problems very seriously.	1	2	3	4	5
17. This athletic trainer was not friendly to me.	1	2	3	4	5
18. The athletic trainer I saw today would be someone I would trust with my life.	1	2	3	4	5
19. The athletic trainer gave me a thorough checkup.	1	2	3	4	5
20. This athletic trainer was too rough when s/he examined me.	1	2	3	4	5
21. The athletic trainer looked into all the problems I mentioned.	1	2	3	4	5
22. I feel that athletic trainer did not spend enough time with me.	1	2	3	4	5
23. The athletic trainer seemed rushed during his/her examination of me.	1	2	3	4	5
24. The athletic trainer gave directions too fast when s/he examined me.	1	2	3	4	5
25. The athletic trainer seemed to know what s/he was doing during the examination.	1	2	3	4	5

Cognitive Subscale = Item numbers 1, 2, 3, 4, 5, 6, 7, and 8
Affective Subscale = Item numbers 9, 10, 11, 12, 13, 14, 15, and 16
Behavioral Subscale = Item numbers 17, 18, 19, 20, 21, 22, 23, 24, and 25

APPENDIX F

Letter and MISSAT form sent to panel

October 12, 1999

Dear Panel,

My name is Joni L. Roh and am a graduate student in the Sport Psychology program at West Virginia University. I have been a certified athletic trainer (ATC) for 13 years and am interested in evaluating the injured athlete's satisfaction with the attending ATC during their rehabilitation experience. A questionnaire to measure patient satisfaction composed of three subscales has been used in the general medical population and a similar one would like to be used to measure the injured athlete's satisfaction with the attending ATC.

You have been selected to evaluate the following questionnaire to measure patient satisfaction of athletic trainers based on your knowledge with athletic injury and psychological aspects related to athletic injury. The questionnaire contains 24 items and would take approximately 3-5 minutes to complete.

Please rate the clarity and ambiguity of each item using a 5-point Likert scale for each, and categorize each item based on the definitions provided below. Please circle the choice you feel best represents the item.

Upon completion of the questionnaire please enclose it with your responses in the self-addressed stamped envelope at your earliest convenience. Should you have any questions please feel free to contact me either by email: jcramer3@wvu.edu or by phone: 304-296-3758. Thank you in advance for your cooperation.

(A) Affective

athletes' perception of the treatment relationship, including feelings of trust and confidence in the athletic trainer, and perceptions of the athletic trainers' positive regard for the athlete and willingness to listen to his/her concern.

e.g. of items: I felt the athletic trainer had a genuine interest in my health and general well-being.

(B) Behavior

athletes' evaluation of the athletic trainer's professional behavior, examination, treatment advice, assessment procedures, and dispensation of advice.

e.g. of items: the athletic trainer was competent in his/her evaluations .

(C) Cognitive

the **giving of information** by the athletic trainer and the **athlete's understanding** of the information

e.g. of items: the athletic trainer explained my injury and what I was to do to get better.

Sincerely,

Joni L. Roh, MAT, ATC
WVU Sport Psychology graduate student

Clarity of Item

Item	Yes				No	Category of Items A: affective B: behavioral C: cognitive
The athletic trainer gave me a thorough checkup Is the item clearly and unambiguously written?	5	4	3	2	1	A B C
The athletic trainer was too rough when s/he examined me Is the item clearly and unambiguously written?	5	4	3	2	1	A B C
The athletic trainer told me the name of my injury in words that I could understand Is the item clearly and unambiguously written?	5	4	3	2	1	A B C
The athletic trainer gave me a chance to say what was really on my mind Is the item clearly and unambiguously written?	5	4	3	2	1	A B C
The athletic trainer seemed to know what s/he was doing during the examination Is the item clearly and unambiguously written?	5	4	3	2	1	A B C
I really felt understood by my athletic trainer Is the item clearly and unambiguously written?	5	4	3	2	1	A B C
The athletic trainer looked into all the problems I mentioned Is the item clearly and unambiguously written?	5	4	3	2	1	A B C
The athletic trainer gave directions too fast when s/he examined me Is the item clearly and unambiguously written?	5	4	3	2	1	A B C
The athletic trainer told me all that I wanted to know about my injury Is the item clearly and unambiguously written?	5	4	3	2	1	A B C

Item	Clarity of Item: Yes				No	Category of Items: A: affective B: behavioral C: cognitive		
I felt this athletic trainer accepted me as a person Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C
After talking with the athletic trainer I know how serious my injury is Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C
After talking with the athletic trainer I felt much better about my problems Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C
I felt that this athletic trainer really knew how upset I was about my pain Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C
I feel the athletic trainer did not spend enough time with me Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C
The athletic trainer told me what the prescribed medicines would do for me Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C
The athletic trainer is very good at explaining the reasons for medical tests Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C
After talking with the athletic trainer, I have a good idea of what changes to expect in my health over the next few weeks and months Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C
I felt that this athletic trainer didn't take my problems very seriously Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C

Item	Clarity of Item: Yes				No	Category of Items: A: affective B: behavioral C: cognitive		
This athletic trainer was not friendly to me								
Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C
The athletic trainer has relieved my worries about being seriously injured								
Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C
I felt free to talk to my athletic trainer about private thoughts								
Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C
The athletic trainer seemed rushed during his/her examination of me								
Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C
I feel I understand pretty well the athletic trainer's plan for helping me								
Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C
The athletic trainer I saw today would be someone I would trust with my life								
Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C
The athletic trainer told me how being injured will affect my ability to work/compete								
Is the item clearly and unambiguously written?	5	4	3	2	1	A	B	C

APPENDIX G

Institutional Review Board for the Protection of Human Subjects

The Institutional Review Board for the Protection of Human Subjects
West Virginia University

DATE: August 10, 1998

NOTICE OF APPROVAL FOR PROTOCOL H.S. #13913 Addm. #2
(Adding cover letter)

This research will be monitored for re-approval annually.
This protocol was first approved on June 17, 1997.

TO: Frank M. Perna

Project Title: Psychological Distress and coping Following Athletic Injury: Impact Upon Rehabilitation

SPONSORING AGENCY: Senate Research (R97.044)

The Institutional Review Board for the Protection of Human Research Subjects (IRB) has approved the project described above. Approval was based on the descriptive material and procedures you submitted for review. Should any changes in your protocol/consent form be necessary, **prior approval must be obtained from the IRB.**

According to the Code of Federal Regulations, Section 312.32, investigators are required to notify the FDA and the study sponsor of any adverse experience associated with the use of an investigational drug that is serious and unexpected. A serious adverse experience is considered any event that is fatal or life-threatening, is permanently disabling, requires inpatient hospitalization, or is a congenital anomaly, cancer, or overdose. An unexpected adverse experience is an event that is not identified in nature, severity, or frequency in the current investigator brochure. Any experience reportable to FDA and the sponsor must also be reported immediately to the IRB.

A consent form* X is___ is not required of each subject.

An assent form X is___ is not required of each subject.

A recruitment ad has___ has not X been approved.

304 293-3073 FAX [illegible]

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Perna
HS #13913

August 10, 1998

* Only copies of the consent and/or assent form with the IRB's approval stamp may be used with human subject research. It is the responsibility of the investigator to submit a revised consent form for the IRB's approval should funding be obtained. This stamped consent form must then be used for subjects enrolled. A copy of each subject's signed Consent/Assent Form must be retained by the investigator and accessible to federal regulatory authorities for at least three years after the study is completed.

Marian J. Turner
IRB/ACUC Administrator

MJT/baw

APPENDIX H

Receipt of Payment to the Athlete

PARTICIPANT RECEIPT

STUDY: Psychological Distress and Coping Following Athletic Injury Among Children and Adults: Impact Upon Rehabilitation

I, _____, have received $5.00 for participation in the above study, which is sponsored by
(Print Name)
West Virginia University.

_____ _____
Participant Signature Date Witness Date
