

Female Collegiate Athletes and Eating Disorders:

A Population at-Risk?

by

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(ABSTRACT)

This study compared the prevalence of eating disorder behavior between collegiate athletes (n = 206) and college female nonathletes (n = 197).

Numerous eating disorder studies conducted on the female college population have shown this population to be at greater risk of developing eating disorders than the general population. Furthermore, some studies have found that women athletes are even at higher risk of eating disorders, but the research has produced conflictual and inconclusive evidence.

In this study, it was hypothesized that athletes would have higher rates of disordered eating. However, a reverse outcome occurred. The t-test conducted on the EAT-26 scores from the two groups showed that the nonathletes females displayed significantly higher eating disordered behavior than the female athletes. Additionally, relationships between sports advocating body leanness as possible risk factors of eating disorders were

investigated and no significance was found. The study did find a link between age and eating disorder behavior among nonathletes.

Traditionally, it has been assumed that collegiate female athletes are more likely to develop an eating disorder because of the intense training and performance demands that are added to the normal stressors of college life. This study challenges this assumption. The implications from the current study suggest additional research is needed to further investigate the specific environmental elements that may predispose subpopulations of college women to develop eating disorders.

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DEDICATION

This study is dedicated to the two greatest teachers in my life.

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CHAPTER 1

Introduction

Within the last fifteen years, public awareness of eating disorders has increased. The recent acknowledgment of these disorders is related to the media's coverage of high profile women athletes and entertainers who have suffered or died from this illness (Holliman, 1991) . There has been great speculation in the mental health profession as to the etiology of eating disorders. Research has linked familial, sociocultural, biopsychological, and individual factors that are too common among eating disorder patients to ignore. The most frequent themes found in individuals with eating disorders include: a high drive to achieve, perfectionists traits, low self-awareness, enmeshed or dysfunctional families-of-origin, and self-worth linked to external validation like being thin (Black, 1991;Bruch, 1973; Garner & Garfinkel, 1997). Western society's emphasis on youthfulness, thinness, and beauty is thought to contribute to eating disorders (Garner & Garfinkel, 1980; Raphael & Lacey, 1992; Striegel-Moore, Silberstein, & Rodin, 1986). Although multiple variables exist within eating disorder symptomatology it is still unknown which factors contribute the most to an individual developing an eating disorder.

The Diagnostic Statistical Manual of Mental Disorders, fourth edition (DSM IV) reveals that 90% of the patients who are diagnosed with anorexia nervosa or bulimia nervosa are women, with 17 to 18 as the mean age of onset (DSM IV, 1994). It is estimated that one to three percent of the general female population meet the DSM-IV criteria for eating disorders (DSM-IV, 1994; Nattiv, 1994). Studies that have focused just on the female college population indicate the incidents of eating disorders increases to between 4 to 19 percent (Borgen & Corbin, 1987). Previous eating disorder studies conducted on college campuses seem to support these findings. In 1985, Ollendick and Hart found that 5% of the women who participated in their study exhibited a binge-purge cycle of behavior. A comprehensive study was conducted (Ratcliff, 1986) that sampled 771 undergraduates women, the results indicated that 17% of the women who completed the survey could be classified as having Bulimia Nervosa (Ratcliff, 1986). Both of these projects support previous studies that estimate eating disorders among college women to be between 4% to 19% (Borgen & Corbin, 1987).

Unfortunately, the seriousness of eating disorders is often unknown to the general population and to many clinicians. Negative outcomes of eating disorders include long-term psychological problems, menstrual dysfunction, electrolyte imbalances, stress fractures to the skeletal system, and premature

osteoporosis (Nattiv, 1994; Perry, Crane, Applegate, Marquez-Sterling, Signorile & Miller, 1996). The most significant problem with eating disorders is the high mortality rate. It is estimated that 4% to 20% of women who are diagnosed with anorexia or bulimia will die if full recovery is not achieved (Garner & Garfinkel, 1997). Death resulting from eating disorders constitutes one of the highest fatality rates among DSM diagnosable mental illnesses. Women are literally dying to be thin. More research is needed on the alarming trend of eating disorders. Studies focused specifically on eating disorders among the female athlete population are even more deficient.

Rationale

As a result of the 1972 Title nine federal mandate, women athletes are ensured equal sports participation as men are, both on secondary and collegiate educational levels. Title nine has enabled more young women the opportunity to participate in competitive sports. More women are participating in college sports today than in the past. With the number of women competing in college sports on the rise, additional research is needed to help determine the prevalence of eating disorder among female athletes.

Some prior studies on female athletes reported they are more prone to developing eating disorders than nonathletes. Research conducted on the female athlete population revealed that 15% to 62% of the women appear to

have pathogenic weight control behaviors (Nattiv, 1994). Pathogenic weight control is defined as harsh methods of weight loss including self-induced vomiting, use of laxatives, diuretics, diet pills, and excessive exercise.

Pathogenic weight control is a dominant feature of eating disorders (Dummer, Rosen, Heusner, Roberts & Counsilman, 1987). In addition to the socioculture esthetics of a thin physique, women athletes often feel tremendous pressure to strive for low body weight or fat in order to please a coach, make the team, or maintain a competitive edge (Black 1991; Borgen & Corbin, 1987; Harris & Greco, 1990).

Research on eating disorders among undergraduate women, both athletes and nonathletes, has been conducted at numerous colleges and universities in the United States. Some research outcomes demonstrate that athletes are at greater risk of eating disorders than nonathletes while other studies indicate that female athletes are not at higher risk. The findings from these studies have often been labeled as inconclusive or unreliable because many studies have used eating disorder assessment instruments lacking in tested validity and reliability, or researchers have not taken steps to ensure that subjects from the female athlete population were not being duplicated into the female nonathlete sample group by way of campus-wide random sampling. One consistent factor

is clear, occurrences of eating disorders among young women have continued to increase (Moriarty & Moriarty, 1994).

Assessing female athletes for eating disorders can present significant challenges. Studies have shown that athletes often exhibit similar characteristics of individuals who have an eating disorder, such as their high drive for achievement, desire to please their coach or teammates, perfectionism, rigorous self-discipline, concern about body weight, and frequent thoughts about food (Black, 1991; Holliman, 1991; Thompson & Sherman, 1993). These personality traits lead successful athletes to their greatest accomplishments, typically separating the elite athlete from the average. Are these intrinsic strengths that make athletes perform their best also a major contributor to the development of an eating disorder? Often times athletes who have an eating disorder may not appear extremely thin due to body muscle mass whereas the emaciated body of a nonathlete anorexic is easy to detect; this can hinder a coach's ability to see the warning signs of an eating disorder. Thus, the special circumstances of female athletes make it especially difficult to detect an eating disorder. As identification of an eating disorder is imperative for treatment and recovery, the difficulties of diagnosing the mask symptoms of an eating disorder in female athletes may prevent these women from ever receiving the help they need.

Upon review of the literature, the subpopulation of female collegiate athletes is a relatively new focus for the study of eating disorders. Articles and research measuring prevalence of eating disorders in this subgroup began to appear in the mid 80s. The first dissertation on this topic was written in 1986. By 1991 only 70 articles had been published specifically on athletes and eating disorders (Black, 1991).

If it is true that the prevalence of eating disorders is higher in women athletes, then the opportunity to maximize elite talent and achievement among some of the most gifted females may become a lost dream that is replaced with the nightmares of long-term physical and psychological dysfunction, and even death. Due to the significant risks of eating disorders and the uncertainty of their prevalence among female athletes, additional research is needed. By gaining more data on eating disorders in the female athlete subgroup, specific education or training programs can be designed and implemented for collegiate athletic departments, coaches, trainers, parents, and athletes. With the lack of clarity in eating disorder etiology, planned intervention and preventative psychoeducation may be the most effective way to decrease risks of eating disorders among female athletes.

Purpose of the Study

Because the study of eating disorders among female athletes is a new focus, additional research is needed to establish consistent and reliable data to support or refute the concept that female athletes are at greater risk of developing an eating disorder than their nonathlete counterparts. Another important question is what are some of the factors that place female collegiate athletes at greater risk?

The purpose of this study is to investigate three related issues: whether female collegiate athletes display a higher rate of eating disorder behaviors than nonathlete college women; to determine if there is a relationship between risks of eating disorder behavior and sports advocating body leanness; and to assess whether maturation reduces the occurrences of eating disorder behavior among female athletes. This study will investigate the following research questions:

1. Is there a difference in the incidence of eating disorder behaviors among female collegiate athletes and nonathlete college females? Previous studies suggest that female athletes are at greater risk than nonathletes (Borgen, 1985; Dick, 1990; Dummer et al., 1987; Rosen, McKeag, Hough, & Curley, 1986; 1987; Nattiv, 1994; Sundgot-Borgen, 1993). However, research on female athletes and eating disorders only began to appear fifteen years ago. These studies have often produced conflictual and inconclusive results. It is

hypothesized that female collegiate athletes will demonstrate greater risks of eating disorder behavior than nonathlete college females because the athletes are in an environment that often leaves them feeling intense pressure to maintain lower body weight.

2. Is there a relationship between the type of sport female athletes participate in and the prevalence of eating disorder tendencies? Previous research indicates female athletes who participate in sports with an orientation and culture toward body leanness have higher incidence of eating disorder behaviors than female athletes participating in sports not emphasizing body leanness (Black, 1991; Borgen, 1985; Borgen, 1994; Burkes-Miller & Black, 1991; Chopak & Taylor-Nicholson, 1991; Petrie, 1993; Striegel-Moore et al., 1986; Sundgot-Borgen, 1993). There is a serious dearth of research on differences in the incidence of eating disorders between different sports. Some of the studies available in this area have also reported no difference between various sports and the prevalence of eating disorder behavior. The importance of continued investigation on this issue can help determine if females in body-lean sports are or are not at greater risk. The hypothesis that there would be differences among sports is based on the theoretical assumption that incidence of eating disorders is related to environmental pressures for maintaining lower body weight. If specific sports are

displaying higher rates of eating disorder tendencies, preventative educational programs for these sports can be designed for coaches, trainers, and athletes.

3. Is there a relationship between age of the athlete and the prevalence of eating disorder behaviors? The average age of onset of eating disorders is 17 to 18 years old. Researchers have speculated that the process of maturation may reduce a female's risk of developing eating disorders; however, few studies have focused on the factor of age among groups of the subjects participating in eating disorder studies. By determining if certain age groups are demonstrating greater eating disorder behavior, targeted interventions can be implemented. It is hypothesized for this study that the natural process of maturation will have a positive effect on reducing female athletes' risk of eating disorder behavior. The theoretical assumption underlying this hypothesis is the belief that the maturational process will have a positive effect on women because post-college females seem to have better self-images, more realistic acceptance of their bodies, greater accumulation of knowledge, and a sense of personal fulfillment from a career and/or family; all of which are typically lacking for the average undergraduate female college student.

Delimitations of Study

The scope of this study is defined as the investigation of the prevalence of eating disorder behavior in female collegiate athletes and nonathlete female college students. Although this study will compare female college athletes with college women who are not athletes, the primary focus will be on the female athlete population. This project will only assess eating disorder tendencies which identify a subject as being at-risk of an eating disorder. Thus, the generalizability of this study would be limited to college age females, and those who participate in collegiate sports. It is a single site study. Although the sample of athletes and nonathletes comes from a large state university, there are strong similarities in college age females and female collegiate athletes across institutions to make the findings of this study reasonable generalizable to college females. Despite some local differences among institutional cultures, the findings of the study would be robust.

Finally, it is important to know that the instrument being used to collect data for the study uses self-reports and thus, relies on the honest responses of the survey participants. If the participants are not honest or have low self-awareness about their bodies or hunger urges, the reliability of the data may be diminished. But there is vast measurement literature that supports the reliability and validity of self-reported data.

Definition of Terms

Athlete A female who is a member of a women's collegiate varsity team.

Anorexia Athletica A subclinical form of anorexia often found in athletes. A female athlete that does not meet the DSM IV diagnostic criteria for anorexia nervosa yet demonstrates an intense fear of gaining weight or becoming fat even though she is underweight; at least 5% less than expected normal weight for age and height for the general female population (Sundgot-Borgen, 1993).

Anorexia Nervosa As defined by the DSM IV:

- A. Refusal to maintain body weight at or above the minimum normal range for age and height. Body weight less than 85% of what is expected
- B. Intense fear of gaining weight or becoming fat
- C. Distortion of body image - actual size versus perceived size; with the denial of being underweight when emaciation is present
- D. In postmenarcheal females, amenorrhea, i.e. the loss of at least three consecutive menstrual cycles.

Restricting Type - an anorexic patient that does not engage in binge eating or purging

Binge-Eating/Purging Type - Anorexic patient who regularly engages in binge-eating or purging behavior

Bulimia Nervosa As defined by the DSM IV:

- A. Recurrent episodes of binge eating that is characterized by the following:
 - 1. eating in a short period of time (within two hours), amounts of food that is significantly larger than most people would eating during a similar period of time
 - 2. feeling a lack of control over the eating ; that one cannot stop or control what is being eaten
- B. Recurrent behavior to prevent weight gain, i.e. self-induced vomiting; laxative abuse, diuretics or other medication; fasting; or excessive exercise
- C. Binge eating and inappropriate behaviors both occur, on an average, at least twice a week for 3 months.
- D. Self-evaluation is influenced by body shape and weight
- E. Disturbance does not occur exclusively during episodes of Anorexia Nervosa.

Purging Type - patient who currently has Bulimia and has regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas

Nonpurging Type - patient who currently has Bulimia and has used other inappropriate behaviors, such as fasting or excessive exercise, but has not regularly engaged in self-induced vomiting or the misuse of laxatives, diuretics, or enemas.

Binge Eating Disorder As defined by the DSM IV:

- A. Recurrent episodes of binge eating characterized by the following:
 - 1. eating, in a short period of time, e.g. within any 2 hour period, an amount of food that is definitely larger than most people would eat in a similar period of time.
 - 2. a sense of lack of control over eating during the episode; feeling one cannot stop eating or control what or how much is being eaten.
- B. Binge eating episodes have three or more of the following traits:
 - 1. eating more rapidly than usual
 - 2. eating until feeling uncomfortably full
 - 3. eating large amount of food when not feeling physically hungry
 - 4. eating alone because of being ashamed by how much one is eating
 - 5. feeling disgusted with oneself, depressed, or guilty after overeating
- C. Marked distress over binge eating
- D. The binge eating occurs on an average of at least 2 days a week for 6 months
- E. The binge eating is not associated with the regular use of inappropriate behaviors such as purging, fasting, excessive exercise; and does not occur with Anorexia Nervosa or Bulimia Nervosa.

Eating Disorder A general term used to describe any of the eating disorders that meet the diagnostic criteria of the DSM IV

Eating Disorder Behavior, (Eating Disorder Tendencies, or Disordered Eating)

Any one or more of the characteristics (e.g. fear of becoming fat, preoccupation with food, binge eating or purging, or use of pathogenic weight control methods) that are present in those individuals who have an eating disorder but cannot be diagnosed as having an eating disorder due to lack of comprehensive assessment.

Eating Disorder Not Otherwise Specified(NOS) As defined by the DSM IV:

Disorders of eating that do not meet the criteria for any specific eating disorder but have some of the criteria necessary for a specific diagnosis.

Nonathlete College women age 16 years or older who are not participating in a varsity collegiate sport but are full-time students.

Pathogenic Weight Control Any inappropriate behavior used to lose body weight such as self-induced vomiting; abuse of laxatives, diuretic, or enemas; diet pills; significant restriction of food intake; and excessive exercise in addition to regular team workouts and practices.

Summary

Although public awareness of eating disorders has increased in the last two decades, the specific etiology and patterns of these deadly diseases still presents a clinical conundrum to mental health professionals and researchers. With athletic environments that can often support and mask eating disorder

symptoms, diagnosing a female athlete with an eating disorder can become a more difficult task than diagnosing a nonathlete. The risk of loss of life is too great to minimize just because of the complexities of diagnosing eating disorders among athlete women. Only through additional research can answers be found.

Because of the inconclusive and inconsistent research on eating disorders among female collegiate athletes, this study will focus on the prevalence of eating disorder behavior among female athletes and compare these findings with the nonathlete female population. More research on the subpopulation of female athletes is needed. Only through additional investigation can greater clarity be gained as to how much athletes really are at greater risk of developing eating disorders.

CHAPTER 2

Review of Literature

The first section of this chapter provides a thorough review of basic literature on the history and etiology of the eating disorders, anorexia nervosa and bulimia nervosa. The second part of this chapter will focus specifically on the review of literature addressing eating disorders in the athletic subpopulation with special concentration on female collegiate athletes and specific sports that may create an environment facilitating greater risks.

SECTION - I

History

Anorexia Nervosa

The symptomatology of anorexia nervosa first appeared in medical literature in the 1600s. Although the term “anorexia nervosa” was not developed until two centuries later, the basic characteristics of the disorder are sporadic but evident in medical records during the last 300 years. In 1689, Richard Morton published the first recorded medical account of anorexia nervosa. He referred to it as a nervous condition related to sadness and anxiety (Silverman, 1997). Only a couple of significant publications relating to anorexia appeared within the following 150 years. A French

physician, Louise-Vida Marce, in 1859, was the first practitioner that clearly identified this illness as psychiatric. Fifteen years later another French physician, Charles Lasegue and an English physician, Sir William Gull, independent of one another, addressed anorexia nervosa in their medical publications. Through the research of Lasegue and Gull, a deeper investigation of the psychopathology of this illness was pursued resulting in the current term “anorexia nervosa” (Bruch, 1973; Silverman, 1997).

During the later years of the nineteenth century numerous articles addressing anorexia were published. The first 50 years of the twentieth century produced numerous reviews of the possible etiology of anorexia. Although well intended, the literature from the early 1900s brought about significant contradiction and confusion regarding the causal components that precipitate the development of anorexia (Bruch, 1973).

The second half of the twentieth century ushered in the modern era of the study and treatment of anorexia. During the last 20 years the contributions of Bruch, Crisp, and Russell are marked as the most significant contributors to research and treatment methods for anorexia (Silverman, 1997). Hilde Bruch believed that self-starvation in anorexics was a desire for the patient to have independence and control from her mother. This view expresses three perceptual/conceptual disturbances that are present in anorexics, this includes

body image disturbance (an over estimation of one's body size), introspective problems (inability to identify internal sensations such as hunger, emotions, and sexual feelings), and the overall feeling of ineffectiveness and loss of control. Bruch first identified the anorexic's errors in thinking and the need for treatment to address the need for the patient to discover her genuine self (Bruch, 1973). Bruch's discovery of these characteristics are currently reflected in many modern assessment instruments that are designed to investigate these factors.

Author Crisp views anorexia from a developmental model. He believes anorexia to be an attempt to dysfunctionally cope with fears and conflicts associated with psychological and biological maturation. By self-induced starvation the patient can revert back to a prepubertal shape (Crisp, 1995). Fear of maturation is currently considered a dominant clinical feature of anorexia nervosa.

In 1970, Gerald Russell recognized anorexic patients as having phobic fears of fatness and identified this as a central factor to the disorder. Additionally, fear of becoming overweight is a diagnostic criteria in the DSM IV for anorexia. Russell was also instrumental in differentiating anorexia from bulimia nervosa (Russell, 1997).

A combination of research on anorexia during the last 300 years has obviously lead the mental and medical professions to the modern diagnostic criteria for anorexia nervosa. The primary clinical features of anorexia include young women (typically adolescents to early adulthood, with a mean age of onset to be 17) displaying a refusal to maintain 85% or more of expected body weight for their particular age and height; intense fear of weight gain; distorted body image; amenorrhea which is a loss of the menstrual cycle, for 3 consecutive months (DSM IV, 1994).

Bulimia Nervosa

The historical account of bulimia nervosa provides minimal references to this disorder. Many researchers speculate a linear history of bulimia nervosa not possible because only since 1979 have the clinical features of bulimia been very specific. The current necessary criteria for bulimia nervosa are: episodic overeating; purging through self-induced vomiting or laxative abuse; and a morbid fear of being fat (DSM IV, 1994). The symptomatology of bulimia nervosa was often so closely associated with anorexia that the two eating disorders did not gain individual clarity until 1979 (Russell, 1997).

Early accounts of purging were practice throughout ancient Egypt, Greece, Rome, and Arabia. Egyptians would purge themselves for 3 days each month as a ritual to ensure and preserve health. The term “bulimia” derives it’s

origin in the ancient Greek language, bou (bull or ox) and limos (hunger) which evolved into the term “bulimy” meaning ravenous ox like hunger. The term bulimia is found in medical texts in the 1700s including the 1797 Encyclopedia Britannica which defined bulimia as a disease of insatiable hunger (Moore, 1996).

Symptoms of binge eating are also found in the historical literature of anorexia. In the 1800s, Gull reported one of his anorexic patients would have bouts of overeating. In 1970, Hilde Bruch, recorded that bulimic behavior sometimes followed by vomiting occurred in one-fourth of the anorexic patients (Bruch, 1973). The early to mid 1970s began to mark the deviation of overeating from the standard diagnostic criteria for anorexia nervosa. Finally, in 1979 Gerald Russell defined the binge-purging disorder as bulimia nervosa to distinguish it as related to anorexia nervosa, but with different distinguishable features of it's own (Russell, 1997). The DSM III (APA, 1980) included the new eating disorder as bulimia which was a significant step, however the criteria was different than that of bulimia nervosa, Bulimia denoted bingeing behavior only. This definition error created great confusion in diagnosing bulimia nervosa. It was not until the publication of the DSM III-R (APA, 1987), that this generalization was changed to bulimia nervosa. As a result of the revision, international agreement among the medical and

mental health professions occurred with consistent agreement on the criteria for bulimia nervosa (Russell, 1997).

During the 1980s reported incidences of bulimia nervosa exceeded that of anorexia to the point that the occurrences of bulimia nervosa to anorexia nervosa was 2 to 1 (Russell, 1997). Many researchers consider bulimia nervosa an illness of modern times as compared to anorexia. This could be due to the fact that the three criteria for bulimia nervosa (episodic overeating, purging, and fear of being fat) have not been clearly documented in historical medical research or publications.

Etiology

The etiology of how an eating disorder develops is still a mystery. Most theories of the causes of eating disorders are most commonly linked to familial, socioculture, biopsychological, and gender factors. Typically an eating disorder patient will have etiological traces in more than one of these areas, that is a combination of psychological and physiological components that appear to be confounded. This section of chapter two will focus on the familial, sociocultural, biopsychological, and gender etiologies.

Familial

The familial element of eating disorders has the clearest historical account of any of the other etiologies. Even the earliest medical publications associated with eating disorders, reference the patient's dysfunctional family environment. In 1694, a medical publication by Richard Morton prescribed that his adolescent eating disorder patient be removed from his/her home during treatment because the environment was in constant turmoil. One-hundred years, later French physician Marce wrote in his treatment plan for a young anorexic that treatment would render ineffective results if she remained in her family surrounding while recovering from her eating disorder (Silverman, 1997).

Hilde Bruch, in the 1970s, proposed that anorexia is symptomatic of a young woman's psychological struggle to gain autonomy, control, and competence from a poor mother/daughter relationship that did not acknowledge the child's expression of independence (Bruch, 1973). Many family system theorists believe that women with an eating disorder act as the visible barometers of a family's dysfunction. For example, in a family where marital discord is present, a child's development of a somatic disorder such as anorexia or bulimia requires the parents to stop focusing on their own conflict and join forces to aide the child to recovery, thus reducing the tension

between the parents. Common familial characteristics of women with anorexia or bulimia include: enmeshment, rigidity, overprotectiveness, and poor ability to handle conflict whether covert or overt (Minuchin, Roseman, & Baker, 1978). Conflicts are usually denied instead of openly discussed or they are handled incorrectly (Casper & Zachary, 1984; Minuchin et al., 1978; Selvini-Palazzoli, 1974). Although there is a high level of conflict, there is little focus on open expression of feelings (Johnson & Flach, 1985) and family members are covertly taught to deny them (Bruch, 1970; Humphrey, 1989).

Another identifiable trait of families with eating disorder members is enmeshment. Relational boundaries are lacking and the children are often overly involved in parental conflict (Root, Fallon, & Friedrich, 1986; Stoltz, 1985). The lack of clear boundaries, which result in “enmeshment” hinders children from appropriate emotional development towards separation, independence, and self-assertion (Humphrey, 1989; Johnson & Flach, 1985). This pattern of enmeshment typically leaves a child with a sense of personal ineffectiveness and inadequacy (Casper & Zachary, 1984), which are corner stones for perfectionism and overachieving personality traits.

Individuals with eating disorders often come from families who have a strong emphasis on achievement and success yet stress the value of feminine

attractiveness and thinness (Roberto, 1987; Stoltz, 1985). These families also reference the value of a woman in the role of subordinates and caretakers in the family and society. Additionally, patterns of perfectionism and self-sacrifice joined with the concept of male superiority are stressed (Gordon, Beresin, & Herzog, 1989).

The values of achievement and success are in direct conflict with self-sacrificing “be seen but not heard” messages. Members from these types of families are taught to deny conflict and feelings. Eating or not eating may be a way that eating disorder victims cope with conflict (Casper & Zachary, 1984) yet meet the familial demands to be attractive, thin and also achieve a sense of intrinsic success by losing excessive body weight.

Sociocultural

Worldwide studies have revealed a greater prevalence of eating disorders in Westernized countries as compared to developing, third-world nations. In countries that emulate Westernization, the cultural pressures to be thin are perpetuated by the media and have been perceived as initiating the stage for dieting and body image dissatisfaction that are often precursors to eating disorders. It is uncertain whether the media reflects or creates pathogenic values of how a woman views her body. Many clinicians and physicians believe the too perfect images women see in magazines and other forms of

the media play a vital role in supporting and enhancing the development of eating disorders (Becker & Hamburg, 1996).

The representation of the female body in the arts and media in Western culture has experienced incredible changes. In the seventeenth century, world famous artist Rubens displayed heavy, more muscular feminine images in his work (Kenneth, 1956). Even within the twenty-first century, the changes in physical characteristics of female movie stars and models during the first 50 years are intriguing. In the 1950s and early 1960s pin-up Betty Grable and actress Marilyn Monroe had fame and popularity based on the more buxom figure. The fashionable trend in the late 1960s transitioned drastically to slim women with small breasts like fashion model Twiggy. The 1980s era ushered in another shape change to broader shoulders and larger breasts grafted unnaturally, often surgically, to an emaciated frame (Raphael & Lacey, 1992). This ideal female body image is an impossible objective to achieve for most women without starvation and/or plastic surgery.

Garner, Garfinkel, Schwartz, & Thompson (1980) examined data from *Playboy* centerfolds and Miss America Pageant contestants over a twenty year period. Their findings indicated a significant move toward a thinner, more tubular female shape that is in direct contrast to the overall weight increase of the average woman in the American population. Additionally, the

authors reported a paralleled increase in the number of diet related articles in popular women's fashion magazines within the same 20 year period. In non-Westernized cultures, a buxom and even obese female figure is often admired and encouraged (Raphael & Lacey, 1992). Research within the last 30 years indicates there is evidence that the cases of anorexia and bulimia are increasing in frequency (Crisp, Palmer, & Kalucy, 1976; Duddle, 1973; Halmi, 1974; Kendell, Hall, Hailey, & Babigian, 1973; Ikemi, Ago, Nakagawa, Mori, Takahashi, Suematsu, Sugita, & Matsubara, 1974; Sours, 1969).

“This apparent increase in the disorder has been paralleled by our cultures aesthetic preference for thinness in women. If social variables are of significance, the increased emphasis for women to appear slim, to diet, and to exercise may be linked to the expression of anorexia nervosa”(Garner & Garfinkel, 1980)

Biopsychological

Research conducted on individuals with eating disorders reveal interesting heredity characteristics that are often discovered during the assessment phase of these disorders. The DSM IV (1994) documents that patients with eating disorders have a high prevalence of first degree biological relatives with an eating disorder, obesity, substance abuse problem, or a mood disorder such as depression.

Prior to puberty, most young girls have 10% to 15% more body fat than boys their age, however, after puberty the average female will have almost twice as much fat as a boy (Marino & King, 1980). With our cultural message that the “thin prepubertal look” is beautiful (Faust, 1983) it is not surprising that adolescent girls report lower body-esteem and greater dissatisfaction with their weight as compared to adolescent boys (Dornbusch, Carlsmith, Duncan, Gross, Martin, Ritter, & Siegel-Gorelick, 1984; Simmons & Rosenberg, 1975).

For girls that begin pubertal development early, gaining body fat and developing a woman’s body out of timing with her female peers, may place them at greater risk of an eating disorder. These early maturing girls may be more likely to diet to try and look like their nondeveloping peers which increases the risk of binge eating and eating disorders at an early age (Bruch, 1981; Striegel-Moore, 1995). An additional biological factor includes a person’s body build and weight which are genetically determined. For women who are genetically predisposed to be larger, the objective to be very thin is virtually impossible, and these women may also be at greater risk of eating disorders. It has also been suggested that an eating disorder is genetic. There is substantial documentation that anorexia and obesity occur in generations of families (Crisp, 1988, White, 1992). Initial research indicates

first degree relatives of anorexics or bulimics have familial clustering of eating disorders (Striegel-Moore et al, 1986).

Affective disorders and substance abuse have a high prevalence among persons with bulimia nervosa (Walsh, Roose, Glassman, Gladis, & Sadik, 1985). Most substance abuse treatment programs report that approximately one-third of women who enter the programs also have an eating disorder or disordered eating. It has been suggested that the personality factors that place women at-risk of substance abuse would also predispose them to bulimia.

These factors include: a lack of ability to cope with negative feelings, need for immediate gratification, low impulse control, and a weak sense of self (Brisman & Siegel, 1984; Goodsitt, 1983).

Women with bulimia nervosa seem to have high rates of depression. Between 35% and 78% of bulimic patients, in the acute stage of the illness, could meet the DSM criteria for affective disorders (Gwirtsman, Roy-Byrne, Yager, & Gerner, 1983; Hatsukami, Eckert, Mitchell, & Pyle, 1984; Herzog, 1982; Hudson, Pope, & Jonas, 1984). Studies have documented that bulimic patients who were prescribed imipramine, an antidepressant, showed significant improvement in their condition. They reported less binge eating and food preoccupation and reduced symptoms of depression (Pope, Hudson,

& Jonas, 1983). It still remains uncertain whether depression is a secondary symptom of bulimia or if depression places a woman at higher risk of developing the disorder (Striegel-Moore, 1986).

Gender

Eating disorders appear to be predominately an illness among women. The DSM IV (1994) documents 90% of those diagnosed with anorexia nervosa or bulimia nervosa are women. Without any of the other etiological components just being female increases the risk of developing an eating disorder.

In modern Western society it seems that women believe they are more attractive to the opposite sex if they are slender (Franzoi & Hezog, 1987; Freeman, 1987; Furnham & Radley, 1989) even though there seems to be no definitive documentation to support that men are drawn selectively to women who are thin (Kleinke & Staneski, 1980). From a feminist perspective it is acknowledged that historically men have exercised control over women, either directly or indirectly, through traditional patriarchal institutions such as monarchies, education, religious bodies, and governments (Raphael & Lacey, 1992). As part of this study, a literature review of 900 articles on eating disorders was reviewed. Some of these studies reported a higher prevalence

of these illnesses in patients who were raised in strong Jewish or Catholic faiths.

The modern woman finds herself caught in the middle of a gender role clarification conflict. A struggle to define herself, externally and internally, by sources like the media, culture, and family-of-origin modeling, can leave a woman questioning who she is. No longer is the modern female expected to be just the submissive wife, mother, and ideal homemaker. Often she is expected to take on traditional male roles such as climbing the corporate ladder in her career and exercising assertiveness. All of the role uncertainties make it virtually impossible for a woman to gain a healthy sense of herself by her own definition (Raphael & Lacy, 1992). With the number of uncontrolled stressors in a woman's life, some woman may unconsciously deduct that her body weight is something she can exercise control over (Lakoff & Scherr, 1984; Raphael & Lacey, 1992).

Another definitional dilemma modern women find themselves in is what constitutes femininity? Numerous studies reveal women who are more attractive are looked at as more feminine, and unattractive women are perceived as more masculine (Cash, Gillen & Burns, 1977; Gillen, 1981; Gillen & Sherman, 1980; Heilman & Saruwatasi, 1979; Unger, 1985). Research has also verified the thinner ectomorphic female body shape is seen

as more feminine and the stockier mesomorphic body to be more masculine (Guy, Rankin & Norvell, 1980). It then appears thinness and femininity are associated together (Striegel-Moore et al, 1986). Certain types of eating behaviors are also believed to be more feminine than others, for example, studies show women who eat small meals are rated more feminine and more attractive than those who eat larger meals (Chaiken & Pliner, 1984).

A predominant feature of individuals with eating disorders is a low self-esteem. Women who depend too heavily on their physical attractiveness and need significant external validation for their femininity and self-worth are at greater risk of developing an eating disorder (Raphael & Lacey, 1992)

In the last 20 years, interesting studies on sex role types and self-esteem among female athletes and nonathletes have been conducted. Women athletes who had the ability to display appropriate androgynous sex role behaviors for different situations had a better positive self-image than women who were predominantly of the masculine, feminine or undifferentiated sex roles. The nonathletes that functioned from strictly the feminine sex role type were lower in self-esteem than all the other sex-role groups (Helmreich & Spence, 1977; Hall, Durborrow, & Progen, 1986) Perhaps the more androgynous sex role types, from the referenced study, learned a healthy manner to integrate both a traditional female role with a masculine role which

is now expected of today's women. Additionally, a study comparing body esteem among female collegiate athletes and female nonathletes reported that the athletes had higher esteem about their physical appearance than the nonathletes (DiNucci, Finkenberg, McCune, McCune, & Mayo, 1994).

Currently research on eating disorders cannot pinpoint a specific etiology to these diseases. However, causal themes continue to be seen from the family, socioculture, biopsychological, and gender arenas. To state that there is a singular etiology for an eating disorder would be inaccurate. With continued research, hopefully a clearer picture of the origin and progression of eating disorders will come forth. When an eating disorder, with all its etiologies, is coupled with the athletic environment, the complexity of possible causes of this illness becomes more clouded.

SECTION - II

Eating Disorders and Athletics

Although the study and treatment of eating disorders can be traced throughout the last 300 years, research specifically concentrating on the subpopulation of athletes is relatively new. Only since the mid-1980s has research been conducted on the prevalence of eating disorders among athletes. The first dissertation on eating disorders and athletes appeared in

1986 and by 1991 only 70 articles had been published related to athletes and eating disorders (Black, 1991).

In 1980 Garner & Garfinkel, performed a study on sociocultural factors in the development of anorexia nervosa. The authors used the Eating Attitudes Test (EAT; Garner & Garfinkel, 1979). The EAT is a highly reliable and valid 40-item, objective, self-reporting assessment that measures a wide range of symptoms associated with anorexia nervosa. The subjects were composed of 183 professional dancers and 56 modeling students that were compared with 59 normal female university students, 68 patients with anorexia, and 35 music students. Among the dance group, 37.7% met the EAT cut-off score of 30 indicating a possible eating disorder. With additional assessment, 11 cases of primary anorexia nervosa were found in the dance group. In the modeling student sample, 4 cases or 7% of the women were identified with anorexia nervosa. Dancers who were from the most competitive dance companies displayed the highest frequency of anorexia than dancers from less competitive companies. This study would suggest that the pressures to be slim and achieve athletic or esthetic expectations of their environments are risk factors in the development of anorexia nervosa (Garner & Garfinkel, 1980). Consider other etiologies, such as familial, socioculture, biopsychological, and gender, along with the pressure to perform, look thin,

please a coach or judge, and the risks of eating disorders are believed to greatly escalate.

In the majority of sports, the efficiency of an athlete's movement adds to the ability to perform well. In sports like ballet, figure skating, and gymnastics, a thin esthetic appearance does affect the athlete's score. The ideal athlete is encouraged to maintain low body fat (Petro, 1993). It is a combination of proper nutrition, cardiovascular fitness, strength training, endurance, and technical skills that contribute to the athlete's overall performance and success. Paradoxically, coaches, trainers, and athletes frequently focus on the simple visible aspect of fitness such as body fat percentage and muscle mass. Generic height and weight charts are often referenced to determine fitness. The problem with this approach is it is much too general (Nash, 1985).

Athletes & Gender Comparison

When body composition is looked at by gender, the female athlete will naturally maintain a higher percentage of fat than a male athlete in a comparable sport. The typical female athlete is taller, leaner but heavier than a nonathlete counterpart. Unfortunately, the female athlete is often not getting proper nutrition in an effort to control her weight (Welch, Zager, Endres, & Poon, 1987).

Although it is often desirable for both male and female athletes to maintain low body fat, female athletes appear to be more at-risk of eating disorder behaviors. Burckes-Miller & Black (1988) conducted a study looking at the prevalence of eating disorders among both female and male collegiate athletes. They used the Eating Disorder Inventory (EDI; Garner, Olmstead & Garfinkel, 1983) a self-reporting instrument designed to measure the psychological and behavioral characteristics of anorexia nervosa and bulimia nervosa. The authors found 4.2% of the females surveyed met the diagnostic criteria for anorexia nervosa as compared to only 1.6% of the males. Looking at the bulimic tendencies, the study revealed 39.2% of the female athletes versus 14.3% of the males met the criteria for bulimia nervosa. Their results show a significant difference between the female and male athletes, that is the females were more than twice as likely to have an eating disorder.

A survey conducted by the sports-science division of the National Collegiate Athletic Association (NCAA) found that 64% of the NCAA member institutions reported at least one student-athlete in their athletic programs had an eating disorder in the past two years. The majority of the reports (93%) were in women's sports (Dick, 1990).

Prior to the onset of an eating disorder, an individual is typically engaged in any of the following behaviors: dieting, cycles of food restriction coupled

with bingeing and purging, obsessive thoughts about weight, compulsive weighing, and constant calorie counting. All of these behaviors or cognitive patterns are major warning signs of eating disorders. Rosen, McKeag, Hough, & Curley (1986) conducted a study on female college athletes and found 32% used at least one form of pathogenic weight control methods. Pathogenic weight control is most often defined as harsh methods of weight loss including: self-induced vomiting, use of laxatives, diuretics, diet pills, or excessive exercise (Dummer et al, 1987). A similar supporting study reported that 15% to 62% of female athletes used pathogenic weight control methods (Nattiv, 1994). These studies showed that women athletes display more symptoms of eating disorder behavior than male athletes.

Case Studies:

Female Athletes with Eating Disorders

Beyond the studies on the female athlete population there are numerous examples of world-class athletes who have fallen victim to an eating disorder. Rosealynn Summers, a former world figure skating champion of the United States was not able to live up to the demands of winning an Olympic gold medal in 1984, and had to take a sabbatical from skating because of continued episodes of bulimia (Smith, 1987). Olympic gymnast Nadia Comenici was unable to compete in the Edmonton World Student FISU

Games in 1984 due to an emaciated body, a result of her eating disorder. Mary Lou Retton, a 1984 United States Olympic gold medalist, was hospitalized in 1985 to be treated for an eating disorder, an illness that had plagued her throughout her athletic career. Canadian champion downhill skier, Barbara Warner, a gold medalist in the 1988 Olympics, was a victim of bulimia and also attempted suicide. The list of female athletes who have become victims of eating disorders is extensive (Moriarty, 1991). Research to support the concept that female athletes are at high-risk of eating disorders is just beginning to increase. Perhaps more sobering are the individual testimonies of those great female athletes that have publicly admitted to the horrific effects that eating disorders have had on their lives.

Female Athletes VS Female Nonathletes - *Eating Disorder Behaviors*

It is generally supported that young women who begin their college careers are at greater-risk of developing an eating disorder than women in the general population. This is believed to be due largely to the lack of predictability of a new environment that is full of high demands for academic performance and social expectations. It has been documented that female adolescents who are faced with new experiences that they are not prepared for, like leaving home for college, will often exhibit anorexic or severe dieting

behaviors. Likewise these young women will also display bulimic symptomatology such as compulsive overeating, vomiting, or purging (Root, et al, 1986; Cauwels, 1983). The DSM IV (1994) indicates only 1% to 4% of the general population suffer with an eating disorder. In 1986 Ratcliff conducted a study sampling 771 undergraduate women. The subjects were asked to complete the EDI. Results revealed 17% of these women fell within the classification of bulimia nervosa. Similarly Borgen and Corbin (1987) report the prevalence of eating disorders among college females to be between 4% to 19%.

In addition to adjusting to college life, the female athlete is faced with the demands of athletic training schedules and performance. It would appear her risk of eating disorders would be greater than her nonathlete counterpart; however research on this specific subpopulation only began to emerge in the mid 1980s.

Beginning in the 1800s, historical literature on eating disorders and excessive over activity are documented (Buemont, Buemont, Touyz, & Williams, 1997). In 1963, King found intense athleticism in 75% of the hyperactive anorexics he studied. Additionally, a ten year review of the medical record of females being treated for anorexia nervosa found hyperactivity in 25 of the 33 patients. The authors also reported the excessive

exercising was not just a secondary symptom; instead it typically preceded the onset of the illness. Twenty-one of the 25 patients described themselves to be extremely active prior to trying to diet or reduce their weight (Kron, Katz, Gorzynski, & Weiner, 1987). It is uncertain if participating in a sport initiates an eating disorder in athletes or if people predisposed to eating disorders are attracted to athletics because it is a good way to provide legitimacy for their illness (Black & Held, 1991). In a self-reporting study designed to identify the extent of eating disorder tendencies among 168 female athletes and nonathletes, Borgen (1985) found 10.5% of the athletes and 6% of the nonathletes scored in a range equal to eating disorder patients.

Most of the studies on eating disorders and athletes use self-reporting instruments to measure risk factors. The problem with self-reporting assessments, such as the EDI and the EAT, is accuracy because the instruments, although well designed, depend solely on the honesty of the subjects. To further support this dilemma of self-reporting surveys, a major symptom of an eating disorder is denial. Women who are in denial about their eating disorder typically do not possess enough self-awareness regarding their emotions, bodies, or hunger urges to admit to themselves or anyone else they have a problem.

A study that supports the theory that self-reporting surveys are not enough took a combination approach using self-reporting instruments, personal interviews, and clinical examinations. The populations were 522 elite female athletes and 488 nonathlete females in Norway. A significantly higher number of athletes, 18%, were found to have an eating disorder as compared to only 5% on the nonathlete group (Sundgot-Borgen, 1993).

Although there is a significant body of research supporting the hypothesis that female athletes are at greater risk of using pathogenic weight control methods and displaying disordered eating behaviors, there also exist numerous studies that indicate female athletes are at no greater risk than nonathlete women. An early 1980s study surveyed intercollegiate female cross-country runners and 228 nonathlete college females. Using the self-reporting EAT(26), a condensed version of the EAT, no significant difference between the two groups was found. However, for both athletes and nonathletes, 19% of the women scored at or above the cut-off indicating possible anorexia nervosa (Court, 1983).

Another study compared the frequency of bulimic behavior between females involved in collegiate athletics ($n = 97$) and nonathletes ($n = 82$). An 18 item self-reporting questionnaire was administered. The results indicated that approximately 77% of both athletes and nonathletes reported having food

binges, 31% binged one to three times a month, 13% binged once a week or more, and 20% used diet pills. This clearly shows a high frequency of bulimic behaviors. Although athletes were not exhibiting a greater degree of disordered eating than the nonathletes (Spelbrink, 1984), these percentages are alarmingly high.

Psychologically, athletes have been described as possessing characteristics similar to patients with anorexia nervosa. They both have similar family backgrounds, inability to express anger and other emotions, a high drive to achieve, perfectionism, and rigorous discipline (Yates, Leehey, & Shisslak, 1983). One study focusing on anorexic tendency among female distance runners found the runners did not have higher incidences of abnormal attitudes or anorexia than the general population. The authors did find, however, the more elite runners were most likely to look anorexic and demonstrate psychological traits similar to anorexic patients (Weight & Noakes, 1987). Another more recent study assessed the prevalence of behavioral and psychological traits that are associated with anorexic patients in a sample of female collegiate athletes. The results found the athletes from various sports did not demonstrate similarities to anorexic patients (Patterson, 1995).

Over the last fourteen years, research focused on measuring the prevalence of eating disorder behaviors among both female collegiate athletes and nonathletes displays contradictory evidence which group is at greater risk. It is apparent, however, the overall risk of the female college population's participation in eating disorder tendencies is far higher than the general public.

Eating Disorder Risks- *Sports Specific*

The concept that women sports that advocate body leanness and esthetics have greater incidences of eating disorders is well supported in research literature (Black, 1991; Borgen, 1985; Borgen, 1994; Borgen & Corbin, 1987; Burkes-Miller & Black, 1991; Chopak & Taylor-Nicholson, 1991; Garner & Garfinkel, 1980; Striegel-Moore et al. 1986; Sundgot-Borgen, 1993). Examples of these sports include: gymnastics, cheerleading, ballet, cross-country running, and body building (Borgen 1985; Borgen & Corbin, 1987; Garner & Garfinkel, 1980).

There have been several studies that support the hypothesis that female athletes participating in sports advocating body leanness are at greater risk of eating disorders. Although Borgen (1985) found that 10.5% of the athletes and 6% of the nonathletes in her study scored in the range of eating disorder

behavior, she also discovered that 28.6% of the athletes in lean-body sports scored in the eating disorder range. This indicated athletes in body-lean sports were at greater risk.

In a recent more comprehensive study, a combination of a self-reporting survey, clinical interviews, and physical examinations were used. The female athletes were divided into two groups, group “A”, consisted of sports where leanness or specific weight was emphasized, and group “B”, sports not focused on weight. All subjects completed the EDI and were given both clinical interviews and examinations. Athletes in group “A”, had 25% of the athletes meeting the criteria for an eating disorder while group “B”, athletes represented 12% with eating disorders. Although athletes in group “B”, had lower occurrences of eating disorders than group “A”, both groups still scored significantly higher than the 5% nonathlete control group (Sundgot-Borgen, 1993).

Another criticism of research on eating disorders among athletes is the lack of large sample studies of the female population. To address this weakness, a national study was launched in Norway to examine the total female elite athlete population. The subjects' ages ranged from 12-35 years, they were defined as “elite” if they qualified for the national team at junior or senior levels, or was part of a squad whose team was being recruited.

Additionally each athlete had to be currently training a minimum of 8 hours per week with active competition during the following 6 months. Each of the 603 athletes that qualified for the study were sent a battery of assessment questionnaires that including a general survey inquiring about their weight, menstrual, and diet histories; physical activity; and diet and nutrition patterns. The athletes were also asked to complete the EDI. From this data, 103 athletes identified as at-risk were then given a clinical interview and physical examination. Of the 103 athletes at-risk, 92% met the criteria for anorexia nervosa, bulimia nervosa, or anorexia athletica . There were higher numbers of athletes with eating disorders among body-lean sports as compared to sports not emphasizing weight. The fact that 92% of the 103 athletes were identified as at-risk by the self-reporting screening may suggest this type of assessment can be reliable in predicting possible eating disorders.

Additionally, from the data collected during the face-to-face interviews, the author found consistent trigger factors that preceded the athletes' eating disorders. Key trigger variables included: specific training and dieting at an earlier age, prolonged dieting, frequent weight fluctuation, sudden changes (increase) in the volume of training, and emotional or physical traumas such as the loss of a coach or an injury (Borgen, 1994).

Studies of eating disorders among athletes has also been criticized for not concentrating on specific sports. Researchers see a need to study a more homogenous subgroup of women's sports in an effort to locate sport-specific environmental factors that may lead to disordered eating patterns. In 1993 a more homogenous study on female collegiate gymnasts was conducted. The subjects were comprised of 215 normal weight gymnasts from 21 NCAA Division I universities in the United States. Participants were assessed by self-reporting surveys measuring bulimic behaviors, body satisfaction, and self-esteem. Over 60% of the gymnasts met criteria for one of the following categories: bulimia, binger, purger, dieter/restrictor, excessive exerciser, and subthreshold bulimic (Petrie, 1993). This study supports the concept that a specific sport advocating body leanness displays a high prevalence of eating disordered behaviors.

If a consistent number of studies could support the idea that lean sports create environments that exacerbate disordered eating, then specific preventative programs for those sports can be developed. However, the problem is that other studies seem to contradict this concept.

When Rosen et al. (1986) performed their study on the 182 female collegiate athletes, they did find that women in sports advocating body leanness had a very high rate of eating disorder tendencies; 74% of the

gymnasts and 47% of the distance runners used pathogenic weight control methods. Unexpectedly they also discovered high scores in sports not emphasizing leanness; 50% of the field hockey team, and 25% of the women in softball, volleyball, track, and tennis also practiced pathogenic weight control behaviors. The high rates in the nonlean sports did not support the hypothesis that just lean-body sports created great risk.

Additionally, some studies show female athletes in body-lean sports may be at less risk. A project conducted on seventy-four NCAA division one female athletes revealed that females athletes are at no greater risk of eating disorders than nonathletes with female cross-country runners showing less risk of body dissatisfaction than the other groups. Body dissatisfaction is a major symptom of eating disorders (Warren, Stanton, & Blessing, 1990).

Another study supporting this theory used the EDI-2 (an updated version of the EDI) to assess eating disorder pathology between females in lean sports, nonlean sports, and nonathletes. The authors concluded that there were no difference among the three groups with regards to eating disorder pathology (Ashley, Smith, Robinson, & Richardson, 1996).

The results of these studies are incongruent with pre-existing studies that found a greater prevalence of eating disorder behaviors among female athletes participating in lean-body sports.

Eating Disorders and Maturity

With the average age of the onset of eating disorders to be 17 to 18, the factor of maturity needs to be considered. Upon assessing female collegiate runners for anorexic behavior, Court (1983) compared the EAT-26 scores of the runners with their ages. The author did not detect any significant pattern that indicated the freshmen athletes displayed more eating disorder tendencies than the upper classwomen. Her hypothesis that younger female athletes were at greater risk was nonsignificant.

A review of literature on female athletes and eating disorders did not produce any longitudinal studies on the female athletic population. Therefore there is no way to determine if a female athlete who displays disordered eating while she is a student athlete will continue this pattern after her collegiate athletic career is over. Even in the broader focus of eating disorders among college women, long-term studies are also gravely deficient. Only one long-term study on nonathlete college women was found. This study was a 10 year look at body weight, dieting, and eating disorder symptoms of 509 undergraduate women. The group completed a detailed survey in 1982 while they were still students. They were then surveyed again 10 years later. The second study revealed that overall the women had a decline in eating disorder behavior and an increase in body satisfaction. The

author concluded that disordered eating declines as a woman transitions into adulthood. They speculated that a women's emotional maturity, self-confidence, stronger identity, and long-term partnerships with spouses or significant others were stabilizing variables that may have helped reduce the eating disorder tendencies (Heatherton, Mahamedi, Striepe, Field, 1997).

SUMMARY

Eating disorders are a major health and mental health concern in collegiate athletics as well as in the general population of college women. Substantial research exists supporting the fact that college women are four times more likely to display symptoms of an eating disorder as compared to the general population. Although there are numerous studies focusing on eating disorders among college females, research assessing the prevalence of eating disorder behavior among female collegiate athletes is very limited and has often produced incongruent results. Due to the dangerous physical and psychological issues associated with eating disorders, a better understanding of its prevalence among female athletes is needed. A clearer understanding of eating disorders among female athletes would help facilitate more accurate education and preventative intervention programs for coaches, trainers, athletes, and parents.

In summary, the major objective of this study is to assess eating disorder tendencies among female collegiate athletes. This project makes no claim to diagnosing eating disorders. Without additional assessments such as clinical interviews or physical examinations, a complete diagnosis cannot be determined. The use of self-reporting surveys can, however, help determine possible eating disorders, eating disorder behaviors, subclinical eating disorders or pathogenic weight control methods.

First, this study will investigate the prevalence of eating disorder behaviors among collegiate female athletes as compared to nonathlete college females. Additionally, the relationship between sports advocating body leanness and eating disorder tendencies among the female athletes will be addressed. Recent research assessing whether lean-body sports create an environment that exacerbates disordered eating reveals these behaviors are no longer restricted among these sports but are also occurring with higher prevalence in nonlean body sports. Finally, this study proposes to assess the possible relationship between age (maturity) and the risk of eating disorder behavior to see if older athletes display less or greater symptoms of eating disorders than younger athletes.

CHAPTER 3

Methodology

Introduction

The focus of eating disorders among female athletes is relatively new. Previous research supports the concept that women athletes are at greater risk of eating disorder behaviors or pathogenic weight control methods than the nonathlete female population, and female athletes participating in sports that emphasize body leanness are placed at even higher risk of developing eating disorders (Black, 1991; Borgen, 1984; Borgen, 1994; Borgen & Corbin, 1987; Davis & Cowels, 1989; Dick, 1990; Garner & Garfinkel, 1980; Moriarty, 1991; Nattiv, 1994; Petrie 1993 Rosen, McKeag, Hough & Curley, 1986; Sundgot-Borgen, 1993).

Other studies, however, have shown no difference in eating disorder risk between female athletes and female nonathletes (Court, 1983; Patterson, 1995; Spelbrink, 1984). These studies provide incongruent and inconclusive findings. Because of the serious and life threatening effects of eating disorders, continued research is greatly needed.

The present study was a quantitative study designed to analyze and compare non-experimental data on female collegiate athletes and college female nonathletes. The purpose of this study was:

- Investigate the prevalence of eating disorder behaviors among female collegiate athletes as compared to college female nonathletes
- Assess whether women sports advocating body leanness have higher incidence of eating disorder behaviors than non-weight specific sports
- Analyze the effects of the athletes' age (maturity) on the intensity of eating disorder behaviors.

The null hypotheses addressed in this research include:

1. Female collegiate athletes will show no significant difference in eating disorder behaviors than college female nonathletes.
2. Female athletes who participate in sports with an orientation and culture toward body leanness will have no significant difference in eating disorder behaviors than female athletes participating in sports not emphasizing body leanness.
3. The natural process of maturation will show no significant difference between the female athletes and their risk level of eating disorder behavior.

Sample/Population

The population for this study included female collegiate athletes and female college nonathletes age 16 to 25 years old from a rural state

university in Southwestern Virginia. The athletes comprised ten varsity intercollegiate sports competing on a NCAA Division One level and one nonvarsity dance team. Since the population of female athletes was small (N=232), efforts were taken to include all women athletes in the study. To be eligible for the study, the athletes had to be enrolled as a full-time student and currently on the team roster for the 97- 98 academic year. The surveying was conducted during the 97-98 fall and spring semesters. The majority of the female athletes participated in the study, resulting in an athlete sample size of 206.

The female nonathlete data were collected by the researcher during the 98-99 academic year. Permission was granted from the Director of Residence Education to perform a randomized cluster sampling of the all-female dormitory floors classified as on-campus housing. These women were also full-time students. All residents on the selected floors were given the opportunity to participate in the study, and 197 female residents responded.

Instrumentation

The instrument chosen for this study was the Eating Attitudes Test 26, most often referred to as the EAT-26 (Garner, Olmsted, Bohr, & Garfinkel, 1982). This self-reporting survey was used for this study to measure the

subjects' attitudes about food and diet patterns that are similar to those of clinically diagnosed anorexia nervosa and bulimia nervosa patients.

The EAT-26 is a shorter version of the original 40 item Eating Attitudes Test (EAT or EAT-40, Garner & Garfinkel, 1979). The EAT-40 questionnaire is considered to be both a reliable and valid measure of attitudes about eating and dieting behaviors (Garner & Garfinkel, 1979). The EAT-40, the longer version of the EAT-26, has 40 items that was originally designed to measure symptoms and attitudes of anorexia nervosa only. The EAT-40 is one of the most widely used standardized instruments that assesses the behaviors associated with eating disorders (Garner, 1993).

In an effort to establish a relationship between symptom areas and clinical features of anorexia nervosa, the developers of the original EAT-40 conducted a factor analysis on the 40 questions to identify item clusters (Garner et al., 1982). Based on the responses of the 160 hospitalized anorexics patients (AN). There were three factors that accounted for 40.2% of the EAT-40 variance (Garner et al., 1982). After an oblique rotation was performed on the items loading at .40 or greater, 14 items did not load on any of the three factors and were thus eliminated from the original 40 item EAT. The results created the abbreviated version, the EAT-26.

The three extracted factors that comprise the EAT-26 include: Factor I titled “Dieting” consists of 13 items relating to avoiding fattening foods and preoccupation with being thinner; Factor II labeled “Bulimia and Food Preoccupation” includes 6 items reflecting thoughts about food and bulimic behaviors; and Factor III named “Oral Control” is comprised of 7 items relating to self-control of eating and the perceived pressure from others to increase body weight. Factor I of the EAT-26 had the highest correlation with the total EAT-26 scores ($r = .93$). Factor II produced a moderate correlation to the total EAT-26 scores ($r = .64$), followed by Factor III displaying the weakest correlation with the total EAT-26 scores ($r = .60$), (Garner et al., 1982).

Validity

Criterion-related validity for the EAT-26 was verified by the results of a discriminant function analysis conducted from the responses of 160 anorexia nervosa inpatients (AN) and 140 female university students serving as the normal control group (NC), (Garner et al., 1982). With this sample, a cut-off score of 20 on the EAT-26 correctly identifies a similar proportion of anorexic and normal control subjects according to group membership. The percentage of correctly classified cases, based on the total score, was 84.9% for the EAT-40 and 83.6% for the EAT-26 (Garner et al., 1982). Significant

differences between two subgroups of anorexic patients, bulimic- type (bingeing & purging) and restricter-type (restricting caloric intake to dangerous levels), were reported. Although the bulimic and restricter subgroups did not differ in the total EAT-40 or the EAT-26 scores, bulimics did score significantly higher on Factor II (Bulimia and Food Preoccupation) and lower on Factor III (Oral control) as compared to the restricters. The restricters scored opposite the bulimics on Factors I and II (Garner et al., 1982).

Concurrent validity on the EAT-26 was provided using the 160 anorexic inpatient group. The total EAT-26 scores were significantly correlated with two clinical feature assessment methods: The Body Dissatisfaction Scale (BDS) which asks subjects to indicate their degree of dissatisfaction on 18 body parts that is rated on a 6 point Likert scale (Berscheid, Walster, & Hohnstedt, 1973), and a Body-Image Composite Score which verifies an anorexic patient's own preference for a thin ideal image and her negative attitudes towards her own body (Garner & Garfinkel, 1981). The EAT-26 total scores were correlated with the BDS at ($r = 0.44, p < 0.001$) and with the Body-Image Composite Score as ($r = 0.57, p < 0.001$). Additionally, the Hopkins Symptom Check List (HSCL), an instrument that assesses psychometric measures related to depression, anxiety, sensitivity,

obsessionality, and somatization (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974) produced a significant correlation with the total EAT-26 scores ($r = 0.42, p < 0.001$).

The three factors of the EAT-26 were highly related to psychometric instruments measuring similar constructs. From the original sample of 160 (AN) inpatients and the 140 (NC) group, scores on Factor I (Dieting) were significantly related to body-image variables yet unrelated to bulimic behaviors. Factor II (Bulimia) was significantly related to the body-image variable but was also positively related to bulimia. And Factor III (Oral Control) was negatively related to the percentages of average weight and to bulimia nervosa (Garner et al., 1982).

Reliability

The intercorrelations between the EAT-40 and the EAT-26 revealed high reliability alpha coefficients calculated from the 160 (AN) inpatients ($\alpha = 0.90$) and the 140 (NC) group ($\alpha = 0.83$). Alpha coefficients on the EAT-40 and EAT-26 were calculated on the three factors. Factor I “Dieting” produced the highest internal consistency (AN, $\alpha = 0.90$ and NC, $\alpha = 0.86$), followed by Factor II “Bulimia and Food Preoccupation” (AN, $\alpha = .84$ and NC, $\alpha = .61$), and Factor III “Oral Control” (AN, $\alpha = .84$ and NC $\alpha = .46$), (Garner et al., 1982). Test-retest reliability has not been reported for either

the EAT-40 or the EAT-26, however, the authors report the EAT-40 is sensitive to clinical remission of anorexia nervosa (Garner & Garfinkel, 1979). The high correlation ($r = 0.98$) among the scores of the EAT-26 and the EAT-40 gathered from the 160 (AN) inpatients and the 140 (NC) groups suggests the EAT-26 is both an economical and reliable substitution for the EAT-40 (Garner et al., 1982).

The validity and reliability of the EAT-26 as an instrument measuring eating attitudes associated with anorexia nervosa and bulimia nervosa have been documented. For these reasons the EAT-26 was selected to assess eating disorder behaviors in this study.

Scoring

The EAT-26 is composed of twenty-six of the original 40 items from the EAT-40, these items were constructed from rational-empirical methods. Each item is scored on a 6-point Likert-type scale using the following response options: 1) always, 2) very often, 3) often, 4) sometimes, 5) rarely, and 6) never. A response in the extreme direction of 1) always, measures the strongest anorexic tendency and is weighted at 3. Likewise 2) very often, is given 2 points, and 3) often, is valued as 1 point. The only item that requires a reversal in the scoring is item 25. Therefore response 6) never, is scored at

a 3 and the less extreme responses 5) and 4) are scored as 2 and 1 points (see Appendix A).

Responses that fall beyond the three weighted choices are assigned a zero because they do not reflect anorexic nervosa or bulimia nervosa traits (Garner & Garfinkel, 1979; Garner et al., 1982). A cut-off score of 20 on the EAT-26 is suggested for identifying anorexia nervosa or bulimia nervosa with a possible 13% of false-positive scores (Garner et al., 1982).

Data Collection

Female Athletes

The female athlete data for this study was provided by the Athletic Department at the participating university. Verbal permission to use the data for the study was granted during the fall 97 semester. A letter was mailed to the Assistant Athletic Director responsible for women's sports confirming the agreement to use the data and to inform them of the purpose of this study.

From August through October of 1997, women in nine sports and one nonvarsity dance team completed the EAT-26 questionnaires. The surveys were completed during team meetings. A team physician and the researcher spoke briefly about the risks of eating disorders in athletics and informed the athletes that the Athletic Department would like to get a better idea of how prevalent eating disorder behaviors may be among the varsity women

athletes. Additionally, the athletes were given referral information to access if they felt they may have a problem with an eating disorder or if they were concerned about a teammate. The athletes were then asked, on a voluntary basis, to complete the EAT-26. The questionnaires were handed out with basic verbal instruction for completing the survey. The athletes were asked not to discuss the survey among themselves while they were completing it. The women were also told the surveys were anonymous and the data would be used in a dissertation. The coaches were present during the completion of the surveys and they were each provided with a copy of the EAT-26 for their review. Some coaches also completed the survey, but these surveys were not used in the data. After completing the surveys, the women athletes placed the EAT-26 surveys face down on a table in the front of the meeting room or the athletes handed the surveys to the team physician or researcher.

Only one team, women's basketball, was not assessed during the fall 97 semester, this delay was requested by the head coach because she did not want the surveying to interfere with their basketball season. The women's basketball team members were given the surveys during individual meetings with the team physician in April of 98. The physician informed the players about the Athletic Department's desire to measure possible eating disorder behaviors among the women athletes. The athletes were informed that

participating in the study was voluntary and confidential. The women were also provided the same eating disorder referral information as the other teams. Each player completed the survey in the presence of the physician and then turned them in to her. None of women's basketball coaches were present during this process.

Female Nonathletes

The female nonathlete data was collected by the researcher during the 98-99 academic year. The nonathletes also attended the same university as the female athletes. Permission was granted from the Director of Residence Education to perform a randomized cluster sampling of the all-female dormitory floors classified as on-campus housing. These all-female floors were randomly selected to participate. The resident assistants assigned to these floors were contacted by the researcher and they assisted in advertising and promoting the study. Flyers were posted on each floor at least five days prior to the survey, informing the residents of the purpose of the study, date, time, and location it would be conducted.

Additionally, each resident who completed a survey was eligible to register to win one cash prize drawing of \$100.00 during the 98 fall semester and one cash prize drawing of \$75.00 in the 99 spring semester. This was implemented to provide an incentive for the women to participate. To

provide incentive to the resident assistants in the promotion of the study, they were registered to win a \$25.00 gift certificate to a local specialty store. One \$25.00 certificate was awarded during the 98 fall semester and one during the 99 spring semester.

The surveys were conducted in a specified location within the dormitory where the floors were located. The researcher provided the volunteers with both oral and written information about the purpose of the study, confidentiality, and eating disorder referral resources. The researcher gave verbal instructions on completing the survey. Each resident was asked to identify herself if she was currently participating on a varsity team so there would be no duplication of the female athletes with the female nonathlete group. Only two surveys in the nonathlete sample were identified as female athletes, and they were removed from the sample, therefore leaving 197 nonathlete participants. The researcher remained at the survey site for thirty minutes in order to allow for late comers. The resident assistants were also present and completed the survey. After the participants completed the survey, they were asked to lay them face down on a table in the front of the survey room. The methodology used on the female nonathletes was implemented the same for each of the ten floors that were surveyed. Six

floors were surveyed during the 98 fall semester and four floors were surveyed during the 99 spring semester.

Methods of Analysis

The first part of the analysis involved descriptive statistics on the demographic characteristics of the two groups and the sports-based subgroups. Means, standard deviations, and range variables such as age, current body weight, lowest adult weight, and highest adult weight were presented to provide a profile of the sample groups. To compare the overall means from the two samples of female athletes and female nonathletes, a two-tailed independent t-test was computed. EAT-26 scores of 20 or above served as the cut-off indicating eating disorder behaviors. Raw scores falling below 20 were classified as lower risk of eating disorder behaviors.

In the second part of the analysis, inferential statistics were used to examine the differences in the athlete and nonathlete groups. Based on the EAT-26 cut-off score, analysis of variance (ANOVA) was used to examine the relationship between eating disorder behavior and the various sports. The EAT-26 raw score served as the dependent variable and the different sports functioned as the independent variable. Additionally, a t-test was conducted on two sport subgroups, four teams that emphasized body leanness and seven teams that focused less on leanness.

The third hypothesis, maturation, was analyzed by calculating a correlation between age and the total EAT-26 raw score. The subjects' age functioned as the independent variable and the EAT-26 scores represented the dependent variable. This process investigated whether younger female athletes were at greater or less risk of eating disorder behavior than the older female athletes. A cut-off score of 20 or greater on the EAT-26 served as the indicator of eating disorder behavior. A negative correlation coefficient between age and total raw score would indicate a relationship between maturation and higher rates eating disorder behavior.

Conjointly, with the three factors (Dieting, Bulimia, and Oral Control), additional investigation for possible eating disorder trends between the athletes and nonathletes were assessed. The data from the two groups were analyzed by a principal component analysis to confirm the presence of the three factors as in Garner's work. It was expected that the three factors, as suggested by Garner et al., (1982) would underlie the responses for both female athletes and female nonathletes. The two groups were compared on the three factors to examine how they differed on the three factors.

Chapter 4

Results

This first section of this chapter provides a description of the sample, instrument reliability, and related measurement issues. The second part presents the statistical results used to respond to the three research questions proposed in the study.

1. Is there a difference in the incidence of eating disorder behaviors among female collegiate athletes and nonathlete college females? It is hypothesized that female collegiate athletes will demonstrate greater risks of eating disorder behavior than nonathlete college females because the athletes are in an environment that often leaves them feeling intense pressure to maintain lower body weight.
2. Is there a relationship between the type of sport female athletes participate in and the prevalence of eating disorder tendencies? The hypothesis that there would be mean differences in eating disordered tendencies among sports is based on the theoretical assumption that incidence of eating disorders are related to environmental pressures for maintaining lower body weight in such sports as cheerleading, dance, cross country running, and track & field.

3. Is there a relationship between age of the athlete and the prevalence of eating disorder behaviors? It is hypothesized that the natural process of maturation will have a positive effect on reducing the female athlete's risk of eating disorder behavior.

Description of the Sample

Combined Groups

The female collegiate athlete sample was taken from a 232 female varsity athlete population who were attending and competing at a major Division I university in Virginia. The female athlete participation resulted in an 88.79 percent response rate ($n = 206$). The nonathlete female sample was selected using randomized cluster sampling from the same university. The unit of sampling was all-female residential dormitory floors on campus. Everyone living on the selected floors was invited to participate in the study which produced a possible sample size of 432. Varsity athlete surveys were identified and removed from the nonathlete sample to ensure no duplication. This resulted in a total response of 197 (45.6%) college female nonathletes.

The female athlete group made up 51% of the total sample size and the nonathlete females comprised 48.9%. The mean demographic scores on both groups combined included: age, $M = 18.97$ years; height, $M = 5'6.8''$; current weight, $M = 137.48$ pounds; non-pregnant highest adult weight (age 16 or

greater) $M = 144.78$ pounds; lowest adult weight (age 16 or greater) $M = 125.34$ pounds.

The age range for the combined group was age 16 to 25 years old (see Table 1).

Collegiate Female Athlete Group

The total female collegiate athlete population at this university consisted of 232 women who were listed on a team roster of one of ten varsity sports and one modern dance team during the 97-98 academic school year. The female athletes who participated in the study were 206 athletes from the 11 different sports ($n = 206$).

The eleven different female athletic teams that participated in the study included: volleyball ($n = 15$), soccer ($n = 24$), high tech dance ($n = 12$), tennis ($n = 10$), cheerleading ($n = 18$), softball ($n = 18$), lacrosse ($n = 31$), cross country ($n = 20$), track & field ($n = 20$), swimming/diving ($n = 27$), and basketball ($n = 11$). All 206 female athletes reported being undergraduates with the exception of one athlete who reported graduate student status.

The mean scores on the demographics of the female athletes included: age, $M = 19.36$ years; height, $M = 5'6.1''$; current weight, $M = 135.89$ pounds; highest non-pregnant adult weight (age 16 or greater), $M = 142.99$ pounds; and lowest adult weight (age 16 or greater), $M = 126.00$ pounds. The age of the female athletes ranged from 17 to 25 years old (see Table 1).

Table 1**EAT-26 Principal Component Analysis – Sample Variance Explained**

	Combined Group			Female Athletes			Female Nonathletes		
Component	Eigenvalue	% of Variance	Cummulative % of Variance	Eigenvalue	% of Variance	Cummulative % of Variance	Eigenvalue	% of Variance	Cummulative % of Variance
1	5.76	22.15	22.15	4.88	18.76	18.76	5.57	21.41	21.41
2	4.04	15.53	37.68	4.83	18.57	37.33	4.36	16.76	38.17
3	2.25	8.63	46.32	2.97	11.41	48.74	2.15	8.28	46.45

N= 403 Combined Group
n= 206 Female Athletes
n= 197 Female Nonathletes

Component 1= Dieting
Component 2= Bulimia and Food Preoccupation
Component 3= Oral Control

Nonathlete College Female Group

The nonathlete female sample ($n = 197$) was comprised of full-time undergraduate women residing on the campus in dormitories where specific floors had “all-female” designation. These women were surveyed during the 98-99 academic school year.

The mean demographic scores of the nonathlete female group included: age, $M = 18.59$ years; height, $M = 5'5.5''$; current weight, $M = 139.13$ pounds; highest non-pregnant adult weight (age 16 or greater), $M = 146.96$ pounds; lowest adult weight (age 16 or greater), $M = 124.67$ pounds. The age range of the nonathlete female group varied from 16 to 21 years old (see Table 1).

Demographic Differences

Differences between the female athletes and female nonathletes did exist.

One of the most critical differences between the female athletes and nonathletes was age. The mean age of the female athletes was 19.34 years, with a standard deviation of 1.29, and the female nonathletes mean age was 18.59 with a standard deviation of .89.

The remaining demographics, height, current weight, highest adult weight, and lowest adult weight were also analyzed in this study. It is important to note the different physical characteristics between the female athletes and

female nonathletes. The female athletes possessed more homogenous weight characteristics and less fluctuation in their body weight than the nonathletes. The female athletes were slightly taller, $M = 5'6.1''$, with a wider height standard deviation, $SD = 3.45''$, than the female nonathletes, $M = 5'5.5''$, $SD = 2.73''$. Likewise, the female athletes varied less on current weight ($M = 135.89$ pounds, $SD = 21.11$ pounds), highest adult weight ($M = 142.97$ pounds, $SD = 23.27$ pounds), and lowest adult weight ($M = 126$ pounds, $SD = 19.71$ pounds) as compared to the female nonathletes (current weight, $M = 139.13$, $SD = 29.07$; highest adult weight; $M = 146.96$, $SD = 32.64$; and lowest adult weight, $M = 124.67$, $SD = 22.52$) (see Table 1).

Reliability Estimates and Principal Component Analysis

Many past studies that used the EAT-26 did not reassess the instrument for reliability or validity. In order to maintain the appropriateness of what an instrument is supposed to measure in a given study, it is important for this process to be ongoing each time the instrument is used. No measurement instrument is immune from the need to be assessed and revised. Terms and items in surveys can become outdated because the meaning of phrases and the interpretation of item questions may change as the linguistic trends of our society evolve. For these reasons, the reliability and validity of the EAT-26 was evaluated in the current study.

Reliability

To investigate the reliability of the three factors in the EAT-26 (Factor I = Dieting, Factor II = Bulimia and Food Preoccupation, and Factor III = Oral Control), alpha coefficients were calculated for the combined group (CG), the female athlete group (AG), and the female nonathlete group (NG). The reliability estimates from these three groups were compared with the internal consistency reported by the survey developers of the EAT-40 and EAT-26 (Garner, et al., 1982).

The alpha coefficients for the total 403 (CG) sample were: $\alpha = .88$ for Factor I, $\alpha = .81$ for Factor II, and $\alpha = .49$ for Factor III. The 206 female athletes (AG) had alpha coefficients of $\alpha = .87$ for Factor I, $\alpha = .81$ for Factor II, and $\alpha = .51$ for Factor III. The nonathlete females (NG) sample had alpha coefficients of $\alpha = .88$ for Factor I, $\alpha = .80$ for Factor II, and $\alpha = .48$ for Factor III (see Table 2). In comparison, the Garner et al. (1982) study reported the EAT-26 reliability of his 160 anorexic inpatients (AN) and the 140 normal control university female group (NC) to be: for Factor I (AN, $\alpha = .90$ and NC, $\alpha = .86$); Factor II (AN, $\alpha = .84$ and NC, $\alpha = .61$); and Factor III (AN, $\alpha = .84$ and NC, $\alpha = .46$) (Garner, et al., 1982). The sample

Table 2**Rotated Factors and Final Communalities – Female Athletes**

Component (Factors) Extractions				EAT – 26 Items
1	2	3	h^2	
.61	.37		.48	1. Am terrified about being overweight.
		.63	.47	2. Avoid eating when I am hungry.
.32	.74		.66	3. Find myself preoccupied with food.
	.80		.68	4. Have gone on eating binges where I feel that I may not be able to stop.
			.075	5. Cut my food into small pieces.
.65			.45	6. Aware of the calorie content of the foods that I eat.
.37			.23	7. Particularly avoid food with a high carbohydrate content (i.e., bread, rice, potatoes, etc.)
		.84	.73	8. Feel that others would prefer if I ate more.
	.60	.58	.74	9. Vomit after I have eaten.
.31	.75		.69	10. Feel extremely guilty after eating.
.69	.47		.70	11. Am preoccupied with a desire to be thinner.
.66	.33		.55	12. Think about burning up calories when I exercise.
		.79	.63	13. Other people think that I am too thin.
.67	.39		.65	14. Am preoccupied with the thought of having fat on my body.
			.052	15. Take longer than others to eat my meals.
.46			.23	16. Avoid foods with sugar in them.
.73			.59	17. Eat diet foods.
	.69		.52	18. Feel that food controls my life.
			.12	19. Display self-control around food.
		.52	.35	20. Feel that others pressure me to eat.
.48	.71		.74	21. Give too much time and thought to food.
.46	.49		.46	22. Feel uncomfortable after eating sweets.
.77			.64	23. Engage in dieting behavior.
.40		.41	.42	24. Like my stomach to be empty.
.30			.092	25. Enjoy trying new rich foods.
	.69	.49	.71	26. Have the impulse to vomit after meals.

n= 206 Female Athletes

Component 1 = Dieting

Component 2 = Bulimia and Food Preoccupation

Component 3 = Oral Control

from this study demonstrated similar reliability estimates. Factor three had the lowest reliability and the other two factors had quite high reliabilities. The reasonably high reliability estimates support the use of this instrument for various subpopulations of female college students.

Principal Component Analysis of Instrument

The purpose of the principal component analysis was to understand the factor structure of the data and to assess whether the data from this study reflected similar principal components as reported by the Garner et al.(1982) study.

When developing the EAT-26, Garner and associates took the original 40 item survey, the EAT-40, and factor analyzed sample data from the 160 anorexic inpatient (AN) sample. An oblique rotation was conducted and three factors were extracted that accounted for 40.2% of the total variance. Fourteen items of the EAT-40 did not load at .40 or above on any of the three factors, and four items (4, 9, 14, 25) loaded almost equally on Factors I and II. After careful inspection of the content of the four complex items, they were retained only on Factor I. The fourteen items that did not load at .40 or above on any of three factors were dropped from the survey resulting in a revised instrument with 26 items, which created the EAT-26 (Garner, et al., 1982).

Garner et al., (1982) reports that Factor I consists of thirteen items. These items were: 1, 6, 7, 10, 11, 12, 14, 16, 17, 22, 23, 24, and 25. The first factor was labeled “Dieting” because the items were related to dieting behaviors. The intent of the items in Factor I was to assess behaviors that relate to the avoidance of fattening foods and preoccupation with being thinner. Factor II “Bulimia and Food Preoccupation”, has six items which are 3, 4, 9, 18, 21, and 26. These items were designed to measure the participant’s thoughts about food and bulimic behaviors. The third Factor titled “Oral Control” is comprised of seven items, which include 2, 5, 13, 15, 19, and 20. Factor III assesses the subjects’ self-control of eating and the perceived external pressures from others to gain weight (Garner et al., 1982) (see Appendix A, EAT-26).

A principal component analysis was conducted on the current data and the outcome was compared to Garner’s results in order to investigate if the factor structure was the same for college athletes and nonathlete groups. The data were separated into two groups: female athlete group (AG, $n = 206$), and female nonathlete group (NG, $n = 197$). Also, analyses were carried out on the combined sample of athletes and nonathletes. Using the statistical software SPSS Base 8.0, a principal component analysis was conducted on the two groups. This procedure searched for common variance among the 26

observed variables within the two groups and reduced the variables to a smaller number of components that would account for at least 40.2 % or more of the total variance. The total variance criteria for retaining factor status in the Garner study was 40.2% (Garner et al., 1982).

The first step computed in the current study was an unrotated factor solution without restricting the number of factors. The results displayed initial eigenvalues of 1.00 or greater on seven factors which explained 68% of the total variance. The second step involved the same procedure with a restriction on the factors to five components. The results of the varimax rotation showed that 5 factors accounted for 56% of the total variance. After the two solutions, the observed variables were restricted to three factors and a varimax rotation concluded that the three factors did in fact account for more than 40.2% of the total variance in both groups (AG = 48.74%, NG = 46.45%) (see Table 3). As part of the rotation procedure, any extraction loading at or below .30 was suppressed, these low level loadings were considered too weak to be meaningful factor loadings (see Table 3).

Additionally, the eigenvalues on the three factors in each group fell between 2.15 and 5.79. The results from the principal component analysis produced slightly better but similar results to Garner's study (Garner, et al., 1982). Communalities extractions were performed on each of the three groups

Table 3**EAT-26 Principal Component Analysis – Sample Variance Explained**

	Combined Group			Female Athletes			Female Nonathletes		
Component	Eigenvalue	% of Variance	Cummulative % of Variance	Eigenvalue	% of Variance	Cummulative % of Variance	Eigenvalue	% of Variance	Cummulative % of Variance
1	5.76	22.15	22.15	4.88	18.76	18.76	5.57	21.41	21.41
2	4.04	15.53	37.68	4.83	18.57	37.33	4.36	16.76	38.17
3	2.25	8.63	46.32	2.97	11.41	48.74	2.15	8.28	46.45

N= 403 Combined Group
n= 206 Female Athletes
n= 197 Female Nonathletes

Component 1= Dieting
Component 2= Bulimia and Food Preoccupation
Component 3= Oral Control

to determine what percent each variable accounted for within the total observed variables. Low communalities were identified on items 5, 15, and 25 in the female athlete group (AG), and item 19 in the female nonathlete group (NG), (see Tables 4 and 5). Since the variance of the three factors differed between athletes and nonathletes, an effort was made to look at the principal components analysis separately in the two groups.

Principal Component Analysis Female Athletes

The results of the principal component on the female athletes (AG) produced strong factor loadings on nineteen of the 26 items which was desirable.

Three items (5, 15, 19) did not produce a loading of .30 or greater on any of the factors indicating weak items. Four items had factorially complex loadings on two of the factors. These items were: 9, 10, 22, and 24 (see Table 4).

Items 10, 22, and 24 were predicted by the test developers to load onto Factor I. In this study, item 10 loaded significantly higher on Factor II (.75) and lower on Factor I (.31); item 22 loaded slightly higher on Factor II (.49) and lower on Factor I (.46); and item 24 loaded almost equally on Factor I (.40) and Factor III (.41). Factor II had one item (9) that was incongruent with the Garner research, it produced a complex loading of .60 on Factor II

Table 4**Rotated Factors and Final Communalities – Female Athletes**

Component (Factors) Extractions				EAT – 26 Items
1	2	3	h^2	
.61	.37		.48	1. Am terrified about being overweight.
		.63	.47	2. Avoid eating when I am hungry.
.32	.74		.66	3. Find myself preoccupied with food.
	.80		.68	4. Have gone on eating binges where I feel that I may not be able to stop.
			.075	5. Cut my food into small pieces.
.65			.45	6. Aware of the calorie content of the foods that I eat.
.37			.23	7. Particularly avoid food with a high carbohydrate content (i.e., bread, rice, potatoes, etc.)
		.84	.73	8. Feel that others would prefer if I ate more.
	.60	.58	.74	9. Vomit after I have eaten.
.31	.75		.69	10. Feel extremely guilty after eating.
.69	.47		.70	11. Am preoccupied with a desire to be thinner.
.66	.33		.55	12. Think about burning up calories when I exercise.
		.79	.63	13. Other people think that I am too thin.
.67	.39		.65	14. Am preoccupied with the thought of having fat on my body.
			.052	15. Take longer than others to eat my meals.
.46			.23	16. Avoid foods with sugar in them.
.73			.59	17. Eat diet foods.
	.69		.52	18. Feel that food controls my life.
			.12	19. Display self-control around food.
		.52	.35	20. Feel that others pressure me to eat.
.48	.71		.74	21. Give too much time and thought to food.
.46	.49		.46	22. Feel uncomfortable after eating sweets.
.77			.64	23. Engage in dieting behavior.
.40		.41	.42	24. Like my stomach to be empty.
.30			.092	25. Enjoy trying new rich foods.
	.69	.49	.71	26. Have the impulse to vomit after meals.

n= 206 Female Athletes

Component 1 = Dieting

Component 2 = Bulimia and Food Preoccupation

Component 3 = Oral Control

Table 5**Rotated Factors and Final Communalities – Female Nonathletes**

Component (Factors) Extractions				EAT – 26 Items
1	2	3	h^2	
.57	.31		.44	1. Am terrified about being overweight.
	.50	.44	.45	2. Avoid eating when I am hungry.
.35	.69		.59	3. Find myself preoccupied with food.
	.7		.49	4. Have gone on eating binges where I feel that I may not be able to stop.
		.47	.24	5. Cut my food into small pieces.
.76			.58	6. Aware of the calorie content of the foods that I eat.
.49			.33	7. Particularly avoid food with a high carbohydrate content (i.e., bread, rice, potatoes, etc.)
		.73	.59	8. Feel that others would prefer if I ate more.
	.49		.24	9. Vomit after I have eaten.
.41	.75		.73	10. Feel extremely guilty after eating.
.73	.43		.72	11. Am preoccupied with a desire to be thinner.
.68			.51	12. Think about burning up calories when I exercise.
		.68	.50	13. Other people think that I am too thin.
.70			.56	14. Am preoccupied with the thought of having fat on my body.
		.48	.23	15. Take longer than others to eat my meals.
.36		.41	.32	16. Avoid foods with sugar in them.
.73			.58	17. Eat diet foods.
.37	.66		.57	18. Feel that food controls my life.
			.04	19. Display self-control around food.
	.59		.45	20. Feel that others pressure me to eat.
.62	.47		.60	21. Give too much time and thought to food.
.66			.49	22. Feel uncomfortable after eating sweets.
.77			.67	23. Engage in dieting behavior.
.39	.63		.60	24. Like my stomach to be empty.
.42			.19	25. Enjoy trying new rich foods.
	.53		.33	26. Have the impulse to vomit after meals.

n= 197 Female Nonathletes

Component 1 = Dieting

Component 2 = Bulimia and Food Preoccupation

Component 3 = Oral Control

and .58 on Factor III. The three items (5, 15, 19) that had weak loadings of .30 or below were intended to load onto Factor III; Garner's study reported these same three items, from his sample, as loading onto Factor III at .40 or greater. In the current study these items failed to do so (Garner, et al., 1982), (see Table 4). The results from this study indicate some differential functioning of items within the different groups, and suggests areas of revisions and further development of the measures in this field.

Principal Component Analysis Female Nonathletes

The principal component analysis was also conducted on the female nonathlete group (NG). Nineteen items produced strong loadings on separate factors, while five items displayed complex loadings (2, 10, 16, 21, 24), measuring equal loadings on two factors. One item (20) produced a strong loading onto a different factor than what was expected, and item 19 did not meet the .30 loading criterion on any of the three factors. Items 10, 16, and 24 were expected to load on Factor I. Instead, item 10 loaded higher on Factor II (.75) and lower on Factor I (.41); item 16 was higher on Factor III (.41) and lower on Factor I (.36). Item 21 was expected to load onto Factor II yet it loaded higher on Factor I (.62) and lower on Factor II (.47) (see Table 5).

The three items (2, 19, 20) that were reported by the Garner study as loading on Factor III, produced factorially complex loadings or insignificant loadings in the current study. Item 2 loaded higher on Factor II (.50) and lower on Factor III (.44). Item 19 did not load onto any of the factors at or above .30; item 20 loaded well onto Factor II (.59) but produced a weak loading on the intended factor, Factor III (see Table 5).

As a result of the reliability estimates and principal component analysis on the two groups, some of the items in the EAT-26 appear to need revision. For this reason, future studies implementing the EAT-26 should continue to reassess each item's appropriateness for the population being measured.

Differences in eating disorder behaviors among female college athletes and nonathlete college females.

The important question that the present study addresses is the issue of differential risk of eating disorders among female college subpopulations depending on different environmental pressures in these groups. The first step in addressing this question involved investigating the frequency of identified eating disorder behavior among the combined sample ($N = 403$), the female athlete group ($n = 206$), and the nonathlete female group ($n = 197$). Based on earlier research, it was assumed that any participant who had a total

score of 20 or higher on the EAT-26 was potentially at risk for eating disorders. Therefore, a score of 20 or higher has been recommended as a cut off score by the test developers for identifying potential eating disorders (Garner et. al. 1982).

The mean raw scores for the two groups were: female athletes, $M = 8.09$, and the female nonathletes, $M = 9.97$. In the combined groups ($N = 403$), revealed 12.9% or 52 women scored 20 or greater on the EAT-26. In the female collegiate athlete group ($n = 206$), 10.7% or 22 athletes scored 20 or greater. The nonathlete college female group ($n = 197$), produced 15.2% or 30 women scoring a total raw of 20 or greater. This comparison indicated that the nonathlete female group had higher percentage of women meeting the criterion for eating disorder behavior (see Table 6).

As a second step, a two-tailed independent sample t-test was conducted to investigate if there was a statistically significant difference on the EAT-26 raw scores between the female athlete and nonathlete groups. The results of the t-test produced a $t = -2.025$ which is significant at the .05 level ($p < .05$). Therefore, the null hypothesis of no difference was rejected. The

Table 6**Frequency of Eating Disorders Among Sample Group and Sport Subgroups**

Groups	N	% scores indicating eating disorder behavior
Combined Group	403	12.9%
Female Athlete	206	10.7%
Female Nonathlete	197	15.2%
Female Sport Subgroups		
Volleyball (subgroup 1)	15	13.3%
Soccer (subgroup 2)	24	16.7%
High-Tech dance (subgroup 3)	12	16.7%
Tennis (subgroup 4)	10	0
Cheerleading (subgroup 5)	18	22.2%
Softball (subgroup 6)	18	5.6%
Lacrosse (subgroup 7)	31	12.9%
Cross Country (subgroup 8)	20	5%
Track and Field (subgroup 9)	20	5%
Swimming/Diving (subgroup 10)	27	11.1%
Basketball (subgroup 11)	11	0
EAT-26 Total raw score of 20 or greater indicates eating disorder behavior.		

N=Number

nonathlete female group scored significantly higher on the EAT-26 than the female athlete group. This was a reverse from what was expected (See Table 7).

The relationship between the type of sport and the risk of eating disorder behavior.

The second question explored was the hypothesis link between the type of sport and the risk of eating disorder. Prior to conducting analysis to answer this question, it was necessary to divide the female athletes into subgroups representing each team sport. This resulted in 11 sport subgroups: volleyball (subgroup 1), soccer (subgroup 2), high tech dance (subgroup 3), tennis (subgroup 3), cheerleading (subgroup 5), softball (subgroup 6), lacrosse (subgroup 7), cross country (subgroup 8), track & field (subgroup 9), swimming/diving (subgroup 10), and basketball (subgroup 11) (see Table 6).

It was expected that female athletes who participated in certain types of sports were likely to display higher levels of eating disorder behavior due to environmental pressures to maintain lean body composition. The percentages of athletes within the sport subgroup who scored 20 or greater on the EAT-26 were: volleyball (n = 15) 13.3% ; soccer (n = 24) 16.7%; high tech dance (n = 12) 16.7%; tennis (n = 10) 0%; cheerleading (n = 18) 22.2%; softball (n = 18) 5.6%; lacrosse (n = 31) 12.9%; cross country (n = 20) 5%; track & field

Table 7**t-test, Female Athlete and Female Nonathlete Groups**

	N	Mean	SD	df	T
Female Athletes	206	8.09	8.78		
Female Nonathletes	197	9.97	9.92		
				401	* -2.025

*Alpha significant at .05 level ($p < .05$), two tailed independent t-test

N = number

SD = standard deviation

df = degrees of freedom

(n = 20) 5%; swimming/diving (n = 27) 11.1%; and basketball (n = 11, subgroup 11)) 0%, (see Table 6). This comparison indicated there were noticeable differences in the percentages of eating disorder behavior among the individual teams.

To investigate whether there were any significant mean differences between sport subgroups, an analysis of variance (ANOVA) was conducted. Although some of the sports had much higher percentages of identified eating disorder behavior than others, the results of the ANOVA had an F value of 1.230; with an alpha level of .05 ($p < .05$). Thus, no significant differences on eating disorder behavior were found between the athlete sport subgroups (see Table 8).

To further investigate the issue of differential environmental pressure, the teams were placed in one of two categories. The total female athlete group was divided into two subgroups; sports that have historically placed higher emphasis on body leanness (HL), and sports with traditionally lower emphasis on body leanness (LL). The teams that comprised the high emphasis on leanness (HL), included cheerleading, high tech dance, cross country, and track & field (n = 70). The lower emphasis on leanness (LL) subgroup included volleyball, soccer, tennis, softball, lacrosse, swimming/diving, and basketball (n = 136).

Table 8**ANOVA, 11 Sport Subgroups.**

	Sum of Squares	df	Mean Square	F	Sig
Between Groups	936.86	10	93.69	1.230	.274
Within Groups	14849.57	195	76.15		
Total	15786.43	205			

F = 1.230, not significant at alpha level .05 ($p < .05$).

df = degrees of freedom

A two-tailed independent sample t-test was conducted. The results indicated a $t = .594$, which is not significant at the .05 level ($p < .05$). Therefore, the EAT-26 mean scores for the sports with high leanness and sports with less emphasis on body leanness, were not significantly different (see Table 9). As a result of the nonsignificant ANOVA and t-test results, the null hypothesis about differences based on sport type was retained.

Relationship between age and the risk of eating disorder behavior.

The third question that was investigated was the hypothesized relationship between the age of the athlete and the risk of eating disorder behavior. This hypothesis was based on the assumption that as college females mature and are exposed to new ideas and develop a better sense of self, the risk of eating disorders would decrease. Thus, the younger the college female, the higher her the risk of an eating disorder.

To determine if lower maturation was related to the level of eating disorder behavior, the EAT-26 total scores were correlated with age in both groups and the combined group. A Pearson correlation was computed for age and total score in each of the three groups. The combined group (1) had an $r = .125$, which was significant at the 0.05 level ($p < .05$). The female

Table 9

t-test, Sports with High Emphasis on Leanness and Sports with Lower Emphasis on Leanness

	N	Mean	SD	df	T
High Leanness Sports (HL) (cheerleading, high tech dance, cross country, track & field)	70	8.54	9.34		
Lower Leanness Sports (LL) (volleyball, soccer, tennis, softball, lacrosse, swimming/diving, basketball)	136	7.85	8.50		
				204	.594

t = .594 not significant at alpha .05 level ($p < .05$)

N = Number

SD = standard deviation

df = degrees of freedom

athlete group (2) displayed an $r = -.055$, which is not significant at the 0.05 level ($p < .05$). Finally, the nonathlete female group produced a correlation of $r = -.164$, indicating a significant negative relationship between age and the total raw score on the EAT-26 at the 0.05 level ($p < .05$), (see Table 10). As a result of the correlation analysis, the female athletes showed no significant relationship between the age of the athlete and eating disorder behavior.

The group that did show a significant negative relationship between maturation and eating disorder behavior were the female nonathletes. This indicated younger female nonathletes were displaying greater eating disorder behavior than their older counterparts. It is important to note that although female athletes showed no significant relationship between age and EAT-26 scores, the relationship was in the predicted direction. These results suggest there was a small negative relationship between age and EAT-26 scores, meaning younger college students, whether athletes or nonathletes, are likely to be at higher risk for eating disorders as well. Additionally, the average age difference between the female athletes and female nonathletes may have contributed to this outcome.

Table 10**Maturation Correlation of Total Sample, Female Athletes and Female Non-Athletes**

	Age – Pearson Correlation (2-tailed)	N	r
Group 1 Combined Group	1.000	399	-.125*
Group 2 Female Athletes	1.000	202	-.055
Group 3 Female Nonathletes	1.000	197	-.164*

*Correlation is significant at the .05 level ($p < .05$)

N = Number

r = Correlation

Summary

The results from this study seem to suggest that collegiate female athletes may no longer be the higher risk college subpopulation for developing eating disorders. There was no strong indication which sport may create an environmental risk for eating disorders. This study showed there was a relationship between higher EAT-26 raw scores and younger age. Although only the female nonathletes produced a significant relationship between age and high risks of eating disorders, the athletes also showed a small relationship.

This study contrasted earlier research on women athletes and eating disorder behaviors. The current research is unique because it may have identified a new trend in eating disorders among college women. Research on the prevalence of eating disorders among female athletes is a relatively new focus with little consistency as to just how susceptible women athletes may be to eating disorders.

Because of the limited research and inconsistent findings on female athletes and risk for eating disorders, more investigation on this topic is needed. The serious complications, life long damaging effects, and risk of death associated with eating disorders is too great to dismiss, especially in a

population that has been well documented to be at greater risk than the general population.

Chapter 5

Summary, Discussion, Implications, and Recommendations

The results of the study are summarized and discussed in this chapter.

First the summary of the results and conclusions of the study are reviewed.

Next, discussion on the methodology, demographics, reliability, and principal component analysis are presented. Finally, implications of the research findings and recommendations for future research are discussed.

Summary of Results

The purpose of this study was to investigate three related issues. The first issue addressed was to investigate whether female collegiate athletes displayed higher risks of eating disorder behavior than nonathlete college women. Secondly, an analysis was performed to determine if there was a relationship between risks of eating disorder behavior and sports advocating body leanness. Finally, the hypothesis that maturation reduces the risk of eating disorders among female collegiate athletes was examined. The results of the study are presented and discussed as they relate to each research question.

Research Question 1

Comparing the rates of eating disorder behavior among the female athletes and the nonathletes produced a significant difference between the two groups. The female nonathletes had significantly greater rates of eating disorder tendencies. The findings from this study suggest that nonathlete college women are at greater potential risk of eating disorders than female athletes. This contradicts conventional wisdom.

Although it was hypothesized that female athletes would score higher on the EAT-26, this study did not support that hypothesis. Previous studies have shown that female athletes are at greater risk of eating disorders than female nonathletes (Borgen, 1985; Dick, 1990; Dummer et al., 1987; Nattiv, 1994; Rosen, McKeag, Hough, & Curley, 1986; Sundgot-Borgen, 1993). However, the current study corroborates with other research that challenges the belief that female athletes are at greater risk (Court, 1983; Patterson, 1995; Spelbrink, 1984).

The findings of the present study, that female nonathletes are significantly at greater risk of eating disorder behavior than female athletes, suggests implications for further research on eating disorders. As previously mentioned, findings of previous studies have been inconsistent and have either shown that athletes were at greater risk, or that there was no risk

difference between the female athletes and female nonathletes. Instead, this study showed there was a significant difference in a new direction, that female nonathletes may currently be the higher risk subpopulation among college women. There be some reasons for this. Much of the prior research on female athletes and eating disorders is several years old. The literature review for this study showed a decline in the amount of research conducted on female athletes and eating disorders over the last five years. Since there was a lack of more recent research in this specialized area, it is possible that changing trends in eating disorders have gone undetected in this population. A research gap of several years is unfortunate, especially with a disease as deadly as an eating disorder.

Historically, studies on eating disorders have identified the college female to be at greater risk (4% to 19%) than the general population (1% to 4%) for developing an eating disorder (DSM IV, 1994; Borgen & Corbin, 1987). This higher risk factor is believed to be due largely to the lack of predictability of the new college environment, different social codes of conduct, higher demands for academic performance, and little or no access to adults for guidance (Cauwels, 1983; Root et al., 1986). Furthermore, the collegiate athletic environment possesses a very different atmosphere than the general college life experience. This includes numerous demands to maintain

both academic and athletic excellence joined with the time commitment of daily practices and weekly competitive events. Although these added demands on the female athlete have created speculation among eating disorder experts as exacerbating factors for eating disorders, it should also be considered that the Division I college female athlete has more environmental structure/ predictability, and accessibility to coaches, trainers, physicians, and academic advisors than nonathletes. This structure would seem to create a more concrete and intact support system for the female athlete. In contrast, college female nonathletes are probably less likely to have a developed resource network from their first day as a college student. It is more likely these nonathlete women have to seek out and build support systems while at the same time adjust to college life. The lower risk of eating disorder behavior among the female athletes, in this study, may reflect positive benefits of a more structured/predictable environment; one that may actually help reduce the risk of eating disorders instead of escalating the pathology. Additionally, eating disorder educational and intervention programs may have helped reduce the risks of eating disorders among the female athletes. Whether any of these types of programs were conducted for the athletes prior to this study was not investigated.

Research Question 2

The second research question investigated whether certain sports had higher rates of eating disorder behavior. The ANOVA showed no significant difference among the participants of the eleven different sports in risks of eating disorder behavior. Additionally, the team sports were divided into two groups, those where body leanness is emphasized, and the other where body leanness is not a central focus. The eleven teams were divided into the two groups based on previous research that identified these sports as having higher or lower emphasis on body leanness (Borgen, 1985; Borgen & Corbin, 1987; Garner & Garfinkel, 1980). For example, cheerleading, high tech dance, cross country, and track & field were considered sports emphasizing leanness while sports such as volleyball, soccer, tennis, softball, lacrosse, swimming/diving, and basketball were considered as having lower emphasis on body leanness. The results from the t-test on the two subgroups showed no significant difference. The sports in this study that have historically emphasized body leanness showed no significantly greater risk of eating disorder behavior than sports that have typically placed less emphasis on body leanness.

Although prior research supports the concept that female athletes participating in sports advocating leaner physiques are more likely to display

symptoms of eating disorders (Black, 1991; Borgen, 1985; Borgen, 1994; Burkes-Miller & Black, 1991; Chopak & Taylor-Nicholson, 1991; Petrie, 1993; Striegel-Moore et al., 1986; Sundgot-Borgen, 1993), the findings from the current study do not support those studies. One reason contributing to the nonsignificance from this part of the study involved the comparison between small sport sample sizes. Future research with larger sport sample sizes is needed.

On the other hand, a number of studies have disputed the concept that lean body sports have higher rates of eating disorders (Ashley, Smith, Robinson, & Richardson, 1996; Rosen et al., 1986; Warren, Stanton, & Blessing, 1990). The current study supports these findings. For example, athletes in traditionally lean body sports, cross country and track & field, both reported low percentages of eating disorder tendencies (5%) while athletes in three sports that traditionally do not focus on body leanness actually had higher percentages of eating disorder tendencies (volleyball 13.3%; soccer 16.7%; lacrosse 12.9%), (see Table 1).

The findings from this study suggest that all sports in which college women participate in are susceptible to eating disorders, and there may not be differences among the type of sports with regards to eating disorders.

There is a need for all athletic programs to develop and implement education and preventive programs about the symptoms and risks of eating disorders, how the athlete can get help, and how an intervention can be conducted for a teammate in trouble.

Research Question 3

The third and final research question investigated the hypothesis of whether there was a relationship between lower maturation and high incidence of eating disorder behavior. There was no significant correlation between age and eating disorder behavior among the female athletes. This suggests younger athletes were not showing more signs of greater eating disorder behavior than their older teammates. This outcome supports the conclusion from an earlier study that also indicated lack of maturation was not a significant risk factor for eating disorders among younger athletes (Courts, 1983).

By comparison, the female nonathletes did show a significant correlation between age and higher EAT-26 scores. The indication is younger female nonathletes were significantly at greater risk of displaying eating disorder tendencies than older female nonathletes.

It is important to notice the discrepancy between the average ages of the two groups. The mean age of the female athletes was 19.34 years ($SD =$

1.29) as compared to the mean age of the female nonathletes, 18.59 (SD = .89). The higher average age of the female athletes may have contributed to the nonsignificant relationship between age and the EAT-26 scores in this group. As mentioned previously, the average age of persons with an eating disorder is 17 to 18 (DSM IV, 1994). The nonathletes were chronologically closer to this age range than the athletes.

Although no significant relationship between age and EAT-26 scores was found among the female athletes, the relationship was in the predicted direction. This suggests a small negative relationship between age and risk of eating disorder behavior, implying younger collegiate athletes may be at higher risk of eating disorders like their nonathlete counterparts.

Discussion of Research Design

This section will discuss the methodology of the data collection, demographics of the two groups, the reliability of the study, and the principal component analysis on the instrument.

The methodology of how the data was collected was a little different between the female athletes and female nonathletes. Although the researcher assisted in administering and collecting the data for the athletes, the data was provided by the Athletic Department from the participating university. In

comparison, the researcher selected the nonathlete females from a randomized cluster sampling and administered the surveys to these volunteers.

The presence of the coaches while the women completed the surveys may have influenced the athletes' participation and responses. The athletes may have felt more obligated to participate instead of declining because the study was verbally endorsed by the Athletic Department. The athletes may have reported lower risk of eating disorders out of concern they would disappoint the coaches if they or their team displayed high rates of eating disorder behavior.

The female nonathletes were given more notice about the study. They were given both oral and written instruction, offered cash prizes, and did not have any adults in a position of authority present. These women were also given more freedom to decline to participate and had to make an effort to attend the survey sessions. It is possible that women residents who had an eating disorder avoided the survey or they may have been curiously drawn to participate. This uncertainty about the nonathlete volunteers raises questions as to the generalizability of the study. It is suggested that more studies similar to this one be conducted on other campuses with a wide geographical area between the different institutions.

Demographic differences between the female athletes and female nonathletes did exist. One of the most critical differences between the female athletes and nonathletes was age. The mean age of the female athletes was 19.34 years and the female nonathletes' mean age was 18.59. The athletes had almost one year of maturity over the nonathletes. This difference may help explain why lack of maturation was found not to be a determinant of eating disorder behavior among the female athletes but was found to be related to eating disorder tendencies in the female nonathletes.

Other demographic differences existed between the female athletes and female nonathletes. The female athletes were slightly taller with a wider height standard deviation than the female nonathletes. Likewise, the female athletes varied less on current weight, highest adult weight, and lowest adult weight as compared to the female nonathletes (see Table 1). This seems to suggest the female athletes in this study possessed more homogenous weight characteristics and less fluctuation in their body weight than the nonathletes. Large weight fluctuation has been identified as a possible warning sign for an eating disorder, particularly bulimia nervosa (DSM IV, 1994). The wider range of weight change among the nonathletes may suggest more bulimic cycles of dieting, starvation, bingeing, and purging in this subpopulation of college women. More research is needed to investigate this concept.

The results of the reliability estimates indicated the EAT-26 was a suitable instrument among this population. The alpha coefficients for the female athletes and female nonathletes were higher on all three factors than Garner's university female control group (NC), and closer to the anorexic inpatient group (AN) on Factor II (Garner, et al., 1982). These reliability estimates suggest that the EAT-26 is a reliable instrument for measuring eating disorder behavior among college females. It may also indicate that current female college students are displaying an increase in eating disorder behavior, more similar to the anorexic inpatients in the original study.

The principal component analysis from both female athletes and female nonathletes showed three items as consistently weak for measuring eating disorder behavior in this population. In both groups, item 10 "Feeling extremely guilty after eating", was supposed to measure Factor I (Dieting), but had a stronger loading in both groups on Factor II (Bulimia and Food Preoccupation). Item 19 "Display self-control around food" should have measured Factor III (Oral Control) and did not load above the .30 cut off on any factor. This was true in both athletes and nonathletes. Finally, item 24 "Like my stomach to be empty", was either factorially complex or loaded onto a different factor than was intended by the survey developers. As a result of the principal component analysis, items 10, 19, and 24 functioned

differently than were supposed to, according to Garner's analysis. (see Tables 9 and 10). These three items need further evaluation as to their appropriateness for measuring eating disorder tendencies in the college female population.

The results of the principal component analysis confirms the need for continued assessment and revision of measurements such as the EAT-26. There is a need for examining the psychometric properties of the instrument, using different college subpopulations. If a researcher relies on the accuracy and appropriateness of an instrument for measuring research outcomes, then it is imperative that the instrument continue to be scrutinized for validity and reliability. It is recommended that the EAT-26 continue to be reassessed and revised on a regular basis as it is used in future studies.

Implications of this Study

1. For this study, both female athletes and nonathletes displayed higher percentages of eating disorder behavior than the general population. This implies college females are at greater risk of developing an eating disorder than the general population. It is not suggested that the women in this study who scored at or above the cut off score have diagnosable eating disorders. Instead it showed these women as displaying thoughts, feelings, and

behaviors characteristic of someone with a clinical eating disorder. The dieting, bulimic, and food restricting patterns measured by the EAT-26 are all symptoms of someone who either has an eating disorder or may be well on her way to developing one. If this is true, counselor educators need to include, in course curriculum for master and doctoral students, information on the prevalence, symptoms, and basic assessment of eating disorders. This is particularly recommended for counselors who will be working with high risk populations such as adolescents, college students, and athletes. Eating disorders are serious threats to the lives of those who suffer from them and often friends, family members, and counselors can easily overlook the warning signs.

2. The results of the t-test on the female athletes and the female nonathletes in this study showed the female nonathletes were at significantly higher risk of practicing disordered eating as compared to the athletes. This is only a single study and these results need to be interpreted conservatively because they challenge previous research. In order to validate the generalizability that college female nonathletes is a subpopulation at greater risk, more comprehensive studies must be undertaken. It is also important to mention that the mean difference in the ages of the female athletes, who were slightly

older, compared to the female nonathlete, may have influenced the lower levels of eating disorder behavior among the athletes.

However, this study may suggest the beginning of a shift in what subpopulations of female college students are more likely to develop an eating disorder. In speculation, if female collegiate athletes have lower rates of eating disorder behavior than their nonathlete counterparts, what factors could account for this difference? It is possible that athletic departments educated coaches and athletes about the hazards of eating disorders. Female athletes are observed far more regularly for changes in academic and athletic performance than female nonathletes. Sudden changes in an athlete's performance or frequent injuries will not go unnoticed by teammates, coaches, trainers, or team physicians; all of these signs could point to a possible eating disorder problem.

Female nonathletes do not have the same support and supervision that collegiate female athletes have. What reasons or environmental factors are related to eating disorders in college subpopulations needs to be further investigated. What environmental and emotional needs of athletes are getting met as compared to the needs of nonathletes? Counselors, campus counseling centers, and athletic departments need to invest in more research

on possible environmental differences in the two groups and what specific factors may help reduce the occurrences of eating disorders in this population.

3. This study challenges previous research that found that women participating in sports with a higher emphasis on body leanness are at greater risk of eating disorders than women in sports with less focus on lean body composition. Although some of the sports in this study had much higher percentages of eating disorder behavior than others, it was not enough of a difference to produce a significant difference among the teams. Also the two sport subgroups, high emphasis on body leanness and lower leanness sports, did not show a significant difference in rates of eating disorder behavior. The sample sizes of each sport were small and this may have affected the significance test between the groups. Regardless of the nonsignificant differences between the sports, some teams displayed high rates of eating disorder behavior, such as cheerleading (22.2%), soccer (16.7%), and high tech dance (16.7%). Despite no significant differences in the sport groups, the groups that showed higher risk for potential eating disorders should be carefully monitored and strategies should be designed to meet the needs of all sport participants.

The results of this study challenge the prevailing view that sports with more emphasis on leanness are a predictor for high rates of eating disorders.

Earlier research on female athletes did show lean body sports were displaying more signs of eating disorders than non-lean sports. Yet more recent research on the topic is more congruent with the findings in this study (Ashley, Smith, Robinson, & Richardson, 1996; Rosen et al., 1986; Warren, Stanton, & Blessing, 1990). The current research may suggest a positive change for women sports that used to have high rates of eating disorders. However, it also implies that there is now less predictability as to which sports are likely to be higher risk environments. This suggests that now all women's sports are just as susceptible to high rates of eating disorders rather than the sports that traditionally reported high levels of eating disorders.

The lack of eating disorder behavior predictability among different sports should signal a warning to counselors, athletic departments, coaches, and trainers that no athlete is immune to developing an eating disorder regardless of the type of sport in which she is participating. Education and prevention programs about eating disorders need to be incorporated into every sport, athletic department, and counseling center to help combat the occurrences of eating disorders among college women.

4. Investigating the effects of maturation on eating disorder behavior in this study produced very important information about the college female who may be more at risk of eating disorders. From this study, it would appear that

youthfulness in female athletes was not related to higher rates of eating disorder behavior. The fact that the mean age of the female athletes was almost a year older than the mean age of the female nonathletes may have been a factor that caused the discrepancy in the correlation between age and the eating disorder behavior in the two groups. Although the relationship between lower maturation and higher eating disorder behavior was nonsignificant in the female athletes, the direction of the correlation was in the predicted negative direction. The issue of maturation as a predictor of higher risks of eating disorders should not be dismissed among female college athletes. To validate or dispute the results of this study, more research on the issue of maturation among female athletes and college women in general, needs to be undertaken.

A significant negative correlation existed between age and eating disorder behavior among the nonathlete college group. This suggested lower maturation was related to higher incidence of eating disorder behavior among the female nonathletes. As previously mentioned, the nonathletes were on the average, younger than the female athletes which may have influenced the correlation.

5. Other factors besides the average age difference between the two groups did exist. The environments of female athletes and female nonathletes

differed. The athlete has more structure, support, and accountability regarding her academic/athletic performance. The scope of this study did not investigate the specific environmental differences between these two groups. The implication for campus residential directors, athletic departments, and counselors is to investigate the environmental differences that do exist between female athletes and female nonathletes. This research effort could help determine what influence environmental factors have on either increasing or decreasing risks of eating disorders in the two subpopulations.

Recommendations for Further Research

Recommendations for future research are presented in this section. These suggestions were derived from the current study.

1. The current study was quantitative. It is recommended that further research on eating disorders and female athletes also include more comprehensive investigation including qualitative integration. The complex etiology makes diagnosis difficult. Implementing structured interviews, physicals, basic family history, and information on athletes' dietary practices would provide a more accurate indication of the prevalence of eating disorders in this subpopulation. Further, it is recommended that future studies

on eating disorders incorporate rigorous reliability and validity estimates on the measurement instrument.

2. Continued assessment and revisions on the EAT-26 is recommended, particularly if it is to be used on the college female population. Although the EAT-26 showed strong reliability estimates, certain items were identified as not functioning as intended.

The principal component analysis from this study showed some differences in the way the female athletes responded to the survey items as compared to the female nonathletes. It is recommended that instruments specifically designed to measure eating disorder behavior among collegiate female athletes be developed and piloted.

3. Since research on eating disorders consistently state that some form of dieting always preceded the onset of an eating disorder, it is recommended that instruments designed specifically to measure dieting behavior be developed. Instruments that assess dieting patterns may provide helpful insight into the earlier developmental stages of eating disorders.

4. In this study, the coaches were present when the female athletes took the EAT-26. Because a coach has authority over his/her athletes as to who plays, or remains on the team, it is recommended that female athletes in future studies have the “coach” factor removed to help eliminate a possible

confounding variable effect. Women athletes want to please their coach and they may be fearful of possible negative consequences if it is discovered they have an eating disorder or if there is high rates of eating disorder among the team.

5. Continued research on the relationship between maturation and prevalence of eating disorder behavior is recommended. There is little research that has investigated this factor and it may actually be one of the most important determinants for risk of eating disorders. Future studies between athletes and nonathletes should attempt to have a closer average age range among the groups, to ensure more maturational equality. The need for longitudinal studies on both collegiate female athletes and college female nonathletes is justified by the current study.

6. One limitation of the current study is it did not assess or investigate specific environmental conditions that may reduce or increase the risks of eating disorders for female athletes or female nonathletes. Since coaches and trainers have such a significant impact on the female athlete, it is recommended that researchers and athletic departments look at how these key individuals view eating disorders. If coaches or trainers have active eating disorders themselves or model negative attitudes about eating disorders, then women athletes who may be suffering from an eating disorder

may want help but are afraid to ask. With the shame and denial that typically accompany eating disorders, this presents a very risky scenario for a female athlete stricken with an eating disorder. Generally people will only ask for help for themselves or others if they feel it is emotionally safe to do so.

7. The result from this study showed that females participating in sports that advocate body leanness are not at greater risk of eating disorder behavior.

Because the sample sizes of each sport in this study was so small, it is recommended that additional research be conducted with larger sport sample sizes from more than one university in order to further support or challenge the current findings.

8. Since the female nonathlete group showed more symptoms of eating disorders than the athletes, it is recommended that counselors and campus residential programs further investigate why this difference may exist.

Preventive programming and added support to female residents regarding eating disorders may help reduce the prevalence of eating disorders in this susceptible subpopulation.

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Appendix A

Eating Attitudes Test-26 (EAT-26)

1. Age _____ 2. Sex _____ 3. Height _____ 4. Current Weight _____
 5. Highest Weight (excluding pregnancy) _____ 6. Lowest Adult Weight _____
 7. Level of Education Completed: ___ Grade School ___ High School ___ College ___ Past College

*Please check a response for each of the following questions:	Always	Usually	Often	Some-times	Rarely	Never
1. Am terrified about being overweight.	___	___	___	___	___	___
2. Avoid eating when I am hungry.	___	___	___	___	___	___
3. Find myself preoccupied with food.	___	___	___	___	___	___
4. Have gone on eating binges where I feel that I may not be able to stop.	___	___	___	___	___	___
5. Cut my food into small pieces.	___	___	___	___	___	___
6. Aware of the calorie content of the foods that I eat.	___	___	___	___	___	___
7. Particularly avoid food with a high carbohydrate content (i.e., bread, rice, potatoes, etc.)	___	___	___	___	___	___
8. Feel that others would prefer if I ate more.	___	___	___	___	___	___
9. Vomit after I have eaten.	___	___	___	___	___	___
10. Feel extremely guilty after eating.	___	___	___	___	___	___
11. Am preoccupied with a desire to be thinner.	___	___	___	___	___	___
12. Think about burning up calories when I exercise.	___	___	___	___	___	___
13. Other people think that I am too thin.	___	___	___	___	___	___
14. Am preoccupied with the thought of having fat on my body.	___	___	___	___	___	___
15. Take longer than others to eat my meals.	___	___	___	___	___	___
16. Avoid foods with sugar in them.	___	___	___	___	___	___
17. Eat diet foods.	___	___	___	___	___	___
18. Feel that food controls my life.	___	___	___	___	___	___
19. Display self-control around food.	___	___	___	___	___	___
20. Feel that others pressure me to eat.	___	___	___	___	___	___

21. Give too much time and thought to food.	___	___	___	___	___	___
22. Feel uncomfortable after eating sweets.	___	___	___	___	___	___
23. Engage in dieting behavior.	___	___	___	___	___	___
24. Like my stomach to be empty.	___	___	___	___	___	___
25. Enjoy trying new rich foods.	___	___	___	___	___	___
26. Have the impulse to vomit after meals.	___	___	___	___	___	___

Note: Cutoff score = 20. Adapted from Garner, Olmsted, Bohr, and Garfinkel (1982, p. 875) and Garner and Garfinkel (1979, p. 278). Copyright 1979 and 1982. Adapted by permission.

Appendix B

Ginger Kirk, Ph.D. candidate
Counselor Education
Department of Education Leadership &
Policy Studies
College of Human Resources and Education

November 2, 1998

Dear Women Residents,

You have been selected at random to participate in a significant research study focusing on college women's ideas about eating. How we think and take care of ourselves is important while in college and beyond. The information from this study will be used in a dissertation and will also be shared with Virginia Tech Residence Education. The information from this study will also provide us with a better understanding of women's needs at Virginia Tech. Your participation is **voluntary**, by completing the survey you will be granting permission for the data to be used in this study.

Attached is a short survey about eating habits. All responses will be confidential. **YOUR NAME WILL NOT BE ATTACHED TO YOUR ANSWER SHEET.** Please complete both the demographic information and the 26 questions. Once you are finished please turn in your survey to the researcher.

If you have questions or concerns about eating habits that you feel maybe unhealthy, the following are resources available in this area:

- Virginia Tech Health Center 231-6444
- Virginia Tech Counseling Services 231-6557
- Women's Center 231-7806
- Saint Albans, Radford 639-2481
- Virginia Highland Health Associates, PC ;
Blacksburg 951-0922, Radford 731-1939

Additionally, if you have any questions about this research or concerns about eating habits, feel free to contact me. Thank you for your time and participation.

Sincerely,

Ginger Kirk, Ph.D. Candidate
gkirk@vt.edu

Appendix C

March 29, 1999

Gerry J. Kowalski, Ph.D.
Director of Residence Education
Virginia Tech
109 E. Eggleston Hall
Blacksburg, VA 24061

Dear Gerry,

I want to inform you that I will be completing my research on collegiate female athletes and eating disorders within the next month. In addition to using the donated data from the Athletic Department, I used the Eating Disorder Test - 26 (EAT-26) surveys that I collected from the nonathlete female residents living in on-campus housing. As you are aware, the surveys were conducted during the 98-99 academic year. The anonymity of each female resident who participated in the study was ensured.

As part of our arrangement, I will send you the results from my research. If you plan additional eating disorder education programs for residents in the future, I hope you will find the information helpful. I want to thank you for allowing me to research the women residents, in so doing, you have helped further the research on eating disorder behavior in this population.

Sincerely,

Ginger L. Kirk
Ph.D. Candidate
Counselor Education

March 29, 1999

Sharon McCloskey
Senior Associate Athletic Director
358 Jamerson Athletic Center
Virginia Tech Athletics
Blacksburg, VA 24061

Dear Sharon:

I want to inform you that I will be completing my research on collegiate female athletes and eating disorders within the next month. The research data that I used in my study included the Eating Attitude Test - 26 (EAT-26) surveys that were conducted on Virginia Tech women athletes during the 97-98 academic year. The anonymity of each athlete who volunteered for the study has been ensured.

As part of our arrangement, I will send you the results from my research. I hope you will find the information helpful to you, the coaches, and the women athletes. Virginia Tech Athletics has made a significant contribution in furthering the study of eating disorder behaviors among female athletes. I want to thank you for donating this important data to the study.

Sincerely,

Ginger L. Kirk
Ph.D. Candidate
Counselor Education

VITA

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EDUCATION

- 1999** **Ph.D., candidate, Counselor Education (ABD)**, final defense May 99
 Virginia Tech
 Blacksburg, VA
- focus on clinical/community counseling
 - cognate concentration in Marriage and Family Therapy (MFT)
 - internship: teaching counselor education courses, master's level
 - dissertation topic: "female collegiate athletes and eating disorders"
- 1995** **M. A. Counselor Education**
 Virginia Tech
 Blacksburg, VA
- focus on agency/community counseling and middle and high school guidance counseling
 - practicums: *clinical* - employee assistance program counseling, *education* - middle school alternative education guidance counseling, and high school guidance counseling
- 1984** **B. A. Psychology**
 Bryan College
 Dayton, TN
- focus on counseling psychology
 - minor: biblical studies
 - internship: *clinical* - inpatient adolescent facility, Moccasin Bend State Psychiatric Hospital, Chattanooga, TN

OTHER TRAINING

Breaking the Cycle of Addiction, Trainer - Claudia Black, Ph.D., Centra Health, Lynchburg, VA 1998.

Critical Incident Stress Debriefing Team Training, HPR, Endorsed by Virginia CISD Team Coordinating Committee, Roanoke, VA 1998

Motivational Enhancement. Technique training in MET; New River Valley Community Services, Blacksburg, VA 1998.

Women, Addictions, and Spirituality: exploring the healing process. Conference; Project Taproot, The College of William and Mary, Williamsburg, VA, 1996.

Psychological Techniques for the Athlete and Practitioner: sport psychology as an applied and academic discipline. Graduate course in Sport Psychology; University of Virginia, Charlottesville, VA, 1995.

WORK EXPERIENCE

- | | |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1998 - Present | <p>Clinician, Adult & Families
 New River Valley Community Services, Blacksburg, VA</p> <ul style="list-style-type: none"> • Provide therapy for individuals and couples • Co-facilitate Substance Abuse Treatment Group • Coordinate medication management with psychiatric consultants • Coordinate discharge planning with inpatient providers |
| 1996 - 1998 | <p>Graduate Assistant/Teaching Assistant (part-time)
 Virginia Tech, Counselor Education
 Blacksburg, VA</p> <ul style="list-style-type: none"> • Co-instructor for master's level counselor education courses • Researcher for program area professors • Participant in CACREP accreditation process • Assisted with distance learning for clinical supervision course |
| 1996 - Present | <p>Employee Assistance Program Counseling Consultant (part-time)</p> <ul style="list-style-type: none"> • Counsel individuals, couples, children, and adolescents • Provide referrals, consultation with staff psychiatrists, family physicians, and inpatient programs • Co-facilitator for women's psychotherapy group |
| 1995 - 1996 | <p>Guidance Counselor (full-time)
 Patrick Henry High School
 Roanoke, VA</p> |

- Provided general guidance services for 300 high school students including career counseling, class scheduling, parent-teacher conferences, and IEP meetings
- Special focus on crisis intervention, conflict resolution, adolescent depression, suicidal ideation, and substance abuse

1989 - 1994

Market Analyst (full-time)

Hayes, Seay, Mattern & Mattern, Inc. (HSMM)

Roanoke, VA

HSMM is one of the largest architectural/engineering firms in the United States with ten regional office locations

- Researcher for future design trends
- Proposal writing for design projects - federal, state, and private industry (medium size to multimillion dollar projects)
- Interview team preparation
- Developed and supervised tri-state telemarketing campaign
- Project coordinator with University of Virginia's Darden Business School in developing an international marketing plan for firm

1984 - 1988

Head Start Director (full-time)

Summer Youth Program Coordinator

Employment Program Coordinator

Summer Youth Counselor

Positions held chronologically

Franklin County Community Action, Inc.

Rocky Mount, VA

- Counseling, management, and coordination for disadvantaged youth and adult employment programs including collaboration with public and private employers
- Designed job search skills training manual for participants including training manuals for trainers, provided instruction to program staff and clients
- Coordinated multiple work sites, hired, trained, and supervised program counselors, work site supervisors, and program participants, (80+ participants, 6-10 staff)
- Wrote program proposals, designed, and implemented pilot programs
- Total management of Head Start Program and staff

TEACHING EXPERIENCE

Higher Education

Group Counseling : master's level course, teaching assistant, spring 1998

Principles and Practices of Counseling : master's level, teaching assistant, fall 1997

Counseling Theories : master's level, teaching internship, spring 1996

Counseling Techniques : master's level, teaching internship, spring 1996

Nonacademic

Career Development/Job Search Skills : for at-risk disadvantaged youth and adults, 1986 - 1988

Head Start Volunteer Training : developed and conducted volunteer training program for classroom volunteers, 1988

COUNSELING EXPERIENCE

Clinical

- EAP counseling - individuals, adults, adolescents, children, and families
- women's psychotherapy group, co-facilitator
- career counseling - youth and adults
- in-patient adolescent psychotherapy group, co-facilitator
- in-patient adolescent, multi-family therapy
- adult substance abuse group therapy
- long-term therapy for individuals with moderate to severe mental illnesses and dual diagnoses

School

- guidance counseling for middle and high school students
- youth substance abuse group, co-facilitator
- crisis intervention, conflict resolution, anger management, depression, substance abuse, career and education planning, and suicidal ideation
- group counseling and testing
- leadership training and team building for at-risk youth
- clinical supervision

PRESENTATIONS/WORKSHOPS

“Collaboration of Counselors and Clergy”. Co-presented, poster session, American Counseling Association World Conference, San Diego, CA; April 1999

“Collaboration of Counselors and Clergy”. Co-presented at Virginia Counselor Association, Vienna, VA; November 1998

“Healthy Eating VS Unhealthy Eating”. Presented during National Eating Disorder Awareness Week to on-campus residence, Virginia Tech, Blacksburg, VA; February 1998

“Piaget Cognitive Development Theory and Processes”. Presented for Clinical Marriage and Family Therapy I, Marriage and Family Therapy (MFT) Program Area, Virginia Tech, Blacksburg, VA; November 1997

“Ministering to Dysfunctional Families”. Workshop conducted for the Mental Health Association of Roanoke Valley and Lewis-Gale Hospital, Department of Pastoral Care, co-facilitator, Roanoke, VA; October 1997

“Critical Incident Debriefing (CID)”. Developed and co-facilitated CID group for emergency room staff, focus - coping with suicide victims and family survivors, Carilion Giles County Memorial Hospital, Pearisburg, VA; August 1997

“Group Counseling - special needs”. Guest speaker for Group Counseling, Counselor Education Program Area, Virginia Tech, Blacksburg, VA; June 1997

“Narrative Therapy”. Co-presented theoretical concepts and techniques of Narrative Therapy, included development of video demonstration. Conducted for Clinical Marriage and Family Therapy IV, MTF Program Area, Virginia Tech, Blacksburg, VA; March 1997

“The Emperor’s Clothing: counseling theories and techniques, identifying the origins of integrative therapy with the Thinking-Feeling-Acting Model”. Paper presentation, Advanced Counseling Theories, Counselor Education Program Area, Virginia Tech, Blacksburg, VA; November 1996

“Value of Cognitive-Behavioral Modification in Managed Care”. Presentation, Advanced Counseling Theories, Counselor Education Program Area, Virginia Tech, Blacksburg, VA; October 1996

“Assessing Eating Disorders”. Presentation of assessment instruments for eating disorders, Appraisal in Counseling, Counselor Education Program Area, Virginia Tech, Blacksburg, VA; June 1995

“German Baptist: religion or culture?”. Presentation of a study and paper written on the local German Baptist culture, Counseling Special Populations, Counselor Education Program Area, Virginia Tech, Blacksburg, VA; March 1995

“Post Traumatic Stress Disorder (PTSD)”. Presentation of symptomatology and diagnostic criteria for PTSD, DSM III-R Course, Counselor Education Program Area, Virginia Tech, Blacksburg, VA; May 1994

PUBLICATIONS

“Clergy and Counselors - Collaborating Toward New Perspectives”. Getz, H., Kirk, G. L., & Driscoll, L., provisional acceptance, Counseling and Values, 1999.

CERTIFICATIONS

High School Guidance Counseling - Commonwealth of Virginia, 1996

Licensed Professional Counselor - Pursuing supervision and required clinical hours for state licensure, Commonwealth of Virginia

AFFILIATIONS

- America Counseling Association, 1996 - present
- Virginia Counselors Association, 1994 - present
- Chi Sigma Iota, 1996 - present
- American Society of Training & Development, 1991 - 1992
- Triathlon Federation USA, 1993 - present

COMMITTEES & AWARDS

- Eating Disorder Task Force, Women’s Center, Blacksburg, VA, 1997 - present
(*served on a special consulting committee for women athletes - 1997*)
- New Faculty Selection Committee, Counselor Education Program Area, Virginia Tech, Blacksburg, VA, spring 1997
- Special Events Committee, Virginia Counselors Association State Conference 1996, Roanoke, VA
- Special Education Advisory Committee, Franklin County Public Schools, Rocky Mount, VA, 1988

- National Association of Private Industry Council, national honorable mentions award for design and implementation of a remedial tutoring program for at-risk special education high school students, Rocky Mount, VA, 1988

SPECIAL INTERESTS & HOBBIES

Interests

- Teaching
- Presenting Workshops and Training Seminars
- Play Therapy
- Marriage and Family Therapy
- Individual Therapy
- Addictive Family Systems
- Codependency
- Substance Abuse
- Abuse issues
- Group Counseling
- Counseling Athletes
- Women's issues
- Spiritualism in counseling
- Sport Psychology

Hobbies - reading, running, cycling, swimming, strength training; age group and over all competitive runner, age group competitive triathlete