

ASSOCIATION BETWEEN ATHLETE BURNOUT AND ATHLETIC INJURY

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A thesis submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Master of Arts in the Department of Exercise & Sport Science.

Chapel Hill
2014

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ABSTRACT

PAMELA BROOK HUGHES: Association Between Athlete Burnout and Athletic Injury
(Under the direction of William Prentice)

The purpose of this study was to examine the association between athlete burnout and athletic injury in a sample of Division I, varsity sport student-athletes. Participants completed an Internet-based survey that assessed demographics, self-reported perceptions of athlete burnout and athletic injury history. A significant association was not found between the number of athletic injuries and athlete burnout. There was an association between sustaining multiple athletic injuries at any given body segment and the burnout dimension of reduced sense of sport accomplishment. Dimension burnout scores on emotional and physical exhaustion were higher in currently injured when compared to uninjured student-athletes while global athlete burnout scores of student-athletes that sustained at least one athletic injury were higher compared to student-athletes that did not sustain any athletic injuries. This study informs clinician knowledge and ultimately more efficient care for the physical and psychological concerns of collegiate student-athletes.

ACKNOWLEDGEMENTS

I give honor to my Lord and Savior, Jesus Christ, for seeing me through the completion of this thesis process. Thank you to my family for unconditional love and support throughout my life, especially graduate school. Thank you to J.D. DeFreese for not letting anything “slip through the cracks” and ensuring that my thesis document was quality work. Thank you to Zack Kerr for always helping me see the bigger picture and being an advocate for me mentally by always letting me know that progress was being made. Thank you to Barnett Frank for introducing me into the world of Qualtrics and your dedication to the development of the survey. Thank you to Brian Pietrosimone for always being a set of fresh eyes to give a different perspective to presentation of this thesis. My most humble gratitude for Bill Prentice who never let me quit on myself, who let me know that perseverance mattered and who remained confident in his decision to make me a part of the Carolina Sports Medicine family. Thank you for the struggle, Bill. Thank you to my classmates for the company along the way of this journey and aiding me in gaining the opportunity to survey your respective student-athletes. Thank you to the coaches who allowed their respective student-athletes the opportunity to participate in this research. Thank you to my clinical supervisors and peer graduate-assistant athletic trainers for allowing me to balance out, mentally and physically, dedication to my academic and clinical experience - without Scott Oliaro and Meredith Petschauer I would not be the confident clinician that I am today. Lastly, thank you to Kevin King for making me apply to the graduate athletic training program at UNC – Chapel Hill.

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LIST OF ABBREVIATIONS

AB	Athlete Burnout
ABQ	Athlete Burnout Questionnaire
AEs	Athlete Exposures
MBI	Maslach Burnout Inventory
NCAA	National Collegiate Athletic Association
UNC	University of North Carolina at Chapel Hill

CHAPTER ONE

Athlete Burnout

In the past two decades, research related to burnout has transcended the workplace context and expanded to include athletes (Goodger, Gorely, Lavalley, & Harwood, 2007). Adapted from burnout occurring in the workplace, athlete burnout (AB) is comprised of three dimensions: (1) emotional and physical exhaustion; (2) reduced sense of sport accomplishment; and (3) sport devaluation (Raedeke, 1997). Empirical research on the prevalence of athlete burnout is continuing to develop. There is limited knowledge regarding the prevalence of burnout in athletes, with current research estimating the prevalence to be less than 10% (DeFreese & Smith, 2013; Gustafsson, Kenttä, Hassmén, & Lundqvist, 2007; Raedeke & Smith, 2001; Smith, 1986). Both individual and organization factors have been theorized to contribute to burnout in athletes including psychological stress and stressors related to sport, unidimensional identification as an athlete, external control, and feelings of entrapment in sport (Coakley, 1992; Raedeke, 1997; Smith, 1986). Continued examination of the relationship of athlete burnout with empirically specified antecedents will further the understanding of this maladaptive experience for athletes (Gould, Udry, Tuffey, & Loehr, 1996).

Burnout Theory

The empirical knowledge base on athlete burnout has largely been guided by three theoretical conceptualizations. The cognitive-affective model of athlete burnout describes burnout as an outcome of the psychological stresses of sport (Smith, 1986). Coakley's

sociological model of athlete burnout focuses on the lack of multidimensional athletic identity and external control of sport participation as key contributors to burnout development in sport (Coakley, 1992). The sport commitment model suggests that athletes adopting a maladaptive pattern of sport commitment, characterized by feelings of entrapment in sport, are at risk for athlete burnout (Raedeke, 1997).

Research guided by these theories has shown athlete burnout to be associated with a variety of empirically-specified variables including years of sport involvement, sources of sport commitment, athlete stress perceptions, motivation, and anxiety (Chu & Wang, 2012; Dale & Weinberg, 1990; DeFreese & Smith, 2013; Gould, Tuffey, Udry, & Loehr, 1997; Hollander, Meyers, & LeUnes, 1995; Johnson & Ivarsson, 2011; Lemyre, Roberts, & Stray-Gundersen, 2007; Raedeke, 1997; Raedeke, Granzyk, & Warren, 2000; Weiss, Kimmel, & Smith, 2001; Wilson et al., 2004). Importantly, these aforementioned theories are not mutually exclusive but are compatible and can be used in conjunction to explain athlete burnout and its association with other outcomes of sport participation, such as athletic injury.

Injury in Athletics

A three-year study of 573 student-athletes from a Division I University found that 1,317 injuries were sustained during sport participation, leading to an injury rate of 63.1 injuries per 10,000 athlete exposures (AEs). An athlete exposure was defined in this study as one athlete attending one coach-directed session of either a game or practice (Yang et al., 2012). A fifteen-year study of injuries across fifteen different National Collegiate Athletic Association (NCAA) organized athletic teams included all injuries that were directly the result of participation in an organized practice or competition, evaluated by an athletic trainer or physician and resulted in least one day of full restriction from participation or performance

directly due to the injury. The study reported competition and practice injury rates of 13.8 and 4.0 per 1,000 AEs, respectively. The injury rate for regular season competitions (14.5/1,000 AEs) was larger than the injury rates for preseason competitions (6.0/1,000 AEs) and postseason competitions (8.7/1,000 AEs). The injury rate for preseason practice (6.6/1,000 AEs) was larger than injury rates for regular season practice (2.3/1,000 AEs) and postseason practice (1.4/1,000 AEs) (Hootman, Dick, & Agel, 2007).

It is important to consider the incidence and severity of injury for individual athletes due to variation in athletic injury responses. The individual differences between athletes responding to athletic injury are related to physiological and psychological outcomes (Walker, Thatcher, & Lavallee, 2007). The extent of an injured athlete's psychological response to injury is based upon cognitive appraisal of the injury, which involves a number of different thoughts, emotions, and behaviors (Tracey, 2003; Walker et al., 2007; Wiese-Bjornstal, Smith, Shaffer, & Morrey, 1998). Potential psychological outcomes to injury include depression, low self-esteem, fear of the unknown (Wiese-Bjornstal et al., 1998), and potentially athlete burnout.

Areas of Needed Research

Building on the current knowledge base and extant athlete burnout theory, continued research is needed which examines the relationship of athlete burnout with other stress-related outcomes in sport, such as injury. Existing research has suggested factors and covariates related to athlete burnout including motivation, starting status, and sport experience (Cresswell & Eklund, 2005, 2006a). However, research on the association between athletic injury and athlete burnout is still in its infancy and methodologically limited

(Cresswell & Eklund, 2005, 2006b, 2006d). For example, current studies have utilized work-based as opposed to a sport-based burnout measure (Grylls & Spittle, 2008).

Other limitations, some of which are innate to injury epidemiological studies, include inconsistent definitions of athletic injury, not limiting the report of injuries to athletic injuries, not assessing current injury status, not assessing the severity of current injury or not assessing the specific history of athletic injuries sustained, and/or not controlling for the time during the sport season when the participants completed the study (Grylls & Spittle, 2008; Hodgson, Gissane, Gabbett, & King, 2007; Orchard & Hoskins, 2007; Verhagen & Van Mechelen, 2010). Research that examines athlete burnout with appropriate sport-specific measures, while obtaining a detailed assessment of athletic injury, will yield more accurate estimates of the association between athletic injury and athlete burnout. Furthermore, such findings will lead to a better understanding of the factors that contribute to and hinder athletes' psychological well-being.

Purpose

Examining potential antecedents of athlete burnout is crucial to pinpoint factors that minimize an athlete's positive sport experience. Therefore, the purpose of this study is to estimate the association between burnout perceptions and injuries reported by student-athletes during their varsity sport experience at the University of North Carolina at Chapel Hill (UNC). Injury outcomes will include: (1.01) total number of injuries sustained during participation in varsity sport at UNC; (1.02) time that is completely restricted from varsity sport participation due to reported athletic injury; (1.03) time that is limited from full varsity sport participation due to reported athletic injury; and (1.04) injury type. This study will also obtain information and examine separate associations between self-reported perceptions of

athlete burnout and sport-related demographic information such as (2.01) years of competitive experience in current varsity sport at UNC, (2.02) years of competitive experience in respective sport over the participants' lifetime, and (3) sport type.

Understanding the potential association between athletic injury and athlete burnout is important for athletic trainers, who are committed to helping athletes achieve their highest physical and mental health levels while participating in sports. Because athletic trainers have day-to-day interactions with athletes, they can help team staff recognize burnout symptoms and refer athletes to proper care (Neal et al., 2013).

Research Questions

1. What is the association between athletic injuries and self-reported athlete burnout perceptions?

1.01 What is the association between the number of athletic injuries sustained and self-reported perceptions of athlete burnout?

1.02 What is the association between the time that is completely restricted from varsity sport participation due to athletic injury and self-reported perceptions of athlete burnout?

1.03 What is the association between the time that is limited from varsity sport participation due to athletic injury and self-reported perceptions of athlete burnout?

1.04 Is there a difference in self-reported perceptions of athlete burnout between athletes sustaining gradual onset injuries and athletes sustaining sudden onset injuries?

2. What is the association between years of competitive experience and self-reported measures of athlete burnout?

2.01 What is the association between years of competitive experience in current varsity sport at UNC and self-reported measures of athlete burnout?

2.02 What is the association between years of competitive experience in the athlete's respective sport over the participant's lifetime and self-reported perceptions of athlete burnout?

3. Is there a significant difference in self-reported perceptions of athlete burnout between individual-sport athletes and team-sport athletes?

Hypotheses

Research:

1.01 A positive association exists between number of athletic injuries and self-reported athlete burnout perceptions.

1.02 A positive association exists between time completely restricted from varsity sport participation due to athletic injury and self-reported perceptions of athlete burnout.

1.03 A positive association exists between time limited from varsity sport participation due to athletic injury and self-reported perceptions of athlete burnout.

1.04 Individuals endorsing gradual onset injuries will display increased self-reported perceptions of athlete burnout compared to sudden onset injuries.

2.01 A positive association exists between years of competitive experience in current varsity sport at UNC and self-reported measures of athlete burnout.

2.02. A positive association exists between years of competitive experience in athletes' respective sport over the participants' lifetime and self-reported perceptions of athlete burnout.

3. Individual-sport athletes will display significantly higher athlete burnout levels as compared to team-sport athletes.

Exposures (Independent Variables)

- Number of athletic injuries
- Time completely restricted from varsity sport participation due to athletic injury
- Time limited from varsity sport participation due to athletic injury
- Injury type
- Sport type
- Years of competitive experience in varsity sport at UNC
- Years of competitive experience in athletes' respective sport over the participants' lifetime

Outcomes (Dependent Variables)

- Self-reported perceptions of athlete burnout
 - Total burnout score
 - Subscales
 - Emotional and physical exhaustion
 - Reduced sense of sport accomplishment
 - Sport devaluation

Operational Definitions

- Varsity sport participation: University-affiliated, varsity team organization sponsored strength and conditioning, practice or competition including both individual and team training sessions (Hodgson et al., 2007).
- Individual-sport: sport in which competition is based off of individual performances that result in individual scores. Individual scores are collectively used for overall team scores. Athletes may advance in the post-season based off of individual performance with or

without team advancement. Example sports include: fencing, gymnastics, and track & field.

- Team sport: sport in which competition is based on team performance and results in a team score. Individual statistics of performance cannot advance an athlete in the post-season without team advancement. Example sports include: soccer, volleyball, and basketball.
- Athletic injury:
 - Evaluated by a member of the sports medicine staff, musculoskeletal damage to one's body sustained directly related to varsity sport participation;
 - Includes new injuries, recurring injuries, as well as re-injury (Hamilton, Meeuwisse, Emery, & Shrier, 2011).
- Limited from varsity sport participation: athlete is not allowed to participate in normal level of varsity sport training and competition. Guidelines for variations in mode, duration, frequency, and intensity of training are set by sports medicine staff (Jacobsson et al., 2010).
- Completely restricted from varsity sport participation: athlete is not allowed any level of varsity sport participation per order of sports medicine staff (Fuller et al., 2007).

Assumptions

- Athlete burnout is a relevant psychological outcome for collegiate athletics.
- Individuals participating in this study are representative of other collegiate athletes.

Limitations

- Athletic demographics, sport injury history and perceptions of athlete burnout collected using self-report measures, and thus may be prone to recall and/or social desirability bias.

- Those who suffer from severe athlete burnout may have dropped out or withdrawn from sport; therefore, their data is unable to be collected (i.e., healthy “worker” effect).
- Only Division I varsity athletes at UNC will participate in the study.
- Unable to control for each teams’ success during the current competition season.

CHAPTER TWO

History of Burnout Syndrome

Burnout has been described as an excessive demand on energy, strength and resources resulting in exhaustion (Freudenberger, 1975). Originally, burnout was introduced into the discipline of psychology as a syndrome affecting human healthcare professionals in the mid- to late-1970s (Freudenberger, 1975). The Maslach Burnout Inventory (MBI) was introduced in 1981 as a manner of measuring burnout as well as its components of emotional exhaustion, depersonalization, and personal accomplishment (Maslach & Jackson, 1981). A number of variables contribute to a healthcare professional's risk of developing burnout including patient population type, work relationships, work schedule, time involved in profession, job attitudes, lack of control, lack of social support, lack of role clarity, difficult interactions with patients' families, work overload, low self-esteem, organizational dysfunction, and interdisciplinary conflict (Marshall & Kasman, 1980; Pines & Maslach, 1978; Schuster, Nelson, & Quisling, 1984; Wolfe, 1981). In the workplace, burnout may result in decreased job performance, decreased productivity, loss of concern for patients and withdrawal from work (Schuster et al., 1984; Wolfe, 1981).

Examination of burnout has extended to individuals outside of healthcare occupations including athletes (Freudenberger, 1975). Popular culture and empirical interest in the development of burnout in the sport environment stimulated from elite athletes withdrawing from sport at the peak of their careers (Dale & Weinberg, 1990; Smith, 1986).

Although the facets of burnout examined with the MBI may be relatable to professional athletes, Raedeke (1997) recommended the development of a conceptualization of burnout distinct to athletes. The conceptualization can also be applied to the numerous athletes that do not play at the professional level (e.g. youth leagues, high school, collegiate, recreational leagues) (Black & Smith, 2007; Cresswell & Eklund, 2006b, 2006d; Gustafsson et al., 2007; Raedeke, 1997).

Athlete Burnout

Athlete burnout is a multidimensional psychological syndrome characterized by emotional and physical exhaustion, reduced sense of accomplishment, and sport devaluation (Raedeke, 1997; Raedeke & Smith, 2001). Emotional and physical exhaustion is linked to fatigue from the mental and physical demands of sport training and competition. Reduced sense of accomplishment is an inefficacy and tendency to evaluate oneself negatively regardless of sport performance or accomplishment, which is linked to an athlete's perception of athletic ability and individual achievement standards. Sport devaluation is resentment towards sport as well as the loss of interest in sport, which is linked to a development of an undesirable attitude toward sport participation and a decline in sport performance quality (Raedeke, 1997; Raedeke & Smith, 2001, 2009). This operational definition has guided empirical efforts to understand this complex psychological phenomenon in athlete populations.

Research has found athlete burnout to be associated with a variety of physiological and psychological antecedents. Responses commonly associated with athlete endorsement of burnout-related perceptions include anxiety, depression, tension, altered sleep patterns, susceptibility to illness, fatigue, lowered self-esteem, apathy, and depression (Goodger et al.,

2007; Silva III, 1990; Smith, 1986). Moreover, the symptoms of burnout itself can present in a number of forms including inappropriate behavior, difficulty interacting with others, emotional and physical isolation, emotional and physical withdrawal, decreased performance, a change in values and beliefs, substance abuse or a sense of helplessness (Lemyre et al., 2007; Silva III, 1990; Smith, 1986). Due to potentially different etiologies across athletes, a variety of theories have been utilized to aid in the understanding of this maladaptive experience and its associated responses.

Theoretical Conceptualizations of Athlete Burnout

Cognitive-Affective Model

Focused on athlete burnout as an outcome of chronic athletic stress, the cognitive-affective model of athlete burnout explains the relationships between situational factors inherent to the competitive environment, an athlete's cognitive appraisal of the person-environment transaction, and the athlete's cognitive and behavioral stress responses (Dale & Weinberg, 1990; Smith, 1986). An athlete's coping responses further contribute to these stress responses (Gould et al., 1996). Specifically, high levels of perceived stress are likely to result when an imbalance presents between an athlete's sport-based demands (e.g., training requirements) and available resources (e.g., coping skills, social support). Athlete burnout has a positive relationship with perceived stress (Goodger et al., 2007; Gould & Whitley, 2009). Perceived stress can result in a variety of behavioral responses including physical withdrawal from sport (i.e., dropout), decreased motivation and performance, strained interpersonal relations, and in some cases athlete burnout (Cresswell & Eklund, 2006d; Smith, 1986).

At the same time, athlete burnout has a negative relationship with coping and social support (Raedeke & Smith, 2001).

Sport Commitment

Beyond a response to chronic stress from sport, athlete burnout has also been conceptualized to be the result of a maladaptive pattern of sport commitment (Raedeke, 1997; Schmidt & Stein, 1991). Athlete patterns of sport commitment are based upon an athlete's reported enjoyment of sport, alternative options outside of a specific sport, personal investment in sport, sport-driven social constraints, social support and satisfaction with sport experience (Raedeke, 1997; Weiss et al., 2001; Wilson et al., 2004). Thus, athletes experiencing athlete burnout may be committed to sport for different reasons than those not experiencing (Raedeke, 1997). Raedeke (1997) performed a cluster analysis to detect athlete commitment profiles based on relevant variables and thus divide participants into distinguishable groups based upon theoretical determinants of commitment (Raedeke, 1997). Athletes that enjoyed their sport participation and exhibited a commitment to sport characterized by an adaptive profile of attraction remained in sport for an extended period of time. These athletes perceived sport participation as having associated with increasingly high rewards, low costs, great satisfaction, and high investments (Schmidt & Stein, 1991). In contrast, characteristics of entrapment and a negative outlook on sport participation were exhibited by athletes self-reporting low to average enjoyment, low to average benefit, average alternative attractiveness, high cost, low perceived control, high social constraints, and high investments. Furthermore, athletes that remained in sport despite a maladaptive, entrapment commitment profile were more likely to report increased levels of burnout as

compared to athletes with more adaptive (e.g., attraction) profiles of sport commitment (Raedeke, 1997).

The sport commitment model also suggests that an athlete's level of burnout is influenced by specific conditions of sport commitment. For example, athletes exhibiting an entrapment profile of sport commitment have elevated athlete burnout perceptions. Athletes exhibiting entrapment or obligated profiles of sport commitment had strong athlete identities and low perceived personal control (Raedeke, 1997). This finding suggests that commitment to sport influences athletic identity, a factor that is also theorized to influence the development of athlete burnout (Coakley, 1992; Raedeke, 1997).

Unidimensional Identity and External Control

Proposed as a problem driven by the sport environment (as opposed to a response to chronic stress), the unidimensional identity and external control model describes stress as a symptom rather than a cause of athlete burnout (Gould et al., 1996). An athlete that commits to only participating and working to master one sport is predisposed to limiting his/her ability to participate in other activities, explore various roles or discover alternate identities (Coakley, 1992). This could lead to a unidimensional athletic identity which precludes identity development in areas beyond sport (Coakley, 1992). In addition, the social structure of sport limits athlete control of their own sport experience as other social factors (e.g., parents, coaches, administrators, sports medicine professionals) often make the rules and guide participation (Black & Smith, 2007; Coakley, 1992). Thus, this model argues that focusing on individual stress management and coping skills, as opposed to increasing organizational social support and relationship changes between coaches and athletes, fails to address the social structure of competitive sport, which is the core issue related to burnout

(Coakley, 1992). Cumulatively, this conceptualization posits that the development of a unidimensional athletic identity and a decreased sense of sport control contribute to perceptions of athlete burnout (Coakley, 1992). Additional research has provided partial support for the unidimensional and external control theory in adolescent and collegiate athletic populations (Black & Smith, 2007; Coakley, 2009).

Measurement of Athlete Burnout

Adapted from research on burnout in healthcare professionals, the Athlete Burnout Questionnaire (ABQ) is a psychometrically sound instrument that can be used across competitive sport settings to measure athlete burnout in adolescents and young adults (Raedeke & Smith, 2009). Raedeke and Smith (2001) conducted a series of studies to develop the ABQ. The first study tested the psychometric properties of the athlete burnout measure (Raedeke, 1997; Raedeke & Smith, 2001). Responses from a sample of swimmers (ages 13 to 18) were examined to see if they conformed to the dimensions of athlete burnout (i.e. emotional and physical exhaustion, reduced sense of sport accomplishment and sport devaluation). The resulting factor analysis enabled further refinement of the ABQ by examining factor loading of each item (Raedeke & Smith, 2001). The second study further examined psychometric properties of the refined measure by examining construct associations with stress, coping, social support and athlete motivation. A confirmatory factor analysis evaluated the factor structure using the responses of swimmers to the revised ABQ. Interfactor correlations were used to test various models of factor combinations to determine an appropriate set of items that represented the dimensions. Models did not contain items that cross-loaded factors. The second study resulted in two core items being replaced to strengthen psychometric properties of the measure as well as found evidence of a positive

association between athlete burnout subscales and perceived stress as well as a negative association between coping, social support and enjoyment (Raedeke & Smith, 2001). The third and final study in the series examined cross-validation of the measure by sampling athletes in a variety of sports. Findings suggested construct validity and reliability (internal consistency and test-retest) of the final version of the ABQ, and justified the item replacement changes from the second study (Raedeke & Smith, 2001). Despite these findings, research on athlete burnout continues to develop, particularly as related to determining clinical validity and clinical significance of ABQ scores (Raedeke & Smith, 2009).

Prevalence of Athlete Burnout

Within the athlete burnout literature, the knowledge on the prevalence of athlete burnout is mixed and is limited by the sampling procedures used to assess this variable in athlete populations (DeFreese & Smith, 2013). Accordingly, there are mixed findings in the literature regarding the prevalence of athlete burnout (DeFreese & Smith, 2013; Gustafsson et al., 2007; Raedeke & Smith, 2001; Smith, 1986). In 1990, Silva reported that 46.9% of athletes experienced athlete burnout (Silva III, 1990). Conversely, utilizing a more stringent definition of athlete burnout, Gustafsson et al. (2007) later reported only 1-9% of athletes have elevated athlete burnout scores (Gustafsson et al., 2007). Consideration of the possible differences in subgroups of athletes by categories such as type of sport, sex, ethnicities and cultures may explain some differences in athlete burnout prevalence (Cresswell & Eklund, 2005, 2006d). For example, it is hypothesized that individual sport participation requires an increased demand of an athlete's time and effort, encouraging the development of athlete burnout (Smith, 1986). Additionally, differences in the prevalence of burnout among

individual sports versus team sports may be explained by those participating in team sport having increased opportunities for social support which can act as a buffer against the development of athlete burnout (Coakley, 1992). Individual sport athletes may lack access to social support that can act as a buffer against athlete burnout development, especially in stress-inducing circumstances of sport, such as athletic injury.

Response to Athletic Injury

Adverse responses to injury have the power to disrupt the effectiveness of an athlete's treatment and ultimately his/her return to play; thus, placing a relevant need to understand the psychological responses of athletic injury (Walker et al., 2007). Considering psychological and sociologic dynamics, an integrated model of response to athletic injury has been used to explain response to athletic injury. The model's foundation rests upon an athlete's cognitive appraisal of injury. The response of an athlete's cognitive appraisal of athletic injury is posited to be tied to physical and psychological recovery outcomes for the athlete (Wiese-Bjornstal et al., 1998).

Personal factors affect an athlete's cognitive appraisal of injury. Significant injury characteristics associated with cognitive appraisal of injury include personality, perception of self, motivation, pain tolerance, athletic identity, age, and amount of sport experience (Wiese-Bjornstal et al., 1998). Also, an athlete's perspective on future sport participation post-injury affects his/her outlook and reaction to an acute injury. Injured athletes that are able to focus on goals for future-sport events adopt a positive outlook and attempt to cope with the sustained injury (Udry, Gould, Bridges, & Beck, 1997). In addition, an athletes' perspective on self-identification can play a role in response to injury (Green & Weinberg, 2001). For example, a study regarding athletes' return to sport following serious athletic

injury, losing athletic identity was motivation to recover and continue with sport participation following athletic injury (Podlog & Eklund, 2006). Personal factors that influence an athlete's response to athletic injury, such as perspectives on sport participation and self-identification, have also been theorized to be influential in the development of athlete burnout.

Variations in situational factors such as sport, social, and environmental dynamics also affect an athlete's cognitive appraisal of injury. Variation in sport situational factors include sport type, time in season, and level of competition (Wiese-Bjornstal et al., 1998). Variations in sport type may be accompanied by differences in sport culture. There is an inherent risk of injury when participating in physical activity; however, there are variations among sports that display varying degrees of tolerance to pain and injury as part of athletic participation. These differences among sport need to be considered as influential on an athlete's cognitive appraisal of injury (Frey, 1991; Hughes & Coakley, 1991; Wiese-Bjornstal et al., 1998). Social differences of interest include the influence of positive support of teammates, coaches, and sports medicine staff (Wiese-Bjornstal et al., 1998). An environment that provides social support from individuals other than staff members allows an athlete to open up emotionally about dealing with injury (Tracey, 2003). For example, one study supported findings that social support from well-respected teammates, especially those that had experienced the same or similar injuries, were venues to express concerns and frustrations resulting in both athlete comfort and self-confidence (Podlog & Eklund, 2006). As posited in theoretical explanations for the development of athlete burnout, personal and situational factors can result in altered perceptions of stress, isolation from social support, feelings of incompetence, lack of control from an impaired physical state, and lack of options

of identification outside of sport (Cresswell & Eklund, 2006b). Personal and situational factors can also result in altered responses to athletic injuries (Wiese-Bjornstal et al., 1998). Factors theorized to contribute to athletic injury response are similar to theoretical explanations for the development of athlete burnout (Coakley, 1992; Gould et al., 1997; Smith, 1986; Wiese-Bjornstal et al., 1998). Thus, it is reasonable to suggest that an association between athlete burnout and athletic injury exists.

Theoretical Link Between Athlete Burnout and Athletic Injury

Through the development of conceptual theories of athlete burnout, a number of athlete burnout antecedents have been identified including: training stress or load, chronic stress, variation in sport commitment, and an athlete's perceptions of identity and sport control (Coakley, 1992; Raedeke, 1997; Silva III, 1990; Smith, 1986). However, acute events also can affect an athlete's enjoyment of sport. For example, injury has been suggested to be an important athlete burnout correlate due to the behavioral and emotional responses and respective personal and situational factors associated with athletic injury responses (Cresswell & Eklund, 2005, 2006b; Grylls & Spittle, 2008). A conceptual and/or theoretical link between the development of athlete burnout and the psychological responses associated with injury recovery exists. An athlete's training for sport can result in both positive and negative training stress. A negative maladaptation to training stress causes concern in regards to susceptibility to athlete burnout (Silva III, 1990). As suggested in the cognitive-affective model, an athlete's perspectives on training determines his/her response to training and the stresses associated with training (Silva III, 1990; Smith, 1986). For example, an athlete's perceived sensation of discomfort or pain is hypothesized to play a role in an athlete's cognitive-appraisal of the demands of sport participation. For example, in a study on the

nature of athlete burnout in rugby, athletes reported injury to be associated with a loss of identity with the team and alternative motivations of pressure to play while injured which ultimately contributed to athlete burnout-related perceptions (Cresswell & Eklund, 2006d). Moreover, in a study examining athlete burnout in gymnasts, participants reported feelings of stress, irritability, frustration with gymnastics in addition to struggles with injuries (Dubuc, Schinke, Eys, Battochio, & Zaichkowsky, 2010).

Extant research has not consistently controlled at what point during the sport season (i.e., pre-season, regular season, post-season) the athletes participated in the study, limited injury reporting to athletic injuries, determined severity of injury, nor assessed current participation status. Bearing in mind the afore mentioned limitations, currently injured athletes experienced lower athlete burnout scores while currently uninjured athletes experienced higher measures of athlete burnout. This finding was contrary to the hypothesis that currently injury athletes would have increased levels of athlete burnout as compared to currently uninjured athletes and possibly due to injured athletes having a physical and mental break from sport involvement (Grylls & Spittle, 2008). The present study hypothesizes that minimizing previous research's limitations will having findings that support the theoretical link between athlete burnout and athletic injury.

Rationale for Study

Extant research guided by athlete burnout theory has provided a number of answers to questions about athlete experience and its relation to other psychological antecedents relevant to sport participation. Yet, research must further explore the relationship of athlete burnout-related perceptions to markers of athletic injury. Conceptual similarities exist between an athlete's psychological response to athletic injury and the development of athlete burnout.

For example, the experience of athletic injury may reinforce psychological antecedents (i.e., perceived stress, sport commitment, athletic identity and external control) and contribute to athlete burnout development. Furthermore, examining the relationship between athlete burnout and athletic injury has potential to positively contribute to the knowledge base on ways to provide more effective and efficient care to athletes. Specifically, the results of the current research will increase the knowledge base of theories and conceptualizations of athlete burnout and athletic injury, enhancing athletic trainers' care given to athletes that considers both short- and long-term psychological responses to athletic injury. The results of the current research will provide information that will help to guide athletic trainers' decisions in regard to treatment and referral of psychological responses to athletic injuries.

CHAPTER THREE

Research Design

A cross-sectional, survey design assessed the association between athlete burnout and athletic injury among varsity student-athletes at UNC. Using an online questionnaire, data were collected on athlete demographics, athlete burnout, and athletic injury history during varsity sport participation at UNC. The study was conducted no sooner than two weeks before each respective varsity sport teams' last regular season competition and no later than the first post-season competition, including conference championship competitions.

Participants and Procedures

UNC varsity student-athletes were recruited from fall and winter championship sports (i.e., women's basketball, fencing, field hockey, gymnastics, indoor track and field, soccer, and volleyball and men's fencing, indoor track and field, and wrestling). Spring championship season sports were excluded due to time restrictions in data collection and time allowed to fulfill the thesis requirements. Men's basketball and football did not participate in this research due to time conflicts associated with these sports.

The eligibility criteria for participation were: (1) participant is 18 years of age or older; and (2) listed on their respective varsity sport team's active roster. E-mails were sent to the coaching staff of each varsity sport team requesting permission to meet with respective athletes to invite them to participate in the research. Once permission was obtained, we arranged a time to meet with the team.

At this meeting, student-athletes received an introductory summary of the study, including explanation of the study's purpose and procedures to maintain confidentiality of study data. Student-athletes received an e-mail with an invitation and link to complete the questionnaire if they chose to participate. Each varsity sport teams' coaching staff provided the list of e-mail addresses. Non-respondents received two subsequent reminder e-mails following the initial survey invitation e-mail. Following the second reminder, no more contact requesting participation was with the potential study participants.

Upon clicking the survey link, student-athletes that agree to participate were redirected to an introductory screen that provided a brief introduction of the purpose of the study. Upon consenting to participate, participants then completed the online, self-administered questionnaire. All operational definitions of injury and varsity sport participation were provided within the questionnaire. Participants were able to elect to not answer any question(s); however, a reminder was given when an answer was not provided for certain questions.

Completion of the survey did not take any longer than 25 minutes. Once the survey was complete, participants received a follow-up e-mail thanking them for their participation as well as the principal investigator's contact information if there were any questions or concerns.

Instrumentation

The online questionnaire, administered through the Internet-based program Qualtrics, contained three sections: Athlete Demographics Assessment (Appendix One), the ABQ (Appendix Two), and Athletic Injury History Template (Appendix Three). The ABQ was presented to participants as a Varsity Sport Experience Questionnaire. Participants were

unaware that athlete burnout characteristics were being measured. The Athletic Injury History Questionnaire in Appendix Three provides a template of questions. The Athletic Injury History Questionnaire that the participants completed had specific body segment names in place of the “[body segment]” term listed in Appendix Three.

Athlete Demographics

Demographic information captured included years of age, varsity sport in which the participant is a current member, years of competitive experience in current varsity sport at UNC, scholarship status, current participation in formal competition not associated with current varsity sport team, years of competitive experience in respective sport over the participant’s lifetime, formal competition in current sport with which the participant was involved prior to being a student-athlete at UNC, and the average months per year the participant was involved in current sport prior to being a student-athlete at UNC. Sport type was determined as individual-sport or team-sport. Individual-sports are sports in which athletes train together but competition is based off of the individual’s performance that result in his/her scores. Individual scores are collectively used for overall team scores. Athletes can advance in the post-season based off of individual scores with or without team advancement. Team sports are sports by which athletes train and compete together that result in a total team score. Individual statistics of performance cannot advance an athlete in the post-season without team advancement.

The number of years of competitive experience in current varsity sport at UNC includes the number of years for which the participant has been an official member of the UNC varsity sport team, regardless of playing status. The number of years of competitive experience includes years of participation on the active roster, years of red-shirt, or years of

medical red-shirt. Years of competitive experience in organized athletic competition in the sport the participant reports he/she is currently a member.

Athlete Burnout Questionnaire

The ABQ measured participants' self-reported athlete burnout perceptions. The ABQ was scored using a five-point Likert scale. Two of the fifteen items used reverse scoring. Participants were able to select "Almost Never," "Rarely," "Sometimes," "Frequently," or "Almost Always." The ABQ consisted of three subscales: emotion and physical exhaustion, reduced sense of sport accomplishment, and sport devaluation. Example items from the ABQ include "I feel wiped out from sport" (emotional and physical exhaustion item), "I am not achieving much in sport" (reduced sense of sport accomplishment item), and "I have negative feelings toward sport" (sport devaluation item). The athlete burnout subscale scores were calculated by taking the average of the items corresponding to each of the individual athlete burnout dimensions. An average of all of the items on the questionnaire were taken for a global athlete burnout score (Raedeke & Smith, 2009). The ABQ has exhibited valid and reliable scores in a variety of sporting populations (Cresswell & Eklund, 2006c; Raedeke & Smith, 2001, 2009), including varsity sport athletes in the collegiate setting (DeFreese & Smith, 2013; Raedeke & Smith, 2001).

Athletic Injury History

The athletic injury history questionnaire captured all musculoskeletal damage that was: (1) sustained during collegiate varsity sport participation; and (2) evaluated by a member of the sports medicine staff. Participants were asked in separate questions if they have sustained an injury to their head or face, neck or spine, chest or abdomen, shoulder, arm (spanning from upper arm to wrist), hand or fingers, hip or thigh, knee, lower leg or ankle,

and foot or toes during varsity sport participation at UNC. If an athlete answered “yes” to sustaining an injury to a specific body part or region, subsequent questions regarding injury will follow. To determine the number of injuries to ask about, participants were asked the number of injuries sustained to specific body parts. Participants may select “1,” “2,” “3,” “4,” “5,” or “More than 5” injuries. Based on the number of injuries reported per body segment, participants were asked to respond to additional items about each injury sustained.

Participants answered questions in regards to injury onset, injury diagnosis, years affected by injury, current status of injury, limitation due to injury, and complete restriction due to injury. Participants were provided with definitions when answering questions regarding limitations and complete restrictions. Being limited from normal varsity sport participation at UNC may include changes in how long the athlete was able to participate, how often the athlete was able to participate, or the intensity of varsity sport activity. Being completely restricted from varsity sport participation at UNC means the athlete is not allowed to participate in any level of varsity sport activity per instruction from sports medicine staff.

Data Analysis

Continuous variables included number of athletic injuries during participation in varsity sport at UNC, time completely restricted from varsity sport participation, time limited from varsity sport participation, years of sport involvement at UNC, and years of competitive experience in respective sport over the participants’ lifetime. Categorical variables included injury type(s) experience: gradual-onset only, acute-onset only, both gradual- and acute-onset, or neither gradual- or acute-onset; sustainment of at least one athletic injury during his/her participation in varsity sport at UNC: yes or no; sustainment of multiple injury at any

given body segment: yes or no; current injury status: currently injured or not currently injured; and sport type: individual-sport or team-sport.

First, descriptive analyses assessed the distribution of all study variables within the study sample. Second, separate correlation analyses examined the association of self-reported perceptions of athlete burnout with each of the continuous variables (number of athletic injuries during participation in varsity sport at UNC, time completely restricted from varsity sport participation, time limited from varsity sport participation, years of sport involvement at UNC, and years of competitive experience in respective sport over the participants' lifetime). Third, separate T-test analyses determined if differences existed in the self-reported perceptions of athlete burnout within each of the categorical variables (injury type(s) experience: gradual-onset only, acute-onset only, both gradual- and acute- onset, or neither gradual- or acute-onset; sustainment of at least one athletic injury during his/her participation in varsity sport at UNC: yes or no; sustainment of multiple injury at any given body segment: yes or no; current injury status: currently injured or not currently injured; and sport type: individual-sport or team-sport). Each analysis examined a global athlete burnout score as well as scores on individual athlete burnout subscales (emotional and physical exhaustion, reduced sense of sport accomplishment and sport devaluation) as the dependent variables of interest.

CHAPTER FOUR

Preliminary Data Screening

A review of 101 surveys revealed that 90 participants completed the all questions necessary to answer the study's research questions. All analyses were completed with data from these 90 participants. The variable of "injuries over the course of a student-athlete's lifetime" was excluded due to decreased responses as compared to responses to other variables (n=81). Additional variables were explored as injury outcomes of interest to examine the association between athlete burnout and athletic injury. All tables associated with the results appear in Appendix Four. Descriptive statistics appear in Table 4.1.

Demographic information appears in Table 4.2.

Relationship Between Athlete Burnout and Athletic Injury

The association between perceived athlete burnout and the number of collegiate athletic injuries was examined using standard Pearson correlation analyses. Total number of college injuries was entered into the analysis to assess the association with reduced sense of sport accomplishment, sport devaluation, emotional and physical exhaustion, and global AB scores. A significant association was not found between number of collegiate athletic injuries and any AB measures: reduced sense of sport accomplishment ($r=0.177$, $p=0.096$), sport devaluation ($r=0.083$, $p=0.438$), emotional and physical exhaustion ($r=0.154$, $p=0.146$), or global AB ($r=0.165$, $p=0.121$) (see Table 4.3).

The association between athlete burnout and time completely restricted due to athletic injury was examined using Pearson correlation analyses. Time completely restricted by

specific athletic injury by body segment was entered into the analysis to assess the association with reduced sense of sport accomplishment, sport devaluation, emotional and physical exhaustion, and global AB scores. Athletic injuries are labeled according to body segments and number of athletic injury occurrences at that body segment. A consistent pattern was not found among significant associations of time completely restricted due to specific athletic injury by body segment and reduced sense of sport accomplishment, sport devaluation, emotional and physical exhaustion, or global AB. A significant association was found between time completely restricted from “Leg and Ankle: Injury” and sport devaluation ($r=0.399$, $p=0.048$), time completely restricted from “Leg and Ankle: Injury 2” and reduced sense of sport accomplishment ($r=0.714$, $p=0.006$), time completely restricted from “Leg and Ankle: Injury 2” and sport devaluation ($r=0.826$, $p=0.001$), time completely restricted from “Leg and Ankle: Injury 2” and global AB ($r=0.694$, $p=0.009$), and time completely restricted from “Foot and Toes: Injury” and reduced sense of sport accomplishment ($r=0.741$, $p=0.047$). A significant association was not found between time completely restricted from all other specific athletic injuries by body segment and reduced sense of sport accomplishment, sport devaluation, emotional and physical exhaustion, or global AB. Associations with a sample size of less than 6 ($n<6$) were not considered as significant associations (see Table 4.4).

The association between athlete burnout and time limited due to athletic injury was examined using Pearson correlation analyses. Time limited by specific athletic injury by body segment was entered into the analysis to assess the association with reduced sense of sport accomplishment, sport devaluation, emotional and physical exhaustion, and global AB scores. A consistent pattern was not found among significant associations of time limited due

to specific athletic injury by body segment and reduced sense of sport accomplishment, sport devaluation, emotional and physical exhaustion, or global AB. A significant association was found between time limited from “Arm: Injury” and global AB ($r=0.852$, $p=0.015$), time limited from “Leg and Ankle: Injury 1” and sport devaluation ($r=0.570$, $p=0.042$), time limited from “Leg and Ankle: Injury 2” and reduced sense of sport accomplishment ($r=0.735$, $p=0.010$), time limited from “Leg and Ankle: Injury 2” and sport devaluation ($r=0.936$, $p<0.000$), and time limited from “Leg and Ankle: Injury 2” and global AB ($r=0.768$, $p=0.006$). A significant association was not found between time limited from all other specific athletic injuries by body segment and reduced sense of sport accomplishment, sport devaluation, emotional and physical exhaustion, or global AB. Associations with a sample size of less than 6 ($n<6$) were not considered as significant associations (see Table 4.5).

The difference between AB measures of participants that sustained only gradual-onset injuries, AB measures of participants that only sustained acute-onset injuries, AB measures of participants that sustained both gradual-onset and acute-onset injuries, and AB measures of participants that neither a gradual-onset nor an acute-onset injury was examined using a one-way between ANOVA. Descriptive statistics of differences in AB between injury-onset groups are found in Table 4.6. A significant difference of any AB measures was not found between injury onset groups: reduced sense of sport accomplishment ($F(3,86)=1.288$, $p=0.284$), sport devaluation ($F(3,86)=0.695$, $p=0.557$), emotional and physical exhaustion ($F(3,86)=1.662$, $p=0.181$), and global AB ($F(3,86)=1.662$, $p=0.181$) (see Table 4.7).

An exploratory analysis using an independent samples T-test was used to examine if there was a difference between AB measure of participants that sustained at least one athletic injury at UNC and AB measure of participants that did not sustain any athletic injuries at

UNC. Data failed to meet the assumption of equal variances based on Levene's Test for Equality of Variances. A significant difference was not found between reduced sense of sport accomplishment ($t_{88}=1.911$, $p=0.064$), sport devaluation ($t_{88}=1.398$, $p=0.173$), or emotional and physical exhaustion ($t_{88}=1.844$, $p=0.076$) of participants that sustained at least one athletic injury at UNC and participants that did not sustain any athletic injuries at UNC. A trend toward significant difference was found between global AB of participants that sustained at least one athletic injury at UNC and participants that did not sustain any athletic injuries at UNC ($t_{88}=2.046$, $p=0.050$) (see Table 4.8).

An exploratory analysis using an independent samples T-test was used to examine if there was a difference between AB measures of participants that experienced multiple injuries to any given body segment and AB measures of participants that did not experience multiple injuries to any given body segment. Data failed to meet the assumption of equal variances based on Levene's Test for Equality of Variances. A statistical significant difference was not found between sport devaluation ($t_{88}=1.152$, $p=0.253$) or emotional and physical exhaustion ($t_{88}=1.855$, $p=0.068$) of participants that experienced multiple injuries to any given body segment and participants that did not experience multiple injuries to any given body segment. A statistical significant difference was found between reduced sense of sport accomplishment ($t_{88}=2.117$, $p=0.038$) and global AB ($t_{88}=2.073$, $p=0.042$) of participants that experienced multiple injuries to any given body segment and participants that did not experience multiple injuries to any given body segment (see Table 4.9).

An exploratory analysis using an independent samples T-test was used to examine if there was a difference between AB measures of participants that were currently injured at the time of participation in the study and AB measures of participants that were not currently

injured at the time of participation in the study. Data failed to meet the assumption of equal variances based on Levene's Test for Equality of Variances. A statistical significant difference was not found between reduced sense of sport accomplishment ($t_{88}=1.323$, $p=0.189$), sport devaluation ($t_{88}=0.602$, $p=0.548$), or global AB ($t_{88}=1.771$, $p=0.080$) of participants that were currently injured at the time of participation in the study and AB measures of participants that were not currently injured at the time of participation in the study. A statistical significant difference was found between emotional and physical exhaustion ($t_{88}=2.596$, $p=0.011$) of participants that were currently injured at the time of participation in the study and AB measures of participants that were not currently injured at the time of participation in the study (see Table 4.10).

Relationship Between Athlete Burnout and Years of Competitive Experience

The association between perceived athlete burnout and years of competitive experience at UNC was examined using Pearson correlation analysis. Total number of years of competitive experience at UNC was entered into the analysis to assess the association with reduced sense of sport accomplishment, sport devaluation, emotional and physical exhaustion, and global athlete burnout scores. A significant association was not found between number of years of competitive experience at UNC and any AB measures: reduced sense of sport accomplishment ($r=0.165$, $p=0.119$), sport devaluation ($r=0.116$, $p=0.276$), emotional and physical exhaustion ($r=-0.047$, $p=0.661$), or global AB ($r=0.100$, $p=0.350$) (see Table 4.11).

The association between perceived athlete burnout and years of competitive experience over the lifetime of the athlete was examined using Pearson correlation analysis. Total number of years of competitive experience over lifetime was entered into the analysis

to assess the association with reduced sense of sport accomplishment, sport devaluation, emotional and physical exhaustion, and global burnout self-reported scores. A significant association was not found between number of years of competitive experience at UNC and any AB measures: reduced sense of sport accomplishment ($r=-0.025$, $p=0.816$), sport devaluation ($r=-0.068$, $p=0.525$), emotional and physical exhaustion ($r=-0.184$, $p=0.083$), or global AB ($r=-0.111$, $p=0.300$) (see Table 4.12).

The association between years of competitive experience at UNC and years of competitive experience over lifetime was examined using Pearson correlation analysis. Total number of years of competitive experience at UNC was entered into the analysis to assess the association with the total number of years of competitive experience over lifetime. A significant association was found between total number of years of competitive experience at UNC and total number of years of competitive experience over lifetime ($r=0.303$, $p=0.004$) (see Table 4.13).

Differences Between Team-Sport and Individual-Sport Athletes

The difference between AB measures of participants that participate in team-sport and AB measures of participants that participate in individual-sport was examined using an independent-samples T-test. A statistical significant difference was not found between reduced sense of sport accomplishment ($t_{88}=1.832$, $p=0.072$) or emotional and physical exhaustion ($t_{88}=1.435$, $p=0.156$) of participants that participated in team-sport and participants that participated in individual-sport. A statistical significant difference was found between sport devaluation ($t_{88}=2.432$, $p=0.017$) global AB ($t_{88}=2.538$, $p=0.013$) of participants that participated in team-sport and participants that participated in individual-sport (see Table 4.14).

The difference between number of athletic injuries sustained during college of participants that participated in team-sport and the number of athletic injuries sustained during college of participants that participated in individual-sport was examined using an independent-samples T-test. A significant statistical difference was not found between the number of athletic injuries sustained of participants that participated in team-sport and the number of athletic injuries of participants that participated in individual-sport ($t_{88}=-0.035$, $p=0.972$) (see Table 4.14)

CHAPTER FIVE

Purpose

The purpose of this study was to examine the association between athlete burnout and athletic injury in collegiate student-athletes at a large Division I university. In efforts to build upon and reduce limitations of previous research, the study considered a standardized definition of athletic injury, which assessed different aspects of severity of athletic injury. The study controlled for the point in the sport-season when participants completed the survey. In light of study purposes, various athletic injury outcomes were used to examine this association including: total number of athletic injuries during participation in varsity sport at UNC, time completely restricted due to an athletic injury during participation in varsity sport at UNC, time limited due to an athletic injury during participation in varsity sport at UNC, and athletic injury type. Sustainment of at least one athletic injury during participation in varsity sport at UNC, sustaining multiple athletic injuries to any given body segment during participation in varsity sport at UNC, and current injury status were further explored as injury outcomes of interest to examine the association between athlete burnout and athletic injury. Findings are discussed in light of both theoretical and practical considerations. Further, suggestions for future research in this area are offered.

Findings

Within the current sample, a significant association was not found between the number of athletic injuries from varsity sport participation at UNC and athlete burnout. The lack of a significant association between number of athletic injuries and athlete burnout is

inconsistent with findings of Grylls & Spittle that a weak, yet statistically significant, association was present between number of injuries sustained and the three burnout subscales – physical and emotional exhaustion ($r=0.13$), depersonalization ($r=0.20$), and sporting accomplishment ($r=0.22$) (Grylls & Spittle, 2008). In light of Grylls & Spittle’s study, the current finding suggests that repeated exposure to the psychological responses associated with athletic injury alone does not have a relationship with the development of athlete burnout and its characteristic dimensions of emotional and physical exhaustion, reduced sense of sport accomplishment, and sport devaluation. Accordingly, future research should aim to determine if there is an association with specific responses to athletic injuries (such as fear, malingering, depression, stress or anger) (Wiese-Bjornstal et al., 1998) and athlete burnout to determine the relationship with athlete burnout. Determining if this association exists will inform clinicians of psychological responses to injury as well as areas to intervention if necessary to deter the development of athlete burnout.

Results from the current study did support the suggestion of Grylls & Spittle that multiple sport injuries have an impact on the psychological outcomes of athlete burnout (Grylls & Spittle, 2008). The current finding suggests that sustaining multiple athletic injuries to any given body segment has a relationship with the development of the characteristic dimensions of athlete burnout, especially reduced sense of sport accomplishment. This current finding suggests that there is a reduction in an athlete’s self-perception of sport accomplishment following multiple injuries to the same body segment. Increased use strategies to enhance of athletic injury recovery outcomes such as sport-specific imagery and strategies to build confidence during functional rehabilitation can help to deter feelings of reduced sense of sport accomplishment when returning to play in athletes

that experience multiple injuries to any given body segment. Reducing these feelings will lead to more successful outcomes of athletic injury rehabilitation. This finding further suggests the need for additional research on the use of sport-specific imagery and other strategies to improve athletic injury outcomes during athletic injury rehabilitation is necessary (Evans, Hare, & Mullen, 2006; Monsma, Mensch, & Farroll, 2009).

Results also were cautiously interpreted to show a significant difference in global AB between participants that sustained at least one athletic injury during varsity sport experience at UNC and participants that did not sustain any athletic injuries during varsity sport experience at UNC. This finding is consistent with previous studies where participants reported that injury contributed to feelings of characteristic dimensions of burnout (Cresswell & Eklund, 2006d; Dubuc et al., 2010; Gould et al., 1996). In addition, we found that participants that were currently injured at the time of participation in the study reported higher measures of emotional and physical exhaustion as compared to participants that were not currently injured at the time of participation in the study. This finding supports Tracey's findings of the profound emotional experiences that currently injured athletes faced (Tracey, 2003). Clinicians, such as athletic trainers, should continue to be aware of the emotional responses of athletic injuries and their effect on the psychological and physical healing of athletic injuries. Athletic trainers should inform their work on how to appropriately communicate support during the rehabilitation process and work towards creating an optimistic, proactive environment of rehabilitation for injured student-athletes. Specifically, this type of environment can contribute to better athlete outcomes from the injury-recovery process (Tracey, 2003).

Examination of specific athletic injury classifications – such as time completely restricted from specific athletic injuries and time limited from specific athletic injuries, and injury onset – was considered to determine the association between athlete burnout and athletic injury. A consistent pattern was not found among significant associations of time completely restricted due to specific athletic injury by body segment and reduced sense of sport accomplishment, sport devaluation, emotional and physical exhaustion, or global AB. A consistent pattern was not found among significant associations of time limited due to specific athletic injury by body segment and reduced sense of sport accomplishment, sport devaluation, emotional and physical exhaustion, or global AB. Considering time completely restricted from varsity sport participation due to athletic injury and time limited from varsity sport participation due to athletic injury as markers of athletic injury severity, study results did not reveal that this degree of injury detail was associated with self-report athlete burnout perceptions. Considering basic categories of mechanism-of-injury (only gradual-onset, only acute-onset, both gradual- and acute-onset, and neither gradual- or acute-onset) as standard for classifying athletic injury, a significant difference was not found in AB measures between participants' athletic injury onset groups based on mechanism of sustaining an athletic injury. Accordingly, the athletic injury classifications employed in the current study were not useful in determining enhanced injury detail. These findings should influence future research to use enhanced markers and alternate measures of athletic injury severity in regard to research on athletic injury regardless if the research aims to determine the relationship between athlete burnout and athletic injury. Enhanced markers and alternate measures will allow more meaningful information to be gained from studies on athletic injuries to inform the work of sports medicine providers.

Results were not consistent with the suggestion that years of sport experience in participants' respective sports influenced measures of AB (Dale & Weinberg, 1990). Results showed that there was not a significant association between years of competitive experience at UNC and AB measures, nor was there a significant association between years of competitive experience over a participant's lifetime. This finding implies that years of experience alone do not influence a student-athlete's perspective on his or her sport experience. This finding informs sports medicine clinicians that a student-athlete does not need to have participated in a sport for an extended amount of time before he or she can experience athlete burnout; it is plausible for any level of athlete to experience athlete burnout.

Results showed that reported sport devaluation and global AB measures were higher in individual-sport athletes as compared to team-sport athletes. These results are inconsistent with findings of Raedeke that there was not a difference in reduced sense of sport accomplishment and sport devaluation between individual-and team-sport athletes; whereas, individual-sport athletes experienced slightly more emotional and physical exhaustion as compared to team-sport athletes (Raedeke & Smith, 2009). Differences in measures of AB between individual- or team-sport can be explained by Coakley's hypothesis that team-sports provide mediation to unidimensional identity development and solely external control in sport which is a different social dynamic as compared to individual-sports. Team-sports allow athletes to form social identities through relationships formed with teammates as opposed to individual-sport athletes being surrounded by peer competitors. Team-sports also have a group of athletes that are considered when making coaching decisions as opposed to individual-sports that are able to dictate control to single athletes by coaching decisions

(Coakley, 1992). The difference in the two types of student-athletes further builds a profile of a student-athlete in which the development of characteristic dimensions of AB is more common. Said another way, such athletes may be “at risk” for burnout development. This represents an idea that sports medicine professionals should be aware of the development processes of athlete burnout. Being aware of differences in individual- and team-sport athletes can allow sports medicine professionals such as athletic trainers to further create an optimal environment of athletic injury recovery for student athletes.

Practical Implications

The results also have important and necessary implications to inform referrals of collegiate student-athletes by sports medicine healthcare providers such as athletic trainers and team physicians. Guided by findings from the current study and the extant literature on athlete burnout and injury, healthcare providers for collegiate student-athletes should have an understanding of the signs of and related psychosocial outcomes associated with athlete burnout. As athletic trainers encounter daily interactions with student-athletes, they are in the position to examine psychological signs and symptoms that otherwise may go unnoticed. Athletic trainers hold a responsibility to be aware of the signs and symptoms of psychological concerns, be able to determine when a referral is or is not necessary, and have a referral plan in place (Neal et al., 2013).

The current study’s findings indicated an increase in the measure of emotional and physical exhaustion of currently injured student-athletes as compared to currently uninjured athletes. Increased measures of emotional and physical exhaustion as measured by the ABQ of currently injured student-athletes is an indication of the emotional fatigue from the physical demands of sport (Raedeke & Smith, 2009). Athletic trainers and other sports

medicine providers should be aware of the negative effects that emotional fatigue can place on recovery from athletic injury. It is the responsibility of the healthcare providers of student-athletes to recognize emotional fatigue, make proper referrals when necessary, and maintain an environment of optimism, proactivity and holistic healing for the currently injured athlete (Tracey, 2003). This may be particularly important for currently injured athletes, as inclusion in team activities may be limited during the injury rehabilitation period.

However, those responsible for the healthcare of collegiate student-athletes should consider that the current study does not show a distinct association between athlete burnout and athletic injury. There is not currently a standardized clinical cut-off that exists to suggest who is and is not burned-out from athletic participation. Sports medicine providers, such as athletic trainers, should consider all psychological concerns, including athlete burnout, on a case-by-case basis, as the symptoms and development of psychological concerns can be very individualized. Ultimately, decisions on treatment and referral should be made according to established protocols and based upon an individual's presentation of psychological concerns (Neal et al., 2013).

Theoretical Implications

The development of the current study began with considering the theoretical link between athlete burnout and the responses to athletic injury. Theoretically, the development of athlete burnout is an outcome of the psychological stress associated with sport participation, the lack of a multidimensional identity and/or entrapment-based patterns of sport commitment (Coakley, 1992; Raedeke, 1997; Smith, 1986). Similarly, an athlete's response to athletic injury can influence individual athlete perceptions of sport-based psychology, athlete identity and sport commitment. Specifically, an athlete's response to

athletic injury is dependent upon his/her cognitive appraisal (thoughts, emotions, and behaviors) of the circumstances surrounding an athletic injury. Cognitive appraisal of athletic injury will determine if an athlete responds to his/her athletic injury in a fashion that is congruent with the development of athlete burnout. It is the theoretical link to cognitive appraisal that supports continued examination of the association of injury and burnout in athlete populations.

Implications for Future Research

The findings from the current study have important implications for future research examining the relationship between athlete burnout and athletic injury. As previously hypothesized, solely considering more nuanced definitions of athletic injury did not provide enhanced understanding of the association between athletic burnout and athletic injury. Future research on the association between athlete burnout and athletic injury that focuses on examining potential mediators in the development of characteristics of the dimensions of AB should be considered. Responses to athletic injury and factors contributing to specific responses of athletic injury should be examined as mediators in the development of characteristic dimensions of AB. Their contribution may be advantageous in understanding of the relationship between athlete burnout and athletic injury.

Assessing stress (Smith, 1986; Wiese-Bjornstal et al., 1998), motivation for sport participation (Raedeke, 1997; Wiese-Bjornstal et al., 1998), and social support (Coakley, 1992; DeFreese & Smith, 2013; Wiese-Bjornstal et al., 1998) in addition to utilizing a more nuanced and standardized operational definition of athletic injury will allow for a better understanding of associations with athlete burnout. Examining the associations between athletic injury, factors that contribute to responses to athletic injury, responses to athletic

injury, athlete burnout antecedents and athlete burnout itself could lead to a greater knowledge on the experiences of student-athletes that have sustained athletic injuries. Knowledge of these associations will guide the direction of future research to develop effective intervention strategies for sports medicine clinicians to aid in the prevention and treatment of athlete burnout.

Limitations and Delimitations

There are several limitations to consider with this study. The current sample was delimited to fall- and winter-competition season student-athletes not associated with the two of the higher-revenue sports (Football and Men's Basketball) at the University of North Carolina at Chapel Hill. Furthermore, an innate limitation of surveys, and of the current study alike, is a low response-rate from those asked to participate in the study. The limitations and delimitations contributed to the decreased sample size of the study and generalizability of research findings. Findings are less able to be generalized due to the decreased sample size. An expansion of the target sample would offer a greater potential sample size and possibly lead to results that can be generalized to broader contexts. Though results were generalized without regard to sex, the split of sex was relatively uneven, with the majority of the sample being female (81.1%). Differences between males and females have been found regarding both AB measures and response to athletic injury (Granito Jr, 2002; Judge, Bell, Theodore, Simon, & Bellar, 2012), which contributes to bias when generalizing findings of the current study. Future work should aim to address these sampling limitations so that interpretations of the association between athletic injury and burnout can be generalized to broader athlete populations.

The focus of this study was placed primarily on the association between athlete burnout and athletic injury. The study did not focus any attention on assessing responses to athletic injury – stress, fear, grief, or coping (Wiese-Bjornstal et al., 1998). Future research should examine the association between assessed responses to athletic injury and athlete burnout to further examine the relationship between athlete burnout and athletic injury. Findings from such research will equip athletic trainers and other sports medicine providers with necessary knowledge to identify potential psychological concerns, such as athlete burnout, of athletic participation and athletic injuries. Such work may also inform intervention strategies designed to prevent burnout and ultimately improve the psychological health of both injured and non-injured collegiate athletes.

Conclusion

Despite the limitations, the current study effectively examined the association between athlete burnout and athletic injury in a Division 1, collegiate athlete sample. No significant was found between athlete burnout perception and the number of athletic injuries reported using this standardized definition of athletic injury; however, there was an association between sustaining multiple athletic injuries at any given body segment and the burnout dimension of reduced sense of sport accomplishment. Dimension burnout scores on emotional and physical exhaustion were higher in currently injured when compared to uninjured student-athletes while global athlete burnout scores of student-athletes that sustained at least one athletic injury were higher compared to student-athletes that did not sustain any athletic injuries. Moreover, defining an athletic injury as an injury that directly resulted from formal competition that required evaluation by medical staff (doctor, clinician,

athletic trainer, sports medicine staff, etc.) in future research studies will allow consistency necessary for comparison between studies.

Findings from the current study further emphasize the need to examine the association between athlete burnout and athletic injuries while also assessing various psychological antecedents, environments and psychological outcomes of athletic injury such as athlete burnout. In addition, the current study supports the motion of the NATA for healthcare providers, such as athletic trainers, of collegiate student-athletes to understand and recognize signs and outcomes of psychological experiences of collegiate student-athletes (Neal et al., 2013). Continuing efforts to learn more about the association between athlete burnout and athletic injury will benefit the quality of holistic healthcare that can be provided to collegiate student-athletes.

APPENDIX ONE: ATHLETE DEMOGRAPHIC ASSESSMENT

Q1 What is your age?

If Age (in years) Is Less Than 18, Then Skip to End of Survey

Q2 Choose your current varsity sport team:

- Gymnastics
- Men's Fencing
- Men's Indoor Track & Field
- Volleyball
- Women's Basketball
- Women's Fencing
- Women's Indoor Track & Field
- Women's Soccer
- Wrestling

Q3 How many years have you participated In Varsity Sport at UNC? _____

Q4 What is your athletic scholarship status on your reported current varsity sport team?

- Full scholarship
- Partial scholarship
- No scholarship

Q5 Over the course of your lifetime, how many years have you participated (been involved in organized competition) of your current sport? _____

Q6 Do you participate in formal competition not associated with your current varsity sport team?

- Yes
- No

Answer If Yes Is Selected for Q6

Q7 Please describe your participation in formal competition not associated with your current varsity sport team.

Q8 Over the course of your lifetime, how many years have you participated (been involved in organized competition) of your current sport?

Q9 Please indicate the formal competition(s) in your current sport in which you participated prior to being a student-athlete at UNC. Select all that apply.

- High school team
- National team
- Club/Travel team
- AAU team
- Other

Answer If Other Is Selected for Q10

Q10 Please describe the formal competition(s) in your current sport in which you participated prior to being a student-athlete at UNC.

Q11 Please indicate the average months per year you participated in your current sport prior to being a student-athlete at UNC.

APPENDIX TWO: ATHLETE BURNOUT QUESTIONNAIRE

Varsity Sport Experience Survey

Please read each statement carefully and indicate how you feel about your **current sport participation**. Your current sport participation includes all of sport training you have completed during **this season**.

"Almost Never" means that you *almost never feel this way* and "Almost Always" means that you *feel this way most of time*.

Please note that there are not any "right" or "wrong" answers to any of the questions as we are looking to learn from your experiences, so answer each question as honestly as you can. Please make sure to answer all items.

Please indicate how often you have had each feeling or thought this season.

	Almost Never	Rarely	Sometimes	Frequently	Almost Always
I'm accomplishing many worthwhile things in sport	<input type="radio"/>				
I feel so tired from my training that I have trouble finding energy to do other things	<input type="radio"/>				
The effort I spent in sport would be better spent doing other things	<input type="radio"/>				
I feel overly tired from my sport participation	<input type="radio"/>				
I am not achieving much in sport	<input type="radio"/>				
I don't care as much about my sport performance as I used to	<input type="radio"/>				
I am not performing up to my ability in sport	<input type="radio"/>				
I feel "wiped out" from sport	<input type="radio"/>				
I'm not into sport like I used to be	<input type="radio"/>				
I feel physically worn out from sport	<input type="radio"/>				
I feel less concerned about being successful in sport than I used to	<input type="radio"/>				
I am exhausted by the mental and physical demands of sport	<input type="radio"/>				
It seems no matter what I do, I don't perform as well as I should	<input type="radio"/>				
I feel successful at sport	<input type="radio"/>				
I have negative feelings toward sport	<input type="radio"/>				

APPENDIX THREE: ATHLETIC INJURY HISTORY TEMPLATE

Q12 An athletic injury is defined as an injury that directly resulted from formal competition that required evaluation by medical staff (doctor, clinician, athletic trainer, sports medicine staff, etc.).

Over the course of your **lifetime**, how many athletic injuries have you sustained during participation in formal sport?

Q13 Please answer the next group of questions about **sports-related injuries** sustained while participating in varsity sport participation at UNC. A sports-related injury is defined as an injury that directly resulted from varsity sport participation at UNC that required evaluation by the sports medicine staff. Please note that the number and severity of injuries sustained varies from one student-athlete to the next. You will not be penalized due the information provided about your injuries.

During your experience at UNC, have you ever sustained an injury to your **[body segment]** that directly resulted from your participation in varsity sport that required evaluation by the sports medicine staff?

- Yes
- No

Answer If Yes Is Selected For Q13

Q14 Please indicate the number of injuries you have sustained to your **[body segment]** that directly resulted from your participation in varsity sport at UNC that required evaluation by the sports medicine staff.

- 1
- 2
- 3
- 4
- 5
- More than 5

Answer If Yes Is Selected For Q13 And If 1 Is Selected For Q14

Q15 Was your injury during your participation in varsity sport at UNC to your **[body segment]** of gradual or sudden onset?

- Gradual Onset - accumulated overtime, a specific identifiable event cannot be determined as the cause (an overuse injury)
- Sudden Onset - accumulated from a specific identifiable event (an acute injury)

Answer If Yes Is Selected for Q13 And If 1 Is Selected For Q14

Q16 Which option best describes the injury you sustained to your **[body segment]** during your participation in varsity sport at UNC?

- Dislocation

- Subluxation
- Fracture (Broken Bone)
- Stress Fracture
- Stress Reaction
- Ligament Sprain
- Tendon Strain
- Tendinitis
- Muscle Strain
- Contusion (Bruise)
- Bursitis
- Other

Answer If Yes Is Selected For Q13 And If 1 Is Selected For Q14 And If Other Is Selected For Q16

Q17 Please describe the injury you sustained to your **[body segment]** during your participation in varsity sport at UNC. _____

Answer If Yes Is Selected For Q13 And If 1 Is Selected For Q14

Q18 What year(s) has the injury to your **[body segment]** during your participation in varsity sport at UNC affected you? Please select all that apply.

- 2008-2009
- 2009-2010
- 2010-2011
- 2011-2012
- 2012-2013
- 2013-2014

Answer If Yes Is Selected For Q13 And If 1 Is Selected For Q14

Q19 Are you currently affected by the injury to your **[body segment]** sustained during your participation in varsity sport at UNC?

- Yes
- No

Answer If Yes Is Selected For Q13 And 1 Is Selected For Q14

Q20 **NOTE:** Being completely restricted from varsity sport participation at UNC means you are not allowed any level of varsity sport participation per instruction from sports medicine staff.

How long were you **completely restricted** and missing time from varsity sport participation at UNC due to the **injury** you sustained to your **[body segment]**? Choose all that apply.

- Never completely restricted
- Less than 1 day
- 1-2 days
- 3-6 days
- 7-9 days
- 10-21 days
- 22 days or more

- Medical disqualification for remainder of season following injury
- Currently completely restricted

Answer If Yes Is Selected For Q13 And 1 Is Selected For Q14

Q21 **NOTE:** Being limited from normal level of varsity sport participation at UNC may include changes in how long you are able to participate, how often you are able to participate or the intensity of varsity sport activity.

How long were you **limited** from your normal level of varsity sport participation at UNC due to the **injury** you sustained to your **[body segment]**? Choose all that apply.

- Never medically limited
- Less than 1 day
- 1-2 days
- 3-6 days
- 7-9 days
- 10-21 days
- 22 days or more
- Medically limited for remainder of season following injury
- Currently medically limited

Answer If Yes Is Selected For Q13 And If Is Not Selected For Q14

Q22 Was your **first** injury during your participation in varsity sport at UNC to your **[body segment]** of gradual or sudden onset?

- Gradual Onset - accumulated overtime, a specific identifiable event cannot be determined as the cause (an overuse injury)
- Sudden Onset - accumulated from a specific identifiable event (an acute injury)

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected For Q14

Q23 Which option best describes the **first** injury you sustained to your **[body segment]** during your participation in varsity sport at UNC?

- Dislocation
- Subluxation
- Fracture (Broken Bone)
- Stress Fracture
- Stress Reaction
- Ligament Sprain
- Tendon Strain
- Tendinitis
- Muscle Strain
- Contusion (Bruise)
- Bursitis
- Other

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected For Q14 And If Other Is Selected For Q16

Q24 Please describe the **first** injury you sustained to your **[body segment]** during your participation in varsity sport at UNC. _____

Answer If Yes Is Selected For Q13 And 1 Is Not Selected For Q14

Q25 What year(s) has the **first** injury to your **[body segment]** during your participation in varsity sport at UNC affected you? Please select all that apply.

- 2008-2009
- 2009-2010
- 2010-2011
- 2011-2012
- 2012-2013
- 2013-2014

Answer If Yes Is Selected For Q13 And If 1 Is Selected For Q14

Q26 Are you currently affected by the **first** injury to your **[body segment]** sustained during your participation in varsity sport at UNC?

- Yes
- No

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected For Q14

Q27 **NOTE:** Being completely restricted from varsity sport participation at UNC means you are not allowed any level of varsity sport participation per instruction from sports medicine staff.

How long were you **completely restricted** and missing time from varsity sport participation at UNC due to the **first injury** you sustained to your **[body segment]**? Choose all that apply.

- Never completely restricted
- Less than 1 day
- 1-2 days
- 3-6 days
- 7-9 days
- 10-21 days
- 22 days or more
- Medical disqualification for remainder of season following injury
- Currently completely restricted

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected For Q14

Q28 **NOTE:** Being limited from normal level of varsity sport participation at UNC may include changes in how long you are able to participate, how often you are able to participate or the intensity of varsity sport activity.

How long were you **limited** from your normal level of varsity sport participation at UNC due to the **first injury** you sustained to your **[body segment]**? Choose all that apply.

- Never medically limited
- Less than 1 day
- 1-2 days
- 3-6 days
- 7-9 days
- 10-21 days
- 22 days or more
- Medically limited for remainder of season following injury

- Currently medically limited

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14

Q29 Was your **second** injury during your participation in varsity sport at UNC to your **[body segment]** of gradual or sudden onset?

- Gradual Onset - accumulated overtime, a specific identifiable event cannot be determined as the cause (an overuse injury)
- Sudden Onset - accumulated from a specific identifiable event (an acute injury)

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14

Q30 Which option best describes the **second** injury you sustained to your **[body segment]** during your participation in varsity sport at UNC?

- Dislocation
- Subluxation
- Fracture (Broken Bone)
- Stress Fracture
- Stress Reaction
- Ligament Sprain
- Tendon Strain
- Tendinitis
- Muscle Strain
- Contusion (Bruise)
- Bursitis
- Other

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14 And If Other Is Selected For Q30

Q31 Please describe the **second** injury you sustained to your **[body segment]** during your participation in varsity sport at UNC. _____

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14

Q32 What year(s) has the **second** injury to your **[body segment]** during your participation in varsity sport at UNC affected you? Please select all that apply.

- 2008-2009
- 2009-2010
- 2010-2011
- 2011-2012
- 2012-2013
- 2013-2014

Answer If Yes Is Selected For Q13 And If 1 Is Selected For Q14

Q33 Are you currently affected by the **second** injury to your **[body segment]** sustained during your participation in varsity sport at UNC?

- Yes
- No

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14

Q34 **NOTE:** Being completely restricted from varsity sport participation at UNC means you are not allowed any level of varsity sport participation per instruction from sports medicine staff.

How long were you **completely restricted** and missing time from varsity sport participation at UNC due to the **second injury** you sustained to your **[body segment]**? Choose all that apply.

- Never completely restricted
- Less than 1 day
- 1-2 days
- 3-6 days
- 7-9 days
- 10-21 days
- 22 days or more
- Medical disqualification for remainder of season following injury
- Currently completely restricted

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14

Q35 **NOTE:** Being limited from normal level of varsity sport participation at UNC may include changes in how long you are able to participate, how often you are able to participate or the intensity of varsity sport activity.

How long were you **limited** from your normal level of varsity sport participation at UNC due to the **second injury** you sustained to your **[body segment]**? Choose all that apply.

- Never medically limited
- Less than 1 day
- 1-2 days
- 3-6 days
- 7-9 days
- 10-21 days
- 22 days or more
- Medically limited for remainder of season following injury
- Currently medically limited

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14 And If 2 Is Not Selected For Q14

Q36 Was your **third** injury during your participation in varsity sport at UNC to your **[body segment]** of gradual or sudden onset?

Gradual Onset - accumulated overtime, a specific identifiable event cannot be determined as the cause (an overuse injury)

Sudden Onset - accumulated from a specific identifiable event (an acute injury)

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14 And If 2 Is Not Selected For Q14

Q37 Which option best describes the **third** injury you sustained to your **[body segment]** during your participation in varsity sport at UNC?

- Dislocation
- Subluxation
- Fracture (Broken Bone)

- Stress Fracture
- Stress Reaction
- Ligament Sprain
- Tendon Strain
- Tendinitis
- Muscle Strain
- Contusion (Bruise)
- Bursitis
- Other

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14 And If 2 Is Not Selected For Q14 And If Other Is Selected For Q37

Q38 Please describe the **third** injury you sustained to your **[body segment]** during your participation in varsity sport at UNC. _____

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14 And If 2 Is Not Selected For Q14

Q39 What year(s) has the **third** injury to your **[body segment]** during your participation in varsity sport at UNC affected you? Please select all that apply.

- 2008-2009
- 2009-2010
- 2010-2011
- 2011-2012
- 2012-2013
- 2013-2014

Answer If Yes Is Selected For Q13 And If 1 Is Selected For Q14

Q40 Are you currently affected by the **third** injury to your **[body segment]** sustained during your participation in varsity sport at UNC?

- Yes
- No

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14 And If 2 Is Not Selected For Q14

Q41 **NOTE:** Being completely restricted from varsity sport participation at UNC means you are not allowed any level of varsity sport participation per instruction from sports medicine staff.

How long were you **completely restricted** and missing time from varsity sport participation at UNC due to the **third injury** you sustained to your **[body segment]**? Choose all that apply.

- Never completely restricted
- Less than 1 day
- 1-2 days
- 3-6 days
- 7-9 days
- 10-21 days
- 22 days or more

- Medical disqualification for remainder of season following injury
- Currently completely restricted

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14 And If 2 Is Not Selected For Q14

Q42 **NOTE:** Being limited from normal level of varsity sport participation at UNC may include changes in how long you are able to participate, how often you are able to participate or the intensity of varsity sport activity.

How long were you **limited** from your normal level of varsity sport participation at UNC due to the **third injury** you sustained to your **[body segment]**? Choose all that apply.

- Never medically limited
- Less than 1 day
- 1-2 days
- 3-6 days
- 7-9 days
- 10-21 days
- 22 days or more
- Medically limited for remainder of season following injury
- Currently medically limited

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14 And If 2 Is Not Selected For Q14 And If 3 Is Not Selected For Q14

Q43 Was your **fourth** injury during your participation in varsity sport at UNC to your **[body segment]** of gradual or sudden onset?

- Gradual Onset - accumulated overtime, a specific identifiable event cannot be determined as the cause (an overuse injury)
- Sudden Onset - accumulated from a specific identifiable event (an acute injury)

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14 And If 2 Is Not Selected For Q14 And If 3 Is Not Selected For Q14

Q44 Which option best describes the **fourth** injury you sustained to your **[body segment]** during your participation in varsity sport at UNC?

- Dislocation
- Subluxation
- Fracture (Broken Bone)
- Stress Fracture
- Stress Reaction
- Ligament Sprain
- Tendon Strain
- Tendinitis
- Muscle Strain
- Contusion (Bruise)
- Bursitis
- Other

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14 And If 2 Is Not Selected For Q14 And If 3 Is Not Selected For Q14 And If Other Is Selected For 34

Q45 Please describe the **fourth** injury you sustained to your **[body segment]** during your participation in varsity sport at UNC. _____

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14 And If 2 Is Not Selected For Q14 And If 3 Is Not Selected For Q14

Q46 What year(s) has the **fourth** injury to your **[body segment]** during your participation in varsity sport at UNC affected you? Please select all that apply.

- 2008-2009
- 2009-2010
- 2010-2011
- 2011-2012
- 2012-2013
- 2013-2014

Answer If Yes Is Selected For Q13 And If 1 Is Selected For Q14

Q47 Are you currently affected by the **fourth** injury to your **[body segment]** sustained during your participation in varsity sport at UNC?

- Yes
- No

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14 And If 2 Is Not Selected For Q14 And If 3 Is Not Selected For Q14

Q48 **NOTE:** Being completely restricted from varsity sport participation at UNC means you are not allowed any level of varsity sport participation per instruction from sports medicine staff.

How long were you **completely restricted** and missing time from varsity sport participation at UNC due to the **fourth injury** you sustained to your **[body segment]**? Choose all that apply.

- Never completely restricted
- Less than 1 day
- 1-2 days
- 3-6 days
- 7-9 days
- 10-21 days
- 22 days or more
- Medical disqualification for remainder of season following injury
- Currently completely restricted

Answer If Yes Is Selected For Q13 And If 1 Is Not Selected for Q14 And If 2 Is Not Selected For Q14 And If 3 Is Not Selected For Q14

Q49 **NOTE:** Being limited from normal level of varsity sport participation at UNC may include changes in how long you are able to participate, how often you are able to participate or the intensity of varsity sport activity.

How long were you **limited** from your normal level of varsity sport participation at UNC due to the **fourth injury** you sustained to your **[body segment]**? Choose all that apply.

- Never medically limited
- Less than 1 day

- 1-2 days
- 3-6 days
- 7-9 days
- 10-21 days
- 22 days or more
- Medically limited for remainder of season following injury
- Currently medically limited

Answer If Yes Is Selected For Q13 And If 5 Is Selected For Q14 Or If More than 5 Is Selected for Q14

Q50 Was your **fifth** injury during your participation in varsity sport at UNC to your **[body segment]** of gradual or sudden onset?

- Gradual Onset - accumulated overtime, a specific identifiable event cannot be determined as the cause (an overuse injury)
- Sudden Onset - accumulated from a specific identifiable event (an acute injury)

Answer If Yes Is Selected For Q13 And If 5 Is Selected For Q14 Or If More than 5 Is Selected for Q14

Q51 Which option best describes the **fifth** injury you sustained to your **[body segment]** during your participation in varsity sport at UNC?

- Dislocation
- Subluxation
- Fracture (Broken Bone)
- Stress Fracture
- Stress Reaction
- Ligament Sprain
- Tendon Strain
- Tendinitis
- Muscle Strain
- Contusion (Bruise)
- Bursitis
- Other

Answer If Yes Is Selected For Q13 And If 5 Is Selected For Q14 Or If More than 5 Is Selected for Q14 And If Other Is Selected For Q51

Q52 Please describe the **fifth** injury you sustained to your **[body segment]** during your participation in varsity sport at UNC. _____

Answer If Yes Is Selected For Q13 And If 5 Is Selected For Q14 Or If More than 5 Is Selected for Q14

Q53 What year(s) has the **fifth** injury to your **[body segment]** during your participation in varsity sport at UNC affected you? Please select all that apply.

- 2008-2009
- 2009-2010
- 2010-2011
- 2011-2012
- 2012-2013

- 2013-2014

Answer If Yes Is Selected For Q13 And If 1 Is Selected For Q14

Q54 Are you currently affected by the **fifth** injury to your [**body segment**] sustained during your participation in varsity sport at UNC?

- Yes
- No

Answer If Yes Is Selected For Q13 And If 5 Is Selected For Q14 Or If More than 5 Is Selected for Q14

Q55 **NOTE:** Being completely restricted from varsity sport participation at UNC means you are not allowed any level of varsity sport participation per instruction from sports medicine staff.

How long were you **completely restricted** and missing time from varsity sport participation at UNC due to the **fifth injury** you sustained to your [**body segment**]? Choose all that apply.

- Never completely restricted
- Less than 1 day
- 1-2 days
- 3-6 days
- 7-9 days
- 10-21 days
- 22 days or more
- Medical disqualification for remainder of season following injury
- Currently completely restricted

Answer If Yes Is Selected For Q13 And If 5 Is Selected For Q14 Or If More than 5 Is Selected for Q14

Q56 **NOTE:** Being limited from normal level of varsity sport participation at UNC may include changes in how long you are able to participate, how often you are able to participate or the intensity of varsity sport activity.

How long were you **limited** from your normal level of varsity sport participation at UNC due to the **fifth injury** you sustained to your [**body segment**]? Choose all that apply.

- Never medically limited
- Less than 1 day
- 1-2 days
- 3-6 days
- 7-9 days
- 10-21 days
- 22 days or more
- Medically limited for remainder of season following injury
- Currently medically limited

APPENDIX FOUR: RESULTS TABLES

Table 4.1
Descriptive Statistics (n=90)

	\bar{x}	$\pm SD$	Range
Age	19.96	1.51	18-26
Years of Participation at UNC	2.27	1.23	0.5-5
Years of Participation Over Lifetime	9.73	4.34	1-21
Total Number of Collegiate Athletic Injuries	2.59	2.32	0-10
Reduced Sense of Sport Accomplishment	2.47	0.83	1-5
Sport Devaluation	2.06	1.00	1-5
Emotional & Physical Exhaustion	2.71	0.82	1-5
Global Athlete Burnout	2.42	0.72	1-5

A sports-related injury is defined as an injury that directly resulted from varsity sport participation at UNC that required evaluation by the sports medicine staff.

Table 4.2
Demographic Frequencies

	%	n
Sex		
Female	81.1	73
Male	18.9	17
Age (years)		
18	21.1	19
19	20.0	18
20	21.1	19
21	23.3	21
22 and over	14.4	13
Years of Participation at UNC (years)		
1 st year (0.5-1 year)	32.2	29
2 nd year (1.5-2 years)	26.7	24
3 rd year (2.5-3 years)	20.0	18
4 th year (3.5-4 years)	17.8	16
5 th year (5 years)	3.3	3
Years of Experience Over Lifetime (years)		
Less than 5.	10.0	9
5.0-9.0	41.1	37
10.0-14.0	28.9	26
15.0 and over	20.0	18
Team		
Men's Indoor Track & Field	11.1	10
Women's Fencing	8.9	8
Women's Indoor Track & Field	18.9	17
Women's Soccer	24.4	22
Volleyball	3.3	3
Sport Type		
Individual Sports	61.1	55
Team Sports	38.9	35
Current Injury Status		
Currently Injured	45.6	41
Not Currently Injured	54.4	49

A sports-related injury is defined as an injury that directly resulted from varsity sport participation at UNC that required evaluation by the sports medicine staff.

Table 4.3

Relationship Between Number of Injuries During Collegiate Career & AB (n=90)

	Pearson r	r ²	P value
Reduced Sense of Sport Accomplishment	0.177	0.031	0.096
Sport Devaluation	0.083	0.007	0.483
Emotional & Physical Exhaustion	0.154	0.024	0.146
Global AB	0.165	0.027	0.121

* Correlations significant at $p < .05$

Table 4.4
Relationship Between AB and Time Completely Restricted

		Pearson r	r ²	P value
Head and Face: Only One Injury (n=13)	Reduced Sense of Sport Accomplishment	-0.020	0.000	0.949
	Sport Devaluation	-0.109	0.012	0.722
	Emotional and Physical Exhaustion	0.116	0.013	0.707
	Global AB	0.021	0.000	0.945
Shoulder: Only One Injury (n=9)	Reduced Sense of Sport Accomplishment	-0.434	0.188	0.244
	Sport Devaluation	-0.341	0.116	0.369
	Emotional and Physical Exhaustion	-0.388	0.151	0.302
	Global AB	-0.410	0.168	0.273
Hand and Fingers: Only One Injury (n=6)	Reduced Sense of Sport Accomplishment	-0.307	0.094	0.554
	Sport Devaluation	0.114	0.013	0.829
	Emotional and Physical Exhaustion	0.496	0.246	0.317
	Global AB	0.119	0.014	0.822
Hip and Thigh: Only One Injury (n=13)	Reduced Sense of Sport Accomplishment	-0.806	0.650	0.779
	Sport Devaluation	-0.293	0.086	0.331
	Emotional and Physical Exhaustion	0.078	0.006	0.801
	Global AB	-0.142	0.020	0.644
Hip and Thigh: First Injury (n=9)	Reduced Sense of Sport Accomplishment	0.316	0.100	0.407
	Sport Devaluation	-0.304	0.092	0.427
	Emotional and Physical Exhaustion	-0.089	0.008	0.819
	Global AB	-0.104	0.010	0.790

	Reduced Sense of Sport Accomplishment	0.327	0.107	0.365
Hip and Thigh: Second Injury (n=10)	Sport Devaluation	0.054	0.003	0.882
	Emotional and Physical Exhaustion	0.340	0.116	0.337
	Global AB	0.243	0.059	0.499
	Reduced Sense of Sport Accomplishment	0.012	0.000	0.970
Knee: Only One Injury (n=12)	Sport Devaluation	-0.226	0.051	0.481
	Emotional and Physical Exhaustion	-0.044	0.002	0.892
	Global AB	-0.117	0.014	0.716
	Reduced Sense of Sport Accomplishment	0.408	0.166	0.363
Knee: First Injury (n=7)	Sport Devaluation	0.088	0.008	0.852
	Emotional and Physical Exhaustion	0.032	0.001	0.946
	Global AB	0.320	0.102	0.483
	Reduced Sense of Sport Accomplishment	0.408	0.166	0.363
Knee: Second Injury (n=7)	Sport Devaluation	0.088	0.008	0.852
	Emotional and Physical Exhaustion	0.032	0.001	0.946
	Global AB	0.320	0.102	0.483
	Reduced Sense of Sport Accomplishment	-0.807	0.651	0.680
Leg and Ankle: Only One Injury (n=25)	Sport Devaluation	0.399	0.159	0.048*
	Emotional and Physical Exhaustion	0.282	0.080	0.172
	Global AB	0.303	0.092	0.141

	Reduced Sense of Sport Accomplishment	0.516	0.266	0.071
Leg and Ankle: First Injury (n=13)	Sport Devaluation	0.570	0.325	0.042*
	Emotional and Physical Exhaustion	0.130	0.017	0.672
	Global AB	0.458	0.210	0.115
	Reduced Sense of Sport Accomplishment	0.714	0.510	0.006*
Leg and Ankle: Second Injury (n=13)	Sport Devaluation	0.826	0.682	0.001*
	Emotional and Physical Exhaustion	0.205	0.042	0.503
	Global AB	0.694	0.482	0.009*
	Reduced Sense of Sport Accomplishment	0.741	0.549	0.047*
Foot and Toe: Only One Injury (n=8)	Sport Devaluation	0.058	0.003	0.891
	Emotional and Physical Exhaustion	0.280	0.078	0.502
	Global AB	0.454	0.206	0.259

*Correlations significant at $p < .05$

Athletic injuries are labeled according to the body segment at which an injury occurred. If labeled “Only One Injury,” the results are representative of the correlation of athlete burnout measures and time completely restricted from participants that only sustained one injury at the respective body segment. If labeled “First Injury,” the results are representative of the correlation of athlete burnout and time completely restricted from participants’ first of multiple injuries at the respective body segments. If labeled “Second Injury,” the results are representative of the correlation of athlete burnout and time completely restricted from participants’ second of multiple injuries at the respective body segments.

Table 4.5

		Pearson r	r ²	P value
	Reduced Sense of Sport Accomplishment	0.230	0.053	0.472
Head and Face: Only One Injury (n=12)	Sport Devaluation	0.164	0.027	0.611
	Emotional and Physical Exhaustion	-0.041	0.002	0.899
	Global AB	0.123	0.015	0.704
	Reduced Sense of Sport Accomplishment	0.655	0.429	0.111
Neck and Spine: Only One Injury (n=7)	Sport Devaluation	0.634	0.402	0.126
	Emotional and Physical Exhaustion	0.256	0.066	0.579
	Global AB	0.613	0.376	0.144
	Reduced Sense of Sport Accomplishment	-0.053	0.003	0.893
Shoulder: Only One Injury (n=9)	Sport Devaluation	-0.072	0.005	0.854
	Emotional and Physical Exhaustion	-0.011	0.000	0.977
	Global AB	-0.049	0.002	0.900
	Reduced Sense of Sport Accomplishment	-0.616	0.379	0.141
Arm: Only One Injury (n=7)	Sport Devaluation	-0.593	0.352	0.161
	Emotional and Physical Exhaustion	0.426	0.181	0.341
	Global AB	-0.852	0.700	0.015*
	Reduced Sense of Sport Accomplishment	-0.536	0.287	0.352
Hand and Fingers: Only One Injury (n=5)	Sport Devaluation	-0.446	0.199	0.452
	Emotional and Physical Exhaustion	-0.467	0.218	0.428
	Global AB	-0.495	0.245	0.396

	Reduced Sense of Sport Accomplishment	-0.297	0.088	0.348
Hip and Thigh: Only One Injury (n=12)	Sport Devaluation	-0.359	0.129	0.252
	Emotional and Physical Exhaustion	-0.111	0.012	0.732
	Global AB	-0.333	0.111	0.291
	Reduced Sense of Sport Accomplishment	-0.501	0.251	0.905
Hip and Thigh: First Injury (n=8)	Sport Devaluation	-0.595	0.354	0.120
	Emotional and Physical Exhaustion	-0.553	0.306	0.155
	Global AB	-0.521	0.271	0.186
	Reduced Sense of Sport Accomplishment	0.173	0.030	0.711
Hip and Thigh: Second Injury (n=7)	Sport Devaluation	-0.064	0.004	0.892
	Emotional and Physical Exhaustion	0.328	0.108	0.473
	Global AB	0.154	0.024	0.742
	Reduced Sense of Sport Accomplishment	-0.014	0.000	0.966
Knee: Only One Injury (n=12)	Sport Devaluation	-0.014	0.000	0.966
	Emotional and Physical Exhaustion	0.090	0.008	0.780
	Global AB	0.035	0.001	0.915
	Reduced Sense of Sport Accomplishment	-0.072	0.005	0.878
Knee: First Injury (n=7)	Sport Devaluation	-0.707	0.500	0.076
	Emotional and Physical Exhaustion	-0.226	0.051	0.626
	Global AB	-0.544	0.296	0.207

	Reduced Sense of Sport Accomplishment	0.237	0.056	0.609
Knee: Second Injury (n=7)	Sport Devaluation	-0.244	0.060	0.597
	Emotional and Physical Exhaustion	-0.556	0.309	0.195
	Global AB	-0.298	0.089	0.516
	Reduced Sense of Sport Accomplishment	-0.248	0.062	0.355
Leg and Ankle: Only One Injury (n=16)	Sport Devaluation	-0.178	0.032	0.509
	Emotional and Physical Exhaustion	0.236	0.056	0.379
	Global AB	-0.073	0.005	0.788
	Reduced Sense of Sport Accomplishment	0.516	0.266	0.071
Leg and Ankle: First Injury (n=13)	Sport Devaluation	0.570	0.325	0.042*
	Emotional and Physical Exhaustion	0.130	0.017	0.672
	Global AB	0.458	0.210	0.115
	Reduced Sense of Sport Accomplishment	0.735	0.540	0.010*
Leg and Ankle: Second Injury (n=13)	Sport Devaluation	0.936	0.876	0.000*
	Emotional and Physical Exhaustion	0.312	0.097	0.350
	Global AB	0.768	0.590	0.006*

	Reduced Sense of Sport Accomplishment	0.512	0.262	0.195
Foot and Toes: Only One Injury (n=8)	Sport Devaluation	-0.210	0.044	0.617
	Emotional and Physical Exhaustion	-0.036	0.001	0.932
	Global AB	0.075	0.006	0.859

*Correlations significant at $p < .05$

Athletic injuries are labeled according to the body segment at which an injury occurred. If labeled “Only One Injury,” the results are representative of the correlation of athlete burnout measures and time completely restricted from participants that only sustained one injury at the respective body segment. If labeled “First Injury,” the results are representative of the correlation of athlete burnout and time completely restricted from participants’ first of multiple injuries at the respective body segments. If labeled “Second Injury,” the results are representative of the correlation of athlete burnout and time completely restricted from participants’ second of multiple injuries at the respective body segments.

Table 4.6
Descriptive Statistics of Differences in AB Between Injury-Onset Groups

	Gradual-Onset Only (n=19)	Acute-Onset Only (n=27)	Both Gradual- and Acute-Onset (n=27)	Neither Gradual-nor Acute-Onset (n=17)
	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$
Reduced Sense of Sport Accomplishment	2.60 ± 0.86	2.38 ± 0.88	2.60 ± 0.89	2.20 ± 0.59
Sport Devaluation	2.08 ± 1.16	2.04 ± 1.05	2.24 ± 0.92	1.79 ± 0.86
Emotional and Physical Exhaustion	2.73 ± 0.77	2.63 ± 0.92	2.96 ± 0.80	2.42 ± 0.68
Global AB	2.47 ± 0.76	2.35 ± 0.83	2.61 ± 0.62	2.14 ± 0.59

Table 4.7
Differences in AB Between Injury-Onset Groups: Gradual-Onset Only, Acute-Onset Only, Both Gradual- and Acute-Onset, and Neither Gradual- nor Acute-Onset

	F	P value
Reduced Sense of Sport Accomplishment	1.288	0.284
Sport Devaluation	0.695	0.557
Emotional and Physical Exhaustion	1.604	0.194
Global AB	1.662	0.181

* Differences significant at $p < 0.05$

Table 4.8
Differences in AB Between Sustained-Injury Groups

	Sustained at Least 1 Athletic Injury (n=73)	Did Not Sustain Any Injuries (n=17)		
	$\bar{x} \pm SD$	$\bar{x} \pm SD$	t	P value
Reduced Sense of Sport Accomplishment	2.54 ± 0.88	2.20 ± 0.59	1.911	0.064
Sport Devaluation	2.13 ± 1.03	1.79 ± 0.86	1.398	0.173
Emotional & Physical Exhaustion	2.78 ± 0.84	2.42 ± 0.68	1.844	0.076
Global AB	2.48 ± 0.74	2.14 ± 0.59	2.046	0.050**

** Trending toward significant difference

Table 4.9
Differences in AB Between Multiple Athletic Injuries to Any Body Segment Groups

	Sustained Multiple Athletic Injuries to at Least 1 Body Segment (n=37)	Did Not Sustain Multiple Athletic Injuries to Any Body Segment (n=53)		
	$\bar{x} \pm SD$	$\bar{x} \pm SD$	t	P value
Reduced Sense of Sport Accomplishment	2.70 ± 0.88	2.32 ± 0.78	2.117	0.038*
Sport Devaluation	2.21 ± 0.95	1.96 ± 1.04	1.152	0.253
Emotional & Physical Exhaustion	2.91 ± 0.91	2.57 ± 0.72	1.855	0.068
Global AB	2.60 ± 0.74	2.28 ± 0.69	2.073	0.042*

* Differences Significant at $p < 0.05$

Table 4.10
Differences in AB Between Current Injury Status Groups

	Currently Injured (n=41)	Not Currently Injured (n=49)	t	P value
	$\bar{x} \pm SD$	$\bar{x} \pm SD$		
Reduced Sense of Sport Accomplishment	2.60 ± 0.82	2.37 ± 0.85	1.323	0.189
Sport Devaluation	2.13 ± 0.97	2.00 ± 1.03	0.602	0.548
Emotional & Physical Exhaustion	2.95 ± 0.74	2.51 ± 0.84	2.596	0.011*
Global AB	2.56 ± 0.65	2.30 ± 0.76	1.771	0.080

* Differences Significant at $p < 0.05$

Table 4.11
Relationship Between Years of Participation at UNC & AB (n=90)

	Pearson r	r ²	P value
Reduced Sense of Sport Accomplishment	0.165	0.027	0.119
Sport Devaluation	0.116	0.013	0.276
Emotional & Physical Exhaustion	-0.047	0.002	0.661
Global AB	0.100	0.010	0.350

* Correlations significant at $p < 0.05$

Table 4.12
Relationship Between Years of Participation Over Lifetime & AB (n=90)

	Pearson r	r ²	P value
Reduced Sense of Sport Accomplishment	-0.025	0.000	0.816
Sport Devaluation	-0.068	0.005	0.525
Emotional & Physical Exhaustion	-0.184	0.034	0.083
Global AB	-0.111	0.012	0.300

* Correlations significant at $p < 0.05$

Table 4.13

Relationship Between Years of Participation at UNC & Years of Participation Over Lifetime (n=90)

	Pearson r	r ²	P value
Years of Participation Over Lifetime	0.303	0.092	0.004*

* Correlations significant at $p < 0.05$

Table 4.14

Differences in AB Between Team- Sport & Individual-Sport Athletes

	Team-Sport (n=35)	Individual- Sport (n=55)	t	P value
	$\bar{x} \pm SD$	$\bar{x} \pm SD$		
Reduced Sense of Sport Accomplishment	2.27 ± 0.61	2.60 ± 0.94	1.832	0.072
Sport Devaluation	1.75 ± 0.77	2.26 ± 1.09	2.432	0.017*
Emotional & Physical Exhaustion	2.55 ± 0.85	2.81 ± 0.79	1.435	0.156
Global AB	2.19 ± 0.59	2.56 ± 0.77	2.538	0.013*
Total Number of Injuries During Collegiate Career	2.60 ± 2.44	2.58 ± 2.26	-0.035	0.972

* Differences significant at $p < 0.05$

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