

1991

The relationship among gender, injury severity, and pain beliefs of athlete

Chris O'Connor
Ithaca College

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THE RELATIONSHIP AMONG GENDER, INJURY SEVERITY,
AND PAIN BELIEFS OF ATHLETES

by
Chris O'Connor

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

December 1991

Thesis Advisor: Veronica L. Eskridge, Ph. D.

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ABSTRACT

The relationship among gender, injury severity, and pain beliefs of athletes was investigated. Ithaca College intercollegiate athletes ($N = 79$) were surveyed. Injury severity was determined from each subject's time spent out of participation as recorded in the Ithaca College training room. Each subject was administered the Pain Beliefs and Perceptions Inventory that was used to assess the three sub-scales thought to comprise one's pain belief system. These pain sub-scales include the perception of the duration of pain, the degree to which one finds pain to be mysterious, and the amount of self-blame one ascribes to pain. Three discrete two-way ANOVA tests were used to assess if differences existed at the .05 level of significance. It was found that gender does not significantly influence an athlete's pain beliefs. Perhaps male and female athletes, once having attained a certain status and success level, maintain similar attributional styles. It appears that athletes, across injury levels, tend to believe that pain is not mysterious, and they tend to not blame themselves for an injury and its pain. While injured and non-injured athletes tend to believe that pain's duration is relatively short, it seems that non-injured athletes have a stronger belief in the short duration of pain when compared to their severely injured counterparts. Therefore, injured athletes, especially those without prior injury experiences, may be overwhelmed by any length of pain experienced and may benefit if the clinician validates their feelings of enduring pain, regardless of their actual time in pain.

THE RELATIONSHIP AMONG GENDER, INJURY SEVERITY,
AND PAIN BELIEFS OF ATHLETES

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

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

by
Chris O'Connor

December 1991

Ithaca College
School of Health Sciences and Human Performance
Ithaca, New York

CERTIFICATE OF APPROVAL

MASTER OF SCIENCE THESIS

This is to certify that the Master of Science Thesis of
Chris O'Connor

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

Thesis Advisor:

Committee Member:

Candidate:

Chairman, Graduate
Programs in Physical
Education:

Dean of Graduate Studies:

Date:

Dec. 4, 1991

DEDICATION

This thesis is dedicated to Dr. Robert John O'Connor, also known as Dad, and to Mrs. Gisele La Salle, also known as Mom. To Dad, for his educational inspiration and scholarly guidance, and to Mom, for her funloving silliness and personal strength.

ACKNOWLEDGEMENTS

1. To Dr. Eskridge, a.k.a. "Doc", who was there to hold my hand when I needed it, shove me out the door to stand on my own two feet when necessary, scare me with her sarcastic wit to get me motivated, compliment me just enough to get me back inside the dreaded computer room for that second round, and support and trust me to get the job done after she had committed herself to a sooner-than-expected deadline.

2. To Dr. Wuest, for her continual line of questioning as to when I would get her that next chapter so that I would be "motivated" to complete it, and for her APA expertise, a thing I don't know if I'll ever master!

3. To Dad, for his continual line of suggestions as to what to do with my life after obtaining my master's degree, and because he always let me believe that I could do anything I set my mind to.

4. To James, for his love and support, and for the listening skills that he employed throughout this ordeal, even though he still has no idea what this is really about.

5. To Terri, El, and Lori, for their inspiration and mutually frustrated understanding for why we must do what "they" say we must do.

6. To my family and friends, for feeling sorry for me and for making me laugh just when I needed it the most in order to save what's left of my sanity.

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Chapter 1

INTRODUCTION

Pain plays a role in the lives of everyone at some time. The actual physical stimulus of pain, however, does not explain pain in its entirety. Evidence indicates that, in addition to the amount of bodily damage done, the degree to which pain is experienced by an individual is determined by one's past pain experiences and the extent to which one remembers these experiences (Egan, 1987). Furthermore, one's cultural background can influence the amount of pain one experiences. Also, one's attention, anxiety, and distraction abilities can determine the degree to which pain is perceived. It is one's ability to comprehend the causes and effects of pain and the meaning that one ascribes to the pain that determine how the pain is interpreted and felt (Egan, 1987).

A common display of pain is seen in the athletic domain, exemplified by an injury on the playing field. An athlete has emotional and cognitive avenues that are affected by the pain of a physical injury that should not be ignored. What an athlete feels and thinks after acquiring an injury play a role in determining his/her immediate and future behavior (Kulund, 1982). Post-injury emotions range from anger and rage to fear and depression (Weiss & Troxel, 1986). Yet, the extreme degree to which some athletes feel these emotions can be prevented if their cognitive appraisal of the injury can be altered during post-injury time (Weiss & Troxel, 1986). For instance, when an

athlete perceives an injury prognosis as hopeful, anxiety and tension decrease, a sensible outlook toward the recovery process is acquired, and the healing process seems to start immediately (Kulund, 1982; Lynch, 1988).

One's cognitive appraisal of pain has been termed one's pain beliefs, which represents an individualized perception of the pain experience (Williams & Thorn, 1989). An individual's perception of pain encompasses one's beliefs as to the duration of the pain, the amount of blame one ascribes to oneself for the pain, and the extent to which one feels that the cause of one's pain is a mystery (Williams & Thorn, 1989).

If one has a strong belief in a long pain duration, then one believes that pain endures on a long-term basis. Conversely, if one has a strong belief in a short pain duration, then one believes that pain lasts a short period of time.

If one ascribes the blame for the pain to oneself, then one believes that he/she is to blame for the pain. If one attributes the blame for the pain to people/things other than oneself, then one believes that he/she is not to blame for the pain.

If one believes that one's pain is a mystery, then one believes that the cause for the pain is beyond one's control and lies in the hands of fate, chance, or God. This is parallel to a person who has an external locus of control orientation in that he/she believes that the outcome is not contingent upon his/her actions, and is, therefore, beyond personal control (Watson & Bauml, 1967). On the other hand, if one does not believe that

one's pain is the result of mysterious causes, then one believes that he/she has control over the pain. This is analogous to a person who has an internal locus of control orientation in that he/she assumes the responsibility for the consequences of his/her actions (Watson & Baumal, 1967).

The pain beliefs delineated above appear to have a predictive value for different facets of the pain experience (Williams & Thorn, 1989). For instance, beliefs in both prolonged pain duration and pain as a mystery were associated with a decrease in physical therapy compliance. Apparently, those who do not understand the pain that results from rehabilitation procedures construe treatments as being counterproductive to pain relief (Williams & Thorn, 1989). It is suggested that an acceptance of the injury along with an understanding of why one must go through rehabilitation serve to reduce the uncertainties that surround an injury. This provides one with a feeling of internal control over the injury (Lynch, 1988; Weiss & Troxel, 1986). Beliefs in pain as a mystery and in the lengthy endurance of pain are linked with negative self-perceptions and a decreased sense of internal control (Williams & Thorn, 1989).

Gender can influence the pain beliefs of an individual due to the differing roles assigned to genders within an individual's culture. For instance, it is acceptable for a woman in the Western culture to report her symptoms of pain immediately to a doctor, while a man is expected to endure the pain longer because

men are thought to be "tougher" than women (Celentano, Linet, & Stewart, 1990; Die & Holt, 1989). It has been shown that male and female athletes differ in their attributional styles, with male athletes attributing success to internal factors such as ability and hard work, while female athletes attribute success to more external factors such as team variables and luck (Klonsky, Croxton, & Ginorio, 1986). This may have an influential effect on the pain belief orientations of male and female athletes.

Scope of the Problem

After having sustained an injury, an athlete is required to undergo some type of rehabilitation program in order to physically recover from it. Once rehabilitation is successfully completed, the athlete is allowed to return to competition. Injured athletes are not allowed to return to competition until they are physically returned to pre-injury status, i.e., their injury must be completely healed.

Assuming that these returning athletes are physically capable of performing at pre-injury levels, they are then expected to do so. Some athletes can. Others cannot. Because all are physiologically capable, it would seem that the cause for this discrepancy lies in the psychological realm. It appears that the longer an athlete is away from competition, as is the case with a seriously injured athlete, the harder it is to return. Perhaps athletes, especially seriously injured athletes, are in need of some type of psychological rehabilitation in addition to their physiological rehabilitation in order to be

both mentally and physically prepared to return to competitive athletics. To begin to address this issue, the beliefs that athletes have about an injury and its pain must be examined.

Statement of the Problem

The purpose of this study was to determine if severely injured, moderately injured, mildly injured, and non-injured male and female athletes differ in their pain beliefs.

Theoretical Hypotheses

It was hypothesized that there would be a difference between the pain beliefs of male and female athletes. Specifically, it was hypothesized that female athletes would score higher on the pain as a mystery sub-scale than would male athletes because of their attributional style. Previous research suggests that females tend to attribute success to external sources, leading to the belief that they will be more externally control-oriented when compared to their male counterparts.

It was also hypothesized that there would be a difference between the pain beliefs of both severely and moderately injured athletes when compared to both mildly injured and non-injured athletes. Specifically, it was hypothesized that athletes who had sustained an injury that required a long-term recovery prognosis would have a pain belief system that resembled an external locus of control orientation, whereas athletes who had sustained either a mild injury or no injury would have a pain belief system that resembled an internal locus of control orientation. In addition, it was hypothesized that athletes who

underwent lengthy rehabilitation procedures would have a stronger belief in a lengthy pain duration when compared to athletes who had either brief or no rehabilitation requirements.

Assumptions of the Study

It was assumed that:

1. Subjects followed the standardized instructions read to them and answered the questions honestly and accurately.
2. The data used to classify each subject's injury status, which was obtained from the Ithaca College training room, accurately reflected each athlete's previous and/or current injury status.

Definition of Terms

The following terms used in this study were stipulatively defined as follows:

1. Athletes: those students at Ithaca College who participated in intercollegiate athletic competition during the 1990-91 season.
2. Injury: bodily damage sustained by the athlete while participating in his/her sport that was recorded in the Ithaca College athletic training files.
 - a. Severely injured: those athletes who missed 11 or more in-season practice days and/or three or more games due to injury, including all athletes who did not finish their season due to injury and those athletes who had to undergo surgery for an injury sustained during in-season participation.
 - b. Moderately injured: those athletes who missed 6-10

in-season practice days and/or two games due to injury.

c. Mildly injured: those athletes who missed 1-5 in-season practice days and/or one game due to injury.

d. Non-injured: those athletes who missed fewer than one in-season practice day due to injury.

3. Pain beliefs: ways in which an individual perceives his/her experience of pain, operationally defined in this study as measured by the Pain Beliefs and Perceptions Inventory (PBAPI) (Williams & Thorn, 1989).

Delimitations of the Study

1. Subjects in this study were athletes who participated in either junior varsity or varsity intercollegiate athletics at Ithaca College during the 1990-91 season.

2. Each subject's pain beliefs were assessed by the PBAPI (with modified instructions), which was designed to reflect an individual's perception of pain.

3. Injury records in the Ithaca College training room were used to categorize the athletes into injury levels. The injury records reflect only those injuries sustained by an athlete while participating in Ithaca College intercollegiate athletics.

Limitations of the Study

1. The results of this study may be generalized only to individuals who are similar to intercollegiate athletes of Ithaca College, Ithaca, New York.

2. The design of this study did not control for the specific sport(s) in which the subjects participated.

3. The amount of elapsed time following the athletic injury in relation to when each subject answered the questionnaire was not controlled for in this study.

4. This study did not control for pain experienced outside of the athletic environment.

Chapter 2

REVIEW OF LITERATURE

It is important that a professional who is involved with an injured athlete understand the various aspects of the injury and the multiple effects on the athlete (Kulund, 1982). Pain is one aspect that is experienced as a result of an injury, and its effects extend well beyond the physical domain. A review of literature on pain is discussed in this chapter under the following headings: (a) the total pain experience, (b) pain beliefs, (c) relating behavior to beliefs, (d) the cultural connection, (e) perceived control over pain, and (f) the influence of gender. The chapter concludes with a summary.

The Total Pain Experience

Aside from those rare individuals who are born with a congenital insensitivity to pain, everyone has experienced sensations identified as "pain" since childhood. However, in spite of this supposed commonality of understanding, pain is actually an individualized experience influenced not only by the physiological pain stimulus, but also by one's educational, cultural, and emotional background (Hannington-Kiff, 1974). For instance, it has been observed that educationally advantaged adults report less pain than their educationally deprived counterparts. This may be due to their desire to appear stoic, or they may actually be coping with pain differently and reducing its effects (Taenzer, Melzack, & Jeans, 1986).

Pain in the athletic realm lives a multifaceted life. There

is the physical pain associated with exertion, such as muscle soreness; there is the emotional pain associated with competition, such as depression after the loss of a close game; and there is the cognitive pain associated with competition, such as finding fault during analysis of one's performance. Thus, pain can be categorized into three dimensions: the sensory-discriminative, the motivational-affective, and the cognitive-evaluative (Kulund, 1982).

The sensory aspect of pain is the physiologic pain stimulus. The pain stimulus includes the sensory nerve endings that detect the stimulus as painful, the nerves that transmit this stimulus to the brain, and the neurological tissue in the brain that is responsible for decoding this information and relaying it to consciousness (Hannington-Kiff, 1974). Thus, if an injury occurs, an athlete will most likely consciously interpret it as a painful stimulus.

Pain tolerance is one's ability to cope with pain, and it is influenced by motivational and cognitive factors (Kulund, 1982). The amount of pain felt by an individual is inversely proportional to the individual's level of pain tolerance. Egan (1987), while studying athletes and pain tolerance, found football players to have a greater pain tolerance ($p < .05$) when compared to karate and fencing participants.

Fear, anxiety, depression, and anger can all participate in one's emotional reaction to pain. Lynch (1988) discovered that injured athletes go through emotional reactions that are similar

to the grieving process one goes through at the loss of a loved one. First, an athlete attempts to deny the injury and/or its severity. Second, an athlete exhibits anger at being injured, which can range from mild to extreme. Third, an athlete slips into the bargaining stage, an example of which could be a talk with God: "I'll run every night after practice if You'll only let me play again". Fourth, an athlete experiences depression until some acceptance of the injury occurs. One begins to show behavioral signs of the healing process once a degree of acceptance of the injury is realized.

Anxiety is another common emotional response to pain. It has been found that dental patients who were highly anxious related this feeling to their prior visit during which they experienced pain (Philips, 1987). It appears, then, that the memory of pain may increase one's anxiety. Also, it seems that an injured athlete's anxiety may increase due to preconceptions about the injury and its long-term effects (Kulund, 1982). For instance, an injured athlete may believe that he/she will never be able to compete again because of the injury. This increasing anxiety could enhance the athlete's pain response because, during rehabilitation, anxiety has been found to be highly correlated to an increase in the athlete's perception of pain (Kulund, 1982).

How an athlete chooses to think of the injury could be categorized as the study of the cognitive area of pain. An injury is a stressor placed on the body and, as with any stressor, its consequences begin with the cognitive appraisal of

the stressor (Weiss & Troxel, 1986). When an injury occurs it is appropriate for an athlete to feel frustrated and sad because of the unfortunate situation. However, there tends to be a negative effect if the situation is thought of as hopeless or it is felt that one's competence in performance will not be regained. An athlete should be encouraged to see the injury in a clearheaded, self-enhancing way, not from a self-destructing standpoint. A positive viewpoint, if not totally unrealistic, will better aid the athlete in the rehabilitation and recovery process (Kulund, 1982).

Pain Beliefs

One's pain beliefs, which encompass one's expectations, attitudes, and beliefs with respect to pain and its treatment, are a crucial, yet underestimated, aspect of the overall treatment process. Knowledge of a patient's pain beliefs prior to treatment is vital because a person's pain beliefs pertain directly to pain management behaviors and overall rehabilitation goals (Schwartz, DeGood, & Shutty, 1985). In an effort to analyze one's comprehensive pain belief system, Williams and Thorn (1989) offered three core pain beliefs: (a) beliefs about the duration of pain, (b) degree of self-blame and pain, and (c) perception of pain as mysterious.

In the sports setting, many injuries require an athlete to abstain from sport participation for some amount of time. Injuries can range from minor (limited participation) to major (potentially out for the season or life). In a recent study,

Crossman and Jamieson (1985) noted that the seriousness of an injury was a major determinant in an athlete's psychological response to that injury. An athlete's overestimation of the seriousness of the injury was found to be significantly correlated to the athlete's subjective reports of increased pain. The authors suggested that athletes who overestimate the seriousness of an injury and believe that the injury has major disruptive effects in their lives may suffer from additional affective trauma.

Of the core beliefs, self-blame exists in approximately 25% of all injured people (Williams & Thorn, 1989). Self-blame is a common problem found in injury management and is manifested by negative self-talk. This negative self-talk can lead to low self-confidence, depression, rage, guilt, and/or fear. All such reactions interfere with an individual's ability to maintain a controllable stress level (Weiss & Troxel, 1986). An increase in stress can lead to additional panic and fear. This increase in panic and fear then intensifies the pain perception and can lead to a secondary increase in stress. Increased stress decreases blood flow to the injured body part and causes a concomitant increase in muscle tension. This vicious cycle of events invariably prolongs the recovery process (Lynch, 1988).

The third core aspect of a person's pain belief system is one's perception of pain as mysterious. This signifies that a person has a poor understanding of the pain and so it is a mystery (Williams & Thorn, 1989). Belief in pain as mysterious

was found to be associated with small amounts of improvement in psychological distress after treatment, a low self-esteem evaluation, and a decrease in physical therapy compliance (Williams & Thorn, 1989).

Relating Behavior to Beliefs

It is predominantly accepted by authorities that various individual beliefs can be used to predict different behaviors (Lobel, 1982). For example, if an individual highly values good health, one would not expect this person to exhibit behaviors considered detrimental to the body. In support of this, it has been shown that runners who highly value good health exhibit more positive health behaviors than do their sedentary counterparts (Walsh, 1985).

It has been suggested (Bresler, 1979) that how one views reality affects how one experiences it. For example, in a study (Clingman & Hilliard, 1988) that involved the comparison of triathletes self-perceptions with non-athletes' perceptions of triathletes, it was discovered that non-athletes viewed only the top finishers as successful athletes, while the triathletes viewed all who finished as successful. Similarly, if a patient believes in a treatment, he/she should have a relatively effective recovery experience in that treatment. For instance, a study on the analgesic effects of acupuncture in subjects with differing beliefs toward acupuncture (Norton, Goszer, Strub, & Man, 1984) revealed that one's belief about acupuncture affected one's response to acupuncture. In effect, the subjects who had

high expectations with respect to the pain relieving effects of acupuncture reported lower pain accounts than did those who held low analgesic expectations. Along with this, in the face of an illness, the patient's own beliefs about health care and recovery are responsible for the patients behavior much more so than the doctor's beliefs about how the patient should be recovering (Roberts, Smith, Bennett, Cape, Norton, & Kilburn, 1984). It would follow that knowledge of a patient's pain beliefs would help identify the most effective way to deal with that patient's pain.

In the athletic realm, knowledge of an athlete's pain beliefs should help determine how the athlete will deal with an injury. It is possible that the more severe the injury, the less motivated the athlete becomes in the face of rehabilitation. It has been stated that the most important step in treatment for patients with a major injury is their willingness to accept that the injury will have chronic, long-term effects and understand the implications this may have in terms of rehabilitation (Schwartz et al., 1985). Without proper acceptance of the chronic nature of the pain from the injury, focus may shift to viewing the pain from the injury as a disability, which could lead to increased functional impairment regardless of the actual pain experienced (Riley, Ahern, & Follick, 1988). This type of behavior, if not changed, can lead the athlete into maladaptive avoidance behaviors.

The Cultural Connection

As children, the performance criteria used in any achievement setting is based on the feedback received from significant others. A child also sets internal goals that can be compared to the actual performance statistics. This learned set of performance criteria can then be used to compare subsequent performances to allow for independent skill judgements (Horn & Hasbrook, 1987). Children tend to use this same type of criteria to understand reasons for pain. Generally, children believe that there is a direct relationship between the experience of pain and some violation of the rules (Gaffney & Dunne, 1987). Thus, children tend to feel guilty for the pain that they feel. This guilt can express itself in the child as self-blame, a feeling that the pain is punishment for some misbehavior (Gaffney & Dunne, 1987). As children grow, experience, and learn, they add to their initial coping systems. Their coping processes are influenced by their predetermined goals for recovery, their desire to receive approval from others, and their refined concept of what is the proper emotion and behavior (Cioffi, 1991).

The activities, beliefs, and behaviors one is exposed to while being raised in a social group, otherwise known as one's cultural background, become an integral part of how one comes to view the world (Moore, 1990; Norton et al., 1984). One's cultural belief system, in turn, can influence one's perception of pain and, thereby, supply contributory factors to one's pain belief system.

The influences of the society in which one is extensively involved can have a profound impact on one's pain beliefs that may cross ethnic lines. For example, Moore (1990) found that dentists, who experienced similar socialization processes due to their professional training but had varied ethnic backgrounds, had similar treatment perceptions. However, their patients, when divided into their respective ethnic groups, differed in their choices of preferred pain coping mechanisms. These results support the theory that the social influences to which one is exposed help mold one's pain belief system.

However, though many influences cross ethnic lines, some attributes seem to be directly influenced by one's ethnicity. For instance, Anshel and Sailes (1990), in a study of black and white athletes from similar socioeconomic backgrounds, found that the black athletes tended to take criticism from the coach more profoundly than did their white counterparts, even though both groups agreed that the coach was fair. In addition, the black athletes seemed to feel more accountable for the results of the team's outcome than did the white athletes. The same ethnic influences could reasonably be involved in the development of different pain belief systems that may be found in athletes who participate on the same team.

One's beliefs about the spiritual realm and/or religion are a major aspect of one's cultural background. As such, they may affect one's pain belief system. For instance, one may believe that pain is a form of punishment for some wrong doing. Some

religious philosophers teach that one must humbly accept pain to gain the "good graces" of God. Others believe that the pain experience must be endured to save mankind as well as to become a faithful and humble servant of their deity (Conwill, 1986).

Knowledge of an athlete's cultural background (e.g., social group, ethnicity, education, spiritual beliefs), therefore, may be important in determining the type of rehabilitation procedures that would be of optimal use with an injured athlete. Pain beliefs constitute one important aspect that can be influenced by one's cultural background.

Perceived Control Over Pain

In assessing pain beliefs, it may be important to assess the locus of control basis from which a person operates (Wallston, Wallston, Kaplan, & Maides, 1976). Locus of control is a variable of one's personality that helps to dictate how one behaves within one's social system (Wise & Rosenthal, 1982). A belief that pain is mysterious is associated with negative self-perceptions along with a decreased sense of internal personal control over health issues (Williams & Thorn, 1989). This leads one to associate a mysterious pain perspective with an external locus of control perspective, in which one perceives pain to be beyond personal control. A non-mysterious pain perspective, on the other hand, is associated with an internal locus of control perspective, in which one believes that the pain experience is contingent on one's actions and is, therefore, under one's control.

In a recent study (Weiss & Troxel, 1986), seriously injured athletes showed signs of being overwhelmed by the lengthy rehabilitation prognosis that was required to reach full recovery, and they felt externally controlled by the injury. These athletes felt that nothing they did was helping them to reach full recovery. The athletes, when questioned, made statements that personified the injury and/or gave it, fate, or God the responsibility for healing. Such statements exemplify an external locus of control perspective.

In a study by Bowers (1975), a perceived lack of control over a painful stimulus led to an increase in the anxiety over that pain. The anxiety generated from this perceived lack of control magnified the subject's experience of pain. Conversely, the perception of control over a painful stimulus decreased the perception of pain. It has been suggested in other literature (Skevington, 1990) that internally controlled subjects have been associated with improved physical and mental health status when compared to externally controlled subjects.

It has also been found that individuals perform best in situations where the environmentally established locus of control is equivalent to an individual's belief about his/her own locus of control (Wallston et al., 1976; Watson & Baumal, 1967). For instance, internally controlled subjects, when placed in an uncontrolled situation, showed more anxiety in an error making task than when in a controlled situation. In contrast, externally controlled subjects were more anxious about their

performance when in a controlled situation (Watson & Baumal, 1967). Also, treatments that are designed to match a subject's locus of control orientation may be more successful than those that are not (Wallston et al., 1976). In addition, internally controlled subjects were found to be more confident in their own ability when compared to externally controlled subjects (Watson & Baumal, 1967).

Physical activity, and the belief that one is a better person for it, becomes incorporated into the athlete's sense of self. Mastery experiences, such as finishing a triathlon, are thought to be the most prominent influence on one's sense of self-efficacy because they provide actual information of one's performance capabilities (Dolce, 1987). If physical activity is taken away, not only is the athlete unable to maintain a sense of physical fitness and team involvement, but also the athlete's sense of self may deteriorate (Clingman & Hilliard, 1988).

One's ability to cope with pain is thought to be greatly influenced by the strength of one's self-efficacy belief (Dolce, 1987). If an individual has an acute injury, avoidance of using that injured body part is a positive adaptive behavior. However, the chronic pain patient may rely on the avoidance behavior in an attempt to control pain levels even after tissue healing has occurred (Philips, 1987). Avoidance behavior may start in an attempt to avoid and cope with the pain, but it may extend over a period of time to avoidance of other things, including social interactions. Avoidance behavior has been strongly correlated

with a decrease in the patient's self-efficacy beliefs (Philips, 1987). This can lead to a decreased sense of internal control by the patient and, hence, a change in one's pain belief system.

Bresler (1979) discusses the different implications pain can have. If, for instance, a bruise was obtained as the result of an attack on the street, it would be interpreted differently than if the same painful sensation was obtained from a football game. When one becomes involved in athletics, there is a known injury risk. Certain sports have higher injury risks than others (DeHaven & Lintner, 1986). An individual may, consciously or unconsciously, choose a sport based on its known injury rate. This choice may be influenced by one's locus of control orientation and/or one's pain beliefs.

It is often the emotional fear of the incurrance of future pain that is worse than the actual pain sensation (Bresler, 1979). Once an injured athlete has successfully completed rehabilitation and is allowed to return to participation, fear of being ineffective and/or of repeated trauma may negatively influence performance (Dolce, 1987). This change in the athlete's sense of self-efficacy, brought about by the experience of pain and injury, could result in a change in a severely injured athlete's system of pain beliefs.

The Influence of Gender

In the world of athletics today, many sports that were traditionally thought to be male dominated are now seeing a surge in the number of women participants. Media coverage of women's

sporting events is beginning to be realized. Still, society's guidelines of appropriate role expectations for women are in conflict with the role of the female athlete (Die & Holt, 1989; Snyder & Kivlin, 1977).

Personality characteristics that are generally considered masculine, such as aggression, strength, and dominance, are those same characteristics that are also generally ascribed to becoming a successful athlete (Die & Holt, 1989). Athletic participation by women, in society's view, has, at best, been acceptable within a limited range of sports (Snyder & Kivlin, 1977). However, this trend may be changing. Barnaba (1983), in a study done in the collegiate environment, investigated the attitudes of male and female athletes and non-athletes toward female athletes. Results from this study suggested that traditional masculine behavior is acceptable athletic behavior for females. Die and Holt (1989), in a more recent study undertaken in the collegiate environment, investigated views of male and female athletes and non-athletes and discovered that all groups were viewed as similar in their display of traditionally male characteristics.

Though female athletes are apparently becoming more like their male counterparts, differences may still exist. Similar performance outcomes on identical sporting tasks yield different attributional responses between males and females (Klonsky et al., 1986). Males, in general, tend to attribute a win to personal characteristics such as hard work and ability, while females, in general, tend to attribute their success to team

variables and luck (Klonsky et al., 1986). However, when higher level athletes were tested, such as intercollegiate athletes, attributional responses were similar across gender (Klonsky et al., 1986).

Gender-related attributional styles could carry over into the recovery process. It has been theorized that if an injured athlete does not attribute recovery to a sense of hard work and an increase in ability, there will be no increase in self-efficacy (Dolce, 1987). An increase in self-efficacy may increase one's sense of personal control and self-confidence, because it has been shown that subjects with an internal locus of control have more confidence in themselves as compared to externally controlled subjects (Watson & Baumal, 1967). It has been reported that women exhibit less personal control over pain than men (Tait, DeGood, & Carron, 1982). However, when men and women have equivalent symptom reports, results indicate that they utilize medical services in a comparable manner (Celentano et al., 1990).

Another gender difference has been found that may also influence how male and female athletes view pain. When one decides to participate in athletics, there is a known risk of injury. However, all sports do not have equivalent injury risk profiles, as is seen in the fact that football has 12 times the amount of injuries as compared to basketball, the next most common injury sport (DeHaven & Lintner, 1986). Football is also a male-dominated sport. Women athletes may have different pain

beliefs than male athletes due to the fact that they participate in sports that have lower injury risk profiles. However, this participation factor is due mainly to society's rules, which do not allow women to participate in high contact/injury rate sports, such as football and boxing, not necessarily to the preference of the female athlete.

For the sports in which men and women both participate, pain belief differences may still exist. It is probably not surprising that each sport has its own set of common injuries that occur within its playing context (DeHaven & Lintner, 1986). For instance, runners are generally seen to have shin splints and twisted ankles, while tennis elbow is particularly common to tennis players. However, Celentano et al. (1990), in a study on the experience of headache pain, noted that women may experience pain in a different way than do their male counterparts, even when considered to be undergoing the same painful experience. Thus, even when suffering from similar injuries, male and female athletes may still have differences in their pain beliefs.

Summary

Sensory, affective, and cognitive factors make up an individual's overall pain experience. Understanding this mind-body connection leads to consideration of all factors in an attempt to decrease a pain stimulus (Lynch, 1988). An important factor that needs to be considered in reference to one's pain perception is one's pain belief system. One's pain beliefs are thought to be comprised of three main areas: a perceived time

dimension, an assessment of self-blame, and a sense of pain as mysterious (Williams & Thorn, 1989).

One's behavior may be predicted by one's beliefs (Lobel, 1982). In addition, one's beliefs influence one's behavior and affect treatment outcome (Norton et al., 1984; Roberts et al., 1984). Knowledge of one's pain beliefs may, then, be important not only in predicting one's pain behavior, but also in helping to choose the most effective form of treatment.

Several factors appear to influence one's pain belief system. One influential factor is one's cultural background. Spiritual or religious beliefs comprise a large part of one's cultural background (Conwill, 1986). In addition, both the society in which one is raised and one's ethnic origins become part of one's cultural background (Anshel & Sailes, 1990; Moore, 1990). Cultural diversities have been shown to influence how an individual perceives the pain experience (Moore, 1990; Norton et al., 1984).

The pain belief orientation from which one operates is a factor that is apparently related to one's locus of control orientation. An individual with an external locus of control perspective is one who leaves the responsibility for the outcome to fate, chance, and/or God. One with an internal locus of control perspective believes that he/she has control over the outcome. An athlete's perceived locus of control is important because it may influence how an athlete responds to a long-term recovery prognosis (Weiss & Troxel, 1986). In addition, it is

related to how an injured individual responds to different types of rehabilitation techniques (Wallston et al., 1976; Watson & Baumal, 1976). One's locus of control orientation may also influence the type of sport in which one chooses to participate because of the different injury levels known to exist in different sports (DeHaven & Lintner, 1986).

One's gender may also influence one's pain beliefs, although the literature is contradictory. For instance, males and females have different attributional styles that may have differing effects on their pain beliefs (Klonsky et al., 1986). However, these attributional styles may be equivalent between male and female athletes who have reached a certain status and success level (Klonsky et al., 1986). Also, men may experience pain differently than women (Celentano et al., 1990), which may result in different perceptions of the pain experience. However, when symptom reports are equivalent between men and women, both appear to seek medical help in a similar fashion (Celentano et al., 1990).

Chapter 3

METHODS AND PROCEDURES

This chapter describes the methods and procedures used in this investigation. The chapter is divided into the following sections: (a) selection of subjects, (b) selection of test, (c) description of test, (d) scoring of data, (e) treatment of data, and (f) summary.

Selection of Subjects

Seventy-nine subjects participated in this study ($N = 79$). The subjects ranged between 18-22 years of age and were located from the population of the Ithaca College junior varsity and varsity athletes who participated in intercollegiate athletics during the 1990-1991 season.

Athletes were informed of the study either through their coaches (Appendix A), through signs posted in the athletic training room, or through direct contact with the experimenter. Once informed, athletes were asked to volunteer. All volunteers were required to read and sign an informed consent form (Appendix B) before being allowed to participate in the study.

Prior to test administration, athletes were divided into sub-categories based on both gender and injury classification information that was acquired from the current and/or final injury reports for each athletic team. These injury reports are compiled and continually updated by the Ithaca College training staff and kept on file in the training room. Permission to access this aspect of their training files was obtained from the

athletes via their signature on an informed consent form.

The injury categories consist of the following: non-injured, mildly injured, moderately injured, and severely injured. Non-injured were those athletes who missed fewer than one in-season practice day due to injury. Mildly injured were those athletes who missed 1-5 in-season practice days and/or one game due to injury. Moderately injured were those athletes who missed 6-10 in-season practice days and/or two games due to injury. Severely injured were those athletes who missed 11 or more in-season practice days and/or three or more games due to injury. Also included in this category were those athletes who did not finish their season due to injury in addition to those who had to undergo surgery for an injury sustained during in-season participation.

Selection of Test

The Pain Beliefs and Perceptions Inventory (PBAPI), developed by Williams and Thorn (1989), was chosen to measure each subject's pain beliefs. This test is one of the few available measures of this variable. It is comprised of three independent sub-scales thought to comprise one's overall pain belief system. These sub-scales are (a) duration of pain, (b) self-blame and pain, and (c) pain as a mystery. Low intercorrelation scores were found between each of these three pain sub-scales suggesting that each represents and assesses a separate aspect of the subject's pain belief system (Williams & Thorn, 1989).

Description of Test

The PBAPI is a paper-and-pencil survey that contains 16 statements. Each statement is designed to measure the extent of a subject's belief in the specific pain sub-scale that it represents. The statements that comprise the PBAPI surpassed predetermined validity criteria both independently and when grouped into the representative pain sub-scales of duration, mystery, or self-blame. In addition, each of these sub-scales was shown to have satisfactory reliability estimates (Williams & Thorn, 1989).

There are nine statements that measure time, three that measure self-blame, and four that measure mystery. Examples of each type of statement can be seen in Appendix C. Each statement is followed by a 4-point Likert-like scale, which has a range of possible points from -2 to +2, with zero not included in the scoring range. Subjects were instructed to rank each statement from strongly agree (+2) to strongly disagree (-2). The strength of one's belief in a sub-scale is reflected by one's overall score in that sub-scale. For instance, a higher negative score in the duration of pain sub-scale would indicate a short duration of pain perception, while a higher positive score would indicate a long duration of pain perception. A higher negative score in the mystery of pain sub-scale would represent a non-mysterious belief orientation, while a higher positive score in this sub-scale would represent a mysterious belief orientation. A higher negative score in the self-blame sub-scale would imply that one

does not blame oneself for the pain, while a higher positive score would imply that one does blame oneself for the pain.

Originally, the PBAPI was designed for use with chronic pain patients. In this study, some of the athletes who participated as subjects may not have been experiencing pain at the time of testing. Hence, the instructions for taking the test were altered. Subjects who had sustained an injury in the 1990-91 season were instructed to remember that pain and answer the questions with respect to that pain. If subjects were currently experiencing pain from an athletic injury, they were instructed to answer the questions with respect to that pain. Non-injured subjects, because they did not sustain an injury during the 1990-91 season, were asked to imagine how they would have felt if they had experienced pain from an injury during their athletic participation.

Administration of Test

Subjects were scheduled to participate at times that were deemed convenient to both the individual subject and the test administrator. Fifteen minutes were scheduled for test completion, but more time was available for questions if necessary. No more than 15 subjects completed the questionnaire at one time.

Subjects were asked to complete the PBAPI. Standardized instructions were read that advised the subjects to answer the questionnaire either from the perspective of their current injury pain, from memories of how the pain affected them while injured,

or from imagining that they had been injured during season and predicting their reactions to the pain (see Appendix D).

Completed questionnaires were collected by the test administrator once testing was completed.

Scoring of Data

The number circled by the subject on the Likert-like scale that followed each question represented the numerical amount that was added to obtain the total score for that sub-scale.

Questions that required a reverse scoring for computation were signified by (R) on the scoring sheet.

Each subject had three scores for the test, representative of the three pain sub-scales that comprise one's overall pain belief system. Individual subject data were then reorganized into the predetermined sub-sample groups as determined by the subject's gender and injury status.

Treatment of Data

A two-way analysis of variance (ANOVA) was used to determine if significant differences existed among the sub-samples for each of the three pain sub-scales. Thus, three discrete ANOVAs were executed. Statistics involved in the ANOVA were performed on the Apple Statistics with Finesse program (Bolding, 1984) for the duration and self-blame sub-scales. Due to a system error, the wrong error term was used for the mystery sub-scale when done on the Apple program, which led to faulty significance being located. Therefore, the VAX Statistical Package for the Social Sciences program (Statistical Package for the Social Sciences

Inc., 1983) was used for the mystery sub-scale.

The .05 level of significance was determined as tolerable. The Tukey method (Hopkins, Glass, & Hopkins, 1987) was used to identify where significant differences were located and was performed by hand.

Summary

Junior varsity and varsity athletes ($N = 79$) who participated in intercollegiate athletics were located from the population of athletes at Ithaca College. The PBAPI was administered to the subjects in an attempt to measure each subject's pain belief system. Subjects were divided into sub-scales based on both their gender and injury classification. An ANOVA ($p < .05$) was used to determine the relationship among gender, injury status, and one's pain belief system for each of the three pain sub-scales as measured by the PBAPI.

Chapter 4

RESULTS

The results of the investigation into the pain beliefs of athletes, as divided by gender and injury status, are presented in this chapter. The chapter is divided into the following sections: (a) description of subjects, (b) duration of pain, (c) pain as a mystery, and (d) self-blame and pain. The chapter concludes with a summary.

Description of Subjects

Subjects in this study were junior varsity and varsity intercollegiate athletes who participated at Ithaca College during the 1990-91 season. All subject volunteers meeting the criteria above were eligible for testing. Originally, 95 athletes volunteered. Data were not collected on 16 of the original volunteers because either they did not arrive for testing at the pre-arranged time and/or they chose not to participate after the standardized instructions were read. Data were collected on the remaining subjects ($N = 79$).

Of the subjects tested, 33 were male and 46 were female. The breakdown for the injury categories is as follows: non-injured = 40, mildly injured = 14, moderately injured = 11, and severely injured = 14. Of those subjects placed in injury categories, no subject tested was permanently eliminated from athletic participation. In fact, only one female was currently not participating due to injury.

Duration of Pain

The mean and standard deviation scores for duration of pain as reported by males and females are presented in Tables 1 and 2, respectively. Note that all the means except for severely injured females are negative, suggesting that most athletes in this study tend to believe that pain is of short duration. To test the hypotheses associated with these data, a 2 x 4 ANOVA (Gender x Degree of Injury) was performed and the results are presented in Table 3. Because there was no statistical significance found in the test of interactions ($F = 2.14$, $p > .05$), the results of the tests on each main effect (Gender and Injury) could be interpreted directly.

Hypothesis 1. There is no significant difference between males and females in their perception of the duration of pain. Because no statistically significant difference was found, $F(1, 71) = 1.96$, $p > .05$ (see Table 3), the hypothesis was accepted.

Hypothesis 2. There are no significant differences among injury categories in the subjects' perception of the duration of pain. The finding of a statistically significant difference, $F(3, 71) = 3.82$, $p < .05$ (see Table 3), required the rejection of this hypothesis. In order to clarify the location of the statistically significant difference, the mean scores of injury categories for the duration of pain regardless of gender were calculated, and a post hoc Tukey test was performed (Hopkins et al., 1987). The Tukey test revealed a statistically significant difference ($q = 3.73$, $p < .05$) between two of the sub-groups of

Table 1

Mean and Standard Deviation Scores for Duration of Pain as
Reported by Males

| <u>Level of Injury</u> | <u>M</u> | <u>SD</u> | <u>n</u> |
|------------------------|----------|-----------|----------|
| Non-injured | -7.45 | 6.20 | 20 |
| Mildly Injured | -5.67 | 7.06 | 6 |
| Moderately Injured | -3.50 | 6.76 | 4 |
| Severely Injured | -11.67 | 6.81 | 3 |

Table 2

Mean and Standard Deviation Scores for Duration of Pain as
Reported by Females

| <u>Level of Injury</u> | <u>M</u> | <u>SD</u> | <u>n</u> |
|------------------------|----------|-----------|----------|
| Non-injured | -8.10 | 6.28 | 20 |
| Mildly Injured | -7.75 | 4.86 | 8 |
| Moderately Injured | -1.29 | 6.63 | 7 |
| Severely Injured | 1.36 | 11.25 | 11 |

Table 3

ANOVA Summary for Gender and Injury Categories on Duration of Pain

| <u>Source</u> | <u>SS</u> | <u>df</u> | <u>MS</u> | <u>F</u> |
|-----------------|-----------|-----------|-----------|----------|
| Gender | 100.87 | 1 | 100.87 | 1.96 |
| Injury | 589.68 | 3 | 196.56 | 3.82* |
| Gender x Injury | 330.93 | 3 | 110.31 | 2.14 |
| Within Cells | 3,652.95 | 71 | 51.45 | |

* $p < .05$.

injury classification; the non-injured subjects were significantly different from the severely injured subjects (see Table 4). Higher negative mean scores ($\bar{M} = -7.77$) indicate that the non-injured subjects have a stronger belief in a short pain duration when compared to the severely injured subjects ($\bar{M} = -1.43$). The trend for the means among the injury categories suggests that the less severe the injury, the stronger one's belief of a short duration of pain.

Mystery of Pain

The mean and standard deviation scores for the mystery of pain as reported by males and females are presented in Tables 5 and 6, respectively. Note that the scores tended to rank low in the mystery category, as is exemplified by the negative means. To test the hypotheses associated with these data, a 2 x 4 ANOVA (Gender x Degree of Injury) was performed and the results are presented in Table 7. Because there was no statistical significance found in the test of interactions ($F = 0.22$, $p > .05$), the results of the tests on each main effect (Gender and Injury) could be interpreted directly.

Hypothesis 3. There is no significant difference between males and females in their perception of the mystery of pain. Because no statistically significant difference was found, $F(1, 71) = 2.75$, $p > .05$ (see Table 7), the hypothesis was accepted.

Hypothesis 4. There are no significant differences among injury categories in the subjects' perceptions of the mystery of pain. Because no statistically significant difference was found,

Table 4

Mean Scores of Injury Categories for the Duration of Pain
Regardless of Gender

| Level of Injury | <u>M</u> | <u>n</u> |
|--------------------|----------|----------|
| Non-injured | -7.77* | 40 |
| Mildly Injured | -6.86 | 14 |
| Moderately Injured | -2.09 | 11 |
| Severely Injured | -1.43* | 14 |

* $p < .05$.

Table 5

Mean and Standard Deviation Scores for Mystery of Pain as
Reported by Males

| <u>Level of Injury</u> | <u>M</u> | <u>SD</u> | <u>n</u> |
|------------------------|----------|-----------|----------|
| Non-injured | -3.00 | 3.04 | 20 |
| Mildly Injured | -3.33 | 1.97 | 6 |
| Moderately Injured | -1.25 | 2.99 | 4 |
| Severely Injured | -1.33 | 3.21 | 3 |

Table 6

Mean and Standard Deviation Scores for Mystery of Pain as
Reported by Females

| <u>Level of Injury</u> | <u>M</u> | <u>SD</u> | <u>n</u> |
|------------------------|----------|-----------|----------|
| Non-injured | -1.30 | 3.85 | 20 |
| Mildly Injured | -0.87 | 3.80 | 8 |
| Moderately Injured | -1.00 | 4.93 | 7 |
| Severely Injured | -0.82 | 5.25 | 11 |

Table 7

ANOVA Summary for Gender and Injury Categories on Mystery of Pain

| <u>Source</u> | <u>SS</u> | <u>df</u> | <u>MS</u> | <u>F</u> |
|-----------------|-----------|-----------|-----------|----------|
| Gender | 40.60 | 1 | 40.60 | 2.75 |
| Injury | 10.50 | 3 | 3.50 | 0.24 |
| Gender x Injury | 9.81 | 3 | 3.27 | 0.22 |
| Within Cells | 1,047.25 | 71 | 14.75 | |

$F(3, 71) = .24, p > .05$ (see Table 7), the hypothesis was accepted.

Self-blame and Pain

The mean and standard deviation scores for self-blame and pain as reported by males and females are presented in Tables 8 and 9, respectively. Note that the scores tended to rank low in the self-blame category, as is exemplified by the negative means. To test the hypotheses associated with these data, a 2 x 4 ANOVA (Gender x Degree of Injury) was performed and the results are presented in Table 10. Because there was no statistical significance found in the test of interactions ($F = 0.23, p > .05$), the results of the tests on each main effect (Gender and Injury) could be interpreted directly.

Hypothesis 5. There is no significant difference between males and females in their perceptions of self-blame and pain. Because no statistically significant difference was found, $F(1, 71) = 0.06, p > .05$ (see Table 10), the hypothesis was accepted.

Hypothesis 6. There are no significant differences among injury categories in the subjects' perceptions of self-blame and pain. Because no statistically significant difference was found, $F(3, 71) = 0.87, p > .05$ (see Table 10), the hypothesis was accepted.

Summary

In the duration of pain sub-scale, no statistically significant difference was found between males and females. The means indicate that all groups tended to have strong beliefs in a

Table 8

Mean and Standard Deviation Scores for Self-blame and Pain as
Reported by Males

| <u>Level of Injury</u> | <u>M</u> | <u>SD</u> | <u>n</u> |
|------------------------|----------|-----------|----------|
| Non-injured | -1.60 | 3.99 | 20 |
| Mildly Injured | -0.50 | 3.45 | 6 |
| Moderately Injured | -2.50 | 3.70 | 4 |
| Severely Injured | -3.00 | 5.20 | 3 |

Table 9

Mean and Standard Deviation Scores for Self-blame and Pain as
Reported by Females

| <u>Level of Injury</u> | <u>M</u> | <u>SD</u> | <u>n</u> |
|------------------------|----------|-----------|----------|
| Non-injured | -1.75 | 3.08 | 20 |
| Mildly Injured | -1.12 | 2.36 | 8 |
| Moderately Injured | -3.29 | 3.04 | 7 |
| Severely Injured | -1.55 | 2.21 | 11 |

Table 10

ANOVA Summary for Gender and Injury Categories on Self-blame and Pain

| <u>Source</u> | <u>SS</u> | <u>df</u> | <u>MS</u> | <u>F</u> |
|-----------------|-----------|-----------|-----------|----------|
| Gender | 0.69 | 1 | 0.69 | 0.06 |
| Injury | 28.74 | 3 | 9.58 | 0.87 |
| Gender x Injury | 7.44 | 3 | 2.48 | 0.23 |
| Within Cells | 780.29 | 71 | 10.99 | |

short pain duration. A statistically significant difference was found among injury groups with respect to their beliefs in the duration of pain. After further statistical analysis, the location of this difference was determined to be between the non-injured and severely injured groups. The higher negative mean for the non-injured group ($M = -7.77$) indicates a stronger belief in a short pain duration when compared to the severely injured group ($M = -1.43$).

In the mystery of pain sub-scale, the means for the subjects were negative, indicating a non-mysterious perception of pain. No statistically significant differences were located in the mystery sub-scale.

In the self-blame and pain sub-scale, the means for the subjects were negative, indicating that the subjects tended not to blame themselves for their pain. No statistically significant differences were found in the self-blame sub-scale.

Chapter 5

DISCUSSION OF RESULTS

The purpose of this chapter is to discuss the statistical results presented in Chapter 4. The specific areas for discussion are the relationship between gender and injury status in reference to: (a) duration of pain, (b) mystery of pain, and (c) self-blame and pain. This chapter closes with a summary.

Duration of Pain

The results of this study indicate that the subject athletes believe the duration of pain to be relatively short. However, a statistically significant difference revealed that non-injured athletes had a stronger belief in the short duration of pain when compared to their severely injured counterparts.

This tendency of the athletes to have beliefs that pain has a relatively short duration influences the athlete's emotional response to an injury. Weiss and Troxel (1986), with similar findings, suggest that athletes, believing/anticipating a short pain duration, may be overwhelmed by the length of the recovery prognosis. However, once recovery has begun or is successfully completed, as in the case with the severely injured athletes in this study, they may decrease their belief in the shortness of pain duration. Athletes, particularly non-injured athletes, would apparently perceive any length of recovery, even acute, as longer than it "should" be.

There was no statistically significant difference noted between male and female athletes with respect to their perception

of the duration of pain. This finding contributes to a growing body of literature that suggests that gender does not predict the amount of time necessary for male and female athletes to recover from similar injuries. Men and women, in a study on the effects of gender on headache pain, were found to seek and utilize medical care in a similar fashion once defined as having equivalent symptom reports, even though they may experience the pain differently (Celentano et al., 1990).

Mystery and Pain

It was hypothesized that severely injured athletes would have a more externally based locus of control belief system, whereas uninjured athletes would be more internally controlled. In fact, no statistical differences were found. It appears that athletes, regardless of injury status, have a belief in pain that is relatively non-mysterious. This non-mysterious belief signifies that athletes may operate from an internal locus of control orientation in reference to pain. However, the majority of injured athletes in this study had returned to athletic competition since their injury, and no athletes in this study represented athletes who had failed at rehabilitation efforts. Mastery experiences, which reflect one's performance capabilities, are a prominent influence on one's sense of self-efficacy (Dolce, 1987). Injured athletes may view their return to competition as indicative of their mastery of pain. By increasing their sense of self-efficacy, these athletes may reinforce an internal locus of control perspective. Once

returning from an injury, it appears that their locus of control perspective is similar to that of uninjured athletes.

While it was hypothesized, based on cultural gender role expectations, that there would be a gender difference on the pain as a mystery sub-scale, this was not supported. Because the means tended toward the negative end of the mystery scale, it appears that neither male nor female athletes believe pain to be mysterious. Klonsky et al. (1986) theorized that intercollegiate athletes, regardless of gender, are viewed as having obtained similar levels of success in their respective sports and as having achieved relatively equal status. This can override the cultural expectations and equalize their attributional responses to the roles of luck and ability in performance. By this theory, competitive intercollegiate athletes, regardless of gender, tend to attribute their performance outcomes to internal factors, hence, they operate from an internal locus of control orientation. The results presented here support this theory.

One's perceived locus of control affects how an individual responds to a long-term recovery prognosis (Weiss & Troxel, 1986). The results from this study indicate that male and female athletes operate from a similar internal locus of control basis and, thus, would have similar responses to injuries of similar recovery lengths. This relationship of locus of control to duration of recovery is also supported by the findings presented under the previous heading in which male and female athletes reported similar perceptions as to the duration of pain.

Self-blame and Pain

It was hypothesized that there would be no significant differences among athletes in their perception of self-blame and pain. Results of this study support this hypothesis in that no significant differences were found either among athletes with different injury levels or between genders. The negative mean scores in this sub-scale suggest that athletes, in spite of their tendency toward an internal locus of control orientation, do not blame themselves for the pain from an injury.

It is well known that those who participate in athletics are exposing themselves to the risk of injury (DeHaven & Lintner, 1986). Because of this known risk, athletes may view an injury as part of the consequences of participation and not blame themselves for it. From the results of this study, it appears that athletes do not incorporate a sense of self-blame to the pain from an athletic injury.

Summary

A statistically significant difference was located in the duration of pain sub-scale between severely injured and non-injured athletes while there was no statistically significant difference between male and female athletes' perceptions of pain's duration. The uninjured athletes reported higher negative scores in this category when compared to the severely injured athletes. This implies that, regardless of gender, non-injured athletes have stronger belief in a short pain duration, and perhaps less time to recovery from pain, when compared to

severely injured athletes.

Athletes across gender and injury status do not appear to differ in their views of the mysteriousness of pain. It would follow that athletes have similar perceptions as to their locus of control orientation. The negative means in this sub-scale indicate a non-mysterious pain perception and, thus, a more internal locus of control orientation. Perhaps injured athletes, either on the road to recovery or once they have successfully returned to athletic competition, view their successes as their mastery over pain and thereby maintain their internal locus of control orientation. In addition, the similar attributional styles of male and female intercollegiate athletes to the roles of hard work and ability may contribute to their similar internal locus of control orientations.

No significant differences were found in the self-blame and pain sub-scale. As is suggested by the negative trend of means in this sub-scale, athletes tend to not blame themselves in the event of an injury. In spite of their internal locus of control orientation, male and female athletes, with or without prior injuries, appear to view the event of an injury during athletic participation as an accident that is without self-imposed and individualized blame.

Chapter 6

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

This chapter gives an overview of the study. The chapter is divided into three sections. First, there is a brief summary of the study. Next, some conclusions are drawn with respect to the results obtained from this study. Finally, some recommendations for further research are suggested.

Summary

Intercollegiate athletes from the Ithaca College population were surveyed in order to assess their pain beliefs. The PBAPI (Williams & Thorn, 1989), with modified instructions, was chosen as the tool to assess their pain beliefs. It divides one's pain beliefs into three pain sub-scales: the duration of pain, pain as a mystery, and self-blame and pain. Each sub-scale represents a different aspect of one's pain belief system.

The athletes were placed into sub-sample groups based on their gender and injury status. Injury status was determined from the Ithaca College training room records for the 1990-91 season. Results indicated that athletes do not differ in their pain beliefs across all three pain sub-scales in terms of gender. No significant differences were located among injury categories on the mystery and self-blame sub-scales. However, a significant difference was found between severely injured and non-injured athletes as to the strength of their belief in the duration of pain.

While all athletes in this study tend to believe that pain

has a relatively short duration, the non-injured athletes appear to have a stronger belief in the short duration of pain when compared to their severely injured counterparts' beliefs. This may indicate that athletes, particularly uninjured athletes, would perceive any recovery prognosis to be longer than necessary, because they feel that pain should last a relatively short time.

It appears that the subject athletes have a non-mysterious pain perspective, regardless of their injury status or gender, from the negative means found in this sub-scale. This is analogous to an internal locus of control perspective in which one believes that he/she has personal control over the outcome of an event. Perhaps injured athletes reinforce their sense of self-efficacy once recovery has begun by perceiving their recovery as a mastery experience over the injury, which could increase their perception of internal control. The similar locus of control orientations found between male and female athletes may have resulted from their having attained similar status levels in their collegiate environment, which could equalize their attribution styles.

Athletes do not differ in their sense of self-blame and pain. From their negatively based means on this sub-scale, it seems that athletes do not blame themselves for the pain incurred from an injury, in spite of their internal locus of control orientation.

Conclusions

As classified by injury status, athletes seem only to differ in their beliefs of the duration of pain. While all athletes tended to believe pain's duration to be relatively short, non-injured athletes held stronger beliefs in short pain duration than did their severely injured counterparts. This finding seems to support Weiss and Troxel's (1986) theory that athletes are overwhelmed by the recovery prognosis from a severe injury. It would appear that the athletes are overwhelmed because they expect pain's duration to be short, so that any length of pain is perceived as lasting too long, and any recovery prognosis is unexpected and overwhelming. Therefore, it may be beneficial to athletes if clinicians validate their belief that the pain is lasting a long time, regardless of the actual length of the pain. After all, it is the patient's, not the therapists, belief in the treatment that affects the patient's response to the treatment (Roberts et al., 1984).

No other statistically significant differences were found among athletes as organized by injury severity. In this study, injured and non-injured athletes may operate from similar internal locus of control orientations because all injured athletes had either begun a productive rehabilitation program or had successfully returned to athletic competition. Therefore, they may have experienced similar mastery experiences that allowed all subject athletes to operate from similar internal locus of control beliefs.

No statistically significant differences were found between male and female athletes. It is theorized (Klonsky et al., 1986) that male and female athletes of similar success levels have similar attributional styles. It may be that these similar attributional styles contribute to the lack of differences found between the male and female athletes of this study.

Determination of one's pain beliefs can have important considerations in the clinical perspective. Because different types of beliefs can predict different types of behavior (Lobel, 1982), perhaps prior knowledge of an athlete's pain belief system can predict how that athlete will respond to the recovery prognosis. This may allow clinicians to be better prepared for the athlete's response.

Recommendations

This investigation was a pioneer study in the area of pain beliefs and athletes. As such, it has raised more questions than it answers. Further research into the realm of pain beliefs can be suggested.

It would be beneficial to test the pain beliefs of athletes in different sporting events. Does each sport's injury risk factor affect the pain beliefs of those involved in that sport? Do athletes in the same sporting event have similar pain belief profiles? Are athletes drawn to a specific sport based on their pain beliefs? Do athletes, once injured, have different self-blame attributional styles based on the type of sport in which they participate? Do athletes who participate in contact sports

differ in their pain beliefs from athletes who participate in non-contact sports? Do participants in team sports have different pain beliefs than those involved in individual sports? Are individual sport athletes more likely to blame themselves for an injury than team sport athletes?

In this study, it was discovered that intercollegiate athletes, in general, have similar pain beliefs with respect to the mystery of pain and self-blame and pain. Do athletes differ in their pain beliefs from non-athletes? Does a person choose to participate in sporting events because of his/her pain belief style? Do athletes, because of the known injury risk factor involved in competitive athletics, view pain from a less mysterious perspective than do non-athletes? Are non-athletes more likely to blame themselves for their pain than athletes? Do athletes and non-athletes have similar beliefs in how long they believe their pain should last? Are athletes, once injured, more likely to benefit from a chronic pain perspective than non-athletes?

Does one's cultural background influence one's pain beliefs? Does the socialization process one undergoes while involved in the athletic realm influence one's pain beliefs? Can this socialization process override one's cultural background? Does one's socioeconomic position influence one's pain beliefs? Can the athletic domain override an individual's initial pain belief system?

Does the pain from an injury affect one's pain beliefs?

Does the pain from an athletic injury (something in which one chooses to participate) have a different impact on one's pain beliefs than would the pain from a car accident (something in which one does not choose to participate)? Does an athlete change his/her pain beliefs after sustaining an injury? Does an athlete's pain belief system return to pre-injury status after successful completion of rehabilitation? Do one's pain beliefs influence how one perceives the return to athletic competition after sustaining an injury? Can one's pain beliefs be altered during rehabilitation to facilitate a successful return to athletic competition? If so, how?

The only thing that seems clear from the results of this study is that there is much left to be learned regarding pain beliefs and athletes. As yet a relatively unexplored area of athletics, this psychological connection between an athlete and his/her injury provides one with a multitude of directions in which to begin exploring.

Appendix A

LETTER TO THE COACH ABOUT THE STUDY

Dear Coach,

I am a graduate student in the School of Health Science and Human Performance, and I would like permission to recruit athletes from your team to participate in a research study. The general purpose of the study is to assess the pain beliefs of both injured and non-injured athletes and to determine if there is a difference between these athletes.

To be participants in this study, subjects will be required to fill out a questionnaire concerning their pain beliefs. The questions address the duration of one's pain, the amount of blame one attributes to oneself as the result of pain, and the degree to which one feels that one's pain is a mystery.

Before participation in this study will be allowed, volunteer athletes will have to read and sign an informed consent form. This will allow the experimenter to view the final injury reports as compiled by the Ithaca College athletic trainers for proper injury classification of collected data. In addition, it will allow the experimenter to determine the athlete's age, gender, sport, extent of in-season injuries, if any, and future contact information.

The athletes will not be subjected to any type of psychological risks that would make them feel uncomfortable or embarrassed. Subjects will be assured that their individual data will remain confidential. Only grouped data will be used for

data analysis and in the presentation of the results.

Participation in this study is purely by voluntary consent. No attempt will be made to pressure the athlete into participation.

It would be greatly appreciated if you would inform your athletes of this study. Some informed consent forms have been provided so that your athletes may volunteer for this study. Completed consent forms can be returned either to Dr. Eskridge or myself no later than Friday, April 19. If more forms are needed, please contact me.

If you have any questions, please contact me at 256-4032, or Dr. Eskridge at 274-3411. Thank you for your time and energy.

Sincerely,

Chris O'Connor

Appendix B

INFORMED CONSENT FORM

1. The study.

a. Purpose: This study will compare and contrast the pain beliefs held by injured and non-injured varsity and junior varsity athletes at Ithaca College.

b. Methods: You will be given a questionnaire that assesses your personal beliefs concerning pain. In order to properly answer the questions on the questionnaire, you must be able to think about pain that you have experienced.

It will take you fewer than 5 minutes to complete the questionnaire. The experimenter will be on hand to answer any questions you may have.

c. Benefits of participation: You will be involved in enhancing information currently available in the area of sports psychology. Therefore, not only could you help yourself to understand the implications of pain in sports, but you may help others to better understand it. You may receive your personal results in addition to a copy of the final results of this study once it is completed.

2. Are there any risks associated with this study?

There will be no attempt to deceive or pressure you in the questions. Also, this study does not require any physical activities that may cause you pain. If, at any time or for any reason, you decide to leave without completing the questionnaire, you may do so.

3. For more information.

If you would like more information about this study or its results, contact Chris O'Connor at (607) 256-4032 or Dr. Eskridge at (607) 274-3411.

4. Withdrawal from this study.

As was stated earlier, remember that if you decide to terminate your participation in this study at any time prior to the completion of this study, please feel free to do so. No questions will be asked of you in terms of why you have chosen to end your participation in this study.

5. Confidentiality.

At no point during this study will your name be associated with the collected data. The only form of identification on the questionnaires will be a personalized identification number that will allow the experimenter to identify your injury category and to contact you if you decide that you would like your personal results from the questionnaire. Only grouped data will be used in this study once it is completed.

6. Consent.

In participating in this study, I give the experimenter permission to view my injury status as is on record in the current and/or final injury report found in the training room. I understand that the experimenter has the approval of Dr. Kent Scriber to view these injury reports and that the experimenter will not have access to my individual medical file in the training room.

I have read the above, understand its contents, and agree to participate in this study. I acknowledge that I am at least 18 years old.

Printed Name

Ithaca College Sport

Signature

Age

Date

Phone Number

Appendix C

SAMPLE QUESTIONS FROM THE PAIN BELIEFS AND PERCEPTIONS INVENTORY

Duration of Pain

3. There are times when I am pain-free.
6. I am continuously in pain.
9. My pain is a temporary problem in my life.
15. Someday I'll be 100% pain-free again.

Pain as a Mystery

1. No one's been able to tell me exactly why I'm in pain.
4. My pain is confusing to me.
14. I can't figure out why I'm in pain.

Self-blame and Pain

7. If I am in pain, it is my own fault.
11. I am the cause of my pain.
13. I blame myself if I am in pain.

Appendix D

STANDARDIZED INSTRUCTIONS

You are going to fill out a 16-question survey that asks you about your pain beliefs. These questions were designed to assess how you feel about pain.

In order to properly answer these questions, you must be able to think about pain. You may have to focus on the pain you feel right now from an athletic injury. You may have to remember the pain you felt from a prior injury. If you have never suffered from an injury, you may have to imagine how you would feel if you were in pain.

Please take a moment to look at the three different categories listed at the top of the questionnaire (pause for a moment).

If you are in pain right now from an injury you got while playing your Ithaca College sport, think about that pain while you answer the questions. If you fit this category, place an "x" on the line next to the first statement.

If you are not in pain, but you were injured during this past season, think back over that season. Try and remember the worst pain you felt.

Think about your practices.

Think about the games you played in.

Think about your time in rehabilitation.

Remember this pain while you answer the questions. If you fit this category, place an "x" on the line next to the second

statement.

If you were not injured while playing your sport this past season, try and imagine how you would have felt if you had been injured.

How would you have felt if the pain from an injury made you miss a few practices?

How would you have felt if you had to miss a game because you were injured and in pain?

Imagine this pain while you answer the questions. If you fit this category, place an "x" on the line next to the third statement.

Please try and answer the questions as honestly and accurately as you can. There are no right or wrong answers. No one else will be able to find out how you, as an individual, answered the questions.

If you like, you may end your participation in this study at any time.

Are there any questions? (time for questions/answers)

If you have any questions after finishing the questionnaire, I will be glad to answer them at that time.

You may begin.

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