

PERCEIVED STRESS LEVELS AND HEALTH  
PROMOTING BEHAVIORS AMONG NAIA AND  
NCAA DIVISION I STUDENT ATHLETES

By

AMANDA LEIGH DIVIN

Bachelor of Science in Kinesiology  
The University of Texas at Austin  
Austin, Texas  
2000

Master of Education in Kinesiology  
The University of Texas at Austin  
Austin, Texas  
2004

Submitted to the Faculty of the  
Graduate College of the  
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By

Amanda Leigh Divin

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STUDENT ATHLETES

Dissertation Approved:

Dr. Steven Edwards

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Dissertation Adviser

---

Dr. Bert Jacobson

---

Dr. Doug Smith

---

Dr. Janice Miller

---

Dr. A. Gordon Emslie

---

Dean of the Graduate College

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## CHAPTER I

### INTRODUCTION

#### *Overview*

The college years represent a transitional period between late adolescence and early adulthood. It is during this time that traditional college students, ages 18-25, may be on their own for the first time, struggle to create or cement their own individual personalities, adjust to a new environment both academically and personally, maintain levels of academic achievement high enough to continue their passage through college, and manage their time efficiently. Additionally, financial issues, disagreements with parents, friends, or peers, and the struggle to fit in may also put a toll on students. Furthermore, they may face self-imposed pressures related to finding a job or a potential life partner. Such challenges can place an extremely high amount of stress on students as they try to master all the tasks at hand. While moderate amounts of stress have shown to motivate and enhance performance (e.g. Yerkes-Dodson curve) (Seaward, 2002), high amounts of stress and the inability to cope with stress can be detrimental both to health (Zakowski, Hall, & Baum, 1992; Seaward, 2002) and academic performance (Wright, 1964; Grace, 1998). In a 1994 study, Abousiere (1994) found that 80% of college students reported feelings of moderate stress, whereas in a 1998 study, Makrides, Veinot, Richard, McKee, and Gallican (1998) found that 60% of college students rated their

stress levels as high or very high. More recently, the American Psychological Association (2007) reported that 48% of Americans believe their stress has increased over the past five years. With such shocking statistics, it is no surprise that in the National College Health Association's 2007 report, stress was ranked as the number one health 'impediment' to academic performance among college students (ACHA, 2008).

It is a widespread impression that the accumulation of ongoing hassles, annoyances, or other negative events can gradually take a toll on an individual and his/her health. While initial stress research focused on major life events such as death, new job, marriage/divorce, etc. as sources of stress (e.g. Holmes & Raphe), over the past 30 years, a new focus in stress research has been on the role of daily hassles as a source of stress. Patterns of hassles have shown to be "roughly consistent with their [the participants] ages and station in life," (Kanner, Coyne, Schaefer, & Lazarus, 1981, p. 23). Therefore, given the nature of college, it can provide a source of stress as both a major life event as well as contributing to the daily hassles experienced. Thus the college years may be one of the most stressful times in one's life.

It is obvious navigating the everyday life and stressors of a typical college student can be challenging. However certain subpopulations within this cohort face even greater stressors. Student athletes are a prime example of this. Student athletes represent a diverse, unique population with special needs due to their roles on campus and their atypical lifestyles (Ferrante, Etzel, & Lantz, 1996). Much like their peers, student athletes must master the challenge of cognitive and developmental tasks such as identity exploration, career decision making, forming effective interpersonal relationships, developing self-esteem, and achieving autonomy. However, unlike their non-athlete

peers, student athletes face overwhelming time commitments, unrelenting public scrutiny, daily physically and emotionally grueling workouts, a high-profile existence on and off campus, and demanding expectations both on and off the playing field (Carodine, Almond, & Gratto, 2001; Humphrey, Yow, & Bowden, 2000). Such stresses associated with sport participation can affect the mental or emotional health of student athletes. In fact, Humphrey, Yow, and Bowden (2000) found that almost half of the male athletes and slightly more than half of the female athletes interviewed reported that stresses associated with sport participation significantly affected their mental or emotional health.

Research has indicated that stress produces physiological changes which directly harm health. For example, psychological stress leads to exaggerated cardiovascular responses, enhanced platelet aggregation, coronary vasoconstriction, plaque rupture, myocardial ischemia, and arrhythmias, all of which are part of the process ultimately leading to myocardial infarction (MI) or sudden death (Kamarck & Jennings, 1991; Markovitz & Matthews, 1991). However, stress is a problem to college students and student athletes not only because of the direct strain it can place on them physically, emotionally, and academically, but also because of the indirect affect it can have on their health behaviors. Zillman & Bryant (1985, as cited in Ng & Jeffery, 2003) suggest that an ‘aversive state’ like stress can encourage individuals to engage in unhealthy behaviors because such behaviors may bring them pleasure. Under stress, some individuals find it more difficult to engage in health-promoting behaviors because they are more emotionally and behaviorally demanding, thus some individuals may offset their stress-induced emotional distress by engaging in behaviors which have health-damaging consequences (Adler & Matthews, 1994). Indeed, numerous studies have found that

stress can change various behaviors which can negatively impact health. For example, stress has been associated with an increase in smoking (Steptoe, Wardle, Pollard, Canaan, & Davies, 1996; Ashby et al., 2002; Jones et al., 1992) and alcohol use (Von Ah, Ebert, Ngamvitroj, Park, & Kang, 2004), a decrease in physical exercise (Payne et al., 2002; Steptoe et al., 1996), and a deterioration in dietary practices (Cartwright, Wardle, Steggle, Simon, Croker, & Jarvis, 2003; Spillman, 1990). Moreover, studies have suggested that college athletes, in particular, who experience high levels of stress are more likely to practice health risk behaviors (e.g. unsafe sexual practices, binge drinking, driving while intoxicated) (Hudd et al., 2000; Nattiv & Puffer, 1991; Nattiv, Puffer, & Green, 1997).

While much research has focused on the relationship between stress and health risk behaviors, little research has examined the relationship between stress and health promoting behaviors. Walker, Sechrist, and Pender (1987) describe health promoting behavior as “an expression of the human actualizing tendency...directed toward sustaining or increasing the individual’s level of well-being, self-actualization, and personal fulfillment” (p. 76). The idea of using health promoting behaviors to strive toward wellness was echoed by a National Institute of Health report (NIH; 1991) which stated,

*Our research is teaching us that many common diseases can be prevented, and others can be postponed or well-controlled, simply by making positive life style changes. For these reasons, intensifying such research and encouraging all Americans to make health-enhancing behaviors a part of their daily lives has taken on more and more importance in our efforts to conquer disease (p. 1).*

Health enhancing or health promoting behaviors are not simply a means to protect against or decrease the probability of disease. Those behaviors are often referred to as health protecting behaviors and are a reaction to external influences (Pender, 1982). Health promoting behaviors, on the other hand, are behaviors “directed toward sustaining or increasing the level of well-being” (p. 65). They represent an individual acting on, not reacting to, his/her environment. Millar and Millar (1993) further explain health promoting behaviors as actions which directly increase health or offer opportunities to individuals to make themselves more healthy. Consequently, health promoting behaviors are activities which must be a continuing and vital part of an individual’s lifestyle in order to reap the benefits. Examples of health promoting behaviors include physical activity, stress management, spiritual growth, and nutritious eating habits.

With the multitude of research performed on health risk behaviors, it may be easy to assume an individual engaging in health promoting behaviors does not engage in health risk behaviors or that an individual engaging in health risk behaviors does not engage in health promoting behaviors. However, upon closer examination, it is evident this is not the case. For example, an individual could be routinely physically active (a health promoting behavior) but still smoke cigarettes (a health risk behavior). Conversely, an individual could regularly practice unsafe sex (e.g. not use a condom during intercourse; a high risk behavior) but maintain a healthy diet (a health promoting behavior). Additionally, one can not necessarily assume that if health promoting behaviors increase, health risk behaviors concomitantly decrease or vice versa (e.g., as nutritional value of diet improves, incidence of driving while intoxicated decreases). Further, given the research addressing stress and its relationship to health risk behaviors,

it may also be easy to assume that individuals with low stress engage in health promoting behaviors while individuals under high stress engage in health risk behaviors. However, no research exists to support this hypothesis. Moreover, with the exception of physical activity, little research has been done examining the relationship between stress and many health promoting behaviors. In fact, very few investigations of the relationship between stress and other health promoting behaviors such as nutrition, spiritual growth, interpersonal relations, and health responsibility have been performed, and none have been performed with student athletes as participants.

#### *Levels of Intercollegiate Competition*

There are two main governing bodies which oversee collegiate athletic participation: the National Association of Intercollegiate Athletics (NAIA) and the National Collegiate Athletic Association (NCAA). When discussing collegiate student athletes, it is necessary to consider the different levels of competition in which a student may compete because each has different demands which could affect his/her life, stress levels, and health behaviors. Such demands could include eligibility requirements, financial aid/scholarships, amount of travel and/or games played, pressure to win, and possibility of “going pro.” Further, those demands vary based on level of competition. For example, Hess (1990) found that student athletes reported different levels of stress based on level of intercollegiate competition, with student athletes competing at a NCAA Division I institution reporting more stress than those in Division II and III institutions. To better understand how and why the level of intercollegiate competition in which a

student plays may affect his/her life stress, a closer look at each competitive division is necessary.

*The National Association of Intercollegiate Athletics (NAIA)*

The NAIA was originally founded in 1937 as the National Association of Intercollegiate Basketball (NAIB). At that time it was an organization hosting only men's basketball teams in an eight team tournament format in Kansas City, Missouri. In 1952, several member institutions expressed desires to include other sports into association play and to change the name from the NAIB to the NAIA. At this time, the first set of all-encompassing rules and standards were adopted for NAIA competition. Shortly after the name change, historically black institutions were permitted to join and compete in NAIA competitions. Athletic programs for women began in 1980 (NAIA, 2005). Currently, almost 300 institutions are members of the NAIA (NAIA, 2008b). The NAIA does not require a minimum number of sports, spectators in attendance, or location of competitive play (NAIA, 2008a). It does, however, place team limits on financial aid (NAIA, 2008b).

*The National Collegiate Athletic Association (NCAA)*

The NCAA was originally founded in 1906 after an overly violent football game left several players injured and/or dead. Originally called the Intercollegiate Athletic Association of the United States (IAAUS), its purpose was to act as a discussion group and rules-making body for college sports. With a name change in 1910 from the IAAUS to the NCAA and its first national championship event in 1921, the NCAA was well on its way to becoming the leader in collegiate sports. In the 1950s, the NCAA set up its



headquarters in Kansas City Missouri and tighter control over membership, championships, financial aid, recruiting, and treatment of student athletes. The year 1973 brought more structure to the NCAA, as its membership was divided into three legislative and competitive divisions - I, II, and III. Athletic programs for women began in 1980 (NCAA, 2008a). Today the NCAA is several hundred members strong with its purpose being “to initiate, stimulate and improve intercollegiate athletics programs for student-athletes and to promote and develop educational leadership, physical fitness, athletics excellence and athletics participation as a recreational pursuit” (NCAA, 2007a, p. 1). The three competitive divisions, I, II, and III are still in effect.

### *NCAA Competitive Divisions*

#### *Division I*

NCAA Division I is considered the most prestigious and rigorous level of intercollegiate athletic competition. In fact, most student athletes who go on to professional athletic competition come from NCAA Division I institutions. To be classified as a Division I institution by the NCAA, an institution must sponsor at least seven sports for men and seven sports for women or six sports for men and eight sports for women, and there must be two team sports for each gender. There are mandated minimum and maximum financial awards for the program, individual sports, and gender. Strict rules regarding opponents and scheduling are also enforced. For example, there is a “minimum number” of competitions which teams must play against other Division I institutions and 50% of competitions exceeding that minimum number must also be played against Division I programs. Other strict rules include allowing only four contests

against non-Division I teams for the sport of basketball and that men's basketball teams are required to play one third of their games in their home arena (NCAA, 2007b; NCAA 2008b). Such restrictions make competition at this level highly rigorous and add to the prestige and stress of the programs.

The Division I classification is made up of two subdivisions, the bowl subdivision (formerly I-A) and the Championship division (formerly I-AA). Differences between these two subdivisions are seen only in football attendance requirements and financial minimums. In Division I Bowl Subdivision play, the football attendance requirement must average at least 15,000 people per home game (NCAA, 2008b).

### *Division II*

To be classified as a Division II institution by the NCAA, an institution must sponsor at least five sports for men and five sports for women or four sports for men and six sports for women, with two team sports for each gender. Additionally, each playing season must be represented by both genders. There is a limit/maximum amount allowed for financial awards, but no minimum. All teams other than football and basketball have no scheduling or competition requirements. However, football and both men's and women's basketball teams are required to play a mandated number of contests against fellow Division II institutions. Unlike Division I competition, there is no attendance requirement for football games or mandatory location of play for basketball games (NCAA, 2007b; NCAA, 2008b). Athletic programs at Division II institutions are financed through the institutional budget, not revenue generated by play as in Division I school. This funding is similar to other academic programs/departments on campus. Regional and/or in-state rivalries are common in Division II play (NCAA, 2007b).

### *Division III*

To be classified as a Division III institution by the NCAA, an institution must sponsor at least five sports for men and five sports for women. There must be two team sports for each gender, and each playing season must be represented by each gender (NCAA, 2007b; NCAA, 2008b). There are minimums set for contests and participants in each sport. Unlike student athletes participating at Division I and Division II institutions, student athletes participating at Division III institutions are not offered ‘athletic’ scholarships. In other words, they receive no financial incentive or reward for sport participation at their institution. Also unlike Division I institutions, Division III athletic departments are staffed, funded, and run like any other department or unit at the institution. Emphasis is placed on the student athlete’s experience participating in the sport rather than generation of revenue, recruiting, or national standing/reputation (NCAA, 2007b).

### *Significance of the Study*

According to the American College Health Association’s National College Health Assessment, stress has been reported as the number one ‘impediment’ to academic performance in college students since and including 2003 (ACHA, 2008; ACHA 2007; ACHA 2006a; ACHA 2006b; ACHA 2005). Stress is an important factor in collegiate life to study because it “reduces work effectiveness, contributes to bad habits, and results in negative long-term consequences, including addictions, crime, absenteeism, poor academic performance, dropping out of school, professional burnout, and ultimately career failure” (Grace, 1998, p. 241).

The college years are well known to be a time of experimentation. It is also a time during which the health-related habits formed can last a lifetime (Paffenbarger, Hyde, Wing, & Hsieh, 1986; Lee and Loke, 2005). Given the relationship between stress and health risk behaviors, along with the aptitude of student athletes to be more likely to engage in health risk behaviors, it is necessary to explore the health promoting behaviors of student athletes and the relationship between stress and health promoting behaviors.

If health promoting behaviors are found to be related to levels of perceived stress in student athletes, professionals who work in student athlete services and support may see the benefit of encouraging health promoting behaviors as an important component to a successful college experience for the student athlete. Poor health behaviors (Nattiv & Puffer, 1991; Selby, Weinstein, & Bird, 1990; Nattiv, Puffer, & Green, 1997; Kokotailo, Henry, Kosciak, Fleming, & Landry, 1996), high stress levels (Humphrey, Yow, & Bowden, 2000; Nikou & Dinardo, 1985), and an increase in multifaceted problems such as anxiety, depression, or hostility (Yang, Peek-Asa, Corlette, Cheng, Foster, & Albright, 2007; Smith, 1988; Brewer & Petitpas, 2005; Pinkerton, Hinz, & Barrow, 1989; Maniar & Carter, 2003) demonstrate the need for effective interventions to improve the overall college experience of the student athlete.

### *Purpose and Research Questions*

While many assume student athletes are ‘healthier’ and/or more attuned with their overall well-being, the demands of collegiate sport participation places a large amount of stress on these students, the result of which can be maladaptive health risk behaviors. A multitude of research has focused on student athletes and their involvement in health risk

behaviors. However, virtually no research has focused on their involvement in health promoting behaviors. With the exception of physical activity, many student athletes may not engage in other health promoting behaviors. Health promoting behaviors may be a viable alternative to alleviate stress. Therefore it is necessary to explore this relationship further.

The purpose of the current study was to examine the perceived stress levels, recent life experiences, and health promoting behaviors among male and female student athletes at two levels of intercollegiate competition (NAIA and NCAA Division I). This study also investigated the relationship between perceived stress levels and health promoting behaviors in both groups of athletes. Additionally, differences in the aforementioned variables were explored between the two levels of intercollegiate competition.

The following research questions guided the development of this study:

1. For the two levels of intercollegiate competition:
  - a. What is the overall perceived stress level of student athletes?
  - b. Which hassles/sources of stress are the most prevalent in student athletes?
  - c. What are the health promoting behaviors of student athletes?
  - d. Are perceived stress levels and health promoting behaviors interrelated in student athletes?
2. Across all student athletes:

- a. Are there differences in perceived stress levels, hassles/sources of stress, and health promoting behaviors in the two different student athlete groups?

### *Delimitations*

The study was delimited in the following ways:

1. Participants were male and female student athletes enrolled full-time at either NAIA or NCAA Division I institutions.
2. Analysis of perceived stress levels was limited to the responses measured by the Perceived Stress Scale (PSS-10) (Cohen, Kamarck, & Mermelstein, 1983).
3. Analysis of hassles/sources of stress was limited to the responses measured by the Inventory of College Students Recent Life Experiences (ICSRLE) (Kohn, Lafreniere, & Gurevich, 1990).
4. Analysis of a health promoting lifestyle and health promoting behaviors was limited to the responses measured by the Health Promoting Lifestyle Profile II (HPLP-II) (Walker & Hill-Polerecky, 1996).

### *Limitations*

The study was limited for a number of reasons:

1. All measures were self-report. Therefore, participants may have answered the questions according to what they believed was socially acceptable or expected of them rather than what they honestly thought, felt, and did.
2. Data was collected convenience sampling. Students who volunteered to participate may be different from those who did not volunteer to participate.

3. The findings are limited to student athletes at the two levels of intercollegiate competition (NAIA and NCAA Division I) measured and only at institutions with similar characteristics as the sampled institutions.

### *Assumptions*

1. Participants answered all items completely, truthfully, and to the best of their ability.
2. Participants understood how to complete the questionnaire correctly and followed the instructions for completion.
3. The instruments used in this study were appropriate measures of perceived stress levels (the PSS-10), hassles (the ICSRLE), and health promoting behaviors (the HPLP-II).

### *Definitions*

Health promoting behaviors – “Any action motivated by the desire to increase the level of well-being and self-actualization of a given individual and focuses on efforts to approach or move toward a positively balanced state of high level health and well-being” (Pender, 1996, p. 34). They are continuing activities which must be an integral part of an individual’s lifestyle directed toward maximizing positive arousal (self-awareness, enjoyment, and pleasure) (Pender, 1982). The six health promoting behaviors of Pender’s Health Promoting Lifestyle used in this study were health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations, and stress management.

Health responsibility – active sense of accountability for one’s own well-being, including paying attention to one’s health, educating oneself about health, and exercising informed consumerism when seeking professional assistance (Walker & Hill-Polerecky, 1996).

Physical activity – regular planned or unplanned participation in light, moderate, or vigorous activity for the sake of health or fitness or incidentally as a part of daily life or leisure activities (Walker & Hill-Polerecky, 1996).

Nutrition – knowledgeable selection and consumption of foods essential for sustenance, health, and well-being, including choosing a healthful daily diet consistent with guidelines provided by the Food Guide Pyramid (Walker & Hill-Polerecky, 1996).

Spiritual growth – development of inner resources achieved through transcending, connecting, and developing. Transcending is said to put individuals in touch with their most balanced selves, providing them with inner peace and opening them to possibilities of creating new options for becoming something more by going beyond who and what an individual is. Connecting is the feeling of harmony, wholeness, and connection with the universe. Developing involves maximizing human potential for wellness through searching for meaning, finding a sense of purpose, and working toward goals in life (Walker & Hill-Polerecky, 1996). Three components of spiritual health found in this subscale are relationship with a higher being, relationship with self, and relationships with others (Pender, 1996).



Interpersonal relations – utilizing communication (sharing thoughts and feelings through verbal and nonverbal messages) to achieve a sense of intimacy and closeness within meaningful relationships with others. Communication involves the sharing of thoughts and feelings through verbal and nonverbal messages (Walker & Hill-Polerecky, 1996).

Stress management – Identification and mobilization of psychological and physical resources to effectively control or reduce tension (Walker & Hill-Polerecky, 1996).

Perceived stress –the degree to which situations in one’s life are appraised as unpredictable, uncontrollable, and/or overloading, any one of which is a central component of the stress experience (Cohen, Kamarck, & Mermelstein, 1983; Cohen, 1994).

Stressors – an agent which produces a state of stress (Humphrey, 1998, as cited in Humphrey, Yow, & Bowden, 2000)

Hassles/sources of stress – defined by Kohn’s ICSRLE as recent life experiences which can be grouped into the categories of developmental challenge, time pressure, academic alienation, romantic problems, assorted annoyances, general social mistreatment, and friendship problems (Kohn, Lafreniere, & Gurevich, 1990).

Student athlete – a male or female college student who participates in intercollegiate athletic sport competition at the institution he/she attends.

NAIA Institution – a level of intercollegiate competition represented by Oklahoma City University.

NCAA Division I Institution – a level of intercollegiate competition represented by Oklahoma State University.

## CHAPTER II

### REVIEW OF LITERATURE

#### *Introduction*

This chapter begins with an overview of the evolution of the term stress and research on stress. It then presents a review of the literature concerning stress, sources of stress (also known as ‘hassles’), health-promoting behaviors, and the relationship between stress and health-promoting behaviors. Literature on the aforementioned variables will be presented with studies using college students and college student athletes as participants if literature was in existence. In the circumstances where literature was not available, studies examining the variables will be presented and extrapolated to collegiate student athletes.

#### *The Evolution of Stress and Stress Research*

The term ‘stress’ has been in existence for quite some time. Dating back as far as the 14<sup>th</sup> century, “stress” was initially a term which meant “hardship, straits, adversity, or affliction” (Lazarus & Folkman, 1984, p. 2). In the 17<sup>th</sup> century, along with the terms ‘load’ and ‘strain,’ stress began to be used by the physical science community. In this context, the definitions are load as “an external force,” stress as “the ratio of the internal force (created by load) to the area over which the force acted,” and strain as “the

deformation or distortion of the object” (p. 2). By the 19<sup>th</sup> century, stress and strain were associated as a basis of poor health. In 1932, when Cannon referred to stress as “a disturbance of homeostasis” and that subjects involved in his research were placed ‘under stress,’ this inferred that stress, or some part of it, could be measured. In the 1950s, Selye used the term stress in a more precise manner, calling it “a universal physiological set of reactions and processes created by such a demand,” (a demand which could be physical, psychological, or environmental (Lazarus & Folkman, 1984, p. 2)). Selye’s research and the ‘General Adaptation Syndrome’ acted as a catalyst for a plethora of work exploring stress, its causes, consequences, responses to, coping, and individual differences in the aforementioned variables.

In the 1960s, the idea that major life events or changes could act as sources of stress became a focus of stress research. In a study which catapulted life events and social stress to the forefront, Rahe, Meyer, Smith, Kjaer, and Holmes (1964) found that “onset of disease occurs in a setting of significant environmental alterations requiring a major change in ongoing adjustment of the individual, appears to have relevance to the ecology and epidemiology of disease” (p. 42). Holmes and Rahe (1967) continued their study of life events and stress, creating the Social Readjustment Rating Scale (SRRS). Consisting of 43 life-events, the SSRS was meant to be a tool used to measure the stressfulness associated with or social readjustment required by a number of life events. The SRRS has been and continues to be extensively used in stress research because its scores have been repeatedly associated to illness and other health conditions in the year(s) following the life event(s) (Hobson, Kamen, Szostek, Nethercut, Tiedmann, & Wojnarowicz, 1998).

In the 1980s, a new avenue in stress research emerged. Kanner et al. (1981) introduced the idea that hassles, “the irritating, frustrating, distressing demands that to some degree characterize everyday transactions with the environment,” can have a cumulative impact which can be more damaging to health than other stressful major life events (p. 3). In a groundbreaking longitudinal study, hassles and uplifts were found to be better predictors of psychological symptoms than major life events, stating that “although daily hassles overlap considerably with life events, they also operate quite strongly and independently of life events in predicting psychological symptoms” (p. 20). Since Kanner et al.’s (1981) study, hassles have continued to be studied in order to uncover their role in both physical and psychological health. Hassles have been found to be more strongly correlated with somatic symptoms (chest, stomach, and/or back pain, and headaches), energy levels, (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982), anxiety, depression, somatization, obsessive-compulsive symptoms (Burks & Martin, 1985), psychological well-being, psychological distress, and life satisfaction (Chamberlain & Zika, 1990) than major life events. They have also been proven significant contributors to poor overall health and suffering (DeMaio-Esteves, 1990). The use of hassles and their subsequent affect on health has been validated across a number of populations and circumstances (Lazarus, 1984; DeLongis et al., 1982; Kanner et al., 1981; Burks & Martin, 1985; Chamberlain & Zika, 1990; Kohn & Macdonald, 1992; Kohn, Lafreniere, & Gurevich, 1990; Kohn, Lafreniere, & Gurevich, 1991; Bodenhorn, Miyazaki, Kok-Mun, & Zalaquett, 2007).

Another groundbreaking idea which came from Lazarus and colleagues was that coping, or the way a person deals with or reacts to a said stress, may be more important

than stress itself. Because stress is an inevitable part of life, it can be considered an ongoing process, rather than just a collection of major life events. Mediating and/or moderating variables as well as an individual's cognitive appraisal (the subjective meaning, interpretation, evaluation, or judgment) of the stressor may help explain the relationship between stress, an individual, the environment, adaptation, and the ultimate outcome (Lazarus & Folkman, 1984). In other words, the perception, experience, reaction to, and resolution of stress or a particular stressor varies from individual to individual. Simply stated: no two individuals will be stressed by the same thing(s) nor will they react identically to the same stressor(s). Because of this, stress is more than just an event. Rather it is a transaction between an individual and the environment mediated by appraisal (Lazarus & Folkman, 1984; Lazarus, 1999). In fact, "it must never be forgotten that it takes both a demanding environmental situation and a susceptible person to produce a stress reaction" (Lazarus, 1981, p. 54).

Given that hassles are particularly prevalent during the college years and have proven to be associated with many problems faced by collegiate student athletes, the current study chose to focus on hassles as sources of stress. Additionally, because the way a person reacts to or copes with stress may be to change their health-related behaviors, examining the overall stress levels, hassles, and health promoting behaviors of collegiate student athletes may yield additional insight into the relationship between stress and health promoting behaviors.

*Sources of Stress (also known as Hassles)*

The same types of hassles seem to act as sources of stress to college students throughout the years. Hassles were first studied as a source of stress in college students by Kanner et al. (1981). The most frequently reported “hassles” of three groups, middle aged participants, college students, and health professionals, were compared. Patterns of hassles for each group were “roughly consistent with their ages and station in life,” meaning that members from each group experienced hassles which others did not (p. 23). For example, the middle aged participants were concerned with economic and retirement issues while the health professionals were concerned with responsibilities and pressures of both their work and home lives, and the college students were hassled by “academic and social demands of campus life” (p. 23). Unlike other groups, they (college students) also reported being hassled by too little sleep.

In a 1985 study, Archer and Lamnin surveyed 893 university students to investigate personal and academic stressors college campuses. They found that sources of stress reported by college students included those which were both academic and personal in nature. The top academic stressors were tests, grade completion, time demands, professors and classroom environment, and career and future success while the top personal stressors reported were intimate relationships, parental conflicts, finances, and interpersonal conflicts with friends (Archer & Lamnin, 1985).

Chamberlain and Zika (1990) sought to find support for the use of daily hassles in the study of stress by studying hassles in 161 non-traditional college students. This study not only found support for the use of hassles in the study of stress, but it found the five most frequently listed hassles in college students were not enough time, too many things

to do, troubling thoughts about future, too many interruptions, and misplacing or losing things (Chamberlain & Zika, 1990).

As a follow up to their 1985 study, Murphy and Archer (1993) replicated their study using a sample of 639 students in order to look at changes in stressors on a college campus between 1985 and 1993. While the results were similar (tests/finals, grades/competition, professors/class environment, and time demands were the top academic stressors and intimate relationships, finances, and parental conflicts were the top personal stressors), there were a few differences. Compared to the 1985 study students in the 1993 sample reported more stress related to grades and competition, professors, and class environment, studying, and papers/essay exams. Additionally, students also reported more stress related to finances and their current job (Murphy & Archer, 1996).

Using 559 college students ages 18-23, Olpin (1996) looked at perceived stress levels and sources of stress among college students and found that the largest sources of stress in this population were related to their academic life. The top five stressors included “a lot of responsibilities,” “struggling to meet your own academic standards,” “too many things to do at once,” “important decisions about your future,” and “important decisions about your education.” The three lowest ranking stressors of the possible 49 were “dissatisfaction with your reading ability,” “poor health of a friend,” and “conflict with teaching assistant(s).”

Ross, Neibling, and Heckert (1999) investigated sources of stress among 100 fraternity members at a mid-sized, Midwestern university. They found that daily hassles were reported more frequently than major life events as sources of stress and



intrapersonal sources of stress were the most frequently reported source of stress. In this sample, the most frequently reported stressors were: change in sleeping habits, vacations/breaks, change in eating habits, new responsibilities, increased class workload, financial difficulties, and change in social activities (Ross, Neibling, & Heckert, 1999).

These studies demonstrate that sources of stress (hassles) in college students have been and continue to be both academic and social in nature. Examination of additional research regarding hassles in college students reveals that gender differences exist in the number and severity of hassles reported.

In creating their scale used to measure hassles (the ICSRLE), Kohn, Lafreniere, and Gurevch (1990) found that females reported a greater number hassles than males and in particular endorsed several hassles significantly more frequently than males including “conflict with boyfriend’s/girlfriend’s/spouse’s family,” “too many things to do at once,” “not enough time to meet your obligations,” “important decisions about your education,” “conflicts with boyfriend/girlfriend/spouse,” “interruptions of your school work,” “dissatisfaction with your physical appearance,” and “dissatisfaction with your athletic skills.”

While validating the ICSRLE in an American population, Osman, Barrios, Longnecker, and Osman (1994) found that females reported a significantly greater number of hassles than males. Another interesting finding was that females also scored significantly higher within the categories of developmental challenge and time pressure, results similar to those in the original development study.

Dusselier, Dunn, Wang, Shelley II, and Whalen (2005) examined personal, health, academic, and environmental predictors of stress for residence hall students, finding that

in 462 residence hall dwelling undergraduate students, conflict with professors, the inability to study in one's residence hall, difficulties with roommate, and problems with sleep were significant sources of stress to undergraduate students in this study. Consistent with other studies, Dusselier et al. found that females experienced greater amounts of stress and frequently of stressors than males (Dusselier, Dunn, Wang, Shelley II, & Whalen, 2005).

Sarafino and Ewling (1999) created a hassles assessment scale for college students which measures the frequency and unpleasantness of and dwelling on stressful events. They found that in their sample of 132 undergraduate psychology students, females reported a greater number of hassles than males, as well as rating their experiences of hassles as unpleasant.

Wu and Lam (1993) found that the number of hassles reported by females did not significantly differ from that of males when they studied the relationship between daily stress and health. However, females did rate their hassles as more severe in intensity than males.

#### *Sources of Stress in Collegiate Student-Athletes*

While it is apparent college students face large amounts of stress predominantly unique to the college years, collegiate student athletes represent a subset of the college student population which faces additional sources of stress above and beyond those of a typical college student.

Student athletes have been accused of being an "overprivileged minority" whose athletic talent segregates them from the rest of the college population and thus inhibits 'normal' college development (Remer, Tongate, & Watson, 1978). They have also been

referred to as a “special” or “underprivileged” group which has unique counseling needs because they have all the typical pressures of a college student, but also things like peer relationships, time management, study skills, career choice options, and self concept bring them additional stress (Lanning, 1982).

Both a review of the literature and common sense indicate that student athletes are hassled by the participatory demands of athletic endeavors. For example, one study found that approximately half of male and 60% of female athletes cited athletic demands as sources of stress, with the most prevalent stressor being pressure to win. Other athletic demands producing stress among student athletes are “exhausting and stressful practice sessions and distant travel to athletics contests” (Humphrey, Yow, & Bowden, 2000, p. 42). Other commonly mentioned hassles associated with athletic participation are missing and making up class time. Rhatigan (1984) asserts that student athletes playing basketball “are required to miss 15-20% of their class work to receive their scholarships, grants, or loans” (p. 43) and that “absences tend to encourage more absences” (p. 44). Indeed, 95% of male and 86% of female athletes were stressed by missing class for athletic event travel and making up class and assignments for athletic travel (Humphrey, Yow, & Bowden, 2000). However, the purpose of this paper is not to explore hassles unique to athletes. Rather it is to explore hassles normally experienced by college students who happen to be athletes. Therefore the remaining portion of this segment focuses on studies primarily utilizing student athletes as participants which used instruments that did not address or measure sport-specific sources of stress.

In examining the literature regarding student athletes and sources of stress not associated with athletic participation, similar themes emerged as those from non-athletes. This was apparent with regards to the sources of stress and gender differences in stress.

While examining the health of university athletes, Selby, Weinstein, and Bird (1990) found the most stressful factors for both male and female athletes were injury and academic work/performance. Academics, as a source of stress, was reported by females more frequently than males (72% vs. 58%). However, females on scholarship, in particular, found academics more stressful than males. Males, on the other hand, found their general health a greater source of stress than females (25% vs. 19%).

In a book examining stress in student athletes, Humphrey, Yow, and Bowden (2000) classified sources of stress into the categories of academic problems, time, relationships with others, and finances. In terms of “academic problems,” 95% of male and 86% of female athletes were stressed by tests/exams, writing papers, missing class for athletic event travel, and making up class and assignments for athletic travel. Complaints of having to prepare for various tests in the midst of physically and emotionally demanding sports practices and competitions was also seen as a source of stress to student athletes. “Time” was a source of stress for 40% of male and about 50% of female athletes. Student athletes complained that insufficient time for planning and not enough time for both academics and athletics were stress inducing. “Relationships with others,” which specifically referred to “negative or unsatisfactory relationships with teachers, coaches, and fellow athletes,” was seen as a source of stress for 12% of male and 7% of female athletes interviewed (p. 42). “Finances” were cited as stressful to about 7% of both male and female athletes. More specifically it was the lack of finances which

these athletes found stressful. Notably, almost all of the respondents in this category were not on scholarship(s) (Humphrey, Yow, & Bowden, 2000).

Catron (2005), when investigating the origins, perceptions, and management techniques of stress in student athletes, found the top five biggest stressors/hassles were “important decisions about your future,” “too many things to do at once,” “financial burdens,” “not enough leisure time,” and “a lot of responsibilities.” The lowest ranking hassles were “social isolation,” “social rejection,” and “social conflicts over smoking.” Interestingly, while females rated their stress levels as higher than their male counterparts, the frequency and number of hassles was not different.

Using 52 student athletes from a Division II institution, Tinsley (2006) looked at the influence of gender, sport, and academic classification on life stress in student athletes. She found that while both male and female student athletes listed academics as their primary stressor, females found academics a greater source of stress than males. Similar to Humphrey, Yow, & Bowden (2000), finances was also a frequently listed source of stress, as was travel and absences related to sport participation.

Another theme which has frequently emerged in the review of literature regarding sources of stress in student athletes is the role conflict these students often times face.

A qualitative study using 10 student athletes identified several distinct themes in the lives of student athletes: conflict of ‘student’ role and ‘athlete’ role, difficulties of balancing the priorities of both roles, the ‘cost’ of being a student athlete, assumptions/judgments of student athletes intellect, and the idea that school/academic work may be less important to the athlete than expected (McKenna & Dunstan-Lewis, 2004).

When Richards and Aries (1999) compared student athletes and non-athletes, they found that student athletes spent significantly more time engaging in extracurricular activities (e.g. athletic practices and events) but approximately the same amount of time was spent in class or studying in an average week as non athletes. This is an interesting finding, as Watson (2003) asserts that depending on sport and institution, student-athletes may spend as much time participating in sports-related activities (games, practices, training, team meetings, travel, etc.) as an individual working a full-time job. Other differences reported between student athletes and non-athletes included student athletes reporting significantly more problems 'being taken seriously by professors,' joining extracurricular activities other than athletics, and making and spending time with new friends/people outside the group of athletics (Richards & Aries, 1999). Those findings hint at the role conflict often experienced by student athletes, the choices they often must make between academics and athletics, and one of the means by which athletic participation/demands can act as a source of stress.

Student athletes must deal with all the typical pressures of college in addition to training and competition. The additional weight pressures associated with their sport and status at the institution can increase the stress experienced by the student athlete (Selby, Weinstein, & Bird, 1990). However, sources of stress as well as levels of stress can vary by level of intercollegiate athletic competition.

Using a national random sample of 551 collegiate student athletes from NCAA Division I, II, and III institutions, Hess (1990) found that level of competition was a significant predictor of stress in student athletes, with Division I athletes scoring higher in overall stress than Division II or III athletes. Considering the differences in requirements

for acceptance in each level of competition, Hess's findings "suggest that Division III student-athletes experience stress due to the actual athletic event whereas Division I student-athletes appear to be more concerned with the outcome of the games and the events surrounding competition" (Hess, 1990, p. 87).

Other predictors of stress in Hess's study included scholarship status and sport in which the student participated. Those on scholarship showed higher overall stress scores than those who were not on scholarship. Moreover, those who were 'starters' showed higher overall stress scores than those who were not starters. Further, the sport in which one participated was also a statistically significant predictor of overall stress, while academic major was not (Hess, 1990).

Surprisingly, gender was not a significant predictor of stress levels or sources of stress in Hess's study as it had been in others. Gender differences did appear in 16 of the 81 items scale, however. Males scored higher on stress in the items "losing in competition," "use and abuse of alcohol and other drugs," "future success as an athlete," "desire to become a professional," "pressure to win," and "value of athletics" than females. The lack of gender differences were not surprising to Hess who believes the lack of differences suggest that

*The role of the student-athlete, in one sense, is well-defined. When viewed as a college student and/or athlete, the demands remain the same regardless of gender. Division I, II, and III student-athletes attending college and universities across the United States appear to consistently be met with stressors not unknown to each other; the university system, as well as the athletic system, appears to*

*have set standards which may generate predictable experiences, potentially stressful to student-athletes* (Hess, 1990, p. 88).

At a NCAA Division III institution (where athletic scholarships are not given), when comparing 135 student-athletes and 135 non-athletes Skirka (2000) found that student-athletes and non-athletes differed significantly in the severity of stress, with athletes perceiving *less* stress than non-athletes. Contrary to previous studies, there were no differences in the types of hassles or severity of hassles between males and females. However, consistent with previous research, a significant relationship between hassles and psychological symptoms among both student athletes and non-athletes did exist (Skirka, 2000). Skirka's findings are in agreement with Richards & Aries (1999) who studied NCAA Division III student-athletes and found that "despite the difficulties posed by membership on an athletic team, most striking about the results of this study is that athletes were able to overcome these difficulties and to make time for their multiple commitments" (p. 216).

Chandanasotthi (2003) found that Thai adolescents who attended private schools reported significantly greater amounts of stress than those who attended public schools. Public school attending Thai adolescents also exhibited significantly greater amounts of health promoting lifestyle and the health promoting behaviors of nutrition and stress management. No differences were found in the areas of physical activity, social support, and general health practice awareness between adolescents who attend private and public schools (Chandanasotthi, 2003). Chandanasotthi's (2003) findings are significant to note



because in the current study, the NAIA institution is a private school and the NCAA Division I institution is a public school.

#### *General Information on the Health Promoting Lifestyle Profile (HPLP-II)*

Health promotion (HP) is defined as “behavior motivated by the desire to increase well-being and actualize human health potential” (Pender, Murdaugh, & Parsons, 2006, p. 7). HP differs from disease prevention or health protection in that behavior in the latter two are driven by the desire to avoid or prevent disease, injury, or illness, not “promote [positive] change and growth” (p. 7). Health promoting behaviors represent an individual acting on, not reacting to, his/her environment. They also provide individuals with opportunities to directly increase their health (Millar & Millar, 1993).

The differentiation between HP behaviors and health protection behaviors is important, as the motivation for health behavior changes with age. Those of younger ages may engage in HP behaviors “for the pure pleasure of doing so” whereas those of older ages may be motivated to engage in health behaviors for both HP and disease prevention (Pender, Murdaugh, & Parsons, 2006, p.7). It is also important to note that habits formed earlier in life are more likely to continue throughout the lifetime (Paffenbarger, Hyde, Wing, & Hsieh, 1986). This may be particularly important during the college years when individuals are bombarded with a variety of new health behavior experiences and opportunities. In fact, Yarcheski, Mahon, and Yarcheski (1997) state that “In the era of health promotion, work focused on determining the most powerful scientific explanation of positive health practices in various age groups should be a priority in research agenda” (p. 92).

A health-promoting lifestyle can be “viewed as a multi-dimensional pattern of self-initiated actions and perceptions that serve to maintain or enhance the level of wellness, self-actualization, and fulfillment of the individual (Walker, Sechrist, & Pender, 1987, p. 77). As a means by which to measure this lifestyle, Walker, Sechrist, and Pender created the Health-Promoting Lifestyle Profile (HPLP). The HPLP consisted of six dimensions: self-actualization, health responsibility, exercise, nutrition, interpersonal support, and stress management. In 1996, the HPLP was updated, and a few changes were made “to more accurately reflect current literature and practice and to achieve balance among the subscales” (Walker, n.d., p. 1). Now called the HPLP-II, three of the dimensions were renamed, with self-actualization becoming spiritual growth, interpersonal support becoming interpersonal relations, and exercise becoming physical activity (Walker & Hill-Polerecky, 1996). Made up of 52 items, responses to the items in the HPLP-II are indicated by the frequency an individual engages in the given behaviors, with higher scores indicating a more consistent pattern of engaging in health promoting behaviors (Felton & Parsons, 1994) and higher levels of wellness and lower scores indicating lower levels of wellness (Oleckno & Blacconiere, 1990).

### *Research using the Health Promoting Lifestyle Profile (HPLP-II) and Health Promoting Behaviors*

With reports like Healthy People 2010 advocating prevention and health promotion, studies examining the health promoting lifestyle and health promoting behaviors of various populations have become more common in the past 20 years.

Becker and Arnold (2004) used 559 participants to examine the differences in health promoting behaviors between the three age groups of young (18-39), middle (40-59), and older (60-92) Americans. The young group had an overall HPLP-II mean score of 2.74, which was not significantly different from the middle and older group's scores. However, significant differences were seen on five of the six subscales. For example, older Americans scored significantly higher than younger adults in the areas of health responsibility, nutrition, and interpersonal relations while younger Americans outscored middle and older Americans in the areas of stress management and physical activity.

The health promoting lifestyle of 59 women experiencing crises (homelessness and otherwise) was examined by Alley, Macnee, Aurora, Alley, and Hollifield (1988). Their overall mean HPLP-II score was 2.37. No significant differences were seen in the demographics of the sample, including age and stability of housing. However, women with higher education levels exhibited significantly higher HPLP-II mean scores than others (Alley, Macnee, Aurora, Alley, & Hollifield, 1988).

Megel, Wade, Hawkins, Norton, Sandstrom, Zajic, Hoefler, Partusch, Willrett, and Tourek (1994) examined health promotion, self-esteem, and weight in 57 female college freshmen. This sample displayed an overall HPLP mean score of 2.42. However, when major was taken under consideration, it was found that nursing students scored significantly higher on the overall HPLP, as well as the subscales of health responsibility, exercise, and interpersonal support. Authors suggest that perhaps knowledge accumulated while in the nursing major could account for higher scores or that nursing attracts those who are more interested in and concerned about health practices (Megel et al., 1994).

*Gender Differences in Research Using the HPLP-II and Health Promoting Behaviors*

In Pender's second edition of *Health Promotion in Nursing Practice* (1987), she states that "sex is the demographic variable most predictive of preventative behaviors" (p. 48). This claim was supported by Ratner, Bottorff, Johnson, and Hayduk (1994), whose study found that "the causal mechanisms underlying health promotion behavior are somewhat different for men and women" (p. 349). Many other studies examining the health promoting lifestyle and health promoting behaviors have also shown differences between genders.

When Hendricks, Murdaugh, Tavakoli, and Hendricks (2000) looked at health promoting behaviors in 1036 seventh and eighth grade students in a rural school, they found the overall mean HPLP-II score was 2.41. Gender differences were also found, with females scoring significantly higher on the interpersonal support subscale and approaching significance on the stress management subscale, and males scoring significantly higher on the subscales of health responsibility, exercise, and nutrition (Hendricks, Murdaugh, Tavakoli, & Hendricks, 2000).

Using 151 college students, ages 18-36, Larouche (1998) explored the relationship between perceived health status, sex, grade point average, and academic major on health promoting lifestyle practices. Results showed that female college students scored significantly better overall in health promoting lifestyle and practiced significantly better nutrition, interpersonal relationships, and health responsibility than male college students. This supports previous research indicating that sex is predictive of health behavior. However in the area of stress management, results showed that both male and female students scored poorly. In this study, 15.26% of variance in overall

health promoting lifestyle was explained by perceived health status and gender (Larouche, 1998).

Using 302 children, Mechanic and Cleary (1980) performed a 16 year follow up study looking at children's positive health behaviors. Items in the index measuring health behavior which were similar to the HPLP-II were the items looking at preventative medical care and physical activity/exercise. Gender differences were seen in the areas of preventative medical care and overall positive health behavior, with females scoring higher than males. Males, however, scored higher in the areas of physical activity/exercise. When the data from 1961 to 1977 was regressed, the two most significant factors in predicting positive health behaviors were education and gender (Mechanic & Cleary, 1980).

In a sample of 1077 college students ages 17-22, Oleckno and Blacconiere (1990) examined the wellness of college students and differences in wellness by gender, race, and class standing. The overall HPLP mean score was 2.57, an "average" level of wellness "leaving significant room for improvement" (p. 426). Gender differences were seen in this study, with females scoring significantly higher in overall wellness, as well as in the subscales of health responsibility, nutrition (higher but not significant), and interpersonal support. Differences in overall wellness, self actualization, nutrition, and stress management were also seen by class standing, with those in higher levels of grades (e.g. seniors and juniors) scoring higher than those in lower levels of grades (e.g. sophomores and freshmen). The most notable difference in class standing was seen between seniors and lowerclassmen (freshmen and sophomores). Oleckno and Blacconiere state that "this demonstrates support for the idea that education and

maturation have positive effects on health behaviors that can be seen within the span of a college education” (p. 427).

Using 1077 college students, Oleckno and Blacconiere (1991) looked at health promoting behaviors, health compromising behaviors, and adverse health outcomes and their relationship to religion. Males and females were compared both in health promoting behaviors and low and high religiosity groups. Overall, females demonstrated higher levels of health promoting lifestyles than males, as did those of either gender with high religiosity versus low religiosity. While results indicated that those who were more religious practiced more health promoting behaviors regardless of gender, it also found that females in the low religiosity group practiced a greater overall health promoting lifestyle than male. This was also the case with the health responsibility subscale. However for those in the high religiosity group, males exhibited greater stress management scores than females.

Odom (2001) used 554 students at Lewis-Clark State College to assess the health promoting lifestyle in college students. The overall HPLP-II mean score was 2.66. Significant differences were seen in the overall health promoting lifestyle and on subscales with females scoring significantly higher than males on the four subscales of health responsibility, nutrition, spiritual growth, and interpersonal relations. This is consistent with previous studies which have found that female college students demonstrate more responsibility toward their health and engage in more health promoting behaviors (Oleckno & Blacconiere, 1990; Conner & Norman, 1996; Goodman et al., 1997; Schweitzer et al., 1998). In the subscale of stress management, male and female scores were almost identical (females  $M=2.45$  vs. males  $M= 2.26$ ). Also, no significant

differences were found between males and females in the subscales of physical activity and stress management. Although males and females were not significantly different on these subscales, certain items within each subscale were significantly different. For example, females consistently indicated they “took some time for relaxation every day” and “practiced relaxation or meditation for 15-20 minutes daily.” Females also were more likely to check their pulse with exercising (Odom, 2001). Similar to Oleckno and Blacconiere (1990), those with a health-related major scored higher than others, as female nursing students scored significantly higher on the overall health promoting lifestyle than general students (M=2.89 versus M=2.65). They also outscored general students on all six subscales (Odom, 2001).

While comparing a health promotion curriculum to a ‘normal’ curriculum in 172 community college students, Hubbard (2002) found that those who were in the health promotion curriculum had higher overall HPLP-II mean scores (2.66), as well as higher scores on all subscales, than the control group (2.45). Gender differences were seen in this study, with females scoring higher on HPLP (2.61) than males (2.37). Females also outscored males in the subscales of health responsibility (2.48 vs. 2.15), nutrition (2.42 vs. 2.12), and interpersonal relations (3.04 vs. 2.61). In this sample, students scored the lowest on physical activity subscale, although “health promotion deficiencies occurred on all subscales” (Hubbard, 2002, p. 70).

In examining the knowledge of cardiovascular risk factors and health-promoting behaviors in 110 undergraduate students, Buchinger (2007) found an overall HPLP-II mean score of 2.60. The overall HPLP-II mean score did not differ by gender, but the subscales of interpersonal relations and physical activity did. Similar to previous

research, females outscored males in the subscale of interpersonal relations (3.23 vs. 2.97) while males outscored females in the area of physical activity (2.55 vs. 2.16). Those students who were majoring in nursing had the highest HPLP-II scores, suggesting that “greater knowledge about cardiovascular risk factors results in greater health-promoting behavior” (Buchinger, 2007, p. 48).

The aforementioned studies (Oleckno & Blacconiere, 1990; Odom, 2001; Hubbard, 2002; Buchinger, 2007) provide evidence that exposure to information may assist individuals to engage in more health promoting behaviors. Extrapolation of this thought in college students leads to the idea that students with certain majors could be more likely to have higher HPLP-II scores due to increased levels of exposure to health-related information.

While numerous studies have found that gender differences do exist in a health-promoting lifestyle and specific dimensions of that lifestyle, other studies have not found evidence to support differences in health promoting behaviors by gender.

Lee and Loke (2005) examined health-promoting behaviors and psychosocial well-being in 247 Hong Kong university students. While no gender differences were seen in the overall HPLP-II score, nor the subscales of health responsibility, spiritual growth, stress management, significant differences between male and female students in the area of physical activity were found, with males outscoring females. Although not statistically significant, another finding of interest was that females demonstrated higher scores in the subscales of interpersonal relations and nutrition.

Stephany (2006) looked at health promoting lifestyles of 48 full-time college freshmen, finding an overall HPLP-II mean score of 2.60. When scores of male and



female students were compared, no statistically significant differences were found, both in the overall HPLP-II mean score as well as the subscales. It is interesting to note, however, that males scored higher than females on the physical activity subscale and females outscored males in the areas of spiritual growth and interpersonal relations.

In a sample of 143 university students, Smith (1999) examined relationship of spirituality, religious orientation, and personality to health promoting behaviors. The overall HPLP-II mean score in this sample was 2.62. Unlike other studies, gender did not significantly predict HP behavior. However, “females tended to express responsibility for their health, nutrition, spiritual life, and relatedness to others as compared to males in the sample” (p. 52) and “males tended to engage in PA and stress prevention more so than their female counterparts” (p. 53).

#### *Student-Athletes and Health Promoting Behaviors*

The literature review revealed no studies using the HPLP-II to measure health promoting behaviors in student athletes. However, since the HPLP-II is a measure of wellness and is comprised of six areas of health promoting behavior, the small volume of literature which examined wellness, a health promoting lifestyle, and health promoting behaviors similar to those found in the HPLP-II in student athletes was found.

Using Myers, Sweeney, and Witmer’s (2002) definition of wellness which was similar to the health promoting lifestyle (“a way of life oriented toward optimal health and well-being in which the body, mind, and spirit are integrated by the individual to live more fully” (p. 252)), Watson and Kissinger (2007) examined the relationship between athletic participation and wellness. Comparing 62 student-athletes to 95 non-athletes, it

was found that non-athletes reported higher levels of wellness than student-athletes. However, both groups scored the lowest in the ‘coping self’ realm which includes realistic beliefs, stress management, sense of worth, and leisure (Watson & Kissinger, 2007).

Nattiv & Puffer (1991) examined the lifestyles and health risks of collegiate athletes. Comparing 109 athletes to 110 non-athletes, they found that athletes had healthier lifestyles compared to non-athletes in the areas of eating breakfast, an area which corresponded to the nutrition subscale in the HPLP-II, (49% vs. 29%) and participation in aerobic exercise (81% vs. 48%). Both of the aforementioned areas have corresponding items on the HPLP-II.

### *Stress and Health Promoting Behaviors*

#### *Rationale to Study Stress and Health Promoting Behaviors*

There are numerous reasons to study the relationship between stress and health promoting behaviors. To understand why, one must first look at the relationship between stress and health-risk behaviors. In 1977, Langlie suggested the idea that with increasing levels of stress came poorer than normal health practices and more negative health behavior(s). Zillman and Bryant (1985) further suggested that the “link between health risk behaviors and stress is mood management” (as cited in Ng and Jeffery, 2003, p. 638). More specifically, that an ‘aversive state’ like stress can encourage individuals to engage in unhealthy behaviors because they may bring them pleasure. Many other studies support the idea that “unhealthy behaviors are rewarding and thus stress relieving” (Ng & Jeffery, 2003, p. 638). When Shapiro, Seigel, Scovill, and Hays (1998) looked at risk

taking behaviors in 58 female college students they found that the reasons for engaging in such behaviors were ‘purposeful’ and acted as a ‘means to an end.’ Analysis also showed that engagement in behaviors was internally driven, as participants reported performing those behaviors to relieve stress or loneliness. Similarly, Hess (1990) states that “the apparent signs of stress among college students may manifest themselves through behaviors which perhaps have become ways to cope with their very specific lifestyle (p. 34). Moreover, “students work with what they know, and very often they unwittingly put themselves at risk in the process” (Hess, 1990, p. 34).

#### *Research on Stress and Health Promoting Behaviors*

While the relationship between stress and health-risk behaviors has been immensely investigated over the past 25 years, research focused on the relationship between stress and health promoting behaviors remains in its infancy.

Using 36 nursing students, Dunham (1995) explored the relationship between perceived stress and health promoting behaviors in nursing students using Pender’s Health Promotion Model. Dunham (1995) found that perceived stress was not a significant modifying factor in the model. While a negative correlation was found between stress and health promoting behaviors ( $r = -.20951$ ), results did not support the idea that health promotion could help students manage their stress successfully. Dunham suggested that one possible reason for the non-significant results could have been the small sample size and encourages replication with a larger sample to clarify the relationship.

When Nikou (1998) examined the relationship among hardiness, stress, and health promoting behaviors in 250 undergraduate nursing students, she found that stress was negatively related to health promoting behaviors ( $r = -.25, p < .001$ ). She concluded that stress was significantly correlated with a limitation of health promotion behaviors. Other notable findings in Nikou's study include the overall HPLP-II mean score of 2.42 and that students with a senior classification had greater levels of health promoting behaviors and perceived less stress than other students (Nikou, 1998).

Chandanasotthi (2003) studied the relationship of stress, self-esteem, and coping styles to health promoting behaviors in 1072 Thailand adolescents. A significant negative relationship between stress and health promoting lifestyle, as well as each HPLP-II subscale, was found. Females reported greater health promoting behaviors and higher levels of stress than did males. Another interesting finding was that adolescents attending public schools demonstrated greater levels of health promoting behaviors than those attending private schools, although those attending private schools had higher levels of stress (Chandanasotthi, 2003).

Sixty seven women in the Midwest experiencing a 'complicated pregnancy' completed the PSS and the HPLP-II to explore the relationship between perceived stress and health promoting behaviors. A significant negative relationship was found between perceived stress and the overall HPLP-II mean score ( $r = -.32, p=.009$ ). Thus, they concluded that "women experiencing more stress had a less health-promoting lifestyle" (Stark & Brinkley, 2001, p. 310). Certain subscales of the HPLP-II also exhibited significant negative relationships with stress. Such subscales were spiritual growth ( $r = -.49, p=.000$ ), interpersonal relations ( $r = -.30, p=.012$ ), and stress management ( $r = -.47,$

p=.000). These results indicate that “women who had more stress had fewer health promoting behaviors in the areas of spiritual growth, interpersonal relations, and stress management” (p. 310). There were no significant differences in stress or health promoting behaviors when race, marital status, employment, and age of the women was considered, meaning these factors did not play a role in the adoption of health promoting behaviors. Significant differences were found in the relationships between income, stress, and health promoting behaviors, as women with higher incomes reported more health promoting behaviors (Stark & Brinkley, 2001).

Using 133 undergraduate psychology students, Weidner, Kohlmann, Dotzauer, and Burns (1996) examined changes in the health behaviors of exercise, nutrition, self-care, substance abuse, and vehicle safety in response to academic stress of finals week. The positive health behaviors of exercise, nutrition, self-care, and drug avoidance decreased during times of high academic stress. In fact, the behavior of exercise decreased the most during times of high stress, supporting the idea that “the least stable health behaviors may be the most affected by environmental stress” (p. 128). Females outscored males in the areas of self-care, vehicle safety, and drug avoidance in times of low and high stress. However, no differences were found in the behaviors of exercise or nutrition. All health behaviors declined during times of stress, but the largest decline was seen in exercise. Weidner et al. (1996) also suggested that under times of stress, the best predictor of future health behavior was past health behavior.

Edmonds (2006) studied the relationship of weight, body image, self-efficacy, and stress to health-promoting behaviors in 167 college educated African American women. A significant correlation between stress and health promoting behaviors was found, with

$r = -0.365$  ( $p < .05$ ). These results suggest that low levels of stress influence an individual's decision to engage in health promoting behaviors and that high levels of stress influence individuals to not engage in health promoting behaviors (Edmonds, 2006).

When Gacad (2002) used 215 first and second year college students to examine the relationship between powerlessness, stress, social support, and health promoting behaviors, she found stress to be “a significant variable in blocking or hampering a health-promoting behavior” (p. 113). Stress, as measured by hassles, was negatively correlated with the overall HPLP-II and each of its subscales. Although the correlations with the subscales of health responsibility, nutrition, and interpersonal relations were not significant, the finding that stress and health promoting behaviors were negatively correlated is important because the “findings indicate that stress, regardless of frequency and severity, has an opposite relationship with health-promoting behaviors” (p. 117). In fact, the frequency of stress predicted the health promoting subscale of spiritual growth, and severity of stress predicted the health promoting subscale of stress management. Gender differences in health promoting behaviors were seen in this study. Males participated more than females in the health promoting behavior of physical activity and stress management while females participated more than males in the health promoting behavior of interpersonal relations. Gender differences were also seen in both the frequency and severity of stress, with females reporting higher levels of both than males. Gacad concluded that stress is a barrier to action and “has a negative influence in the engagement of health-promoting behaviors by college students” (p. 117).

*The relationship between stress and specific health promoting behaviors*

As previously mentioned, research examining stress and health promoting behaviors remains in its infancy. Therefore, only a small quantity was available at the time of this literature review. However, research has been performed examining the relationship between stress and certain aspects of a health promoting lifestyle (e.g. specific health promoting behaviors).

*Stress and Interpersonal Relations (Social support)*

Social support is an essential variable in the relationship between stress and participation in health promoting behaviors (Skinner & Hampson, 1998; Stevenson, Maton, & Teti, 1999; Cheever & Hardin, 1999; Waite, Hawks, & Gast, 1999; Gacad, 2002). Individuals with peer/social support have been able to fare better under high levels of stress, supporting the idea that social support has a stress buffering (Willis, 1991) or lessening (Hagerty & Williams, 1999) effect. Coleman and Iso-Ahola (1993) suggest that social support is one of the characteristics of leisure participation which enables it to assist an individual to cope with stress.

Using 185 female undergraduate students, Lee and Robins (1998) found that levels of social connectedness had an inverse relationship with perceptions of stress. More specifically those students with high levels of social connectedness perceived life as less stressful and those with low levels of social connectedness perceived life as more stressful. This may also be the case with student athletes, as teammates can be seen as social support and act to keep levels of perceived stress in student athletes low.

Social support also influences engagement in health promoting behaviors, as it “affects health promoting behavior directly as well as indirectly through social pressures or encouragement to commit a plan of action” (Pender, 1996, p. 71). Yarcheski, Mahon, and Yarcheski (1997) suggest that social support has the greatest impact on health behavior and health practices stating that “clearly, perceived social support is a critical variable in the promotion of health behaviors” (p. 119). This idea, that peers can influence the behaviors of an individual, is empirically supported by studies investigating peer pressure. It is also supported by other studies which have shown individuals may be influenced to engage in behaviors, both health promoting and health risk, which they would not normally perform if encouraged by the pressures of a group (Heisler, 2009; Lemke, Schutte, Brennan, & Moos, 2008; Allen, Donohue, Griffin, Ryan, & Turner, 2003).

The relationship between social support and stress is inverse, particularly in the areas of depression and substance abuse (Unger et al., 1998). Results from a study using 432 homeless youth suggest that social support may offset the adverse effects of stressful life experiences on both physical and psychological health.

### *Stress and Nutrition*

Using baseline data from the Health and Behavior in Teenagers Study (HABITS), 4320 adolescents in a London school, ages 11-12, completed questionnaires asking about stress and dietary practice (fatty food intake, fruit and vegetable intake, snacking, and breakfast consumption). Females reported significantly more stress, a higher fruit and vegetable intake, and less frequently eating of fatty foods than males. Results also



demonstrated that students under greater levels of stress practiced more unhealthy dietary practices than those who were not. More specifically, the stressed group had a significantly higher consumption of fatty foods, a lower consumption of fruits and vegetables, higher levels of snacking, and a lower likelihood of eating breakfast. Cartwright, Wardle, Steggles, Simon, Croker, and Jarvis, (2003) suggest that “stress appears to be consistently harmful to children in terms of steering their food choices away from the healthy toward the unhealthy” (p. 367).

With 116 seventh and eighth grade students, Townsend (2002) found a negative relationship between stress and the health promoting behavior of healthy nutrition. There was an increase in snacking Calories consumed as perceived stress increased. Additionally, females snacked more under stress than males.

#### *Stress and Spirituality*

Using 120 college students at a private religious institution, Fabricatore, Handal, and Mickey (2000) studied an individual’s spirituality as a moderator between stressors and subjective well-being. A significant negative relationship was seen between stress and subjective well-being for those with low spirituality, but not for those with high spirituality (Fabricatore, Handal, & Mickey, 2000).

In a sample of 364 college students, mean age 19.6, Nagel and Sgoutas-Emch (2007) found that the factors of church attendance, prayer time, and spirituality were significantly related to the health behaviors of physical activity and exercise. Gender differences were seen in this study, with males scoring higher in the area of exercise than females. It was also interesting that men were more likely to believe fate was a cause in

illness whereas females believed lifestyle was more the cause (Nagel & Sgoutas-Emch, 2007). While not examined in this study, this difference could be one of the contributing reasons differences in health responsibility scores are seen between males and females.

With 200 employees at a large home fitness equipment company (100 assembly line workers and 100 administrative workers) Waite, Hawks, and Gast (1999) looked at the relationship between spiritual health and health-promoting behaviors. This sample had an overall HPLP-II mean score of 2.637. The correlation between spiritual health and overall health promoting lifestyle was  $r=.665$  ( $p=.0001$ ), indicating that spiritual health is a good predictor of health promoting behaviors. Gender and employment status had significant effects on spiritual health, as females scored higher than males and white collar employees outscored blue collar employees (Waite, Hawks, & Gast, 1999).

Using 5000 American adolescents from 48 states, Wallace and Forman (1998) found that those who felt religion was very important were more likely to engage in the health promoting behaviors of healthy nutrition, regular exercise, and adequate and regular sleep than those who did not believe religion was very important.

### *Stress and Physical Activity*

Crews and Landers (1987) performed a meta-analysis over aerobic fitness (which is achieved through physical activity and/or exercise) and reactivity to psychological stressors. Findings from their analysis suggest that the improved physiological functioning which occurs in high fitness individuals can more efficiently dissipate the potentially harmful effects of raised stress levels. Similarly, many other studies have shown a relationship between physical activity and stress.

Aldana, Sutton, Jacobson, and Quirk (1996) looked at the relationship between stress and leisure time activity in 32,229 working adults. Thirty percent were classified as having low stress, 40.9% as having moderate stress, and 29.1% as having high stress. Based on Caloric expenditure per day, participants were grouped into either a high or low activity group. Gender differences were found, with males reporting more perceived stress than females. Those in the high activity group reported less perceived stress than those in the low activity group. “Physical activity during leisure is related to perceived stress with the lowest stress associated with high physical activity during leisure” (p. 319), meaning that engaging in more leisure time physical activity was associated with less stress (Aldana, Sutton, Jacobson, & Quirk, 1996).

When exploring exercise and psychological well-being in 3403 participants ages 25-64, in Finland, Hassman, Koivula, and Uutela (2000) found that participants who exercised daily perceived less stress than those who did not. Moreover, participants who exercised at least 2-3 times a week experienced less stress than those exercising less or not at all. Age differences were also seen in this study, with older participants perceiving less stress than younger participants (Hassman, Koivula, & Uutela, 2000).

Nguyen-Michel, Unger, Hamilton, and Spruijt-Metz (2006) explored the relationship between perceived stress, hassles, and physical activity. Using 814 first and second year students at three institutions of varying size, stress, hassles, and physical activity scores varied significantly across the three different institutions. Students at the private institution had the highest scores in physical activity. Students at community college had the lowest scores in physical activity, perceived stress, and hassles. When stratified for gender, males had higher levels of physical activity than females. An inverse

relationship between stress, hassles, and age was found, as was an inverse relationship between physical activity and hassles. Additionally, although a significant relationship was not found between perceived stress and physical activity, it did “approach significance.” Findings from this study suggest that “the perception or experience of stress discourages participation in physically active behavior” (p. 186). Thayer (2001) suggests that high levels of stress may fatigue individuals making them too tired to be physically active and/or not give them the additional time to participate in physical activity (as cited in Nguyen-Michel, Unger, Hamilton, & Spruijt-Metz, 2006).

#### *Stress and Health Promoting Behaviors in Student Athletes*

As demonstrated above, to date, only a handful of studies have looked at the relationship between stress and health promoting behaviors. Important to this dissertation is that virtually none have look at this relationship in student athletes. The following section presents what literature could be found concerning stress and health promoting behaviors in student-athletes.

Humphrey, Yow, and Bowden (2000) state that “to cope means to deal with and attempt to overcome challenges, problems, and difficulties” (p. 44). Coping processes are an important consideration when discussing stress and hassles, as the means by which one chooses to cope can have an impact on health. As previously mentioned, under stress, individuals may choose to cope or offset their emotional distress by engaging in hedonistic, health risk behaviors due to the distraction and immediate pleasure they bring despite the health damaging consequences (Zillman & Bryant, 1985; Adler & Matthews, 1994).

Humphrey et al. (2000) believe that stress coping procedures can be categorized as either coping behaviors or coping techniques. Behavior is defined as “anything that the human body does as a result of some stimulus” (p. 44). Humphrey et al. coined the term “principles of living” to refer to “general principles in the form of behaviors that may be applied as guidelines to help alleviate stressful situations” (p. 44). These principles are similar to the health promoting behaviors the HPLP-II and its subscales measure. Such principles include “practice good personal health habits,” “learn to recognize and value your own accomplishments,” “learn to take one thing at a time,” “learn to take things less seriously,” “do things for others,” and “talk things over with others.” The authors stress that the principles are “interrelated and interdependent.” The first principle of living, “practice good personal health habits” was reported by 42% of male and 69% of female athletes as a means by which to alleviate stress. Things such as healthful nutrition, sleep habits, and physical conditioning fall under this principle. In comparison to the HPLP-II, such things would fall under the nutrition, health responsibility, and physical activity subscales. Humphrey et al. stress that these should be relatively easily performed during the competitive season, as athletes are expected to stay in optimal physical condition. However in the off season this could easily fall to the wayside when they are no longer under the microscope on a daily basis by coaches and support staff.

The second principle of living is “learn to recognize and value your own accomplishments.” This was reported by 42% of male and 33% of female athletes as a means of coping with stress. Humphrey et al. suggest that “positive attitudes and belief systems can be developed about one’s accomplishments and thus reduce stress” (p. 45). This principle is like giving yourself a pat on the back. Items under this principle are

similar to the spiritual growth subscale of the HPLP-II. “Learn to take one thing at a time,” the third principle of living, which is associated with time management, was reported by 70% of male and 72% of female athletes. Since time (or lack of) can be a stress inducing factor for student athletes, it is not surprising that this principle was ranked by many athletes as a means to cope with stress (Humphrey et al., 2000). This principle is similar to the stress management subscale of the HPLP-II.

“Learn to take things less seriously,” the fourth principle of living, was cited by 42% of male and 44% of female athletes as a means to cope with stress. This principle is defined as keeping a balanced perspective. The fifth principle, “do things for others” was cited by 30% of male and 49% of female athletes. This principle helps student athletes cope with stress by taking their minds off their own stresses by focusing on others (Humphrey et al., 2000). This principle has similarities to the stress management, interpersonal relations, and the spiritual growth subscales of the HPLP-II.

Sixty five percent of male and 58% of female athletes reported that “talk things over with others,” the sixth principle of living, was a way they deal with stress. The premise behind this principle is that “the experience of simply talking with someone about one’s stress-inducing experiences tends to help dissipate stress” (Humphrey et al., 2000, p. 46). This is similar to the interpersonal relations subscale of the HPLP-II.

### *Summary*

The review of the literature indicated that college students are under moderate amounts of stress, have hassles consistent with their station in life, engage in average amounts of health promoting behaviors, and that a relationship between stress and health

promoting behaviors exists. It also demonstrated that further research examining gender as a variable in stress, hassles, and health promoting behaviors should be performed. Moreover, specific to the purpose(s) of the current study, the literature review revealed little research examining stressors specific to the student aspect of student athlete, a substantial lack of research regarding health promoting behaviors in collegiate student athletes, and no research investigating the relationship between stress and health promoting behaviors in collegiate student athletes. Therefore, more investigation needs to be performed in the area of collegiate student athletes, their perceived stress levels, categories of hassles, health promoting behaviors, and how stress levels and health promoting levels relate.

## CHAPTER III

### METHODOLOGY

The purpose of this chapter is to describe the research methods involved in the study. The following topics are reported: (a) participants, (b) instrumentation, (c) data collection procedures, and (d) data analysis.

Prior to conducting this study, approval was obtained from the Oklahoma State University (OSU) Institutional Review Board (Appendix A) and Oklahoma City University (OCU) Institutional Review Board (Appendix B). All procedures used in this study were performed in accordance with the IRB recommendations and guidelines for ethical treatment of human subjects.

#### *Participants*

Participants were male and female student-athletes enrolled full-time and academically eligible at a NAIA institution and a NCAA Division I institution in the academic year of 2008-2009. Participants included student-athletes involved in all sporting teams at the respective universities, both receiving and not receiving athletic scholarships.

#### *Recruitment of Participants*

*The NAIA Institution -- Oklahoma City University (OCU)*



The investigator spoke with Jim Abbott, director of athletics at OCU, who had no objections to using OCU student athletes as participants in the current study. Several ways were used to recruit student athletes as participants from this NAIA institution. First, the primary investigator (PI) was employed as an assistant professor at OCU, where many of the students in her classes were student athletes. Participation in the survey was one of the many extra credit opportunities offered to students in the PI's classes. Other extra credit opportunities included writing a brief research paper, attending a university sponsored health-related event, and/or completing various worksheets. To be compliant with the IRB and not discriminate against students in classes who may not be student athletes, non-student athletes were also able to participate in the survey; however their data was not used for this study.

*The NCAA Division I Institution -- Oklahoma State University (OSU)*

The investigator was given permission by the athletic director for academics, Dr. Marilyn Middlebrook, to recruit OSU student athletes for participation in the current study. Initially, the PI planned to work in conjunction with a new program the athletic department was going to institute called the Orange Power Cup Competition to recruit participants from this NCAA Division I institution. However, the Orange Power Cup failed to be implemented. Therefore, the PI and the athletic department devised other means by which to recruit participants. First, the CHAMPS/Life Skills coordinator agreed to offer participation in the survey as extra credit to student athletes enrolled in Life Skills classes. In the fall 2008 semester, the two sections of Life Skills, consisting of a total of 40 participants, were solicited via a mass email. In the spring 2009 semester, the

only section of Life Skills was solicited via an announcement during class by the Life Skills coordinator to participate. Students were offered 50 points as incentive for their participation. The second means to recruit participants consisted of the CHAMPS/Life Skills coordinator asking student athletes serving on the SAAC to voluntarily participate in the study. The third means of recruiting participants consisted of the CHAMPS/Life Skills coordinator soliciting participants from within the Academic Enrichment Center (AEC). The AEC is the facility in which all academic services for student athletes are housed. The CHAMPS/Life Skills coordinator attempted to solicit participation from five student athletes from each sport. She did this by approaching them and kindly asking for their help. The fourth means of recruitment consisted of the PI, who previously worked as a tutor in the athletic department for two years prior to this study, emailing student athletes with whom she had worked to participate in the survey. In this email, the PI encouraged not only their participation, but the participation of teammates as well.

### *Instrumentation*

#### *Demographic Questions*

The demographic information questions gathered data regarding the participant's university, age, gender, academic major, sport played, scholarship status, and various other factors which the literature indicated could contribute to an individual's stress levels (Appendix C)

#### *Perceived Stress*

Perceived stress levels were measured using the Perceived Stress Scale (PSS-10) (Cohen, Kamarck, & Mermelstein, 1983) (Appendix D). This was used as an overall

measure of perceived stress. The PSS-10 is a 10-item survey which “measures the degree to which situations in one’s life are appraised as stressful” (p. 385). It asks participants to make a general rating on how often they have experienced certain feelings or thoughts associated with situations in their lives in the past month (e.g., “In the last month, how often have you been upset because of something that happened unexpectedly? In the last month, how often have you felt nervous or “stressed”?). A five point Likert-scale was used with responses ranging from “Never” (0) to “Very Often (4). Items four, five, seven, and eight are reversed coded (e.g. 0 = 4, 1 = 3, 2 = 3, 3 = 1, and 4 = 0) and responses to the 10 items are then summed, giving an overall score of perceived stress. The range of scores is 0 to 40, with higher scores indicating higher levels of perceived stress and lower scores indicating lower levels of perceived stress. The PSS-10 has been related to a variety of behaviors that influence health (Cohen & Williamson, 1988; Pbert et al., 1992) and has been validated across gender, racial groups, and educational groups (Cole, 1999). Scale development testing of the original PSS (14 items) revealed reliability coefficients of  $\alpha = .84$  in 332 college freshmen,  $\alpha = .85$  in 114 introductory psychology students, and  $\alpha = .86$  in 64 individuals enrolled in a smoking cessation program (Cohen et al., 1983). More recently, psychometrics of the PSS-10 have been updated specifically for use in college students, demonstrating an alpha coefficient value of .89 and strong validity in this population (Roberti, Harrington, & Storch, 2006).

#### *The Inventory of College Students’ Recent Life Experiences*

The Inventory of College Students’ Recent Life Experiences (ICSRLE) was used to measure hassles-based stress and to categorize such stressors/hassles (Kohn,

Lafreniere, & Gurevich, 1990) (Appendix E). This scale was chosen because of its specificity for use in college students and exclusion of physical and psychological/mental hassles/stressors which could be also potential outcome measures. The ICSRLE is said to be a ‘decontaminated’ scale, measuring only hassles which may adversely affect physical and mental health instead of those directly associated with physical and mental health (Kohn, Lafreniere, & Gurevich, 1990; Osman, Barrios, Longnecker, & Osman, 1994; Kohn & Gurevich, 1993). The ICSRLE is a 49-item survey asking the participant to indicate the intensity of experience over the past month to hassles/stressors in the seven areas: (1) developmental challenge, (2) time pressure, (3) academic alienation, (4) romantic problems, (5) assorted annoyances, (6) general social mistreatment, and (7) friendship problems. The items were scored on a 4-point Likert scale with choices being “not at all part of my life,” (scored as 1), “only slightly part of my life,” (scored as 2), “distinctly part of my life,” (scored as 3), or “very much part of my life,” (scored as 4). An overall hassles score can be calculated by summing the answers to all 49 items, with a possible range of scores being 49 – 196. Thus higher scores indicate higher levels of hassles/stressors in the individual’s life. Similarly, a score for each of the seven subscales can be calculated by summing the following items for each category: (1) developmental challenge – items 11, 14, 19, 20, 23, 25, 30, 32, 40, and 45; (2) time pressure – items 5, 13, 15, 18, 27, 29, and 41; (3) academic alienation – items 16, 34, and 46; (4) romantic problems – items 1, 17, and 39; (5) assorted annoyances – items 10, 35, 36, 38, and 47; (6) general social mistreatment – items 4, 6, 12, 24, 42, and 44; and (7) friendship problems – items 2, 8, and 31. Scale development testing using 208 college undergraduates revealed reliability coefficients of  $\alpha = .79, .80, .79, .73, .47, .76, \text{ and } .68$

in each of the subscales, respectively. It also revealed an alpha reliability coefficient of .88 in male and .89 in female undergraduates (Kohn, Lafreniere, & Gurevich, 1990).

For the purposes of this study, sum scores were not calculated for the ICSRLE and its subscales. Rather, mean scores were calculated and used in order to compare scores across the ICSRLE and its subscales. Use of this method is consistent with the HPLP-II and its subscale scores. It was also done to make comparisons across the ICSRLE and HPLP-II relative.

### *Health-Promoting Behaviors*

Health-Promoting Behaviors were measured using the Health-Promoting Lifestyle Profile II (HPLP II) (Walker & Hill-Polerecky, 1996) (Appendix F). The HPLP II is a 52-item survey on a four point Likert-scale which gives an overall measure of a health-promoting lifestyle, as well as a measure of health-promoting behaviors in its six subscales: (1) health responsibility, (2) physical activity, (3) nutrition, (4) spiritual growth, (5) interpersonal relations, and (6) stress management. Responses to items are indicated by the frequency an individual engages in the given behaviors. Choices of response include “Never,” scored as 1, “Sometimes,” scored as 2, “Often,” scored as 3, or “Routinely,” scored as 4. The score for overall health-promoting lifestyle was obtained by calculating the mean of an individual’s response to all 52 items. Scores for each subscale are also means. The health responsibility subscale includes items 3, 9, 15, 21, 27, 33, 39, 45, and 51. The physical activity subscale includes items 4, 10, 16, 22, 28, 34, 40, and 46. The nutrition subscale is made up of items 2, 8, 14, 20, 26, 32, 38, 44, and 50. The spiritual growth subscale is made up of items 6, 12, 18, 24, 30, 36, 42, 48, and 52.

The interpersonal relations subscale includes items 1, 7, 13, 19, 25, 31, 37, 43, and 49. The stress management subscale is made up of items 5, 11, 17, 23, 29, 35, 41, and 47. Creators of the HPLP II chose to use means rather than sums of the scale items in order to “retain the one to four metric of item responses and to allow meaningful comparisons of scores across subscales” (Walker, 1995; University of Nebraska Medical Center, 2007). With a midpoint score of 2.50 reflecting a “typical level of wellness” (Oleckno & Blacconiere, 1990, p. 423), it has been proposed that higher scores are indicative of a more consistent pattern of engaging in health promoting behaviors (Felton & Parsons, 1994) and thus higher levels of wellness whereas lower scores indicate lower levels of wellness (Oleckno & Blacconiere, 1990). Scale development testing using 712 adults revealed a reliability coefficient of  $\alpha = .943$  for the HPLP-II and alpha coefficients of .793 to .872 for the subscales (Walker & Hill-Polerecky, 1996). The HPLP-II has been widely used as a measure of health promoting behaviors in college students (Catron, 2005; Dunham, 1995; Chandanasotthi, 2003; Gacad, 2002; Larouche, 1998; Lee & Loke, 2005; Nikou, 1998; Odom, 2001; Olpin, 1996; Stark & Brinkley, 2001; Buchinger, 2007).

#### *Data Collection Procedures*

Data was collected through an online survey containing the demographic questions, the PSS, the ICSRLE, and the HPLP-II. This survey was hosted by the OSU College of Education and was located at [www.frontpage.okstate.edu/coe/amandadivin](http://www.frontpage.okstate.edu/coe/amandadivin) (Appendix G, Appendix H, Appendix I).

The online survey was set up through the Microsoft Office 2007 webpage building software application Frontpage. Frontpage allows the survey to be built onto its

own webpage which is hosted by an online domain. To complete the survey, the participant selected (clicked on) or typed in the answer which they wanted to submit for each question. Once all questions were answered, the participant clicked on the “submit” icon. Upon this command, Frontpage transferred the data into a coded Microsoft Office Excel 2007 databank. This databank was accessed through the Frontpage Software online using only the investigator’s user name and password. Prior to publishing the website, each item’s response button was tested to ensure proper coding and accuracy of the data transfer. The datum transfer for all items in the survey was without error.

### *Data Analysis*

Once collected, data were transferred from the Microsoft Office 2007 Excel databank in which Frontpage placed it, into the Statistical Package for Social Sciences (SPSS) version 16.0 for Windows. SPSS 16.0 was used to analyze all data in this study. Because this study was the first of its kind, it was predominantly descriptive, as descriptive based studies aide in comparison of groups as well as the establishment of baseline(s) and exploring relationships and correlations between variables (Polit & Hungler, 1996).

The following analyses were performed to answer each of the research questions:

- (1) **Research Question:** For the two levels of intercollegiate competition what is the overall perceived stress level of student athletes?
- (1) **Analysis:** Descriptive statistics (mean and standard deviation) were reported for the Perceived Stress Scale.

- (2) **Research Question:** For the two levels of intercollegiate competition which “categories of hassles” are the most prevalent in student athletes?
- (2) **Analysis:** Descriptive statistics (mean and standard deviation) were reported for the Inventory of College Students’ Recent Life Experiences.
- (3) **Research Question:** For the two levels of intercollegiate competition what are the health promoting behaviors of student athletes?
- (3) **Analysis:** Descriptive statistics (mean and standard deviation) were reported for the Health Promoting Lifestyles Profile II and each of its six subscales.
- (4) **Research Question:** For the two levels of intercollegiate competition are perceived stress levels and health promoting behaviors interrelated in student athletes?
- (4) **Analysis:** A correlation was used to investigate the relationship between perceived stress levels and health promoting behaviors in student athletes overall and in both levels of intercollegiate competition separately.
- (5) **Research Question:** Across all student athletes, are there differences in perceived stress levels and health promoting behaviors in the two levels of intercollegiate competition student athlete groups or by gender?
- (5) **Analysis:** A multivariate analysis of variance (MANOVA) was used to compare the perceived stress levels and health promoting behaviors across the two levels of intercollegiate competition and the two levels of gender.



## CHAPTER IV

### FINDINGS

The purpose of this chapter is to present the analysis and discussion of the data collected according to the methods described in chapter three. This analysis and discussion begins with a reiteration of the purpose of the study and demographic data pertinent to the study collected from participants at the NAIA institution (Oklahoma City University) (OCU) and the NCAA Division I institution (Oklahoma State University) (OSU). Each research question is answered with statistical analysis and data. Results are then discussed.

#### *Purpose of the Study*

There were several purposes to this study. First, it sought to assess the perceived stress levels, recent life experiences, and health promoting behaviors among male and female student athletes at two levels of intercollegiate competition (NAIA and NCAA Division I). Second, it investigated the relationship between perceived stress levels and health promoting behaviors in an overall sample of student athletes and in both groups of student athletes. Finally, it compared differences in the relationship between perceived stress levels and health promoting behaviors between the two levels of intercollegiate competition and gender.

### *Sample Demographic Results*

Frequencies, percentages, means, and standard deviations were calculated as appropriate for gender, age, sport, major, and athletic scholarship status for the entire sample as well as separately for both levels of intercollegiate competition.

#### *Gender*

The entire sample was made up of 98 student athletes, 47 males (48%) and 51 females (52%). Fifty three participants came from the NAIA institution, with 47.2% (25) being male and 52.8% (28) being female. Forty five participants came from the NCAA Division I institution, with 48.9% (22) being male and 51.1% (23) being female.

#### *Age*

The mean age of the entire sample was  $19.71 \pm 1.66$ , with a range of 18-25 years of age. Frequency distribution of ages were as follows: 28.9% age 18, 28.9% age 19, 11.3% age 20, 13.4% age 21, 10.3% age 22, 6.2% age 23, and 1% age 25. Mean age by gender and level of competition can be seen in Table 1.

TABLE 1

MEAN AGE BY GENDER AND  
LEVEL OF COMPETITION

	Overall	NAIA	NCAA DI
Males	$19.9 \pm 1.67$	$20.3 \pm 1.84$	$19.4 \pm 1.32$
Females	$19.6 \pm 1.65$	$19.9 \pm 1.77$	$19.2 \pm 1.51$

*Sport*

The sports represented in this study, along with the number of athletes from each sport, are presented in Table 2. Participants represented a variety of sports and no one sport monopolized the sample.

TABLE 2  
ATHLETES DIVIDED BY SPORT

Sport	Number of Athletes	Percentage of Sample
Baseball	9	9.2%
Basketball	13	13.3%
Equestrian	5	5.1%
Football	13	13.3%
Golf	9	9.2%
Rowing	5	5.1%
Soccer	12	12.2%
Softball	7	7.1%
Tennis	3	3.1%
Track and Field	6	6.1%
Volleyball	4	4.1%
Wrestling	12	12.2%
Total	98	100%

*Major*

Participants in this study represented a wide variety of academic majors. The majors are presented in percentages in Table 3.

TABLE 3  
ATHLETES DIVIDED BY MAJOR AND LEVEL OF COMPETITION

Major	All Student Athletes	NAIA Student Athletes	NCAA DI Student Athletes
Education and Kinesiology	35.7%	47.2%	24.6%
Undeclared	11.2%	9.4%	13.3%
Business-related majors	23.4%	15.1%	33.1%
Science-related majors	13.1%	17%	11%
Liberal Arts	15.1%	9.5%	17.6%

*Athletic Scholarship Status*

Participants in this study represented a range of academic scholarship status in that some received and some did not receive scholarship based on athletic performance. Percentages of participants receiving scholarships based on athletic performance by entire sample and by level of intercollegiate competition are presented in Table 4.

TABLE 4

## ATHLETIC SCHOLARSHIP STATUS BY LEVEL OF COMPETITION

Type of Athletic Scholarship	Percentage of Sample (N = 98)	Percentage of NAIA Student Athletes (n = 53)	Percentage of NCAA DI Student Athletes (n = 45)
Not on athletic scholarship	21.4%	28.3%	13.3%
“Full Ride”	42.9%	30.2%	57.8%
Tuition Only	4.1%	5.7%	2.2%
Room and Board	2%	0%	4.4%
Books	4.1%	0%	8.9%
On athletic scholarship, type unknown	25.5%	35.8%	13.3%

*Research Question One*

For the two levels of intercollegiate competition what is the overall perceived stress level of student athletes?

Perceived stress levels were measured with the PSS-10. The possible range of score was 0 to 40, with higher scores indicating higher levels of perceived stress. The PSS-10 score for all student athletes was  $18.29 \pm 5.91$ . According to Cohen and Williamson (1988), PSS-10 scores in the range of 0-13 indicate low stress, those in the range of 14-26 indicate moderate stress, and those in the range of 27-40 indicate

high stress. Thus with a score of  $18.29 \pm 5.91$ , the participants in the current sample perceived moderate stress. The score seen in the entire sample is similar to that of the 559 college students ( $18.96 \pm 6.76$ ) examined by Olpin (1996) and that of 285 undergraduate students ( $17.4 \pm 6.1$  in men and  $18.4 \pm 6.5$  in women) examined by Roberti, Harrington, and Storch (2006). However it is somewhat lower than the PSS-10 score of  $22.83 \pm 3.04$  reported in Catron's (2005) study only using student athletes. It is also significantly lower than PSS-10 scores of smoking ( $27.9 \pm 7.7$ ) and non-smoking ( $26.2 \pm 7.7$ ) undergraduate students in Naquin and Gilbert's (1996) study.

When separating the two levels of intercollegiate competition, the PSS-10 score for the NAIA student athletes was  $19.79 \pm 5.61$  (with a range of 9 to 31) and for NCAA Division I student athletes was  $16.51 \pm 5.826$  (with a range of 3 to 36). In both levels of intercollegiate competition, PSS-10 scores were indicative of 'moderate' levels of perceived stress. The moderate, rather than high, levels of stress in this sample could be due to demands intrinsic to their roles as student athletes such as physical conditioning and teammate. In order to achieve and maintain such condition, they must engage in exercise daily. Hassman, Koivula, and Uutela (2000) found that participants who exercised daily perceived less stress than those who did not. Similarly, Aldana, Sutton, Jacobson, and Quirk (1996) found that engagement in more leisure time physical activity was associated with less stress. This could also be the case with student athletes. Another demand in the role of student athlete is teammate. Empirical evidence investigating student athletes shows that they tend to fraternize with other student athletes and/or individuals on their team. Such close

relationships can act to help student athletes feel connected to others. Levels of social connectedness have been shown to have an inverse relationship with perceptions of stress. More specifically those with high levels of social connectedness perceive life as less stressful, and those with low levels of social connectedness perceive life as more stressful (Lee & Robins, 1998; Kimball & Freysinger, 2003). One reason the PSS-10 scores may have been only moderate in this population was because teammates can be seen as social support and act to help keep levels of perceived stress low in student athletes.

#### *Research Question Two*

For the two levels of intercollegiate competition which “categories of hassles” are the most prevalent in student athletes?

The Inventory of College Students’ Recent Life Experiences (ICSRLE) was used to obtain an overall score of hassles as well as to categorize the hassles experienced by college student athletes. In order to make the scores more meaningful for comparison, means were calculated rather than the usual sum score. Means and standard deviations of ICSRLE and ICSRLE subscales for all student athletes, NAIA student athletes, and NCAA Division I student athletes are presented in Table 5.

Overall, the entire sample of student athletes had a total ICSRLE mean of 1.85  $\pm$  .442, indicating that hassles were “only slightly a part of their life.” Total mean scores of the ICSRLE were similar between NAIA and NCAA Division I student athletes ( $m = 1.90$ ), indicating that hassles were minimal (not at all or only slightly a part of) of their lives.

TABLE 5

MEAN  $\pm$  STANDARD DEVIATION OF ICSRLE AND ICSRLE SUBSCALES  
FOR ALL STUDENT ATHLETES, NAIA STUDENT ATHLETES,  
AND NCAA DIVISION I STUDENT ATHLETES.

ICSRLE Subscale	All Student Athletes	NAIA Student Athletes	NCAA D I Student Athletes
Developmental Challenge	2.17 $\pm$ .442	2.26 $\pm$ .504	2.06 $\pm$ .716
Time Pressure	2.53 $\pm$ .677	2.57 $\pm$ .623	2.49 $\pm$ .741
Academic Alienation	2.11 $\pm$ .763	2.20 $\pm$ .741	2.00 $\pm$ .785
Romantic Problems	1.99 $\pm$ .781	2.11 $\pm$ .867	1.84 $\pm$ .646
Assorted Annoyances	1.62 $\pm$ .479	1.69 $\pm$ .483	1.55 $\pm$ .468
General Social Mistreatment	1.72 $\pm$ .646	1.74 $\pm$ .638	1.70 $\pm$ .662
Friendship Problems	1.83 $\pm$ .722	1.77 $\pm$ .745	1.90 $\pm$ .801
ICSRLE Total	1.85 $\pm$ .442	1.90 $\pm$ .367	1.90 $\pm$ .534

Time pressure was the hassles subscale with the highest score, both for the overall sample and each of the levels of competition. The scores in this subscale indicate that time pressures were more than “only slight a part of their lives” but less than “distinctly a part of their lives.” Mean scores on the other subscales were different between the two groups, as NAIA student athletes outscored NCAA Division I student athletes in all subscales (developmental challenge, time pressure, academic alienation, romantic problems, assorted annoyances, and general social mistreatment) with the exception of friendship problems. Such differences could be



attributable to several things. The sampled NAIA institution is a substantially smaller university than the sampled NCAA Division I institution. In this smaller community, student athletes may feel as though they are struggling to meet more demands with less support services dedicated solely to student athletes and/or feel more personally accountable due to the “you’re a name, not a number” phenomenon for which the sampled NAIA institution is known.

The subscales of developmental challenge and academic alienation differed between the two group’s means by 0.20, with the NAIA institution scoring higher than the NCAA Division I institution. A closer look at those subscales reveals that items in them were related and similar. Items in the hassles subscale of developmental challenge were things which dealt primarily with academic struggles commonly faced by the typical college student (e.g. “struggling to meet your own academic standards,” “dissatisfaction with your mathematical ability,” “important decisions about your education,” “important decisions about your future,” “finding courses too demanding,” “hard effort to get ahead,” “dissatisfaction with your physical appearance”). Items in the academic alienation subscale included “dissatisfaction with school,” “disliking your studies,” and “finding course(s) uninteresting.” The difference between the two schools on these subscales, in particular, could be attributable to campus size and campus culture. The type of student who attends a NAIA institution, which in this study was a small, private, liberal arts university, in general, comes from a different background than a student who attends a NCAA Division I institution, which in this study was a large, public university. Their parents may have more education and/or place more emphasis on education. Additionally, at

a small university, there are numerous opportunities to become involved in on campus activities. This may occur particularly at the sampled NAIA institution, as it is mandatory for those under 21 to live on campus. The items in this subscale which were scored higher by NAIA student athletes indicate that they are more “hassled” by such events or in other words, such events act as greater sources of stress to this group.

The subscale of romance problems differed between the two group’s means by 0.27. Items in this subscale included “conflicts with boyfriend’s/girlfriend’s/spouse/s family,” “decisions about intimate relationship(s),” and “conflicts with boyfriend/girlfriend/spouse.” Examination of the relationship status data from the two groups showed comparable percentages of participants in the various classifications (e.g. single, casually dating, in a relationship, other). Therefore, the differences seen are not attributable to relationship status. It may be that at the sampled NAIA institution, because it is a significantly smaller institution, students are more closely connected to their significant others family/friends, making problems in the relationship seem amplified due to the smaller, more closely knit community.

Means of all other subscales were less than 2.0, indicating that those areas or hassles were less than “only slightly a part of my life” and therefore will not be discussed.

When discussing the ICSRLE, one item was of particular interest due to the sample from which the data was collected. Item #49 of the ICSRLE is “dissatisfaction with your athletic skills” (how frequently has this been a part of your life?). Because

this study used student athletes as participants, the PI believed this item warranted closer examination. Table 6 presents the means and standard deviations for item #49.

In the overall sample, dissatisfaction with one’s athletic skills had a score of  $1.93 \pm .888$ , meaning that dissatisfaction with one’s athletic skills was less than “only slightly a part” of the participant’s life. In fact, only 20 of the 98 participants responded to this item with “distinctly part of my life” and 5 of the participants responded with “very much part of my life.” Because more than half of the participants (64.3%) indicated they were “in season” at the time of completing the survey, such low scores on this item are somewhat surprising, as “in season” is a time when athletic competition is at its highest and one play or action can win or lose a game.

TABLE 6

MEAN  $\pm$  STANDARD DEVIATION FOR ITEM #49 FROM  
THE INVENTORY OF COLLEGE STUDENTS’ RECENT LIFE EXPERIENCES  
(DISSATISFACTION WITH YOUR ATHLETIC SKILLS)

	All Student Athletes	NAIA Student Athletes	OSU Student Athletes
Dissatisfaction with your athletic skills	$1.93 \pm .888$	$2.06 \pm .842$	$1.78 \pm .927$

It is also somewhat surprising that NCAA Division I student athletes scored, on average, 0.28 less than NAIA student athletes because the NAIA is a less rigorous and less prestigious level of intercollegiate competition. This may be attributable to additional pressures which are self-imposed by student athletes at the NAIA institution. Because many of the student athletes at this NAIA institution are on some

form of athletic scholarship and could not afford to attend the institution without that scholarship, they may feel additional pressure to perform well as to not lose their scholarship and subsequently their financial ability to attend OCU. It could also be that because they compete in a less rigorous and less prestigious level of competition, they may feel added pressures to ‘prove themselves’ or feel ‘good enough’ in their athletic skills. It may also be that they feel more pressure to perform well in order to elicit the attention of scouts and/or agents so they can move to the next level of competition beyond college.

### *Research Question Three*

For the two levels of intercollegiate competition what are the health promoting behaviors of student athletes?

#### *HPLP-II*

Means and standard deviations for the HPLP-II and its subscales are presented in Table 7. The mean HPLP-II score for all student athletes was  $2.41 \pm .46$ . This is lower than previous studies using college students which have found HPLP-II mean scores of 2.74 (Becker & Arnold, 2004), 2.68 (Dubois, 2006), 2.66 (Odom, 2001), 2.64 (Edwards, 1997), 2.62 (Smith, 1999), 2.60 (Stephany, 2006), 2.60 (Buchinger, 2007), 2.58 (Larouche, 1998), and 2.57 (Oleckno & Blacconiere, 1990). It is also lower than studies using a variety of participants such as midlife women (2.65) (Duffy, 1998), home fitness equipment company workers (2.64) (Waite, Hawks, & Gast, 1999), high risk pregnant women (2.61) (Stark & Brinkley, 2007), older Appalachians (2.60) (Riffle et al., 1989), postmenopausal women (2.52) (Ali &

Bennett, 1992), and 16-19 year old females (2.5) (Felton et al., 1998). However the current sample's HPLP-II score is similar to other studies using the HPLP-II which have found mean scores of 2.45 in college students enrolled in a non-health promotion curriculum (Hubbard, 2002), 2.43 in college students (Gacad, 2002), 2.42 in female freshman (Megel et al., 1994), and 2.37 in women experiencing crisis (Alley et al., 1988). The mean HPLP-II score for all student athletes is, however, higher than that of Hong Kong university students who scored 2.30 in Lee and Loke's 2005 study.

When interpreting the HPLP-II and its subscale scores, a score of 3 indicates 'often' engaging in an activity, and a score of 4 indicates 'routinely' engaging in a behavior. It has been suggested that a midpoint score of 2.50 is indicative of a "typical level of wellness" (Oleckno & Blacconiere, 1990, p. 423). Given these things, it is no surprise that a sample of college students would score in the "typical" range given their demands and stage of life. However, it is a little surprising that college student athletes, a group of individuals which must maintain a certain level of health and performance, would only score in a midpoint range on a scale measuring a health promoting lifestyle and behaviors. Participating in health promoting behaviors such as healthy eating, sufficient sleep, and time away from sports and school for relaxation are essential components to developing optimal performance for student athletes (Kellmann, 2002). In a group which many perceive as healthier than most and more in tune with their health, such a score may suggest that it is just a perception, not an actual fact, that student athletes engage in a healthier lifestyle than do non-athletes. It could also be that items in the HPLP-II may not be applicable to or

sensitive enough in individuals who participate in intercollegiate athletic competition. No matter what the reasons, however, this sample's HPLP-II score of  $2.41 \pm .46$  left room for improvement.

#### *HPLP-II Subscales*

Examination of scores on the subscales of the HPLP-II demonstrated that college student athletes were lacking in many areas of health promoting behaviors as well. In the subscale of health responsibility, student athletes only scored  $1.89 \pm .48$ . This is indicative of only 'sometimes' engaging in behaviors which involve accountability for one's own well-being and demonstrates substantial deficiencies in this area. A low score in this area could be attributable to the lack of control a student athlete has over his/her body when participating in intercollegiate competition. For example, they must see a team doctor/medical support staff for health/physical problems who may or may not have their best interest at heart. Student athletes may also sacrifice their own health for the good of the team, fear being seen as weak for seeking additional medical advice/help, or feel impervious to health problems due to their high level of physical performance and/or age/level of maturity.

Another subscale in which all student athletes were lacking was stress management. Their score of  $2.17 \pm .49$  indicates that they 'sometimes' engage in the health promoting behaviors of stress management. When compared with all studies found using the HPLP-II at the time of this publication, the current sample of student athletes demonstrated the lowest score on the stress management subscale in print. Examination of items in the stress management subscale reveal that such behaviors are commonly suggested for management of stress, and unlike many of the behaviors

in the health responsibility subscale, student athletes could easily have control over such behaviors and perform them with minimal effort (e.g. “get enough sleep,” “take some time for relaxation each day,” “spend some time with close friends,” etc). Such low scores in this area may indicate that student athletes in this sample were unaware of stress management behaviors, that they did not value them, or that they were unable to devote the time to perform them. Given the stress of being a student athlete on top of the demands of a college student and the profound impact stress can have on health and performance, it is disappointing that scores in this area were so low.

In the subscale of nutrition, student athletes were also somewhat deficient, scoring  $2.31 \pm .58$ . Items in this subscale are similar to the general recommendations of the food guide pyramid for healthy nutrition (e.g. “eat breakfast,” “eat 2-4 servings of fruit each day,” “eat 3-5 servings of vegetables each day,” “eat 6-11 servings of bread, cereal, rice, and/or pasta each day,” etc.). Therefore, once again because student athletes are required to maintain high levels of physical performance, it is somewhat surprising they scored so poorly in this area.

Another subscale where student athletes may appear deficient is physical activity. The mean score on the physical activity subscale was only  $2.71 \pm .624$ . Looking at the questions which comprise the physical activity subscale and how it is scored may lend some understanding to what seems like a low score in a habitually active sample. The physical activity subscale is made up of eight items, and a mean score is then calculated. When calculating a mean score, if there are any items which participants consistently rank as low, it may bring down the overall mean score. Two of the questions in particular which may have brought down the overall physical

activity subscale mean score were “check my pulse rate when exercising” and “reach my target heart rate when exercising.” Because much of the physical activity in which student athletes engages may be practice for their sport, coaches may not give them the opportunity to check their pulse or determine if they have reached a target heart rate. Such circumstances would result in low scoring responses on the aforementioned items which subsequently would bring down the subscale score.

When looking at all student athletes, females had higher mean scores than males on the HPLP-II and each of its subscales. This was consistent with previous research which has found females scoring higher than males on the overall HPLP-II (Odom, 2001; Oleckno & Blaconiere, 1990; Larouche, 1998; Hubbard, 2002; Oleckno & Blaconiere, 1991) and the subscales of health responsibility, nutrition, and interpersonal relations (Odom, 2001; Oleckno & Blaconiere, 1990; Larouche, 1998). However, it was inconsistent with previous research which has found males consistently scoring higher than females on the subscale of physical activity (Hendricks et al., 2000; Mechanic & Cleary, 1980; Buchinger, 2007; Lee & Loke, 2005; Stephany, 2006; Smith, 1999).

When looking at NAIA student athletes, females also outscored males on the overall HPLP-II as well on each subscale. When looking at NCAA Division I student athletes, females outscored males on the overall HPLP-II, and all subscales except health responsibility and stress management, on which male and female scores were virtually identical.

When comparing NAIA and NCAA Division I student athletes, NAIA student athletes outscored NCAA Division I student athletes on the overall HPLP-II and all



subscales except stress management (on which scores were virtually identical). When comparing NAIA male student athletes to NCAA Division I male student athletes, NAIA male student athletes outscored NCAA Division I male athletes on the HPLP-II, physical activity, nutrition, spiritual growth, and interpersonal relations. However scores on the subscales of health responsibility and stress management were virtually identical between the two groups. When looking at NAIA and NCAA Division I female athletes, NAIA female student athletes scored higher than NCAA Division I female student athletes on the HPLP-II and all subscales.

TABLE 7

MEAN  $\pm$  STANDARD DEVIATION FOR HPLP-II AND HPLP-II SUBSCALES FOR  
ALL STUDENT ATHLETES, NAIA STUDENT ATHLETES, AND NCAA DIVISION I STUDENT ATHLETES

		HPLP-II	HPLP-II: Health Responsibility	HPLP-II: Physical Activity	HPLP-II: Nutrition	HPLP-II: Spiritual Growth	HPLP-II: Interpersonal Relations	HPLP-II: Stress Management
All Student Athletes	All	2.41 $\pm$ .462	1.89 $\pm$ .481	2.71 $\pm$ .624	2.31 $\pm$ .581	2.76 $\pm$ .654	2.60 $\pm$ .649	2.17 $\pm$ .489
	Males	2.30 $\pm$ .440	1.87 $\pm$ .448	2.63 $\pm$ .690	2.16 $\pm$ .496	2.65 $\pm$ .609	2.39 $\pm$ .598	2.14 $\pm$ .431
	Females	2.50 $\pm$ .465	1.92 $\pm$ .513	2.79 $\pm$ .553	2.45 $\pm$ .624	2.86 $\pm$ .683	2.79 $\pm$ .643	2.19 $\pm$ .540
NAIA Student Athletes	All	2.47 $\pm$ .430	1.92 $\pm$ .469	2.77 $\pm$ .594	2.38 $\pm$ .579	2.83 $\pm$ .642	2.74 $\pm$ .628	2.17 $\pm$ .468
	Males	2.37 $\pm$ .371	1.87 $\pm$ .384	2.72 $\pm$ .671	2.26 $\pm$ .462	2.72 $\pm$ .558	2.54 $\pm$ .556	2.13 $\pm$ .411
	Females	2.55 $\pm$ .466	1.96 $\pm$ .538	2.82 $\pm$ .524	2.48 $\pm$ .656	2.93 $\pm$ .705	2.91 $\pm$ .647	2.21 $\pm$ .518
NCAA DI Student Athletes	All	2.33 $\pm$ .491	1.86 $\pm$ .498	2.64 $\pm$ .658	2.24 $\pm$ .582	2.67 $\pm$ .665	2.44 $\pm$ .644	2.16 $\pm$ .516
	Males	1.86 $\pm$ .498	1.86 $\pm$ .521	2.53 $\pm$ .713	2.06 $\pm$ .521	2.56 $\pm$ .666	2.23 $\pm$ .613	2.16 $\pm$ .460
	Females	2.43 $\pm$ .465	1.86 $\pm$ .487	2.75 $\pm$ .596	2.41 $\pm$ .594	2.78 $\pm$ .662	2.64 $\pm$ .620	2.15 $\pm$ .575

#### *Research Question Four*

For the two levels of intercollegiate competition are perceived stress levels and health promoting behaviors interrelated in student athletes?

Table 8 presents correlations between the PSS-10, HPLP-II, and HPLP-II subscales in all student athletes. In all student athletes, stress, as measured by the PSS-10, had a significant negative relationship with a health promoting lifestyle, as measured by the HPLP-II ( $r = -.334$ ;  $p = .001$ ). Examination of the coefficient of determination revealed that 11.2% of the variance in health promoting behaviors was accounted for by perceived stress in all student athletes.

Stress also had a negative relationship with each of the HPLP-II subscales. Given previous research, this was to be expected. However, not all the correlations between stress and health promoting behaviors were significant, nor were they as strong as anticipated. Most notably is the relationship between stress and physical activity, followed closely by the relationship between stress and interpersonal relations. Because many individuals cope with stress by engaging in physical activity, and previous research (Crews & Landers, 1987; Aldana et al., 1996; Hassman, Koivula, & Uutela, 2000) supports the use of physical activity in the prevention and dissipation of stress, a non-significant relationship ( $r = -.194$ ;  $p = .055$ ) was contrary to expectations, particularly considering the sample from which the data was collected, student athletes. In fact, the coefficient of determination revealed that only 3.71% of the variance in the health promoting behavior of physical activity was shared with perceived stress, possibly suggesting that stress neither adds to nor takes away from participation in physical activity in this sample.

TABLE 8  
CORRELATIONS BETWEEN PSS-10, HPLP-II, AND HPLP-II SUBSCALES IN ALL STUDENT ATHLETES

	PSS-10	HPLP-II	HPLP-II Health Responsibility	HPLP-II Physical Activity	HPLP-II Nutrition	HPLP-II Spiritual Growth	HPLP-II Interpersonal Relations	HPLP-II Stress Management
PSS-10	1.00							
HPLP-II	-.334**	1.00						
HPLP-II Health Responsibility	-.277**	.578**	1.00					
HPLP-II Physical Activity	-.194	.804**	.293**	1.00				
HPLP-II Nutrition	-.212*	.786**	.645**	.538**	1.00			
HPLP-II Spiritual Growth	-.353**	.901**	.311**	.713**	.544**	1.00		
HPLP-II Interpersonal Relations	-.143	.848**	.250*	.659**	.516**	.843**	1.00	
HPLP-II Stress Management	-.467**	.796**	.364**	.557**	.492**	.778**	.629**	1.00

\*\*Correlation significant at the 0.01 level (2-tailed)

\* Correlation significant at the 0.05 level (2-tailed)

A large body of previous research (Humphrey et al., 2000; Lee & Robins, 1998; Yarcheski, Mahon & Yarcheski, 1997; Coleman & Iso-Ahola, 1993) also indicates social support (referred to as “interpersonal relations” in the HPLP-II) is a means to cope with stress. Therefore, a weak and non-significant relationship between the PSS-10 and the HPLP-II subscale of interpersonal relations ( $r = -.143$ ;  $p = .159$ ) is somewhat surprising, especially considering that student athletes have a built in system of social support in their teammates. Examination of the coefficient of determination showed that only 2% of the variance in the health promoting behavior of interpersonal relations was shared with perceived stress. Similar to the relationship between stress and physical activity, such a small amount of variance indicates that interpersonal relations is not greatly influenced by stress, neither in a positive or negative manner. This may also suggest that this sample of student athletes does not utilize social support as a means by which to cope with stress.

Upon examination of all coefficients of determination for the other HPLP-II subscales, it appears that the relationship between stress and health promoting behaviors varies by subscale/dimension. For example, stress accounted for 21.81% of the variance in stress management, 12.46% of the variance in spiritual growth, and 4.49% of the variance in nutrition. Such statistics suggest that stress may have a greater impact on certain aspects of health promoting behavior than others.

Given that the overall health promoting lifestyle score is made up of those subscales, it is not surprising that the HPLP-II would have significant positive correlations with each of its subscales.

Perceived stress, as measured by the PSS-10, had a significant negative correlation with health promoting lifestyle, as measured by the HPLP-II ( $r = -.461$ ,  $p = .001$ ) in NCAA Division I student athletes (Table 9). Examination of the coefficient of determination revealed that 21.25% of the variance in health promoting behaviors was accounted for by perceived stress in NCAA Division I student athletes. This is in contrast to NAIA student athletes, in whom only 10.76% of the variance in health promoting behaviors was shared with stress. Differences in the amount of variance suggests that stress and health promoting behaviors operate differently in the two sets of student athletes.

Consistent with previous findings, as stress levels increase, health promoting behaviors decrease (Dunham, 1995; Nikou, 1998; Chandanasotthi, 2003; Stark & Brinkley, 2001; Weidner, Kohlmann, Dotzauer, & Burns, 1996; Gacad, 2002; Edmonds, 2006). The PSS-10 was also significantly negatively correlated with each of the HPLP-II subscales, with the exception of interpersonal relations. These findings concerning the subscales are in contrast to those of NAIA student athletes, as the correlations between the PSS-10 and health responsibility, physical activity, nutrition, and interpersonal relations were not significant. The above correlations (Table 10) show that for NCAA Division I student athletes, all subscales except interpersonal relations were significant. These results may suggest that stress impacts the health promoting behaviors of NCAA Division I student athletes differently (more severely) than those at the NAIA institution.

Physical activity subscale had a stronger negative correlation in the NCAA Division I student athletes ( $r = -.345$ ;  $p = .020$ ) than in the NAIA student athletes ( $r =$

-.127;  $p = .365$ ). The coefficients of determination showed that in NCAA Division I student athletes, 11.9% of the variance in physical activity was shared with perceived stress whereas in NAIA student athletes, only 1.6% of the variance in physical activity was shared with perceived stress. Research supports physical activity as means by which to lessen the effects and/or to cope with stress (Crews & Landers, 1987; Aldana et al., 1996; Hassman, Koivula, & Uutela, 2000). It also indicates that individuals may also neglect physical activity during times of high stress (Weidner et al., 1996; Nguyen-Michel et al., 2006). Given this information, the aforementioned correlations suggest several things: (1) physical activity in NAIA student athletes is not as greatly affected by stress as it is in NCAA Division I student athletes (it does not decrease to the extent that it does in NCAA Division I student athletes); (2) physical activity may actually be a source of stress in NCAA Division I student athletes (because it is a higher level of competition, more stress, they are active because they *have* to be, not for the joy of it or stress relieving benefits, etc) and activity in addition to that required for sport participation may be adversely affected by increasing levels of stress. The subscale of physical activity not being significantly correlated with stress in NAIA student athletes is consistent with a study by Nguyen-Michel et al. (2006) which found that students at a four year private university were more physically active than those at a public four year university. If NAIA student athletes were more physically active prior to stress, perhaps during times of stress, it was not as significantly affected.

The subscale of interpersonal relations did not have a significant negative correlation with stress in either level of intercollegiate competition. This subscale is

synonymous with the idea of social support. Even though all the subscales had negative correlations with stress, it is surprising that interpersonal relations had a weak negative relationship with stress because research supports social support as a means by which many individuals, including student athletes, cope with stress (Humphrey et al., 2000; Lee & Robins, 1998; Yarcheski, Mahon, & Yarcheski, 1997; Coleman & Iso-Ahola, 1993). If social support was used during times of stress to cope with stress, the correlation would be positive, not negative. These results may indicate that social support is not used as much as expected as a means by which to cope with stress. At the same time, they also indicate that if the health promoting behavior of social support does decrease during times of stress, it is not affected to the magnitude as other health promoting behaviors.

Also interesting about the above data is that all correlations for NCAA Division I student athletes were of greater magnitude than those for NAIA student athletes. When the correlations are converted to coefficients of determination it becomes obvious that stress may assert greater influence on NCAA Division I student athletes than NAIA student athletes, as more variance in the health promoting behaviors was due to stress. This may suggest that NCAA Division I student athletes are sensitive to the ill effects of stress on health promoting behaviors.



TABLE 9

## CORRELATIONS BETWEEN PSS-10, HPLP-II, AND HPLP-II SUBSCALES IN NAIA STUDENT ATHLETES

	PSS-10	HPLP-II	HPLP-II Health Responsibility	HPLP-II Physical Activity	HPLP-II Nutrition	HPLP-II Spiritual Growth	HPLP-II Interpersonal Relations	HPLP-II Stress Management
PSS-10	1.00							
HPLP-II	-.328*	1.00						
HPLP-II Health Responsibility	-.268	.528**	1.00					
HPLP-II Physical Activity	-.127	.715**	.166	1.00				
HPLP-II Nutrition	-.181	.776**	.635**	.483**	1.00			
HPLP-II Spiritual Growth	-.353**	.866**	.207	.558**	.498**	1.00		
HPLP-II Interpersonal Relations	-.161	.832**	.204	.559**	.430**	.817**	1.00	
HPLP-II Stress Management	-.460**	.800**	.304*	.441**	.500**	.764**	.663**	1.00

\*\*Correlation significant at the 0.01 level (2-tailed)

\* Correlation significant at the 0.05 level (2-tailed)

TABLE 10

CORRELATIONS BETWEEN PSS-10, HPLP-II, AND HPLP-II SUBSCALES IN NCAA DIVISION I STUDENT ATHLETES

	PSS-10	HPLP-II	HPLP-II Health Responsibility	HPLP-II Physical Activity	HPLP-II Nutrition	HPLP-II Spiritual Growth	HPLP-II Interpersonal Relations	HPLP-II Stress Management
PSS-10	1.00							
HPLP-II	-.461**	1.00						
HPLP-II Health Responsibility	-.437*	.626**	1.00					
HPLP-II Physical Activity	-.345*	.883**	.412**	1.00				
HPLP-II Nutrition	-.344*	.792**	.653**	.586**	1.00			
HPLP-II Spiritual Growth	-.463**	.934**	.414**	.866**	.583**	1.00		
HPLP-II Interpersonal Relations	-.288	.861**	.286	.757**	.592**	.872**	1.00	
HPLP-II Stress Management	-.521**	.806**	.425**	.674**	.489**	.802**	.623**	1.00

\*\*Correlation significant at the 0.01 level (2-tailed) \* Correlation significant at the 0.05 level (2-tailed)

*Research Question Five*

Across all student athletes, are there differences in perceived stress levels and health promoting behaviors in the two levels of intercollegiate competition or by gender?

A multivariate analysis of variance (MANOVA) was used to compare the perceived stress levels (PSS-10 scores) and health promoting behaviors (HPLP-II mean scores) across the two levels of intercollegiate competition (NAIA and NCAA Division I) and the two levels of gender (male and female). The PSS-10 and HPLP-II scores were the dependent variables. Gender (two levels: male and female) and level of intercollegiate competition (two levels: NAIA and NCAA Division I) were the independent variables.

TABLE 11  
MULTIVARIATE TESTS FOR PSS-10 AND HPLP-II

Variable	Wilks' Lambda	F	Significance
Gender	.870	6.96	.002
Level of Intercollegiate Competition	.846	8.46	.000
Gender X Level of Intercollegiate Competition	.997	.123	.884

Results from the MANOVA showed that for the combination of PSS-10 scores and HPLP-II scores, significant differences were seen in gender ( $\lambda = .870$ ,  $p = .002$ ) and level of intercollegiate competition ( $\lambda = .846$ ,  $p = .000$ ). However

differences in PSS-10 scores and HPLP-II scores were not seen when the combination of gender and level of intercollegiate competition was examined ( $\lambda = .997, p = .884$ ). These results suggest that differences in the relationship between stress (PSS-10 score) and health promoting behaviors (HPLP-II score) which exists between genders operate independently from differences which exist in level of competition. In other words, one must look at stress and health promoting behaviors in combination when discussing gender or level of intercollegiate competition independently or no differences will be seen.

*Post Hoc Analysis - PSS*

Post hoc analysis done via the tests of between-subjects effects from the MANOVA revealed that for stress scores, significant differences did exist between levels of competition. However, significant differences did not exist between genders and the combination of gender and level of competition (Table 12).

TABLE 12  
TESTS OF BETWEEN SUBJECT EFFECTS FOR PSS-10

Source	Sum of Squares	df	Mean Square	F	Significance
Gender	105.58	1	105.58	3.30	.073
Level of Intercollegiate Competition	252.48	1	252.48	7.88	.006
Gender X Level of Intercollegiate Competition	7.38	1	7.38	.230	.632

Examination of the subgroup means showed that student athletes at the NAIA institution (a less rigorous level of intercollegiate athletic competition) perceived higher levels of stress than student athletes at the NCAA Division I institution (the highest/most rigorous level of intercollegiate athletic competition) (Table 13). This may initially seem counterintuitive because it is well documented that student athletes at higher levels of intercollegiate competition face high levels of stress associated with their sport participation (Hess, 1990). However, upon closer consideration of circumstances surrounding sport participation at lower levels of intercollegiate competition, the stress of sport participation may not be as great but stress associated with all other aspects of college life may be greater. This may be due to the high costs of attending such an institution, the lower amount of scholarship funds allocated for sport participation, and/or the pressure to maintain athletic performance in order to continue receiving scholarship/funding. Previous research by Hess (1990) did find that student athletes receiving scholarship reported more stress than those not receiving scholarships. Part of the reason NAIA student athletes report more stress may be due to the large cost of attending that institution and the pressure to maintain their athletic performance because scholarship depends on it. Student athletes receiving scholarships at the sampled NAIA institution are having part of the high cost of attendance lessened by their participation in sport. Thus they may feel self-imposed pressure to maintain or raise their level of performance so that they do not have to find other ways to finance their education.

Higher levels of stress perceived by NAIA student athletes may also be due to a lower quantity of support services (e.g. free tutors, mentors, counseling, etc.)

available to students at less rigorous levels of athletic intercollegiate competition because of less funding allocated or revenue generated for such purposes.

Additionally, although the sampled NAIA institution is a less rigorous level of intercollegiate competition, it is also a private institution. Chandanasotthi (2003) found that when comparing students attending public and private schools, those attending private schools reported more stress than those attending public schools.

Examination of subgroup means also indicates that females, no matter what level of competition, perceived higher levels of stress than males. Although this finding was not statistically significant, it was consistent with previous research which supports females experience more stress than males. The lack of significant differences seen between combining gender and level of competition may be due to the similar types of stressors faced by students attending similar types of institution.

TABLE 13

MEAN  $\pm$  STANDARD ERROR OF PSS-10 BY  
LEVEL OF INTERCOLLEGIATE COMPETITION

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Level of Intercollegiate Competition	All Student Athletes from that level
NAIA	19.72 $\pm$ .779
NCAA Division I	16.49 $\pm$ .844

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### *Post Hoc Analysis – HPLP-II*

Post hoc analysis done via the tests of between-subjects effects from the MANOVA revealed that for health promoting behaviors, significant differences did exist between genders (Table 14). This is consistent with previous research which supports females engage in more health promoting behaviors than males (Larouche, 1998; Oleckno & Blacconiere, 1990; Oleckno & Blacconiere, 1991; Conner & Norman, 1996; Goodman et al., 1997; Schweitzer et al., 1998; Odom, 2001; Hubbard, 2002). Significant differences did not exist between levels of intercollegiate competition and the combination of gender and level of competition (Table 14). Examination of the subgroup means showed that all females reported more health promoting behaviors than males (Table 15). They also showed that NAIA student athletes, no matter the gender, outscored NCAA Division I student athletes in health promoting behaviors. This is inconsistent with Chandanasotthi's (2003) study which found that students attending a public school participated in higher levels of health promoting behaviors than those attending a private school.

TABLE 14

TESTS OF BETWEEN SUBJECT EFFECTS FOR HPLP-II

Source	Sum of Squares	df	Mean Square	F	Significance
Gender	.911	1	.911	4.44	.038
Level of Intercollegiate Competition	.425	1	.425	2.07	.154
Gender X Level of Intercollegiate Competition	.002	1	.002	.009	.925

TABLE 15

MEAN ± STANDARD ERROR OF HPLP-II BY GENDER

Gender	All Student Athletes of that Gender
Males	2.30 ± .066
Females	2.49 ± .064

*Summary*

All student athletes reported moderate levels of perceived stress. However, levels of perceived stress were significantly different based on level of intercollegiate competition, with NAIA student athletes reporting significantly higher levels of perceived stress than NCAA Division I student athletes. They were also different



based on gender, with female student athletes reporting more perceived stress than male student athletes. However, when looking at the combination of gender and level of intercollegiate competition, no significant differences were found.

Consistent with previous research and empirical evidence, all student athletes were most hassled by time pressures. When examining the hassle of dissatisfaction with one's athletic skills, all student athletes reported being only slightly dissatisfied with their athletic skills.

All student athletes reported a typical level of wellness and health promoting lifestyle, but were deficient in the areas of health responsibility and stress management, leaving substantial room for improvement. NAIA student athletes reported greater participation in a health promoting lifestyle, as well as each subscale. Health promoting behaviors were significantly different based on gender, with females scoring higher than males, but not on the combination of gender and level of intercollegiate competition.

Correlational analysis revealed that for all student athletes, perceived stress had a negative correlation with the HPLP-II and all of its subscales. When looking at levels of intercollegiate competition, differences in this relationship were seen. In NAIA student athletes, HPLP-II, spiritual growth, and stress management had significant negative correlations with stress. However, in NCAA Division I student athletes, HPLP-II and all subscales but interpersonal relations had significant correlations with stress. The coefficients of determination indicated that a larger amount of variance in the HPLP-II and all subscales was due to stress in NCAA Division I student athletes in comparison to NAIA student athletes. This suggests that

stress may influence health promoting behaviors differently in the two levels of competition.

However, when looking at the combination of the dependent variables of stress and health promoting behaviors, no differences were seen in the combination of the independent variables of level of intercollegiate competition and gender. These results suggest that stress and health promoting behaviors must be examined together when discussing gender, or no differences will be seen. Further, while student athletes at the NAIA institution perceived more stress than student athletes at the NCAA Division I institution, health promoting behaviors between the two levels of competition did not significantly differ. Additionally, while females perceived more stress than males, there was not a concomitant change/decrease in their health promoting behaviors. However when looking at males, higher levels of perceived stress were associated with lower health promoting behaviors. These results lend evidence to support that gender differences exist in the relationship between stress and health promoting behaviors. They also may infer that males engage in less health promoting behaviors (and possibly more health risk behaviors) during times of elevated stress. Additionally, the results may suggest that factors such as gender and/or level of intercollegiate competition may somehow play a role in stress, health promoting behaviors, and the relationship between them.

## CHAPTER V

### SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

#### *Summary*

The purpose of this chapter is to summarize the findings outlined in the previous chapter, discuss conclusions drawn from the current study, and make recommendations for future research performed with collegiate student athletes. The findings and conclusions were based on data collected from student athletes at a NAIA institution (Oklahoma City University) (OCU) and a NCAA Division I institution (Oklahoma State University) (OSU). The purpose of this study was to (1) assess perceived stress levels, recent life experiences, and health promoting behaviors among male and female student athletes at two levels of intercollegiate competition (NAIA and NCAA Division I), (2) identify the categories of hassles which were the most prevalent in this sample of student athletes, (3) investigate the relationship between perceived stress levels and health promoting behaviors in an overall sample of student athletes and in both groups of student athletes, and (4) compare differences in the relationship between perceived stress levels and health promoting behaviors between the two levels of intercollegiate competition and gender.

#### *Findings*

Data was obtained from 98 male and female student athletes enrolled at two institutions of differing levels of intercollegiate competition who completed an online

survey consisting of the Perceived Stress Scale (PSS-10), the Inventory of College Students' Recent Life Experiences (ICSRLE), and the Health Promoting Lifestyle Profile II (HPLP-II). Overall, this sample of collegiate student athletes reported moderate levels of perceived stress. When separating the participants by gender, differences were seen with female student athletes reporting higher levels of perceived stress than male student athletes. When separating the participants by level of intercollegiate competition, those at the NAIA level of intercollegiate competition reported significantly more stress than those at the NCAA Division I level.

Student athletes in this sample reported that hassles, as measured by the ICSRLE, were only slightly a part of their lives. Experiences which hassled these participants the most were time pressures, developmental challenge, and academic alienation. Student athletes at the NAIA level of intercollegiate competition reported being more hassled than those at the NCAA Division I level.

The HPLP-II score of the entire sample was  $2.41 \pm .46$ , indicating a typical or average level of wellness. Overall, female student athletes reported engaging in significantly more health promoting behaviors than male student athletes. Female student athletes also scored higher in all aspects (subscales) of a health promoting lifestyle. No significant differences in health promoting behaviors were found when comparing the two levels of intercollegiate competition.

The correlation between stress and health promoting behaviors revealed a significant negative relationship. This relationship was negative for all aspects (subscales) of the health promoting lifestyle, with stress accounting for 2% to 21.8% of the variance in health promoting behaviors. When comparing levels of intercollegiate

competition, the health promoting lifestyle and health promoting behaviors were all also negatively associated with stress, with stress accounting for 1.61% to 21.2% of the variance in health promoting behaviors in NAIA student athletes and 8.29% to 27.1% of the variance in health promoting behaviors in NCAA Division I student athletes.

Differences in the relationship between stress and health promoting behaviors across gender, level of intercollegiate competition, and the combination of the two was examined via a multivariate analysis of variance (MANOVA). Results from the MANOVA revealed significant differences in stress and health promoting behaviors across gender and across level of intercollegiate competition, but not on the combination of the two. Post hoc analysis of perceived stress scores showed significant differences based on level of intercollegiate competition, with NAIA student athletes reporting more stress than NCAA Division I student athletes. No significant differences were seen in stress scores based on neither gender nor the combination of level of intercollegiate competition and gender. Pos hoc analysis of health promoting behaviors revealed significant differences in health promoting behaviors based on gender, with female student athletes reporting more participation in health promoting behaviors than male student athletes. No significant differences in health promoting behaviors were seen across level of intercollegiate competition or the combination of gender and level of intercollegiate competition.

#### *Limitations*

This study was conducted at two distinctly different Midwestern colleges which varied in student body size, student body demographics, cost of attendance, and level of intercollegiate competition. Therefore, data collected and participants used may not be

representative of collegiate student athletes across the country. Random sampling was not employed, rather convenience sample was used. Thus, the results may be limited in their generalizability to other populations. The data were collected using self-report measures. Therefore, the accuracy of the self-reported information cannot be guaranteed.

### *Conclusions*

Within the limitations of this study, it was concluded that:

- (1) Collegiate student athletes in this sample reported moderate levels of perceived stress, despite the immense demands of their dual roles as student and athlete.
- (2) They were most hassled by time pressures, which is to be expected given their stage and position in life.
- (3) Despite being perceived as exceptionally healthy or health conscious by those not in the realm of collegiate athletics, student athletes in this sample reported only an average or typical level of a health promoting lifestyle and were deficient in several areas of health promoting behaviors leaving significant room for improvement.
- (4) In all student athletes, the relationship between perceived stress levels and health promoting behaviors was negative, supporting the idea that stress contributes to pathological states not only due to the direct physiological strain it places on the body, but also through changes in one's behavior.
- (5) The relationship between stress and health promoting behaviors was significantly different based on gender or level of intercollegiate competition, but not the combination of the two which suggests that the differences exist independently of

each other. Thus, an intervention must take into consideration differences in this relationship, or it may not be effective.

### *Recommendations*

- (1) Health educators, administrators, and other support personnel working with collegiate student athletes can have an immense impact on the health promoting behaviors of these individuals. Interventions designed to address the areas (health responsibility and stress management) in which student athletes may be deficient can go a long way to help improve their behaviors in these areas.
- (2) Faculty, staff, coaches, and student athlete support personnel need to be aware of the levels of stress and daily hassles which student athletes are perceiving or experiencing and be aware of the impact such stresses and hassles can have on health, wellness, and behavior. They also must be sensitive to the additional demands above and beyond academic responsibilities and/or athletic participation faced by student athletes
- (3) Gender specific interventions and health promotion strategies for the areas where large differences between genders appeared (in this sample: nutrition, spiritual growth, and interpersonal relations) should be implemented in athletic departments to help meet the special gender specific needs of student athletes.

### *Recommendations for Universities and their Student-Athletes*

- (1) The leading source of stress in all student athletes was “time pressure.” Often times, moderately important tasks turn into being critically urgent when students

procrastinate or when they are cast aside for insignificant activities to the detriment of the important tasks. Courses or lessons in time management, prevention of procrastination, and/or how to focus time and efforts may go a long way in decreasing levels and sources of stress. They could also help student athletes learn to manage/delegate their time more efficiently so that they can devote proper energy and effort to both academics and athletics.

- (2) All student athletes scored in the average level of health promoting lifestyle and below average or typical for the subscales of health promoting behaviors. For a population which is perceived as inherently healthier than non-athletes, low scores may represent the invulnerability student athletes feel during the college years. Because many chronic health conditions begin early and develop gradually over time and that the earlier a habit is formed in life the more likely it is to persist, courses which provide not only information, but also skills building on how to apply and practice health promoting behaviors in their own lives, could assist student athletes in living longer, healthier, and disease free lives.
- (3) Male student athletes consistently reported lower levels of health promoting behaviors than female student athletes. Therefore, courses which target males and deficiencies specific to males could assist to narrow the gap between genders.
- (4) Since the lowest health promoting behavior subscale was health responsibility, offering student athletes experiences which encourage and empower them to take personal responsibility over their own personal health and wellness may help to lessen this deficiency. Further Larouche (1998) suggests that by taking responsibility for one's health, students may be more likely to increase the



frequency of exercise, manage and reduce stress, and engage more in all aspects of a health promoting lifestyle. Therefore, targeting this area of health promotion may have a domino effect on other health promoting behaviors.

- (5) Another low scoring health promoting subscale was stress management. Stress is an inevitable part of life during the college years, and the means by which an individual copes with stress varies. Providing opportunities for student athletes to learn and practice new ways to cope with stress would be beneficial.

#### *Recommendations for Future Research*

- (1) Replication of the study in a broader segment of the student athlete population at varying levels of intercollegiate competition, differing conferences of play, and/or different regions of the country to explore if differences exist based on such factors.
- (2) A longitudinal study to investigate changes in the perceived stress levels, categories of hassles, health promoting behaviors, and the relationship between stress and health promoting behaviors over time in undergraduate student athletes.
- (3) Implementing interventions specific to deficient health promoting behaviors in student athletes and recording the efficacy/influence of such interventions on the behaviors of student athletes and the length of behavior change.

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## APPENDICES

APPENDIX A  
OKLAHOMA STATE UNIVERSITY  
INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

Oklahoma State University Institutional Review Board

Date: Tuesday, October 21, 2008  
IRB Application No: EDC8150  
Proposal Title: Perceived Stress Levels and Health Promoting Behaviors in Collegiate Student Athletes

Reviewed and Processed as: Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 10/20/2009

Principal

Investigator(s):

Amarce Dlin ✓ Steven Edwards  
1133 Spring Hollow Rd., #224 3250 Willard  
Okla. City, OK 73120 Stillwater, OK 74078

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The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 46 CFR 46.

The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approved period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700; beth.mcternan@okstate.edu).

Sincerely,

  
Sarah Kennison, Chair  
Institutional Review Board

APPENDIX B  
OKLAHOMA CITY UNIVERSITY  
INSTITUTIONAL REVIEW BOARD APPROVAL LETTER





**OKLAHOMA CITY UNIVERSITY**

Perree College of Arts and Sciences • Office of the Dean  
5501 N. Blackwelder • Oklahoma City, Oklahoma 73106-4103 • (405) 521-6446 • Fax (405) 531-8147

October 27, 2008

Amanda Divin  
Department of Kinesiology and Exercise Studies  
Oklahoma City University

Dear Dr. Divin:

Your research proposal, *Perceived stress levels and health promoting behaviors in collegiate student athletes* (supervised by Dr. Steve Edwards at Oklahoma State and previously approved as an exempt study) meets the criteria for exempt status and has been approved in accordance with the Code of Federal Regulations governing human subjects research (Title 45, Part 6, *Protection of Human Subjects*) and Oklahoma City University Institutional Review Board policies and procedures.

This approval expires October 27, 2009. On or before that date please submit either a Periodic Progress Report (PPR) if the project will continue, or a final PPR if the project has ended. Please note that if it becomes necessary to modify the protocol or consent form you have described in your proposal, an amending request must be submitted to the IRB chairperson for review and approval before implementing any such changes.

Sincerely yours,

Terry R. Conley, Ph.D.  
IRB Chairperson

APPENDIX C  
DEMOGRAPHIC QUESTIONS

## Demographics Questionnaire

1. What university do you attend?
  - a. OSU
  - b. OCU
2. Age?
3. Gender?
  - a. M
  - b. F
4. What sport do you play?
5. What is your major?
6. Are you on scholarship?
  - a. If so, what level?
    - i. Full ride
    - ii. Tuition only
    - iii. Room and board
    - iv. Books
    - v. Don't know
7. Are you currently "in season" or "out of season"?
8. Did you have a test or major assignment due one week before or one week after taking this survey?
9. Are you a smoker?
  - a. If you are a smoker, on average how many packs of cigarettes do you smoke per week?

- b. If you are a smoker, do you smoke more or less in times of stress?
- 10. What are your living arrangements?
  - a. On campus
  - b. Off campus
- 11. What is your relationship status?
  - a. Single
  - b. Casually dating
  - c. In a relationship
  - d. Married
  - e. Other
- 12. Do you have a job?
  - a. If so, is it on or off campus?
  - b. Hours per week you work?
- 13. How many days per week you work out with the team?
  - a. How many hours per day do you work out with the team?
- 14. How many days per week do you workout alone (without the team)?
  - a. How many hours per day do you work out alone?
- 15. How many academic hours are you enrolled in this semester?
- 16. Please list the top three sources of stress in your life
- 17. Please list the three main/usual ways you cope/deal with stress in your life.

APPENDIX D  
PERCIEVED STRESS SCALE

## Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

Name \_\_\_\_\_ Date \_\_\_\_\_

Age \_\_\_\_\_ Gender (Circle): M F Other \_\_\_\_\_

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly? ..... 0 1 2 3 4
2. In the last month, how often have you felt that you were unable to control the important things in your life? ..... 0 1 2 3 4
3. In the last month, how often have you felt nervous and "stressed"? ..... 0 1 2 3 4
4. In the last month, how often have you felt confident about your ability to handle your personal problems? ..... 0 1 2 3 4
5. In the last month, how often have you felt that things were going your way? ..... 0 1 2 3 4
6. In the last month, how often have you found that you could not cope with all the things that you had to do? ..... 0 1 2 3 4
7. In the last month, how often have you been able to control irritations in your life? ..... 0 1 2 3 4
8. In the last month, how often have you felt that you were on top of things? .. 0 1 2 3 4
9. In the last month, how often have you been angered because of things that were outside of your control? ..... 0 1 2 3 4
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? ..... 0 1 2 3 4

Please feel free to use the *Perceived Stress Scale* for your research.

### Mind Garden, Inc.

info@mindgarden.com

www.mindgarden.com

#### References

The PSS Scale is reprinted with permission of the American Sociological Association, from Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 386-396.  
Cohen, S. and Williamson, G. Perceived Stress in a Probability Sample of the United States. Spacapan, S. and Oskamp, S. (Eds.) *The Social Psychology of Health*. Newbury Park, CA: Sage, 1988.

APPENDIX E

INVENTORY OF COLLEGE STUDENT'S RECENT LIFE EXPERIENCES

## Inventory of College Students' Recent Life Experiences (ICSRLE)

Following is a list of experiences which many students have some time or other. Please indicate for each experience how much it has been a part of your life **over the past month**. Put a “1” in the space provided next to an experience if it was **not at all part** of your life over the past month (e.g., “trouble with mother in law - 1”); “2” for an experience which was **only slightly** part of your life over that time; “3” for an experience which was “**distinctly** part of your life; and “4” for an experience which was **very much** part of your life over the past month.

### Intensity of Experience over Past Month

- 1 = **not at all** part of my life
- 2 = **only slightly** part of my life
- 3 = **distinctly** part of my life
- 4 = **very much** part of my life

1. Conflicts with boyfriend's/girlfriend's/spouse's family \_\_\_\_\_
2. Being let down or disappointed by friends \_\_\_\_\_
3. Conflict with professor(s) \_\_\_\_\_
4. Social rejection \_\_\_\_\_
5. Too many things to do at once \_\_\_\_\_
6. Being taken for granted \_\_\_\_\_
7. Financial conflicts with family members \_\_\_\_\_
8. Having your trust betrayed by a friend \_\_\_\_\_
9. Separation from people you care about \_\_\_\_\_
10. Having your contributions overlooked \_\_\_\_\_
11. Struggling to meet your own academic standards \_\_\_\_\_
12. Being taken advantage of \_\_\_\_\_
13. Not enough leisure time \_\_\_\_\_
14. Struggling to meet the academic standards of others \_\_\_\_\_



Intensity of Experience over Past Month

1 = **not at all** part of my life

2 = **only slightly** part of my life

3 = **distinctly** part of my life

4 = **very much** part of my life

15. A lot of responsibilities \_\_\_\_\_
16. Dissatisfaction with school \_\_\_\_\_
17. Decisions about intimate relationship(s) \_\_\_\_\_
18. Not enough time to meet your obligations \_\_\_\_\_
19. Dissatisfaction with your mathematical ability \_\_\_\_\_
20. Important decisions about your future career \_\_\_\_\_
21. Financial burdens \_\_\_\_\_
22. Dissatisfaction with your reading ability \_\_\_\_\_
23. Important decisions about your education \_\_\_\_\_
24. Loneliness \_\_\_\_\_
25. Lower grades than you hoped for \_\_\_\_\_
26. Conflict with teaching assistant(s) \_\_\_\_\_
27. Not enough time for sleep \_\_\_\_\_
28. Conflicts with your family \_\_\_\_\_
29. Heavy demands from extra-curricular activities \_\_\_\_\_
30. Finding courses too demanding \_\_\_\_\_
31. Conflicts with friends \_\_\_\_\_
32. Hard effort to get ahead \_\_\_\_\_
33. Poor health of a friend \_\_\_\_\_
34. Disliking your studies \_\_\_\_\_
35. Getting “ripped off” or cheated in the purchase of services. \_\_\_\_\_

Intensity of Experience over Past Month

- 1 = **not at all** part of my life
- 2 = **only slightly** part of my life
- 3 = **distinctly** part of my life
- 4 = **very much** part of my life

- 36. Social conflicts over smoking \_\_\_\_\_
- 37. Difficulties with transportation \_\_\_\_\_
- 38. Disliking fellow student(s) \_\_\_\_\_
- 39. Conflicts with boyfriend/girlfriend/spouse \_\_\_\_\_
- 40. Dissatisfaction with your ability at written expression \_\_\_\_\_
- 41. Interruptions of your school work \_\_\_\_\_
- 42. Social isolation \_\_\_\_\_
- 43. Long waits to get service (e.g., at banks, stores, etc.) \_\_\_\_\_
- 44. Being ignored \_\_\_\_\_
- 45. Dissatisfaction with your physical appearance \_\_\_\_\_
- 46. Finding course(s) uninteresting \_\_\_\_\_
- 47. Gossip concerning someone you care about \_\_\_\_\_
- 48. Failing to get expected job \_\_\_\_\_
- 49. Dissatisfaction with your athletic skills \_\_\_\_\_

APPENDIX F

HEALTH PROMOTING LIFESTYLE PROFILE - II

## LIFESTYLE PROFILE II

DIRECTIONS: This questionnaire contains statements about your *present* way of life or personal habits. Please respond to each item as accurately as possible, and try not to skip any item. Indicate the frequency with which you engage in each behavior by circling:

N for never, S for sometimes, O for often, or R for routinely

		NEVER	SOMETIMES	OFTEN	ROUTINELY
1.	Discuss my problems and concerns with people close to me.	N	S	O	R
2.	Choose a diet low in fat, saturated fat, and cholesterol.	N	S	O	R
3.	Report any unusual signs or symptoms to a physician or other health professional.	N	S	O	R
4.	Follow a planned exercise program.	N	S	O	R
5.	Get enough sleep.	N	S	O	R
6.	Feel I am growing and changing in positive ways.	N	S	O	R
7.	Praise other people easily for their achievements.	N	S	O	R
8.	Limit use of sugars and food containing sugar (sweets).	N	S	O	R
9.	Read or watch TV programs about improving health.	N	S	O	R
10.	Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber).	N	S	O	R
11.	Take some time for relaxation each day.	N	S	O	R
12.	Believe that my life has purpose.	N	S	O	R
13.	Maintain meaningful and fulfilling relationships with others.	N	S	O	R
14.	Eat 6-11 servings of bread, cereal, rice and pasta each day.	N	S	O	R
15.	Question health professionals in order to understand their instructions.	N	S	O	R
16.	Take part in light to moderate physical activity (such as sustained walking 30-40 minutes 5 or more times a week).	N	S	O	R
17.	Accept those things in my life which I can not change.	N	S	O	R
18.	Look forward to the future.	N	S	O	R
19.	Spend time with close friends.	N	S	O	R
20.	Eat 2-4 servings of fruit each day.	N	S	O	R
21.	Get a second opinion when I question my health care provider's advice.	N	S	O	R
22.	Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling).	N	S	O	R
23.	Concentrate on pleasant thoughts at bedtime.	N	S	O	R
24.	Feel content and at peace with myself.	N	S	O	R
25.	Find it easy to show concern, love and warmth to others.	N	S	O	R
26.	Eat 3-5 servings of vegetables each day.	N	S	O	R

	NEVER	SOMETIMES	OFTEN	ROUTINELY
27. Discuss my health concerns with health professionals.	N	S	O	R
28. Do stretching exercises at least 3 times per week.	N	S	O	R
29. Use specific methods to control my stress.	N	S	O	R
30. Work toward long-term goals in my life.	N	S	O	R
31. Touch and am touched by people I care about.	N	S	O	R
32. Eat 2-3 servings of milk, yogurt or cheese each day.	N	S	O	R
33. Inspect my body at least monthly for physical changes/danger signs.	N	S	O	R
34. Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walking).	N	S	O	R
35. Balance time between work and play.	N	S	O	R
36. Find each day interesting and challenging.	N	S	O	R
37. Find ways to meet my needs for intimacy.	N	S	O	R
38. Eat only 2-3 servings from the meat, poultry, fish, dried beans, eggs, and nuts group each day.	N	S	O	R
39. Ask for information from health professionals about how to take good care of myself.	N	S	O	R
40. Check my pulse rate when exercising.	N	S	O	R
41. Practice relaxation or meditation for 15-20 minutes daily.	N	S	O	R
42. Am aware of what is important to me in life.	N	S	O	R
43. Get support from a network of caring people.	N	S	O	R
44. Read labels to identify nutrients, fats, and sodium content in packaged food.	N	S	O	R
45. Attend educational programs on personal health care.	N	S	O	R
46. Reach my target heart rate when exercising.	N	S	O	R
47. Pace myself to prevent tiredness.	N	S	O	R
48. Feel connected with some force greater than myself.	N	S	O	R
49. Settle conflicts with others through discussion and compromise.	N	S	O	R
50. Eat breakfast.	N	S	O	R
51. Seek guidance or counseling when necessary.	N	S	O	R
52. Expose myself to new experiences and challenges.	N	S	O	R

© S.N. Walker, K. Sechrist, N. Pender, 1995.  
 For information about this scale go to [www.unmc.edu/nursing/](http://www.unmc.edu/nursing/).

APPENDIX G

COVER SHEET/ INFORMED CONSENT PAGE FOR SURVEY

### Cover Sheet/Informed Consent

**Project Title:** Perceived Stress Levels and Health Promoting Behaviors in Collegiate Student Athletes

**Investigator:** Amanda L. Divin, M.Ed., Doctoral Candidate  
Steve Edwards, Ph.D.

**Purpose:** The purpose of this study is to explore perceived stress levels, health promoting behaviors, and the relationship between them in student athletes.

**Procedures:** The project will consist of the participant answering questions in an online survey which contains questions asking them to rate the frequency and/or intensity of their stress levels, life experiences, and health promoting behaviors. Completing the survey will take 20-30 minutes. This data will be used to examine the relationships between the aforementioned variables.

**Risks:** There are no known risks associated with this project which are greater than those ordinarily encountered in daily life.

**Benefits:** Currently very little research exists in these areas. This study will benefit the research community by furthering knowledge about the perceived stress levels, health promoting behaviors, and the relationship between the two in collegiate student athletes.

**Confidentiality** Data will be stored electronically in an SPSS data file on the password protected hard drive of the principle investigator's computer located on the OCU campus in Loeffler 119b. The computer is located in a locked office (Loeffler 199b), and no one will have access to the data and/or results obtained. Additionally, no subject identifiers will be present with the data. An electronic copy of the dataset will be kept indefinitely in case future studies wish to attempt the replication of our findings. Data collected will be used for study purposes only. Please note that the OSU Institutional Review Board has the authority to inspect consent records and data files to assure compliance with approved procedures.

**Compensation:** Oklahoma State University student athletes will be awarded points in the Orange Cup Competition upon turning in copy of the confirmation page with their name written on the top of it to Sally Randolph, the CHAMPS/Life skills coordinator. Other opportunities to earn points in the Orange Cup Competition include participation in the areas of CHAMPS/Life Skills seminars, community service, Student-Athlete Advisory Committee (SAAC), academics, athletics, career, and athletes supporting athletes.

Oklahoma State Univ. IRB
Approved 10/21/08
Expires 10/20/09
IRB# EDO8150

Oklahoma City University student athletes will be awarded extra credit in KES courses. Non-student athletes are also able to participate and earn extra credit. Other extra credit opportunities include writing a brief research paper, attending a university sponsored health-related event, and/or completing various worksheets. In order to receive extra

credit, students are to print out a copy of the survey's confirmation page, print their name on top of it, and turn it in to their instructor.

**Contact:** Should you have any questions regarding this study, please contact:

Amanda L. Divin  
Oklahoma City University  
Department of Kinesiology and Exercise Studies  
2501 N. Blackwelder  
Oklahoma City, OK 73106  
405-208-5016  
amanda.divin@okstate.edu

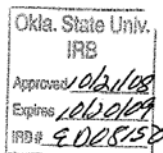
Dr. Steve Edwards  
Oklahoma State University  
325U Willard  
Stillwater, OK 74078  
405-744-7476  
steve.edwards@okstate.edu

If you have questions about your rights as a research volunteer, you may contact:

Dr. Shelia Kennison, IRB Chair  
219 Cordell North  
Oklahoma State University  
Stillwater, OK 74078  
405-744-1676  
[irb@okstate.edu](mailto:irb@okstate.edu)

**Participant Rights:** Participation in this project is voluntary. If at any time you wish to discontinue the activity, you may do so without any reprisal.

By participating in this study, I indicate that I accept the aforementioned terms. I also understand that all information I provide is strictly confidential and will be used for study purposes only. I also understand that I will remain anonymous throughout the course of this study. I am free to discontinue participation during data collection at any time. **My agreement to take part in this study is signified by my participation.**





APPENDIX H  
COPY OF ONLINE SURVEY



Oklahoma State University  
 College of Education  
 School of Applied Health and Educational Psychology

## Perceived Stress Levels and Health Promoting Behaviors in Collegiate Student Athletes

*Directions: Please answer the following questions to the best of your ability.*

What university do you currently attend?

Oklahoma State University (OSU)     
  Oklahoma City University (OCU)

What is your age?

What is your gender?

Male       Female

What sport do you play?

What is your major?

What type or level of athletic scholarship are you on?

<input type="radio"/> None, I am not on an athletic scholarship	<input type="radio"/> Full ride
<input type="radio"/> Tuition only	<input type="radio"/> Room and board
<input type="radio"/> Books	<input type="radio"/> Don't know, but I am on some type of athletic scholarship

Is your sport currently "in season" or "out of season"?

In season       Out of season

Did you or do you have a test or major assignment due *one week before* or *one week after* taking this survey?

<input type="radio"/> Yes	<input type="radio"/> No
---------------------------	--------------------------

Are you a smoker?	
<input type="radio"/> Yes	<input type="radio"/> No
If you are a smoker, on average how many <b>packs</b> of cigarettes do you smoker <b>per week</b> ? <input style="width: 50px;" type="text"/>	
If you are a smoker, do you smoke more or less during times of stress?	
<input type="radio"/> I smoke <b>more</b> during times of stress	<input type="radio"/> I smoke <b>less</b> during times of stress

What are your living arrangements?	
<input type="radio"/> On campus	<input type="radio"/> Off campus

What is your relationship status?	
<input type="radio"/> Single	<input type="radio"/> Casually dating
<input type="radio"/> In a relationship	<input type="radio"/> Married
<input type="radio"/> other: <input style="width: 100px;" type="text"/>	

Do you currently have a job?	
<input type="radio"/> Yes	<input type="radio"/> No
If you do have a job, is it on or off campus?	
<input type="radio"/> On campus	<input type="radio"/> Off campus
If you do have a job, on average how many hours do you work per week? <input style="width: 50px;" type="text"/>	

How many <b>days per week</b> do you work out or practice <i>with your team</i> ?	<input style="width: 50px;" type="text"/>
How many <b>hours per day</b> do you work out or practice <i>with the team</i> ?	<input style="width: 50px;" type="text"/>
How many <b>days per week</b> do you workout or practice <i>alone</i> (without the team)?	<input style="width: 50px;" type="text"/>
How many <b>hours per day</b> do you work out or practice <i>alone</i> (without the team)?	<input style="width: 50px;" type="text"/>
How many academic hours or credits are you enrolled in this semester?	<input style="width: 50px;" type="text"/>

Please list the top three sources of stress in your life.	
<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 50px;" type="text"/>
<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 50px;" type="text"/>
<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 50px;" type="text"/>
Please list the three usual or main ways you cope or deal with stress in your life.	
<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 50px;" type="text"/>
<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 50px;" type="text"/>
<input style="width: 95%; height: 20px;" type="text"/>	<input style="width: 50px;" type="text"/>

**Directions:**

*The questions below ask you about your thoughts and feelings during the last month.  
For each question, please indicate how often you have thought or felt a certain way.*

	Never	Almost Never	Sometimes	Fairly Often	Very Often
In the last month, how often have you been upset because of something that happened unexpectedly?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt that you were unable to control the important things in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt nervous and/or "stressed"?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt confident about your ability to handle your personal problems?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt that things were going your way?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you found that you could NOT cope with all the things that you had to do?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you been able to control irritations in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt that you were on top of things?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you been angered because of things that were outside of your control?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Directions:**  
*The following is a list of experiences which many college students have at sometime or other.  
For each experience, please indicate how much it has been a part of your life over the past month.*

	not at all a part of my life	only slightly a part of my life	distinctly part of my life	very much part of my life
Conflicts with my boyfriend's, girlfriend's, or spouse's family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being let down or disappointed by friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conflict with professor(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social rejection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Too many things to do at once	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being taken for granted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial conflicts with family members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having your trust betrayed by a friend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Separation from people you care about	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Having your contributions overlooked	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Struggling to meet your own academic standards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being taken advantage of	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	not at all a part of my life	only slightly a part of my life	distinctly part of my life	very much part of my life

Not enough leisure time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Struggling to meet the academic standards of others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A lot of responsibilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dissatisfaction with school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decisions about intimate relationship(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not enough time to meet your obligations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dissatisfaction with your mathematical ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Important decisions about your future career	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial burdens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dissatisfaction with your reading ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Important decisions about your education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Loneliness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<b>not at all a part of my life</b>	<b>only slightly a part of my life</b>	<b>distinctly part of my life</b>	<b>very much part of my life</b>
Lower grades that you hoped for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conflict with teaching assistant(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not enough time for sleep	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conflicts with your family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Heavy demands from extracurricular activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Finding courses too demanding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conflicts with friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hard effort to get ahead	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poor health of a friend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Disliking your studies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Getting "ripped off" or cheated in the purchase of products or services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social conflicts over smoking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<b>not at all a part of my life</b>	<b>only slightly a part of my life</b>	<b>distinctly part of my life</b>	<b>very much part of my life</b>
Difficulties with transportation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Disliking fellow student(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conflicts with boyfriend, girlfriend, or spouse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dissatisfaction with your ability at written expression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interruptions of your school work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social isolation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Long waits to get service (e.g. at banks, stores, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being ignored	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dissatisfaction with your physical appearance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Finding course(s) uninteresting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Gossip concerning someone you care about	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Failing to get expected job	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dissatisfaction with your athletic skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Directions:**  
 The following questions contain statements about your present way of life or personal habits.  
 Please respond to each item as accurately as possible by indicating the frequency with which you engage in each behavior.  
 Try not to skip any item(s).

	Never	Sometimes	Often	Routinely
Discuss my problems and concerns with people close to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Choose a diet low in fat, saturated fat, and cholesterol	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Report any unusual signs or symptoms to a physician or other health professional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Follow a planned exercise program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Get enough sleep	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feel I am growing and changing in positive ways	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Praise other people easily for their achievements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Limit use of sugars and food containing sugar (e.g. sweets)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Read or watch TV programs about improving health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exercise vigorously for 20 or more minutes at least 3 times a week (such as brisk walking, jogging, bicycling, aerobics, using the stair climber, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Take some time for relaxation each day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Believe that my life has purpose	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Never	Sometimes	Often	Routinely
Maintain meaningful and fulfilling relationships with others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat 6-11 servings of bread, cereal, rice, and/or pasta each day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Question health professionals in order to understand their instructions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Take part in light to moderate physical activity (such as sustained walking) 30-40 minutes 5 or more times a week	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accept those things in my life which I cannot change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Look forward to the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spend some time with close friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat 2-4 servings of fruit each day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Get a second opinion when I question my health care provider's advice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Take part in leisure-time (recreational) activities (such as swimming, dancing, bicycling, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Concentrate on pleasant thoughts at bedtime	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feel content and at peace with myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Never	Sometimes	Often	Routinely
Find it easy to show concern, love, and warmth to others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat 3-5 servings to vegetables each day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discuss my health concerns with health professionals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do stretching at least 3 times per week	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

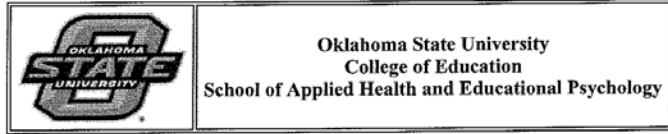
Use specific methods to control my stress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work toward long-term goals in my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Touch and am touched by people I care about	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat 2-3 servings of milk, yogurt, or cheese each day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inspect my body at least once a month for physical changes or danger signs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Get exercise during the usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Balance time between work and play	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Find each day interesting and challenging	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<b>Never</b>	<b>Sometimes</b>	<b>Often</b>	<b>Routinely</b>
Find ways to meet my needs for intimacy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat only 2-3 servings of meat, poultry, fish, dried beans, eggs, and/or nuts each day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ask for information from health professionals about how to take good care of myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Check my pulse rate when exercising	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Practice relaxation or meditation for 15-20 minutes each day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Am aware of what is important to me in life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Get support from a network of caring people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Read labels to identify nutrients, fats, and sodium content in packaged food(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attend educational programs on personal health care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reach my target heart rate when exercising	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pace myself to prevent tiredness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feel connected with some force greater than myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<b>Never</b>	<b>Sometimes</b>	<b>Often</b>	<b>Routinely</b>
Settle conflicts with others through discussion and compromise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eat breakfast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seek guidance or counseling when necessary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Expose myself to new experiences and challenges	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Amanda Divin  
 amanda.divin@okstate.edu  
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APPENDIX I

COPY OF ONLINE SURVEY CONFIRMATION PAGE





~ Thank you ~

You have successfully completed the survey

*Perceived Stress Levels and  
Health Promoting Behaviors  
in Collegiate Student Athletes*

your participation is greatly appreciated!

*You may want to print this page for your records*

0 0 5 0 5

Close your Browser Window  
to exit this survey

Amanda Divin  
[amanda.divin@okstate.edu](mailto:amanda.divin@okstate.edu)  
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## VITA

Amanda Leigh Divin

Candidate for the Degree of

Doctor of Philosophy

Dissertation: PERCEIVED STRESS LEVELS AND HEALTH PROMOTING BEHAVIORS AMONG NAIA AND NCAA DIVISION I STUDENT ATHLETES

Major Field: Health, Leisure, and Human Performance with a specialization in Health Education and Promotion

### Biographical:

Personal Data: Born June 12, 1978, in Bellville, Texas, to Alice and Jerry Divin

Education: Graduated from Waller High School, Waller, Texas, May 1996; received Bachelors of Science degree from The University of Texas at Austin, May 2000; received Masters of Education degree in Kinesiology (Clinical Exercise Physiology) from The University of Texas at Austin, December 2004; Completed the requirements for the Doctor of Philosophy in Health, Leisure, and Human Performance at Oklahoma State University, Stillwater, Oklahoma in July 2009.

Experience: Adjunct Faculty in the Division of Health, Physical Education, and Fitness, Houston Community College, (2002-2003); Teaching Assistant in the Department of Kinesiology and Health Education, The University of Texas at Austin, (Spring and Fall 2004); Health and Fitness Specialist for the Well at Dell Initiative, Medi-Fit Corporate Services, Austin, Texas, (2005); Exercise Technologist for Metabolic Testing Services (Met-Test), Monroe, Louisiana, (2005-2006); Teaching and Research Associate in the Department of Health and Human Performance, Oklahoma State University, (2006-2008); Assistant Professor in the Department of Kinesiology and Exercise Science, Oklahoma City University, (2008-2009).

Professional Memberships: American College of Sports Medicine (ACSM), American Alliance for Health, Physical Education, Recreation, and Dance (AAHPERD), American Association of Health Education (AAHE).

Name: Amanda Leigh Divin

Date of Degree: July, 2009

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: PERCEIVED STRESS LEVELS AND HEALTH PROMOTING  
BEHAVIORS AMONG NAIA AND NCAA DIVISION I STUDENT  
ATHLETES

Pages in Study: 152

Candidate for the Degree of Doctor of Philosophy

Major Field: Health, Leisure, and Human Performance

Scope and Method of Study: The purpose of this study was to assess perceived stress levels and health promoting behaviors among collegiate student athletes. The relationship between stress and health promoting behaviors was also examined, as well as if differences in this relationship existed based on gender and/or level of intercollegiate competition. Fifty three student athletes competing at a NAIA institution and 45 student athletes competing at a NCAA Division I institution completed the Perceived Stress Scale, The Inventory of College Students' Recent Life Experiences, and the Health Promoting Lifestyle Profile II.

Findings and Conclusions: All student athletes reported moderate levels of perceived stress and a typical level of wellness. A significant negative relationship existed between stress and health promoting behaviors, supporting the idea that stress contributes to pathological states through changes in one's health behavior. The amount of variance in health promoting behaviors accounted for by stress was different based on level of competition, suggesting that stress affects health promoting behaviors differently in the two levels of competition. Results from a MANOVA indicate that differences exist in stress and health promoting behaviors across gender and level of competition, but not the combination of the two. Post hoc analysis showed that participants at the NAIA institution reported significantly more stress than those at the NCAA Division I institution, and that females reported more health promoting behaviors than males. These results suggest that differences in the relationship between stress and health promoting behaviors which exist between genders operate independently from differences which exist in level of competition. Further research examining stress, health promoting behaviors, and the relationship in between should be performed to further clarify how, if, and why these variables relate, and possibly change, across time and type of participant.

ADVISER'S APPROVAL: Dr. Steven Edwards

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