A COMPARISON OF PERCEPTIONS OF ATHLETIC DIRECTORS
AND STUDENT-ATHLETES ON THE COLLEGIATE LEVEL
REGARDING EATING DISORDERS

A dissertation submitted to the
Kent State University College and Graduate School
of Education, Health, and Human Services
in partial fulfillment of the requirements
for the degree of Doctor of Philosophy

by

Mary Lynne McDade

August 2012
A dissertation written by

Mary Lynne McDade

B.S. Penn State University, 1990
M.A. Edinboro University, 1999
Ph.D., Kent State University, 2012

Approved by

________________________________, Co-director, Doctoral Dissertation Committee
Cynthia W. Symons

________________________________, Co-director, Doctoral Dissertation Committee
Kele Ding

________________________________, Member, Doctoral Dissertation Committee
Kimberly S. Peer

Accepted by

________________________________, Director, School of Health Sciences
Lynne E. Rowan

________________________________, Dean, College and Graduate School
Daniel F. Mahony of Education, Health, and Human Services
A COMPARISON OF PERCEPTIONS OF ATHLETIC DIRECTORS AND STUDENT-ATHLETES ON THE COLLEGIATE LEVEL REGARDING EATING DISORDERS (248 pp.)

Co-directors of Dissertation: Cynthia W. Symons, D.Ed.
Kele Ding, Ph.D.

The purpose of this study was to analyze the differences in perceptions about institutional policies, procedures, and educational programming in regard to eating disorders between athletic directors and student-athletes participating in selected sports at National Collegiate Athletic Association (NCAA) Division II (DII) designated institutions. This study will make a valuable contribution to the body of literature since there is no published research addressing this concern from the perspective of athletic directors.

For the purpose of this study, a population study was conducted with athletic directors. Also, a random sample of six NCAA DII institutions was generated to obtain access to student-athletes as subjects that were representative of athletes participating on sports teams at DII colleges and universities.

The time frame for the data collection process was conducted between the fall and winter of 2010-2011. The data collection protocol followed the Dillman Tailored Method (DTM; 2000). A four-page, 24-item instrument was developed and administered to athletic directors. In addition, a four page, 23-item instrument was developed and administered to student-athletes.
Out of 10 hypotheses, eight statistically significant findings were revealed. The findings revealed a statistically significant difference between eating disorder formal education, educational opportunities, knowledge, and respondent status: student-athlete or athletic director. In addition, the results revealed a statistically significant difference between athletic department eating disorder rules and regulations, referral process, prevention, support, influential individuals, and respondent status. Future research is needed to determine what intervention and evidence-based practices are best to help address these statistically significant differences and respondent status.
ACKNOWLEDGMENTS

The writing of a dissertation has been an experience that will influence me for the rest of my life. Throughout the process of coursework, comprehensive written exams, comprehensive oral exams, and the dissertation process, a multitude of individuals have supported and encouraged me. I thank you all from the bottom of my heart. You do not know how valuable you have been to me over the years.

First, my appreciation goes out to my family. My parents, Georgianne and Warren, provided a strong foundation for me as a child to become the person that I am today. I wish that my father would have been with us in my adult years. Thank you for looking down upon me throughout the years, dad. I also value the support, love, and encouragement throughout my life that my grandmother Mary has been able to provide to me. Finally, thank you, thank you, thank you to my brothers, Scott and David, for their support and brotherly love.

I want to thank all of my friends over the years for your support and patience, especially when I was writing my dissertation. You were very understanding when I would say I had to go spend time with my spouse, also known as my dissertation. You even let me take my “spouse” on vacation to Maine. A special thank you goes to Teri for her support while I was working on my coursework. A thank you goes to Maria, Tim, and Lisa for being there throughout the whole process. Judy, Judy, Judy, I thank you from the bottom of my heart for all of your encouragement throughout the years. Thank you Kira for your patience and support when I first started writing my dissertation. Also, I want to thank Rachel for being supportive during the winter of 2010-2011 when I was
conducting my research, and we would sit together and do our academic work. Donna, thank you for proofreading, especially chapters 4 and 5. In addition, thank you Carol for being supportive of me as I wrapped up the dissertation process during 2011-2012. Finally, thank you for helping me run the home stretch, Erica and Amy. Thank you, thank you, thank you.

Dr. Cindy Symons, I thank you for the 10 years of guidance and mentoring through the coursework and the dissertation process. I am so appreciative of you for being so supportive of me, especially through some of the toil and strife that I had encountered over the years. I am thankful to Dr. Kele Ding who guided me through the methods process and statistical analyses. I am deeply grateful for the guidance from both of you as the two co-directors of my dissertation committee.

I am also thankful for Dr. Kim Peer being part of my dissertation committee and being a fellow certified athletic trainer. Dr. Symons, Dr. Ding, and Dr. Peer, your professional commitment proved to be so valuable to me in the completion of this dissertation. Dr. Jason McGlothlin, I want to thank you for serving as the graduate faculty representative and moderator of my dissertation defense.

As a result of the support, encouragement, and dedication of everyone involved, I have reached the end of this journey. I hope that all of you are able to be there to join me in the next journey that makes its appearance in my life. Thank you, thank you, and thank you.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACKNOWLEDGMENTS</strong></td>
<td>iv</td>
</tr>
<tr>
<td><strong>LIST OF TABLES</strong></td>
<td>x</td>
</tr>
<tr>
<td><strong>CHAPTER</strong></td>
<td></td>
</tr>
<tr>
<td><strong>I. INTRODUCTION</strong></td>
<td>1</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>17</td>
</tr>
<tr>
<td>Purpose Statement</td>
<td>18</td>
</tr>
<tr>
<td>Research Questions</td>
<td>18</td>
</tr>
<tr>
<td>Definition of Terms</td>
<td>19</td>
</tr>
<tr>
<td>Basic Assumptions</td>
<td>20</td>
</tr>
<tr>
<td><strong>II. REVIEW OF THE LITERATURE</strong></td>
<td>22</td>
</tr>
<tr>
<td>Eating Disorders</td>
<td>22</td>
</tr>
<tr>
<td>Anorexia Nervosa</td>
<td>32</td>
</tr>
<tr>
<td>Bulimia Nervosa</td>
<td>34</td>
</tr>
<tr>
<td>Eating Disorder Not Otherwise Specified (EDNOS)</td>
<td>36</td>
</tr>
<tr>
<td>Eating Disorder Prevention and Education</td>
<td>37</td>
</tr>
<tr>
<td>Intervention and Treatment</td>
<td>39</td>
</tr>
<tr>
<td>Eating Disorders and the Collegiate Population</td>
<td>43</td>
</tr>
<tr>
<td>Eating Disorders and College Students</td>
<td>43</td>
</tr>
<tr>
<td>National Collegiate Athletic Association (NCAA)</td>
<td>46</td>
</tr>
<tr>
<td>Collegiate Athletic Directors</td>
<td>52</td>
</tr>
<tr>
<td>Certified Athletic Trainers</td>
<td>53</td>
</tr>
<tr>
<td>Collegiate Coaches</td>
<td>55</td>
</tr>
<tr>
<td>Athletes With Eating Disorders</td>
<td>61</td>
</tr>
<tr>
<td>Collegiate Student-Athletes With Eating Disorders</td>
<td>62</td>
</tr>
<tr>
<td>Eating Disorder Education and Collegiate Athletics</td>
<td>64</td>
</tr>
<tr>
<td>Eating Disorder Prevention and College Athletics</td>
<td>65</td>
</tr>
<tr>
<td>Eating Disorder Intervention and College Athletics</td>
<td>67</td>
</tr>
<tr>
<td>High Risk Sports and Eating Disorders</td>
<td>71</td>
</tr>
<tr>
<td>College Athletes and Social Norming</td>
<td>72</td>
</tr>
<tr>
<td><strong>III. RESEARCH METHODS AND PROCEDURES</strong></td>
<td>77</td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td>77</td>
</tr>
<tr>
<td>Identification of the Subjects</td>
<td>77</td>
</tr>
<tr>
<td>Athletic Director (AD) Sampling</td>
<td>78</td>
</tr>
<tr>
<td>Student-Athlete Sampling</td>
<td>79</td>
</tr>
</tbody>
</table>
Instrumentation ................................................................. 81
  Athletic Director (AD) Instrument ...................................... 81
  Student-Athlete Instrument ............................................. 86
Psychometric Analysis of the Instruments ................................ 93
Research Design .................................................................. 95
Operationalizing the Variables ............................................. 95
Data Collection Protocol .................................................. 98
  Athletic Directors (ADs) ..................................................... 98
  Student-Athletes ............................................................ 99
Data Analysis ..................................................................... 101
Analysis of the Hypotheses ............................................... 102
Limitations ....................................................................... 103

IV. ANALYSIS OF THE DATA.................................................. 107
  Purpose of the Study ....................................................... 107
  Data Collection ................................................................ 107
    NCAA DII Athletic Director (AD) Sampling ....................... 107
    NCAA DII Student-Athlete (SA) Sampling ......................... 108
  Description of the Sample .............................................. 110
    NCAA DII Athletic Directors (ADs) ................................. 110
    NCAA DII Student-Athletes (SAs) .................................. 115
  Eating Disorder Education Reported by SA and AD Subjects .... 118
  Eating Disorder Knowledge Level Among SA and AD Subjects ... 127
  Eating Disorder Policies, Procedures, Guidelines Reported by SA and AD Subjects ........................................... 132
  Eating Disorder Referral Process Within the Athletic Department
    Reported by SA and AD Subjects ..................................... 135
  Eating Disorder Prevention and Support Reported by SA and AD Subjects ................................................................. 137
  Prevalence Rate of Eating Disorders at their Respective Institutions
    Reported by SA and AD Subjects ..................................... 140
  Eating Disorders and a Decrease in Athletic Performance Reported by SA and AD Subjects ........................................... 141
  Parties Influential in a Student-Athlete Developing or Not Developing an Eating Disorder Reported by SA and AD Subjects .......... 142
  Analysis of Hypotheses ................................................... 144
    Hypothesis 1 .................................................................. 144
    Hypothesis 2 .................................................................. 146
    Hypothesis 3 .................................................................. 148
    Hypothesis 4 .................................................................. 150
    Hypothesis 5 .................................................................. 152
    Hypothesis 6 .................................................................. 155
Hypothesis 7 ................................................................. 156
Hypothesis 8 ................................................................. 158
Hypothesis 9 ................................................................. 160
Hypothesis 10 ................................................................. 161
Summary of Findings ...................................................... 162
Hypothesis 1 ................................................................. 162
Hypothesis 2 ................................................................. 164
Hypothesis 3 ................................................................. 164
Hypothesis 4 ................................................................. 165
Hypothesis 5 ................................................................. 165
Hypothesis 6 ................................................................. 166
Hypothesis 7 ................................................................. 167
Hypothesis 8 ................................................................. 167
Hypothesis 9 ................................................................. 168
Hypothesis 10 ................................................................. 168

V. DISCUSSION AND RECOMMENDATIONS .................................. 170
Purpose of the Study ....................................................... 170
Discussion of Findings in Context of Body of Literature ............... 170
Discussion of Hypothesis Test Findings .................................. 173
Hypothesis 1 ................................................................. 173
Hypothesis 2 ................................................................. 175
Hypothesis 3 ................................................................. 177
Hypothesis 4 ................................................................. 178
Hypothesis 5 ................................................................. 180
Hypothesis 6 ................................................................. 183
Hypothesis 7 ................................................................. 184
Hypothesis 8 ................................................................. 186
Hypothesis 9 ................................................................. 186
Hypothesis 10 ................................................................. 188
Recommendations for Further Research .................................. 190
Limitations .................................................................. 194
Survey-Related Limitations ............................................. 195
Limitations in Sampling .................................................. 195

APPENDICES ........................................................................ 196
APPENDIX A. DIVISION II (DII) COLLEGES AND UNIVERSITIES .... 197
APPENDIX B. STUDENT-ATHLETE INSTRUMENT ................... 207
APPENDIX C. SAMPLE STUDENT-ATHLETE COVER LETTER ...... 215
APPENDIX D. ATHLETIC DIRECTOR (AD) INSTRUMENT .......... 217
APPENDIX E. SAMPLE ATHLETIC DIRECTOR (AD) COVER LETTER .... 225
APPENDIX F. SAMPLE THANK YOU/REMINDER POSTCARD ............227
APPENDIX G. HUMAN SUBJECTS REVIEW APPROVAL FORM ..........229
APPENDIX H. INSTRUMENT WRITTEN INSTRUCTIONS ..................231

REFERENCES ........................................................................... 233
## List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Research Hypotheses and Items</td>
<td>87</td>
</tr>
<tr>
<td>2. Instrumentation and Variables</td>
<td>104</td>
</tr>
<tr>
<td>3. Sex of Responding DII Athletic Directors (ADs)*</td>
<td>111</td>
</tr>
<tr>
<td>4. Age of Responding DII Athletic Directors (ADs)*</td>
<td>112</td>
</tr>
<tr>
<td>5. Advanced Degree of Responding DII Athletic Directors (ADs)*</td>
<td>113</td>
</tr>
<tr>
<td>6. Years Reported as an Athletic Director on the Collegiate Level*</td>
<td>114</td>
</tr>
<tr>
<td>7. Years at Current Institution of Responding DII Athletic Directors (ADs)*</td>
<td>115</td>
</tr>
<tr>
<td>8. Sex of Responding DII Student-Athletes*</td>
<td>116</td>
</tr>
<tr>
<td>9. Age of Responding DII Student-Athletes*</td>
<td>117</td>
</tr>
<tr>
<td>10. Academic Year of Responding DII Student-Athletes*</td>
<td>117</td>
</tr>
<tr>
<td>11. Primary Sport of Responding DII Student-Athletes*</td>
<td>119</td>
</tr>
<tr>
<td>12. Formal Eating Disorder Education Within the Athletic Department Reported by SAs and ADs*</td>
<td>120</td>
</tr>
<tr>
<td>13. Form of Eating Disorder Education Provided Within the Athletic Department Reported by SAs and ADs*</td>
<td>121</td>
</tr>
<tr>
<td>14. Eating Disorder Educational Materials Within the Athletic Department Reported by SAs and ADs*</td>
<td>123</td>
</tr>
<tr>
<td>15. Eating Disorder Education Recipients Within the Athletic Department Reported by SAs and ADs*</td>
<td>125</td>
</tr>
<tr>
<td>16. Mandatory Eating Disorder Education Recipients Within the Athletic Department Reported by SAs and ADs*</td>
<td>127</td>
</tr>
<tr>
<td>17. Eating Disorder Knowledge Level Among SAs and ADs*</td>
<td>129</td>
</tr>
</tbody>
</table>
18. Eating Disorder Educational Opportunities Within the Athletic Department
   Reported by SAs and ADs* ..................................................................................131

19. Mandatory Eating Disorder Education Reported by SAs and ADs* ...............132

20. NCAA Eating Disorder Conference Rules and Regulations Reported by SAs
    and ADs* .............................................................................................................133

21. Institutional Athletic Department Eating Disorder Rules and Regulations
    Reported by SAs and ADs* ..................................................................................134

22. Eating Disorder Referral Process Within the Athletic Department Reported
    by SAs and ADs* .................................................................................................136

23. Responsible for Support of Student-Athletes Reported by SAs and ADs* .........138

24. Friends and Peers: Participation, Contribution, and Support of Student-
    Athlete Reported by SAs and ADs* .....................................................................139

25. Prevalence Rate of Eating Disorders at their Respective Institutions
    Reported by SAs and ADs* ..................................................................................141

26. Eating Disorders and a Decrease in Athletic Performance Reported by SAs
    and ADs* ..............................................................................................................142

27. Parties Influential in a Student-Athlete Developing or Not Developing an
    Eating Disorder Reported by SAs and ADs* .....................................................144

28. Formal Eating Disorder Education Status Reported by SAs and ADs* ..........145

29. Forms of Eating Disorder Education Reported SAs and ADs* ..................147

30. Frequency Distribution of Available Eating Disorder Training Formats
    Reported by SAs and ADs* ..................................................................................149

31. Descriptive Statistics of Eating Disorder Knowledge Scores by SAs and
    ADs* .....................................................................................................................150

32. Frequency Distribution of Eating Disorder Educational Opportunities
    Reported by SAs and ADs* ..................................................................................152

33. NCAA Conference Rules and Regulations Reported by SAs and ADs* ...........154
34. Institutional Athletic Department Rules and Regulations Reported by SAs and ADs* ................................................................. 155

35. Frequency Distribution of the Eating Disorder Referral Process Reported by SAs and ADs* ................................................................. 157

36. Descriptive Statistics of Prevention and Support Status by SAs and ADs* ........ 158

37. Prevalence Rate of Eating Disorders at their Respective Institutions Reported by SAs and ADs* ................................................................. 159

38. Decrease in Athletic Performance Reported by SAs and ADs* ...................... 161

39. Parties Influential/Needed in the Prevention of Eating Disorders Reported by SAs and ADs* ................................................................. 163
CHAPTER I
INTRODUCTION

In the fall of 1980, the U.S. Department of Health and Human Services established a national agenda to promote the health and prevent disease among all age groups of Americans. This sweeping set of priorities was launched with a document entitled *Promoting Health/Preventing Disease: Objectives for the Nation*. The prevention and health promotion measures identified in this set of objectives identified nutrition as a priority. These objectives included the assertion that educational materials should be developed and information related to this issue should be communicated to increase “awareness of ideal weight ranges and safe weight reduction” among citizens of the United States (U.S. Department of Health and Human Services [USDHHS], 1980, p. 73).

Importantly, eating disorders including anorexia and bulimia nervosa were not identified in this first set of objectives, but this document did include the assertion that: Adequate intakes of sources of energy and of essential nutrients are necessary for satisfactory rates of growth and development, physical activity, reproduction, lactation, recovery from illness and injury and maintenance of health through the life cycle. Deficits of essential nutrients or energy sources can lead to several specific diseases or disabilities and increased susceptibility to others. (USDHHS, 1980, p. 73)

In this context, it was asserted that counseling related to dietary practices should be made available for adults over the age of 18. In addition, these earliest objectives suggested
that psychosocial support groups should be made accessible for people focused on weight control and maintenance (USDHHS, 1980).

With the publication of Healthy People 2000: Health Education and Promotion Objectives for the Nation in 1990, the continuation of this agenda was formalized. In this publication, anorexia and bulimia nervosa were mentioned in the introduction to the nutrition section as an issue of national concern. Importantly, however, no national nutrition objectives specified a target for action on the management of eating disorders. In addition, at this time, there were no national data available to quantify progress toward reaching a measurable objective focused on reducing the incidence and prevalence of anorexia and bulimia nervosa (USDHHS, 1990).

Importantly however, among these national health objectives, one specific objective found in the Mental Health and Mental Disorders priority area was focused on the issue of eating disorders. Objective 6.5a classified eating disorders as a clinical illness related to stress. This objective was subcategorized under Objective 6.5: Reduce to less than 35 percent the proportion of people aged 18 and older who experience adverse health effects from stress. The Healthy People document was established to help individuals learn to cope with personal and emotional concerns and learn to control stress because “it has been suggested that the effects of stress are related to a variety of clinically defined illnesses such as anxiety, eating disorders” and depression (USDHHS, 1990, p. 214).

In further continuation of this national agenda, Healthy People 2010 was published in 2000. Like its predecessors, this document served to update the nation’s
health objectives to be achieved in the decade between 2000 and 2010. In the *Mental Health and Mental Disorder* priority area of *Healthy People 2010*, the definition of mental health was developed to include such issues as “personal well-being, family and interpersonal relationships, and one’s contribution to society” (USDHHS, 2000, p. 18-3). Emotional and mental matters experienced by an individual help to determine whether or not the person is experiencing a positive or negative mental state of health. Within Focus Area 18: *Mental Health and Mental Disorder* in *Healthy People 2010*, eating disorders was listed specifically as one of the medical conditions from which an individual can be suffering. As such, *Healthy People 2010* clarified that eating disorders are co-morbid with other mental health and emotional issues such as depression and anxiety. Eating disorders such as anorexia and bulimia nervosa were characterized as mental health concerns as often they are defined as psychiatric illnesses. Importantly, within this objective, depression is associated with medical conditions including heart disease, cancer, and diabetes as well as anxiety and eating disorders (USDHHS, 2000).

Further, objective 18.5: *Eating Disorder Relapses* establishes a target for the reduction of individuals with anorexia or bulimia nervosa who relapse back to unhealthy eating habits (USDHHS, 2000). This assertion is supported by the work of Eckert, Halmi, Marchi, Grove, and Crosby (1995) and Strober, Freeman, and Morrell (1997) who have reinforced that between 30 to 50% of patients treated in the hospital will become ill again within one year of being discharged from the hospital. In addition *Healthy People 2010* contained confirmation that less than half of individuals diagnosed with bulimia
Eating disorders are documented in two focus areas in Healthy People 2010. The focus areas that specifically document eating disorders include Mental Health and Mental Disorders and Nutrition and Overweight. Focusing once again upon psychological issues, objective 19: Nutrition and Overweight in Healthy People 2010 documented that under-nutrition can occur among people with mental disabilities. Under-nutrition has been found to be associated with anorexia and bulimia nervosa. In this context, it is necessary to educate and treat individuals at a young age about nutrition and the manner in which to eat healthy. Youth and young adults can learn how to maintain an appropriate body mass based on height and weight (USDHHS, 2000).

In the United States, anorexia and bulimia nervosa are the two most commonly recognized eating disorders (American Psychiatric Association [APA] DSM-IV-TR, 2000). These eating disorders have been documented by the American Psychological Association (APA) in the Diagnostic and Statistical Manual of Mental Disorders (2000). Research has confirmed that eating disorders such as anorexia nervosa and bulimia nervosa are driven by an obsession with food and/or body image (APA DSM-IV-TR, 2000).

Anorexia nervosa is characterized by self-starvation and excessive weight loss. Anorexia nervosa is also characterized by failure to maintain body weight of at least 85% of what is expected for an individual. This condition is characterized by a fear of losing control over one’s weight or of becoming fat. Typically there is a distorted body image
present. Rather than having an accurate perception of their body weight, this condition is evident when individuals believe themselves to be overweight (APA *DSM-IV-TR*, 2000).

Bulimia nervosa is characterized by a cycle of binging and compensatory behaviors, which can include purging (APA *DSM-IV-TR*, 2000). Self-induced vomiting, laxative abuse, and excessive exercise are purging methods in which an individual engages as a weight management technique. These compensatory behaviors can occur when people try to engage in unhealthy weight management because they feel as if they are “being driven in a way that makes them feel desperately out of control” (Johnson & Tobin, 1991, p. 119).

Also, recognized in the *DSM-IV-TR* (APA, 2000) is a disordered eating not otherwise specified diagnosis. Eating disorder not otherwise specified (EDNOS) is terminology that is used when an individual does not meet the specific criteria for anorexia or bulimia nervosa but exhibits abnormal eating behaviors (APA *DSM-IV-TR*, 2000). Such disordered eating patterns range from dieting constantly, abusing laxatives, consuming diet pills, or even engaging in binge eating and purging by means that include vomiting and the use of laxatives on occasion (APA *DSM-IV-TR*, 2000).

In addition, research has confirmed that disordered eating and excessive exercise can co-occur. Excessive exercise is a method of purging in which individuals with an eating disorder such as bulimia nervosa can engage in physical activity to lose or maintain body weight. Such behaviors are suspected when an individual engages in physical activity such as jogging at a higher frequency and intensity level over a period of time that mediates or interferes with other life activities (Ackard, Brehm, & Steffen,
Affected individuals are likely to engage in excessive exercise as a means to control their weight and/or their self-image (Ackard et al., 2002).

In this regard, a study of college males conducted by O’Dea and Abraham (2002) found that 48% of their subjects believed that exercise was important for self-esteem. Importantly however, exercise becomes a concern when the individual engages in more than the amounts that are recommended (O’Dea & Abraham, 2002). Excessive exercise has been defined as exercising more than 3 hours a day or being so obsessed with physical activity that it interferes with other aspects of life (Nattiv et al., 2007).

O’Dea and Abraham (2002) “identified significant exercise concerns in one third of the young men” among the subjects in their study (p. 276). These researchers found that the men in the study exercised at least five days of the week, and the subjects reported that they exercised even when they were injured or ill.

The experience of annoyance, anger, or agitation if exercise sessions were interrupted is more worrisome from a clinical viewpoint because it may indicate both physiological and psychological problems associated with exercise dependence, withdrawal symptoms, anxiety and depression, and physiological symptoms related to the withdrawal of exercise. (O’Dea & Abraham, 2002, p. 276)

Eating disorders are estimated to occur in one million males and 5–10 million young females in the United States. In this regard, among the general population of the United States, nine out of 10 individuals with an eating disorder such as anorexia and/or bulimia nervosa are female (ADA, 2001). A number of researchers have agreed that the
incidence of anorexia nervosa includes about 0.3 to 0.5% of the population, whereas bulimia nervosa has been documented to occur in about 1–3% of the female population (APA DSM-IV-TR, 2000; Croll, Neumark-Sztainer, Story, & Ireland, 2002; Plehn, 1990).

Research has documented that the onset of eating disorders occurs most commonly between the ages of 15 and 30 (APA DSM-IV-TR, 2000; Bryla, 2003; Stephenson, 1991; USDHHS, 2000). Anorexia nervosa can emerge among youth during early adolescence, whereas it is more common for bulimia nervosa to develop in later adolescence. Importantly however, a study conducted by Cusumano and Thompson (2000) revealed that boys and girls as young as 8 to 11 years old displayed concerns with their body image. The body dissatisfaction among this age group was found to be associated with the internalization of pressure that subjects felt about the desirability of a particular body type (Cusumano & Thompson, 2000). In fact, “eating disorders, affecting up to 2 percent of the population, arise predominantly—but not exclusively—in adolescent and young adult women (90% in all cases); the median age of onset is 17 years” (USDHHS, 2000, p. 18-8). In this regard, anorexia and bulimia nervosa have been confirmed among adolescents and young adults. Eating disorders account for one of the highest death rates of any of the mental disorders identified in Healthy People 2010 (USDHHS, 2000).

Among both males and females, the etiology of eating disorders is complex and appears to include both genetic and psychological factors (APA DSM-IV-TR, 2000). For some individuals, the disorder appears to develop on its own without the presence of any other significant psychological factors. Among others, eating disorders are triggered by
an emotional concern or incident (APA *DSM-IV-TR*, 2000; USDHHS, 1990). Often co-morbidity is evident since eating disorders can co-exist with other emotional issues including anxiety and depression. In addition, the psychological factors that can influence eating disorders also can include a history of trauma and childhood sexual abuse (APA *DSM-IV-TR*, 2000).

Finally, specific environments or occupations can place pressure upon individuals to strive to be thin or to manifest a particular body type. Included among such occupations are modeling, dancing, and other pursuits including athletics. In such professions, it is common for pressure to be applied to individuals to be a particular body weight to be successful within a certain career or athletic activity. Based on aesthetics or weight classes individuals can have specific body weight criteria imposed upon them (DeBate, Lewis, Zhang, Blunt, & Thompson, 2008; DePalma et al., 2002; O’Dea & Maloney, 2000; Trattner-Sherman & Thompson, 2004). Trattner-Sherman and Thompson (2004) asserted that high-risk sports emphasize not only thinness, but use judging, weight classifications, and even revealing competitive attire to help score competitors. In particular, participating in sports that are judged upon aesthetics and events in which a lean body is perceived to increase ability and performance can also have an impact upon some student-athletes (Griffen & Harris, 1996). In addition, coaches and other advocates for athletics can inadvertently exert a negative influence upon student-athletes. By ignoring or even recommending dangerous weight control behaviors, coaches, athletic trainers, and athletic directors (ADs) can affect eating habits of student-athletes. As a result of pressure from coaches or other influential authority
figures, athletes increase their focus on their bodies and develop an “all or nothing” view of their athletic efforts (Wilson & Eldredge, 1992). Dancers and models also have been found to be judged upon thinness and aesthetics (Amara & Cerrato, 1996; Bryla, 2003; McCabe & Ricciardelli, 2005).

Due to the potential impact of such varied influences, eating disorders have become a public concern of particular importance in such developed countries as France, Italy, and the United States of America. In this context, the French parliament passed a groundbreaking bill in April 2008 that made it illegal to publicly encourage extreme thinness through such public venues as fashion magazines, advertisers, and websites including such occupations as modeling (Current TV, 2009).

Factors that can influence people with eating disorders include external sources such as the media, the environment, society, family members, and peers. Family history appears to be a risk factor for anorexia nervosa. In addition, individuals are at increased risk for developing anorexia who have other family members suffering from the disease. In this context, if either parent is excessively thin or obese an individual can also be more likely to experience anorexia (Neumark-Sztainer, 1996). Additional risk factors associated with developing eating disorders include stressful life events such as death and divorce. Sociocultural factors can also exert negative influences upon individuals with the potential to develop eating disorders (Heffner, Ogles, Gold, Marsden, & Johnson, 2003; Johnson & Tobin, 1991).

Sociocultural factors including body ideals in the media, the societal emphasis on attractiveness and social expectations for women with regard to appearance also can play
a role in individuals developing eating disorders (Heffner et al., 2003; Neumark-Sztainer, 1996). In this regard, the social ecological systems approach postulated by sociocultural risk factors has an impact on an individual and others who have the potential to develop an eating disorder. Social ecology is the study of people in an environment or circumstance and the influence of these complex factors (Oetzel, Ting-Toomey, & Rinderle, 2006). Sociocultural and environmental factors can exert an impact upon an individual’s body image and eating behaviors. Societal emphasis and celebration of a thin body ideal can increase body image awareness among teenagers and young adults. Self-esteem can be enhanced or challenged based on the body perceptions of the individual (Giles, Helme, & Krcmar, 2007; McCabe & Ricciardelli, 2005). In this regard, over time an individual becomes aware of this importance placed on thinness and appearance in his or her culture. The potential to develop an eating disorder becomes greatest when the individual internalizes such a view of society with regard to thinness and appearance (DeBate et al., 2008).

College aged individuals are at a higher risk of disordered eating than their counterparts in the general population. It is common for college students to experience many of the social, environmental, and psychological factors that can contribute to the development of anorexia and bulimia nervosa (Ackard, Brehm, & Steffen, 2002; Bryla, 2003; Cooley & Toray, 1996). The demands and stresses placed on young adults, especially those transitioning into college, can contribute to low self-esteem and threats to self-image (Cooley & Toray, 1996). As evidenced in O’Dea and Abraham’s study
(2002) conducted on the collegiate level, both male and female students experience eating disorders.

Twenty percent of the young college men in our current study displayed eating attitudes and behaviors characteristics of eating disorders and disordered eating. They did not differ from a comparable group of female students in eating attitudes, undereating, and overeating behaviors or psychological feelings. (p. 275)

In this context, “health professionals should be aware that eating and exercise disorders may be present in college men” and women, so early identification of these problems is important (O’Dea & Abraham, 2002, p. 273).

Research has revealed that student-athletes on the collegiate level experience eating disorders just as their peers do among the post-secondary community at-large. Disordered eating behaviors appear in equal prevalence or can be even more common among athletes than the general population of age-cohort peers (Engel et al., 2003; Johnson, Powers, & Dick, 1999; A. Thompson, Boardley, Yingling, & Rocks, 2007). Also, as reinforced in a number of studies, collegiate athletes experience eating and exercise disorders at the same rate or even at a greater rate than the non-athletic college population (Engel et al., 2003; Johnson et al., 1999). Most often, being involved in organized sports helps improve an individual’s self-esteem and body image (Taliaferro, Rienzo, Miller, Pigg, & Dodd, 2008). Importantly however, research has revealed that athletic competition can cause severe psychological and physical stress. When the pressures of athletic competition are added to an existing cultural emphasis on thinness,
risks can be increased among athletes to develop eating disorders (Biesecker & Martz, 1999; Engel et al., 2003).

Like individuals among the non-athletic college population that develop anorexia or bulimia nervosa, sociocultural and environmental factors including the media, teammates, and gender roles can influence student-athletes’ perceptions and behaviors. When an athlete’s perception and behavior come under question, body concerns, anxiety in relationship to athletic performance, and the influence of coaches can contribute to the development of an eating disorder. These concepts were first discovered among individuals in the general population through the social ecological approach and have since been replicated in studies involving student-athletes (Boskind-White & White, 2000; Sundgot-Borgen, 1994).

Consistent with earlier discussions about research focused on the social ecological systems approach, collegiate student-athletes also are at an increased risk for eating disorders because of the complex and interrelated set of factors found specifically within the sports environment. The attitudes of coaches in context of the pressure to succeed imposed on college student-athletes contribute to eating disorders (Boskind-White & White, 2000; Sundgot-Borgen, 1994). Research has reinforced the fact that it is unclear what causes some athletes to cross the line from dieting and excessive exercise to more serious diagnosable eating disorders. As such, a combination of genetic, social, and environmental factors could be of significance (Engel et al., 2003; Johnson et al., 1999).

Peer pressure and social norming are influences that college students and, in particular, college athletes experience when they are at risk of developing an eating
disorder (Giles et al., 2007; Lewis, 2008; Perkins, Craig, & MacInnis, 2004; Peters et al., 2005). The social norming theory shows that student-athletes also experience peer pressure in regard to unhealthy behaviors so it is necessary to study the influence that peer pressure has upon a student-athlete in regard to eating disorders (Lewis, 2008; Peters et al., 2005).

Student-athletes experience cognitive, social, and psychosocial influences with which they must cope while engaged in athletics on the collegiate level. In this context, athletes become aware of the importance placed on appearance and thinness (DeBate et al., 2008; Fletcher, Benshoff, & Richburg, 2003). Therefore, a number of different triggers could cause a student-athlete in particular to develop an eating disorder such as anorexia and/or bulimia nervosa. The desire to succeed, the fear of failure, comments from coaches, family members, or other athletes; and societal pressures can influence how a student-athlete perceives himself or herself (Heffner et al., 2003; Trattner-Sherman, Thompson, DeHass, & Wilfert, 2001; Turk, Prentice, Chappell, & Shields, 1999). Therefore, sociocultural or environmental factors such as media, teammates, gender roles, body concerns, anxiety in relationship to athletic performance, and a coach’s interaction with a particular athlete can influence the athlete’s behaviors and perceptions of himself or herself (Bergandi & Wittig, 1984; Biesecker & Martz, 1999; DeBate et al., 2008; Giles et al., 2007).
The percentage of student-athletes on the collegiate level who meet the criteria for anorexia nervosa ranges from 1 to 6.9% compared to the general population prevalence rate which is 0.3 to 0.5% (APA DSM-IV-TR, 2000; Dick, 1991). The percentage of college athletes who meet the criteria for bulimia nervosa falls in a broad percentage range of 5 to 15%, whereas the percentage of individuals experiencing bulimia nervosa in the general population ranges from 1 to 3% (APA DSM-IV-TR, 2000; Dick, 1991).

Female athletics have been shown to exert a more frequent occurrence of diagnosable eating disorders and unhealthy eating behaviors compared to the general population (Boskind-White & White, 2000). Student-athletes on the collegiate level meet the criteria for anorexia nervosa at a higher percentage (1 to 6.9%) than the general population (0.3 to 0.5%; APA DSM-IV-TR, 2000; Dick, 1991). Also, the percentage of college athletes who meet the criteria for bulimia nervosa falls in a broader percentage range (5 to 15%) than does the general population (1 to 3%; APA DSM-IV-TR, 2000; Dick, 1991).

Athletes with eating disorders may have personality characteristics that include competitive, compulsive, anxious, and perfectionistic patterns and/or traits. Empirical studies show that collegiate female athletes in several sports who showed clinical or subclinical eating disordered habits had lower self-esteem, higher anxiety and perfectionistic traits, and felt more ineffective than female college non-athletes who reported no clinical or subclinical eating habits. (Zablocki, 2004, p. 8)
In this context, studies have revealed that over one-third of female athletes on the collegiate level have reported attitudes and symptoms placing them at risk for eating disorders (Dick, 1991; Engel et al., 2003). Johnson et al. (1999) and Katherine Beals’ (2003) works have confirmed similar results for attitudes and symptoms among female college athletes.

In a study by Katherine Beals (2003) of 425 female college athletes, findings revealed that 43% stated that they were afraid of being or becoming too heavy, and 55% reported experiencing pressure to achieve or maintain a certain body weight. More often females are diagnosed with eating disorders than their male counterparts within collegiate athletics. Some of the female athletes in the study conducted by Beals reported feeling that the pressure was self-imposed, whereas others reported feeling the pressure to achieve or maintain a certain body weight was placed upon them by coaches and teammates. Although most athletes with eating disorders are female, male athletes also are at risk, especially those athletes competing in sports that tend to place an emphasis on the athlete’s diet, appearance, size, and weight requirements, such as wrestling, bodybuilding, crew, running, and football (Engel et al., 2003; Johnson et al., 1999; NEDA, n.d.; Ransone & Hughes, 2004).

Student-athletes from a number of different sports display signs and symptoms of eating disorders. Sports in which there are the greatest incidences of eating disorders include swimming, wrestling, gymnastics, and running such as track and cross country (Vaughn, King, & Cottrell, 2004). In a study conducted by Engel and others (2003),
“wrestling and gymnastics demonstrated elevated levels of drive for thinness, food restriction, and purging behavior” (p. 1).

In this context, it is important to educate athletic personnel about eating disorders and the risk factors associated with eating disorders. The members of the collegiate athletic community such as athletic directors, certified athletic trainers, and coaches are uniquely positioned to promote the health of all student-athletes, not just those with eating disorders. Those professionals involved with student-athletes on a day-to-day basis can be such an important source of assistance to those particular athletes who have the potential to develop eating disorders (Bonci et al., 2008; A. Thompson et al., 2007; Turk et al., 1999).

Coaches are in a position to understand the demands and pressures of athletics and competition. Coaches can be a source of negative influence though in the lives of student-athletes. On occasion, coaches recommend pathogenic weight loss methods and even minimize the struggles that an athlete encounters. As a consequence, it is important for coaches to be educated about eating disorders and the risk factors associated with these health risks (Biesecker & Martz, 1999; Hawes, 1999; Heffner et al., 2003).

In addition to the influence of coaches, “the athletic department acts as the organizational body for all coaches and teams. Those policies, procedures, and preventative guidelines enforced by the athletic department will be carried out by coaches and department personnel and, in turn, will benefit the health of the athletes” (Turk et al., 1999, p. 21). Coaches, athletic directors, and certified athletic trainers need to be made aware of promoting or ignoring disordered behaviors in their student-athletes. Research
focused on educational programs about eating disorders, nutrition, and related health issues of student-athletes is rather limited. The National Collegiate Athletic Association (NCAA) and other athletic governing organizations should, therefore, try to help inform and direct athletic departments at colleges and universities to help improve the education of the collegiate personnel in direct contact with student-athletes on specific eating disorder topics (Heffner et al., 2003; Turk et al., 1999; Zablocki, 2004). The NCAA currently utilizes resources to try to raise this awareness and to educate the athletic community on eating disorders. The NCAA uses videotapes, a website, and other materials on eating disorders that are distributed to NCAA member institutions to be used by athletic directors, certified athletic trainers, coaches, and student-athletes (Hawes, 1999; NCAA, 2002).

**Statement of the Problem**

Student-athletes on the collegiate level tend to engage in disordered eating habits such as anorexia and bulimia nervosa more often than their counterparts in the general population (Engel et al., 2003; Johnson et al., 1999; NEDA, n.d.; Wilson & Eldredge, 1992). The student-athlete believes that if he or she were thinner, athletic performance would improve (Beals, 2003; Boskind-White & White, 2000; Sundgot-Borgen, 1994). A number of researchers have confirmed that the athletic environment itself and the people within the environment such as coaches and teammates and the pressure to succeed in general can cause athletes to engage in disordered eating behaviors (Biesecker & Martz, 1999; Boskind-White & White, 2000; Sundgot-Borgen, 1994). Also, the student-athlete can experience pressure to maintain a specific weight due to particular demands of
selected sports (Ransone & Hughes, 2004). A study conducted with collegiate coaches revealed, “education is a primary tool for minimizing the risk of eating disorders and that coaches, parents, athletes, and sport-related personnel should all be included in educational programs” (Turk et al., 1999, p. 21). Also, a study conducted by Vaughan et al. (2004) concluded that certified athletic trainers felt more confident working with student-athletes with eating disorders when their institutions helped increase their awareness and knowledge concerning eating disorders. Therefore, athletic directors need to find a way in which to make policies and procedures mandatory for university personnel that work with student-athletes to attend training and educational programs about eating disorders (Turk et al., 1999; Vaughan, King, & Cottrell, 2004; Zablocki, 2004).

**Purpose Statement**

The purpose of this study was to analyze the differences in perceived institutional policies, procedures, and educational programming in regard to eating disorders between athletic directors and student-athletes participating in selected sports at NCAA Division II (DII) designated institutions.

**Research Questions**

1. Have student-athletes and athletic directors (ADs) had formal education regarding eating disorders?
2. What form of eating disorder education was provided to student-athletes and athletic directors?
3. What was the knowledge level of student-athletes and athletic directors about eating disorders?

4. What assistance and information are perceived helpful by athletes in regard to eating disorder prevention and intervention among NCAA Division II (DII) student-athletes?

5. Do NCAA Division II (DII) athletic programs have policies, training programs, and educational materials for eating disorder prevention available for their student-athletes?

6. What is most frequently done when a student-athlete is suspected of having an eating disorder?

7. What are the perceptions of NCAA Division II (DII) student-athletes and athletic directors in regard to eating disorder prevention and support received?

8. As perceived by student-athletes and athletic directors, how prevalent are eating disorders among collegiate athletes?

9. Do student-athletes and athletic directors believe that eating disorders influence athletic performance?

10. Who is influential/needed in the prevention of eating disorders among athletes as perceived by student-athletes and athletic directors?

**Definition of Terms**

*Anorexia Nervosa*: dietary habits characterized by self-starvation and excessive weight loss and characterized by failure to maintain body weight of at least 85% of what is expected (APA *DSM-IV-TR*, 2000).
**Athletic directors**: sports administrators that over-see the operation of the athletic department on college campuses (NCAA, 2002).

**Bulimia Nervosa**: dietary habits characterized by a cycle of bingeing and compensatory behaviors such as purging (APA DSM-IV-TR, 2000).

**Division II**: an athletic classification for colleges and universities that have an average enrollment of 4,535 students among 282 active institutions out of 302 total member institutions (NCAA, 2002).

**Eating disorders**: dietary habits driven by an obsession with food and/or body image (APA DSM-IV-TR, 2000).

**Excessive exercise**: engaging in physical activity and exercise above and beyond what is recommended on a daily basis and the time commitment interferes with other life activities (Ackard, Brehm, & Steffen, 2002).

**National Collegiate Athletic Association (NCAA)**: athletic governing body that over-sees sports and the student-athletes that participate in those sports on the collegiate level (2002).

**Student-athletes**: individuals that attend college to earn a degree and to participate in sports while enrolled at the institution (NCAA, 2002).

**Basic Assumptions**

Basic assumptions for this research include:

1. Data collection maintained conformity to protocol cleared by Kent State University Institutional Review Board (IRB).

2. All responses were provided voluntarily.
3. Subjects were able to read and understand the items included in the instrument.

4. Subjects replied honestly to items in the instrument.

5. All responses were provided anonymously.

6. The instruments measured the research questions that were proposed.
CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this study was to analyze the differences in perceptions about institutional policies, programming, and responses to eating disorders between athletic directors and student-athletes participating in selected sports at National Collegiate Athletic Association (NCAA) Division II (DII) designated institutions.

Eating Disorders

Disordered eating behaviors have been recognized for many centuries. As long ago as in Ancient Rome, it was documented that people would vomit the food that they had consumed at a feast. Although not because of an eating disorder, this behavior was pursued merely as a means to regain one’s appetite.

In ancient Greece, research also has confirmed that individuals would engage in abnormal eating behaviors. Ancient Greeks would eat significant amounts of food and then would vomit as a purging method to rid their bodies of the food on which they had indulged. Interestingly, ancient Romans and Greeks constructed specifically designated places to vomit known as “vomitoriums” (Bruch, 1973).

The terms used to describe eating disorders, which include anorexia and bulimia nervosa, are Greek in origin. The definition for anorexia nervosa literally is a phrase in Greek that means “to lose one’s appetite.” The phrase bulimia nervosa literally means that someone has an appetite like an ox (Anderson, 1985; Bruch, 1973).

The ancient practices of binging and purging are similar to modern bulimia nervosa behaviors. Importantly, there is no concrete historical evidence of a drive for
thinness in ancient Roman and Greek cultures since extreme thinness was not the body shape being sought by these ancient people. The association of binging and purging behaviors with the drive for thinness has manifested itself only in more modern times (Anderson, 1985; Bruch, 1973).

As understood in the 21st century, eating disorders have been referenced in the medical literature only since the 1870s. Scholars of that time documented that individuals would engage in self-starvation and other abnormal eating behaviors to maintain or even to lose weight. In 1873 Charles Lasegue, a French physician, first diagnosed the eating disorder anorexia nervosa as a medical condition. Dr. Lasegue confirmed that young girls between the ages of 15 and 20 years suffered from emotional concerns that they tried to conceal. Generally, a psychopathology such as stress was believed to be related to the occurrence of anorexia diagnoses in the subjects involved in Dr. Lasegue’s case studies. Based on the physical signs and symptoms that the subject displayed, the condition was then diagnosed as anorexia. Symptoms confirmed by Dr. Lasegue included uneasiness after eating food, the elimination of a particular food from one’s diet, a significant decrease in weight, and the cessation of menstruation as the disorder became chronic (Brumberg, 1988).

The following year, 1874, Dr. William Withey Gull, a British physician, confirmed the existence of eating disorders in an article published in the Transactions of the Clinical Society of London. In this publication, Dr. Gull confirmed that young women who displayed extreme emaciation were suffering from anorexia and referenced an article about this condition written by Dr. Charles Lasegue. Originally labeling the
eating disorder that he had diagnosed as Apepsia Hysterica, Dr. Gull changed to the use of the term anorexia coined by his contemporary colleague Dr. Lasègue (Brumberg, 1988).


The American Psychiatric Association’s (APA) *Diagnostic and Statistical Manual of Mental Disorders,* fourth edition (APA *DSM-IV-TR*, 2000) has been published to name and define medical diagnoses. Important, this manual represents the standard in classification of disorders used by mental health professionals (APA *DSM-IV-TR*, 2000). First appearing in the *DSM* in 1980, the APA officially classified anorexia and bulimia nervosa as mental illnesses (APA *DSM-III*, 1980). In the *DSM-IV-TR*, the eating disorder not otherwise specified (EDNOS) also was recognized as an eating disorder (APA *DSM-IV-TR*, 2000).

The most current fourth edition of the *DSM-IV-TR* (APA *DSM-IV-TR*, 2000) continues to recognize anorexia, bulimia nervosa, and eating disorder not otherwise specified as mental illnesses. Research conducted by Eddy and colleagues (2008) has provided reinforcement for the current classifications of anorexia and bulimia nervosa into two distinct diagnostic categories of eating disorders. As such, these eating disorder
classifications are projected to be included in the fifth edition of the *DSM-IV-TR*, slated to be published in 2013 (Eddy et al., 2008). In reinforcement, the *International Statistical Classification of Diseases and Related Health Problems* (WHO, ICD-10, 2009) published by the World Health Organization, identified and defined eating disorder terminology. This publication is used worldwide to communicate morbidity and mortality statistics as well as reimbursement data, and to promote international comparability in the collection, processing, and classification of health and disease statistics (WHO, ICD-10, 2009).

According to varied sources, people suffering from any of the three eating disorders engage in eating habits that are not consistent with the norm for their age. Initial signs and symptoms among people engaging in disordered eating habits are most often recognized in adolescents and young adults. Anorexia, bulimia nervosa, and EDNOS typically develop during adolescence and constitute one of the top three most common chronic health disorders among people in this age group. In a study of a representative sample of 6,728 American adolescents, Neumark-Sztainer and Hannan (2000) confirmed that anorexia, bulimia nervosa, and EDNOS most often develop initially in individuals during their teenage years or early 20s in most cases. In addition, S. H. Thompson and Digsby (2004) confirmed that high school females in the study that they conducted experienced a preoccupation with being thinner. In this study of 156 female high school students, the researchers were able to assess the manner in which the subjects viewed body satisfaction and weight loss habits. Sixteen percent of the
adolescent female subjects usually or almost always wanted to be thinner than they were at the time of the study (S. H. Thompson & Digsby, 2004).

Irrespective of the age at which eating disorders begin, people diagnosed with these conditions exhibit a preoccupation with food and an excessive concern about body weight. As such, people with eating disorders are driven by an obsession with body shape and body image. Anorexia nervosa is characterized by a pursuit of thinness, whereas bulimia nervosa is characterized by secretive binge-eating episodes, which are followed by self-induced vomiting, fasting, or use of laxatives. People with bulimia nervosa try to control specific aspects of their lives including weight and stress. When all of the diagnostic criteria for anorexia or bulimia nervosa are not met but abnormal eating behaviors are displayed, the patient’s diagnosis is a condition known as eating disorder not otherwise specified or EDNOS (APA DSM-IV-TR, 2000; WHO, ICD-10, 2009).

Excessive exercise, a method of purging, has been revealed through research. In 2000, Penas-Lledo, Vaz Leal, and Waller (2002) established specific diagnostic criteria to identify subjects engaging in this particular purging method of excessive exercise. These researchers conducted a retrospective study of 124 female subjects. Analyses were based on the information available about subjects being treated for eating disorders on an outpatient basis. Subjects were determined to be excessive exercisers “if they reported practicing physical exercise at least five times a week, for at least one hour without stopping, and with the aim of burning calories” (p. 371). In addition, subjects who were diagnosed with anorexia or bulimia nervosa were more likely to be depressed than their counterparts without a diagnosed eating disorder. Further, this research revealed that
subjects with anorexia experienced anxiety and interpersonal sensitivity about excessive exercise and eating disorders. Frequently, when the subjects experienced interpersonal sensitivity, they reported feeling insecure, rejected, and even depressed (Penas-Lledo et al., 2002). In support, Ackard et al. (2002) surveyed 586 college women at a midwestern university. Their findings revealed that subjects reported negative feelings if they missed exercise sessions. The subjects in this study used exercise to compensate for overeating. Like other methods of purging, excessive exercise is pursued by teenagers and young adults to maintain or lose weight (Ackard et al., 2002).

Eating disorders have been diagnosed in males as well as females. Excessive exercise is also recognized in both male and female subjects. Ninety-three male undergraduate students served as the subjects for a study conducted by O’Dea and Abraham (2002). The work of these researchers confirmed that it is common for male subjects to engage in excessive exercise for weight loss purposes. This study included an extended investigation into the relationship between eating, weight, and exercise behaviors. Subjects were found to engage in exercise beyond the expected rate of other people of the same age (O’Dea & Abraham, 2002). In addition, this preoccupation with and engagement in excessive exercise were demonstrated to interfere with other life activities (O’Dea & Abraham, 2002). Key to excessive exercise among male and female subjects was the shared attribute of engaging in activity that interferes with other life pursuits. In this way, while not a diagnosed eating disorder in and of itself, excessive exercise is an underlying characteristic of anorexia, bulimia nervosa, and EDNOS (APA DSM-IV-TR, 2000; Munson, 2000; O’Dea & Abraham, 2002).
Whereas it is true that for best health, people must engage in the proper amount of exercise, they must also consume adequate calories from a variety of foods to maintain a healthy weight. Proper nutrition and healthy eating behaviors include an adequate quality and quantity of food and fluid to provide essential nutrients and support energy, tissue growth, and repair (Ackard, Fulkerson, & Neumark-Sztainer, 2007; APA DSM-IV-TR, 2000; Garfinkel, Moldofsky, & Garner, 1980; Munson, 2000; WHO, ICD-10, 2009). If people restrict calories, engage in rapid weight-loss practices, or eliminate specific foods or food groups from their diet, an eating disorder should be suspected. People with eating disorders engage in abnormal eating practices causing weight loss. These disordered eating patterns are not the norm for their age, height, and gender (APA DSM-IV-TR, 2000; Garfinkel et al., 1980; Munson, 2000; WHO, ICD-10, 2009).

Garfinkel et al. (1980) conducted research with 141 subjects in a study sponsored by the National Institute of Mental Health (NIMH). Some of the subjects displayed food restrictive behaviors recognized in people suffering from anorexia. Specific criteria also were used to classify bulimic behaviors. About half of patients with anorexia demonstrated bulimic behaviors by this research (Garfinkel et al., 1980). The shared features common to anorexia, bulimia nervosa, and EDNOS include the use of food and weight control to deal with emotional distress and developmental crises. Further, shared features of eating disorders include preoccupation with weight and calories. Finally, among these subjects there were increased family incidences of depression and eating and weight disorders (Ackard et al., 2007; APA DSM-IV-TR, 2000; Eddy et al., 2008; Garfinkel et al., 1980; Tozzi et al., 2005; WHO, ICD-10, 2009).
Research has confirmed that a person can experience anorexia, bulimia nervosa, or EDNOS as they progress through the course of their illness. As such, it has been documented that a subject can suffer from any of the three eating disorders throughout the course of a lifetime. In particular, anorexia and bulimia nervosa can be part of a spectrum of disorders that share certain fundamental features. A subject can make a transition to bulimia nervosa soon after anorexia is established. A number of researchers have confirmed if subjects are unable to control appetite, the reaction tends to include panic and self-induced vomiting or other purging methods to rid the body of food and calories (Ackard et al., 2007; APA DSM-IV-TR, 2000; Bulik, Sullivan, Fear, & Pickering, 1997; Eddy et al., 2008; Garfinkel et al., 1980; Tozzi et al., 2005; WHO, ICD-10, 2009). In a study of 88 subjects, the work of Tozzi et al. (2005) revealed that 36% (N = 32) of the subjects had transitioned between signs and symptoms of anorexia to signs and symptoms more characteristic of bulimia nervosa. Most of the subjects in the study developed bulimia nervosa after having previously been diagnosed with anorexia (Tozzi et al., 2005).

In support of this work, Eddy et al. (2008) confirmed that more than one-third of the 216 female subjects in a related study transitioned from anorexia to bulimia nervosa by the seven year follow-up. In this study, the data revealed that 34% of bulimic subjects later in life began to display signs and symptoms more common to anorexia (i.e., restricting calories and food). A transition to bulimia nervosa can occur at any time during the course of anorexia, but the probability of the transition increased when the subject displayed the personality features more characteristic and more consistent with
those associated with bulimia. These characteristics can include an exaggerated focus on self-image and low self-esteem (Ackard et al., 2007; APA *DSM-IV-TR*, 2000; Eddy et al. 2008; Tozzi et al., 2005; WHO, *ICD-10*, 2009).

Through their research, Bulik et al. (1997) confirmed that subjects transitioned to bulimic behaviors after having experienced anorexia. Subjects who experienced this transition became more emotional and reported feeling that they were unable to control certain aspects of their lives compared to their counterparts who displayed only anorexic signs and symptoms. For some subjects the transition did not take place until many years after the original diagnosis of the condition. A person who is chronically ill due to an eating disorder can transition back and forth between anorexia and bulimia nervosa. In addition, these subjects were more likely to experience a reoccurrence of an eating disorder years after their original presentation of signs and symptoms (Eddy et al., 2008; Tozzi et al., 2005). The reoccurrence usually was associated with a major stress in the person’s life such as depression associated with a spectrum of issues including anxiety or even sexual abuse. There are specific emotional signs and symptoms subjects display such as denial of an eating disorder or even a distorted image of body weight and shape. Personal factors such as low self-esteem, a feeling of lack of control, anxiety, and depression are common among individuals suffering from anorexia, bulimia nervosa, and EDNOS (Anderson, 1985; Bulik et al., 1997; Eddy et al., 2008; Tozzi et al., 2005).

In addition to transitioning between conditions, there also can be a co-occurrence of eating disorders. The overall picture of a subject with a co-occurrence of disorders includes the medical complications of one eating disorder and the personality
characteristics of another. For example, one of the personality characteristics of subjects suffering from bulimia nervosa has been demonstrated to include trying to control aspects of their lives. In this way, subjects tried to maintain weight or even lose weight because they believed that it would improve self-confidence and help them become more extroverted (Casper, Eckert, Halmi, Goldberg, & Davis, 1980; Eddy et al., 2008; Tozzi et al., 2005). In a study sponsored by National Institute of Mental Health (NIMH), Casper et al. (1980) studied the co-occurrence of anorexia and bulimia nervosa. The study included 105 female subjects who experienced anorexia but also displayed signs and symptoms of bulimia. The study revealed that 47% of the subjects engaged in bulimia even though the subjects had been diagnosed with anorexia originally. Initially, the diagnoses were based on subjects being underweight and having experienced amenorrhea (Casper et al., 1980).

In addition to the range of behavioral and psychological consequences, eating disorders have been demonstrated to be related to significant physical morbidity and mortality. Research has confirmed that approximately 5% to 10% of individuals with eating disorders die every decade (Herzog et al., 2000). The subjects in a study conducted by Herzog et al. included 246 women being treated at a hospital in Massachusetts for eating disorders. During the 11th year of the longitudinal study, data revealed that seven deaths had occurred as a result of eating disorders. Causes of death most often cited included electrolyte imbalances, dehydration, and suicide (Herzog et al., 2000). Importantly, the rate of death due to eating disorders was higher than the average
yearly mortality rate due to all causes of death among females aged 15-24 (Sullivan, 1995).

**Anorexia Nervosa**

The diagnosis for anorexia nervosa is based on eating habits that include limiting one’s calories to 800 or fewer per day, limiting dietary consumption of meat, and a reduction of high calorie foods in an attempt to lose weight (Ackard et al., 2007). Results compiled from the Neumark-Sztainer (1996) study confirmed that individuals with anorexia lost at least 15% of a normal body weight for their age, gender, and height because of abnormal eating practices. Subjects diagnosed with anorexia had been confirmed to have had a fear of gaining weight even though they were extremely underweight (Ackard et al., 2007; Amara & Cerrato, 1996; APA DSM-IV-TR, 2000; Neumark-Sztainer, 1995). The fear of becoming overweight “is the excessive fear of and preoccupation with the idea of becoming fat, despite being normal in weight or even very thin” (Anderson, 1985, p. 201).

Often, emotional and physical complications are associated with anorexia. In fact, emotional distress most often precedes physical manifestations of the disorder. The emotional signs and symptoms displayed by a person diagnosed with anorexia include denial of the eating disorder and distorted thought processes about one’s body weight and shape. Specifically, there is a misperception of body image wherein patients perceive themselves or claim to feel fat even when the body is emaciated (Ackard et al., 2007; Cooley & Toray, 1996; DeBate et al., 2008). Research conducted by Ackard et al. (2007) focused on 4,746 male and female adolescents from Minnesota. This study revealed that
0.04% of the subjects met the emotional and physical criteria for anorexia among this adolescent population (Ackard et al., 2007). Further, data from a study by DeBate et al. (2008) were obtained by surveying 224 young adults attending a southeastern university. Emotional factors identified in subjects in this study included depression, low self-esteem, and an expressed feeling of a lack of control.

In addition to emotional concerns, the physical consequences of anorexia can be detrimental to a subject’s life. Hoek and van Hoeken (2003) conducted a literature review to compile data from a number of epidemiological studies on eating disorders. This comprehensive review examined over 70 publications. Verified by this compilation of literature, prevalence rates were confirmed to be 0.3% for anorexia diagnoses (Hoek & van Hoeken, 2003). In a related publication, Hudson, Hiripi, Pope, and Kessler (2007) conducted research by focusing on the National Comorbidity Survey results from 2001 through 2003. The survey included 9,282 subjects during the four years. These researchers confirmed in the United States, anorexia nervosa is diagnosed in 0.3% to 0.5% of the general population (Hudson et al., 2007).

Additionally, anorexia has one of the highest mortality rates of any mental illness. The mortality rate among people with anorexia has been estimated to be 0.56% per year, or approximately 5.6% per decade (Sullivan, 1995). Sullivan (1995) compiled data through a meta-analysis. The results from the meta-analysis confirmed that 178 deaths had occurred among the 3,006 subjects in the 42 studies reviewed for the analysis. Further, in a study conducted by Keel et al. (2003) involving 246 women, 11 women (4.5%) died due to complications associated with eating disorders. Through this
research, 10 of the women had diagnoses of anorexia, and one woman had a diagnosis of bulimia nervosa (Keel et al., 2003).

**Bulimia Nervosa**

Bulimia nervosa is characterized by problematic eating behaviors including abusing laxatives, taking diet pills, and binge eating followed by purging. Binge eating involves consuming an excessive amount of food in a short period of time. In specific, binge eating is characterized by consuming a large amount of calories. The amount of food consumed exceeds the 2,000 calories recommended for healthy daily consumption by the Department of Health and Human Services (USDHHS, 2000). Eating this excessive amount of food exceeds the amount of food most people would consume in the same amount of time (APA *DSM-IV-TR*, 2000). Purging then occurs to eliminate food bulk and calories by means that include vomiting and using laxatives (Ackard et al., 2007; APA *DSM-IV-TR*, 2000; Munson, 2000). Purging by such methods as vomiting and using laxatives is known as compensatory behaviors. In this way, bulimia nervosa is characterized by a cycle of binging and compensatory behaviors (APA *DSM-IV-TR*, 2000). As previously discussed, the subjects in the Ackard et al. (2007) study included thousands of teenagers and young adults. A significant percentage of these subjects were confirmed to have engaged in recurrent purging methods. Results revealed that 9.4% of the females and 13.5% of the males had engaged in previously described purging methods (Ackard et al., 2007).

An unwarranted and excessive amount of exercise is another compensatory behavior in which people suffering from bulimia nervosa engage. Compared to other
eating disorder patterns, excessive exercise behaviors often are more commonly recognized in people diagnosed with bulimia nervosa (Ackard et al., 2002; O’Dea & Abraham, 2002; Penas-Lledo et al., 2002). In a study conducted by Penas-Lledo et al. (2002) with 124 female subjects, the results confirmed that subjects had engaged in excessive exercise. The study “examined links between excessive use of exercise and levels of eating, and general psychopathology” (Penas-Lledo et al., 2002, p. 374). The activities in which subjects were participating exceeded recommended timeframes and intensity levels. Also, engagement in such exercise behaviors was found to interfere with other life activities (Penas-Lledo et al., 2002).

This purging method becomes evident when an individual participates in a two hour sports practice then precedes to work out for two or three more hours. As confirmed by research conducted by Johnson and Tobin (1991), “those who appeared to be at risk for attempting to solve self-esteem and self-regulatory problems by manipulating their bodies through excessive dieting, may now be replaced by a group attempting to compensate by overexercising” (p. 128).

Therefore it is recognized self-induced vomiting, laxative abuse, and excessive exercise are purging methods in which people engage for the purpose of weight management (Ackard et al., 2007; APA DSM-IV-TR, 2000; Johnson & Tobin, 1991, Penas-Lledo et al., 2002). In this way, people with bulimia nervosa engage in compensatory behaviors as a way to eliminate what they believe to be excess calories as a foundation for weight maintenance or loss (Ackard et al., 2007; APA DSM-IV-TR, 2000).
As such, bulimia nervosa is diagnosed in approximately 3% of the population. In an analysis of more than 70 articles, as previously discussed, Hoek and van Hoeken (2003) conducted a comprehensive literature review to compare and contrast the incidence and prevalence rates of subjects with eating disorders. The prevalence rate of bulimia nervosa was determined to be at least 1% of the general population based on this retrospective analysis (Hoek & van Hoeken, 2003).

As previously discussed, the study by Ackard et al. (2007) included close to 5,000 male and female subjects. The researchers used information obtained through the administration of the National Comorbidity Survey (Hudson et al., 2007). The results from the study revealed that at least 0.2% of the subjects had experienced a diagnosis of bulimia nervosa (Ackard et al., 2007). In support of the data obtained in a study conducted by Ackard et al. (2007), Hudson et al. (2007) confirmed in their study of 9,282 subjects that 1% to 3% of the subjects had been diagnosed with bulimia nervosa.

**Eating Disorder Not Otherwise Specified (EDNOS)**

Although abnormal eating behaviors are exhibited when an individual is diagnosed with eating disorder not otherwise specified (EDNOS), the signs and symptoms of EDNOS do not meet the specific criteria for an anorexia or bulimia nervosa diagnosis (APA *DSM-IV-TR*, 2000). Consistent with other eating disorders, people diagnosed with EDNOS are driven by an obsession with food and body image as are recognized with other eating disorders. Such disordered eating patterns range from dieting constantly, abusing laxatives, consuming diet pills, or even engaging in binge eating and purging (i.e., vomiting). In addition, people with EDNOS display signs and
symptoms that include the reduction of caloric intake, limiting specific foods, and engaging in excessive exercise (APA *DSM-IV-TR*, 2000).

Importantly, people suffering from EDNOS cannot be fit neatly into the diagnostic criteria assigned to anorexia and bulimia nervosa by the American Psychiatric Association (*DSM-IV-TR*, 2000). For example, a person who shows almost all of the symptoms of anorexia, but who maintains a normal menstrual cycle will be diagnosed with EDNOS. Also, episodes of binging and purging can be experienced by a patient but not often enough to warrant a diagnosis of bulimia nervosa (APA *DSM-IV-TR*, 2000; WHO, ICD-10, 2009). Although people who suffer from EDNOS display disordered eating behaviors, these signs and symptoms are not as intense and are not as consistent over a determined period of time as are other eating disorders (Ackard et al., 2007; APA *DSM-IV-TR*, 2000; WHO, ICD-10, 2009).

Through the work of Ackard et al. (2007), the frequency of harmful eating behaviors is recognized in subjects even if they are unable to be diagnosed with anorexia or bulimia nervosa. Prevalence rates among adolescent subjects involved in this study revealed that potentially harmful eating behaviors were engaged in by 16.0% of the females and 15.4% of the males. These disordered eating habits though did not meet the specific criteria for anorexia nor bulimia nervosa; therefore the subjects were diagnosed with EDNOS (Ackard et al., 2007).

**Eating Disorder Prevention and Education**

Advocates and scholars assert the need for educational programming. Educational programming and training should address issues related to people engaged in
inappropriate weight loss methods and other eating disorder behaviors. In terms of preventing eating and body image concerns, medical professionals, adolescents, young adults, and family members of patients with eating disorders require education, training, and access to counseling and referral services. Education should include learning to better understand eating concerns, promoting awareness of proper nutrition, and learning to no longer ignore disordered eating behaviors. Further, training and education should include the dissemination of accurate information for effective and safe prevention techniques (Brown, Winzelberg, Abascal, & Taylor, 2004; Martz & Bazzini, 1999; Neumark-Sztainer, 1996). The work of Amara and Cerrato (1996) clarified that “someone who thinks poorly of herself may notice that thin people are often admired and conclude that if she loses weight, she’ll be appreciated more and feel better about herself” (p. 4). As such, medical professionals should be educated about physical and mental concerns associated with eating disorders. In addition, medical professionals should be equipped with the knowledge to help treat and refer patients for further treatment by specialists including counselors, psychiatrists, and dieticians (Amara & Cerrato, 1996; Clarke & Polimeni-Walker, 2004).

Medical professionals including doctors and nurses have been, and will be called upon to recognize the signs and symptoms of eating disorders (Amara & Cerrato, 1996; Clarke & Polimeni-Walker, 2004). In particular, physicians need to be prepared to recognize and treat symptoms with which patients present when diagnosed with eating disorders. As previously emphasized, physicians should have knowledge of available
resources including psychiatrists and dieticians so patients can be referred for further treatment (Clarke & Polimeni-Walker, 2004).

In addition, to better educate nurses about eating disorders, an article Eating Disorders—Still a threat by Amara and Cerrato (1996) was associated with continuing education hours through the journal RN. The continuing education hours were available through the completion of a question and answer section once the article had been read and reviewed. Through the application of continuing education, Amara and Cerrato (1996) focused on educating nurses more efficiently than previously accomplished so as to be able to address eating disorders, malnutrition, and body image concerns in their patients. Education is necessary for nurses to be able to better address issues occurring in conjunction with eating disorders (Amara & Cerrato, 1996; APA DSM-IV-TR, 2000; Penas-Lledo et al., 2002).

**Intervention and Treatment**

In the fall of 1980, the U.S. Department of Health and Human Services established a national agenda to promote health and prevent disease among all age groups of Americans. These priorities were promoted through a document entitled Promoting Health/Preventing Disease: Objectives for the Nation (1980). Then with the publication of Healthy People 2000: Health Education and Promotion Objectives for the Nation in 1990, the continuation of this agenda was formalized. In this publication, as an issue of national concern, anorexia and bulimia nervosa were mentioned in the introduction. Further, these national health objectives were focused on in the Mental Health and Mental Disorders priority area (USDHHS, 1990).
In addition, eating disorders have since been recognized within the *Mental Health and Mental Disorder* focus area in *Healthy People 2010* as psychiatric illnesses. In *Healthy People 2010*, eating disorders have been catalogued specifically as one of the medical conditions from which patients can be suffering. Eating disorders are a co-morbid condition with other mental health and emotional diagnoses such as depression and anxiety (USDHHS, 2000).

Research has demonstrated both medical and emotional concerns associated with eating disorders (Fairburn et al., 1995; LeGrange, Eisler, Dare, & Russell, 1992; USDHHS, 2000). Further, intervention and treatment of anorexia, bulimia nervosa, and EDNOS include inpatient and outpatient psychological and medical care. Psychological treatment includes family therapy and family counseling (LeGrange et al., 1992). LeGrange et al. (1992) used both methods of family intervention while treating male and female subjects over a 12-month period of time. Family therapy used for this study included sessions in which all family members were present at the same time. The family members worked with a clinical psychologist, counselor, or social worker. So physical and mental progress could be accomplished, the therapeutic professional suggested parental involvement to better assist the patient in developing a more controlled set of eating patterns. In contrast, family counseling involves one on one counseling for each individual family member with a psychological professional (LeGrange et al., 1992). The results from this study conducted by LeGrange et al. revealed equal improvement among patients when psychological and weight gain measures were used as the treatment techniques (LeGrange et al., 1992).
Behavior, cognitive behavior, and focal interpersonal therapy are other forms of therapy used with patients diagnosed with eating disorders. Behavior therapy includes observing an individual’s behavior then conducting therapy without having to truly discuss the person’s mental state of mind. Cognitive behavior therapy was developed through a merging of behavior therapy and cognitive therapy. A goal oriented systemic intervention approach is used in cognitive behavior therapy. The goal of focal interpersonal therapy is to help subjects recognize and change interpersonal problems through counseling (Fairburn et al., 1995). In research conducted by Fairburn et al., 89 subjects completed one of three therapeutic interventions: cognitive behavior, focal interpersonal, and behavior therapy. Subjects were diagnosed with anorexia (19%), bulimia nervosa (3%), and EDNOS (24%). Fairburn et al. asserted that cognitive behavior therapy and focal interpersonal therapy had better prognoses for eating disorders than behavior therapy. Follow-up was conducted with the subjects after the completion of their therapy. A 12-month and a 6-year follow-up were conducted with the subjects. As previously discussed, people with cognitive behavior therapy (CBT) and focal interpersonal therapy had better prognoses then did behavior therapy (BT; Fairburn et al., 1995). “It is unlikely that BT was actually harmful to the subjects, since it contained many of the same ingredients of CBT and since it was comparable to CBT in short-term outcome” (Fairburn et al., 1995, p. 311).

Both therapy and medical treatment can be conducted on an inpatient or outpatient basis. More often, subjects diagnosed with eating disorders receive outpatient treatment. So, Striegel-Moore, Leslie, Petrill, Garvin, and Rosenheck (2000) analyzed
data from an American insurance database to assess the cost of eating disorder therapy and medical treatment. The database included over 4 million insurance claims. The researchers chose to compare the cost of treatment for eating disorders including anorexia, bulimia nervosa, and EDNOS to the cost of treatment for schizophrenia and obsessive compulsive disorder (OCD). The researchers chose schizophrenia as a study variable since it is categorized as a serious mental illness, and OCD was included in the study since OCD and eating disorders share similar characteristics. The insurance claims included inpatient and outpatient treatment for medical and mental concerns that were covered by “some form of health insurance” for the period of one year during 1995 (Striegel-Moore et al., 2000). Findings from this study confirmed that the cost of treatment for eating disorders fell between the cost of treatment for schizophrenia and OCD. The cost of treatment for a patient with anorexia averaged $6,045.00 for the year. Bulimia nervosa treatment cost an average of $2,962.00 for 1995. Treatment for EDNOS cost an average of $3,207.00 in the same one year period of time. Schizophrenia costs were $4,824.00 for the year, and the cost of OCD treatment was $1,930.00 for the same time frame (Striegel-Moore et al., 2000).

As such, pediatricians and practitioners of adolescent medicine must recognize the importance of patients possessing health insurance. Evidence suggests health insurance can precipitate better access to treatment for patients diagnosed with eating disorders. The lack of appropriate insurance can pose obstacles and barriers to care. As early as the 1990s, scholars and advocates acknowledged health insurance and eating disorder concerns. Through 21 case presentations in 1994, the research conducted by
Silber (1994) revealed eating disorder and health insurance issues were intertwined. Even an early eating disorder diagnosis does not always bring about appropriate treatment for the patient, especially when there are health insurance concerns. Preceding a lawsuit settlement in the 1990s, Aetna insurance company’s coverage for patients diagnosed with eating disorders had been limited to 20 outpatient visits per year and 30 days of treatment for inpatient benefits. More recently, it has been acknowledged that the federal government has had to enact governance in states throughout America to address health insurance limitations. Such as, the federal government enacted the mental health parity law, which requires insurers to cover the cost of eating disorder treatment (Mental Health America, 2009; Silber, 1994). In this regard, it is important for people diagnosed with eating disorders and the physicians that work with their patients to advocate for equal access to equitable benefits from the health insurance companies. The Wellstone-Domenici Mental Health Parity and Addiction Equity Act of 2008 became effective January 1, 2010. This act was signed into effect to end health insurance benefits’ inequity between mental health/substance use and medical/surgical benefits for group health plans with more than 50 employees (APAPO, n.d.).

**Eating Disorders and the Collegiate Population**

**Eating Disorders and College Students**

Since the majority of initial cases of eating disorders are diagnosed among teenagers and young adults, researchers often conduct studies on college and university campuses. On the collegiate level individuals engage in disordered eating patterns
including anorexia, bulimia nervosa, and EDNOS due to the stresses of collegiate life (Cooley & Toray, 1996; Fulcher & Janosik, 2008; O’Dea & Abraham, 2002).

A study conducted by Cooley and Toray (1996) included 225 college freshmen as subjects. The results from this research revealed that 94% of the subjects wanted to weigh less than they did at the time of the study. In addition, those subjects who were dissatisfied with their weight and body shape also were the same subjects whose bulimia scores got worse throughout the course of the year in which the research was conducted (Cooley & Toray, 1996).

Further, Fulcher and Janosik (2008) recruited 1,220 female college students at a university in the southeastern United States. Forty-one percent of the instruments were returned ($N = 497$). The study included women who lived in the residence halls on this university campus. In specific, the study focused on the risk factors associated with the development of eating disorders among these female subjects. The relationship between eating disorders and the living environment plus the academic year of the subjects was analyzed in regard to the development of eating disorders. In particular, the researchers analyzed variables that included residing in the dorms and class ranking. The data obtained through this study confirmed that the collegiate population is at an increased risk of developing disordered eating patterns (Fulcher & Janosik, 2008). In addition, findings revealed that women in their first year at the university were more likely to be preoccupied with a desire to be thinner ($x^2 = 6.416, df = 2, p = .040$) when compared to female upperclassmen attending the same university (Fulcher & Janosik, 2008).
As such, Pearson and Young (2008) conducted a study at a large southeastern university. The research included 307 students. The drive for thinness contributed to students experiencing a fear of weight gain and a desire to lose weight. When people are dissatisfied with their body shape and weight, these feelings can lead them to engage in a range of behaviors including excessive dieting. Findings from this study confirmed that “perceptions of others, and self-perceptions based on beliefs about others’ attitudes and opinions, are strong influences in the college-age population” (Pearson & Young, 2008, p. 219).

In addition, research conducted by DeBate et al. (2008) further supported the notion that college students are susceptible to risk factors for eating disorders. This study included 224 male and female college students. Results revealed that both male and female college students tend to internalize sociocultural attitudes about changing their appearance. The internalization of these attitudes contributed to subjects’ increased efforts to try to change their weight, thereby confirming that risk factors contributed to the development of eating disorders (DeBate et al., 2008). The sociocultural perceptions, beliefs, and attitudes among college students influence eating behaviors. The research has confirmed that the competitiveness of the campus environment increases the pressure that college students experience in regard to losing weight and becoming thinner. The combination of body dissatisfaction and extreme dieting behaviors have been confirmed to be risk factors associated with anorexia, bulimia nervosa, and EDNOS (Cooley & Toray, 1996; Fulcher & Janoski, 2008; Pearson & Young, 2008).
National Collegiate Athletic Association (NCAA)

On the collegiate level, the National Collegiate Athletic Association (NCAA) is the governing body that oversees athletics at institutions throughout the United States. The NCAA establishes and implements guidelines, policies, and procedures to encourage collegiate athletic departments to focus on the mental and physical health concerns of student-athletes (NCAA, 2002).

Colleges and universities within the NCAA participate in one of three athletic divisions. The three NCAA athletic divisions include: Division I, Division II, and Division III (NCAA, 2002).

Division I institutions who are members of the NCAA are required to sponsor at least seven sports for men and seven for women (or six for men and eight for women) with two team sports for each gender. According to NCAA guidelines, Division I schools must meet minimum financial aid requirements for their athletic programs based on four bylaws’ criterion. There are also specific maximum amounts of financial aid that cannot be exceeded for each sport sponsored by Division I institutions. Bylaw 15.5 addresses each sport and the criterion that is used to calculate the maximum amount of financial aid allowable to each sports team. Further, student-athletes are ineligible of participating in intercollegiate athletics if they receive financial aid that exceeds the cost of attendance (NCAA, 2002).

Unlike other sports at designated NCAA institutions, Division I football teams can compete in Division I or Division I-AA. Division I-AA, a subcategory of Division I athletics, focuses on football and its lack of dominance as a sport at certain institutions.
If an institution has a football team, that college or university is permitted by NCAA rules to have more male athletes than female athletes no matter what division the institution fields its other athletic teams. If the institution does not have a football team on campus, then the male to female ratio of athletes has to be more equivalent. All of these criteria have been established based on guidelines imposed upon institutions by the Federal legislation referred to as Title IX. In 1972 this mandate was passed. This law required equal opportunities for males and females within federally funded educational programs. Females have a right to equal opportunity throughout educational institutions, not just in athletics. The educational institutions include K-12 and post secondary. In this context, athletics is only one of 10 areas addressed by this law. Specific areas addressed in Title IX include: Access to Higher Education, Career Education, Education for Pregnant and Parenting Students, Employment, Learning Environment, Math and Science, Sexual Harassment, and Standardized Testing and Technology. All of these criteria have been established based on guidelines imposed upon institutions in regard to Title IX (NCAA, 2002; TitleIX and Athletics, 2009).

Division II institutions are required to sponsor at least five sports for men and five for women (or four for men and six for women), with two team sports for each gender. NCAA rules permit institutions to gain a multi-divisional classification on a limited basis. In specific, DII programs can choose to classify one men’s and one women’s sport at the DI level. Member institutions must comply with rules and regulations that vary from division to division.
In addition, there are maximum financial aid amounts for each sport that a Division II school must not exceed. As previously discussed, sport-by-sport criteria have been established by the NCAA to limit the maximum amount of financial aid allowable. Further, the maximum amount of financial aid for student-athletes cannot exceed the cost of attendance according to Bylaw 15.1. As such, many Division II student-athletes pay for school through a combination of scholarship money, grants, student loans, and employment earnings (NCAA, 2002).

Further, the scholarship money, grant, and student loan ratio must be fairly equivalent between male and female athletes. In particular on the Division II level, 36.9% of male athletes and 27.4% of the female athletes on average, receive scholarships at this participation level. According to the NCAA (2006), student-athletes on the Division II level included approximately 52,441 males and 36,086 females in 2006. Like their Division I counterparts, if the Division II institution has a football team, the college or university is able to have more male athletes than female athletes. If the institution does not have a football team on campus, the male to female ratio of student-athletes has to be more equivalent (NCAA, 2002; TitleIX and Athletics, 2009).

Further, based on NCAA regulations Division III institutions have to sponsor at least five sports for men and five for women, with two team sports for each gender. Division III athletics features student-athletes who receive no financial aid related to their athletic ability, and athletic departments are staffed and funded like other departments within the university (NCAA, updated February 1, 2007).
In addition to regulations governing these matters, specific guidelines, policies, and procedures established by the NCAA for all three divisions address health concerns of student-athletes. The health issues include eating disorders and other mental and physical health concerns including drug use and alcohol abuse. Academic concerns are also addressed by NCAA guidelines, policies, and procedures (NCAA, 2002). The NCAA disseminates resource material to raise awareness and help educate the athletic community about student-athletes suffering from eating disorders. This awareness and education is implemented at institutions within all three divisions of the NCAA. As documented by Hawes (1999) the NCAA has made available videotapes, posters, manuals, and other materials regarding eating disorders, which have been distributed to NCAA member institutions. The availability of these resources has the potential to help promote the health and well-being of college athletes. In particular, specific guidelines documented in the NCAA sports medicine handbook address nutrition and athletic performance. Athletic directors, certified athletic trainers, and coaches are encouraged to follow the guidelines established and implemented by the NCAA in regard to the health and welfare of their student-athletes on the collegiate level (Sports Medicine Handbook, 2002). In addition, the NCAA has published a reference guide that addresses the management of student-athlete mental health issues. One of the seven health concerns in this document addresses eating disorders (NCAA, 2002).

Among research conducted at NCAA institutions, the studies most often cited in the literature focus on Division I student-athletes in regard to health concerns such as eating disorders (Beals, 2003; Martin, Schlabach, & Shibinski, 1998; Ransone & Hughes,
2004; Turk et al., 1999; Vaughan et al., 2004). In particular, a study conducted by DePalma et al. (2002) recognized potential limitations when NCAA Division II student-athletes (319) were not recruited to analyze eating disorders and college athletes. Division I and III student-athletes were included as subjects in the DePalma et al. study when assessing pathogenic eating among collegiate athletes. Results revealed more than 70% of the student-athletes with an increased risk of developing abnormal eating habits were recognized. Further, the impact of the athletic environment was a significant variable in predicting eating disorders among collegiate athletes. These researchers were then able to recognize and address the limitations of the study since no Division II athletes were included in the research population. Specifically, these researchers addressed the limitations in which generalization was not possible in regard to Division II athletes since only Division I and Division III student-athletes were research subjects (DePalma et al., 2002).

Importantly, however, three studies did include subjects from all three NCAA divisions as their subject pool, which helped make the results more generalizable to the collegiate athlete population (Dick, 1991; Heffner et al., 2003; A. Thompson et al., 2007). The results obtained through the participation of 303 coaches in the Heffner et al. (2003) study revealed the importance of including the three NCAA divisions (Division I, II, and III) when assessing eating disorders among college athletes. Results showed Division I coaches differed significantly compared to Division II and Division III coaches in regard to properly monitoring eating behaviors. Further, Division I coaches had more resources available to them when addressing eating disorders (Heffner et al., 2003).
As previously stated, the NCAA has established guidelines, policies, and procedures to help protect student-athletes on the Division I, II, and III levels. These recommendations focus on the student-athlete’s health and over-all well-being. Specifically, the NCAA has established guidelines and procedures, which are to be used by athletic departments to help educate, recognize, prevent, intervene, and treat student-athletes who are diagnosed with eating disorders (Hawes, 1999; NCAA, 2002).

Under the auspices of the NCAA, the members of the collegiate athletic community have the unique opportunity to promote the health and well-being of student-athletes. Under the governance of the NCAA, athletic departments at colleges and universities have the opportunity to improve the education of the athletic personnel in direct contact with student-athletes about health topics and mental and physical concerns (Heffner et al., 2003; Turk et al., 1999; Zablocki, 2004).

Athletic personnel who are employed by colleges and universities fall under the scope of the NCAA. These athletic personnel include athletic directors, coaches, and certified athletic trainers. As such, these institutional employees must be equipped to disseminate mentally and physically healthy messages to young adults involved in collegiate athletics. Recommendations by the NCAA (2002) state, professionals involved with collegiate athletics should strive to encourage more optimal mental and physical behaviors of their student-athletes so as to encourage healthy lifestyle choices.

Heffner et al. (2003) conducted a study by surveying 600 randomly selected collegiate coaches. Coaches of women’s sports on the collegiate sports were included in this study. The results from the study confirmed that a team approach to treating eating
disorders in NCAA college athletes is necessary (Heffner et al., 2003). The treatment team should include athletic directors, certified athletic trainers, coaches, physicians, sports nutritionists, and psychologists who must work together to provide helpful information, guidance, and support for eating disorder programs geared toward student-athletes (Heffner et al., 2003). It is important to educate collegiate athletic department personnel and student-athletes about anorexia, bulimia nervosa, EDNOS, and other health concerns that are encountered by student-athletes (Heffner et al., 2003; Turk et al., 1999; Vaughan et al., 2004; Zablocki, 2004).

**Collegiate Athletic Directors**

Athletic directors on the collegiate level work with the NCAA to ensure that their respective athletic departments are in compliance with all guidelines and policies related to collegiate athletics. Research conducted by Branch (1990) focused on athletic directors’ leadership abilities. In specific, this research was conducted by surveying 105 athletic directors. Results confirmed that college athletic directors are administrators who must effectively and efficiently govern the athletic departments at their respective institutions (Branch, 1990). In addition to compliance matters, athletic directors implement policies and procedures to prevent, recognize, and treat student-athletes with eating disorders. On the collegiate level, athletic directors often are the athletic personnel who are trained with regard to implementing polices, procedures, and guidelines to address eating disorders and student-athletes. This training and knowledge helps athletic directors compile educational material to address concerns, to implement prevention techniques, and to establish treatment protocols on their campuses. Such education
materials are used to assist college student-athletes who have developed, or have the potential to develop eating disorders (Branch, 1990; Zablocki, 2004).

Very little research addresses athletic directors and their student-athletes who might be suffering from eating disorders at their respective institutions. Therefore, a gap in the literature was found. There has been very little research addressing the ability of athletic directors to develop prevention, recognition, and treatment options for collegiate athletes with eating disorders and the athletic personnel that work with those student-athletes (Dick, 1991; Trattner-Sherman et al., 2005; Turk et al., 1999; Zablocki, 2004). Typically research has illustrated the role and knowledge of other collegiate athletic personnel such as coaches and certified athletic trainers, which has been cited significantly throughout the literature (Beals, 2003; Heffner et al., 2003; Turk et al., 1999; Vaughan et al., 2004). Further, a majority of the research that has been conducted regarding eating disorders in college athletics has been obtained through the perspective of the college student-athlete, not university personnel. More often, certified athletic trainers, coaches, and student-athletes are the subjects recruited when researchers assess and evaluate issues related to eating disorders (Hinton & Kubas, 2005; Martin et al., 1998; Nagel, Black, Leverenz, & Coster, 2000; Ransone & Hughes, 2004).

Certified Athletic Trainers

Research has been conducted that focuses on the knowledge, perceptions, and attitudes of certified athletic trainers and other personnel in regard to student-athletes and eating disorders (Beals, 2003; Dick, 1991; Heffner et al., 2003; Trattner-Sherman et al., 2005; Turk et al., 1999). As such, certified athletic trainers were the subjects involved in
the Vaughn et al. (2004) study. In this study, researchers had administered a self-developed survey that was distributed to certified athletic trainers at NCAA institutions on the Division I level. The certified athletic trainers returned 171 completed surveys. Researchers analyzed the confidence levels of certified athletic trainers’ who worked directly with college student-athletes with eating disorders. Results revealed that certified athletic trainers possessed the education and the experience to work with student-athletes with eating disorders. Only one in four certified athletic trainers though felt confident working with student-athletes with eating disorders (Vaughn et al., 2004). Further, the certified athletic trainers were found to be concerned about passing along inaccurate information about eating disorders to their student-athletes. These subjects believed that they needed to be provided with proper educational materials and resources by their respective institutions to help better address health concerns among their student-athletes (Vaughn et al., 2004).

When certified athletic trainers believed that they possessed the proper educational material they felt more confident and better prepared to work with student-athletes with eating disorders (Beals, 2003; A. Thompson et al., 2007; Vaughan et al., 2004). The work of A. Thompson et al. (2007) confirmed that when eating disorder resources were made available to certified athletic trainers ($N = 500$) by their respective athletic departments, there was a significant relationship to the percentage of items that the athletic trainers were then able to answer correctly on the research instrument. Also, the more resources made available to the certified athletic trainers correlated to higher knowledge about eating disorders. Findings from this analysis led
these researchers to conclude that if more institutions were able to provide appropriate resources to their certified athletic trainers, the potential would increase for these athletic personnel to be better prepared to recognize, educate, and prevent eating disorders among their student-athletes (A. Thompson et al., 2007; Vaughn et al., 2004).

Along with receiving educational materials and resources as previously discussed, researchers found that certified athletic trainers and other athletic personnel realized that it is beneficial to attend lectures and workshops addressing eating disorders. Certified athletic trainers, though, more often attended eating disorder programs at a rate of 66% as cited by A. Thompson et al. (2007) compared to collegiate coaches in which only 46% of the coaches attended similar eating disorder programs as cited by Turk et al. (1999).

Athletic personnel have a role in the prevention, recognition, and intervention of disordered eating in collegiate athletes (NCAA, 2002; A. Thompson et al., 2007; Trattner-Sherman et al., 2005; Turk et al., 1999; Zablocki, 2004).

**Collegiate Coaches**

Coaches understand the demands and pressures of athletics and competition. Importantly however, coaches can exert a negative influence in the lives of their student-athletes. As such, coaches recommend pathogenic weight loss methods and occasionally minimize the struggles that an athlete encounters. As revealed in the Biesecker and Martz (1999) study that included 110 subjects, the researchers revealed student-athletes started dieting because a coach mentioned body weight and athletic accomplishments in the same context. Specifically, higher reported incidents of greater
intentions to diet have been documented when subjects experienced negative, performance-oriented coaching styles (Biesecker & Martz, 1999).

As a result of such pressures being placed upon student-athletes by coaches, it is common for student-athletes to increase their focus on their bodies and develop an all or nothing view of their athletic efforts (Biesecker & Martz, 1999; Turk et al., 1999). Biesecker and Martz (1999) conducted an analog study to evaluate specific coaching styles. These researchers set out to determine how a negative coaching style would affect a student-athlete when compared to the effects of a positive coaching style. Results revealed the negative coaching style included performance centered strategies focused on an athlete’s body weight communicated in a threatening fashion. Importantly, findings revealed that such a negative coaching style was more likely to cause subjects to view their bodies in a less than favorable manner. In this context, the subjects were more likely to experience dieting intentions after encountering this negative style of coaching. By contrast a positive coaching style was characterized as centered more on the student-athlete as a person instead of focusing on athletic performance. In addition, the positive style of coaching included presenting a caring demeanor (Biesecker & Martz, 1999).

Of course, there are both positive and negative interactions encountered by student-athletes on the collegiate level. These interactions then influence student-athletes and their mental and physical health (Biesecker & Martz, 1999; Steiner, Pyle, Brassington, Matheson, & King, 2003).
Similar to other findings, Trattner-Sherman et al. (2005) confirmed it is the responsibility of the coach to intervene and refer the student-athlete for professional assistance when recognizing and managing student-athletes with eating disorders. As cited by Trattner-Sherman et al. (2005) and Turk et al. (1999), coaches are not always properly trained or educated, though, on recognizing signs and symptoms of psychological issues such as eating disorders. The Trattner-Sherman et al. (2005) study revealed that only 51% of the 2,894 coaches involved in the study had ever attended a lecture on the topic of eating disorders. Therefore, the NCAA (2002) has made recommendations that coaches should implement while training and coaching student-athletes.

Trattner-Sherman et al. (2005) analyzed results from the 2003 National Collegiate Athletic Association (NCAA) Questionnaire for Collegiate Coaches of Female Student-Athletes. These researchers were able to evaluate the manner in which 2,894 coaches at NCAA institutions recognized, managed, and referred student-athletes for assistance when the athletes displayed signs and symptoms of anorexia, bulimia nervosa, or EDNOS. In this study, the attitudes and perceptions of coaches were measured. The instrument used in this analysis helped researchers measure how detrimental coaches felt eating behaviors were to the health and athletic performance of student-athletes. Results revealed that coaches “rated symptoms as being serious, both in terms of how they affect the athlete’s health and her athletic performance” in regard to eating disorders (Trattner-Sherman et al., 2005, p. 447).
As such, coaches have come to the realization that reducing body fat or weight will not enhance the performance of their athletes. Therefore, a joint position statement on eating disorders released by the American College of Sports Medicine (ACSM), the American Dietetic Association (ADA), and the Dietitians of Canada (2000), stated that low body weight and a decrease in body composition negatively affect athletic performance. So, these two factors should not be used as criterion to train and educate athletes (ADA, 2001). It is important for coaches to gain the proper information and appropriate education about nutrition, healthy weight loss techniques, and body composition to address eating disorder concerns among athletes. Then, the accurate information that coaches obtain can then be disseminated to their student-athletes (Heffner et al., 2003; Turk et al., 1999). The increased risk of eating disorders among student-athletes in a sports environment suggests that this population requires special approaches to coaching and sports training (Biesecker & Martz, 1999; Heffner et al., 2003; Wilson & Eldredge, 1992). It can be important, therefore, for coaches to be well educated about eating disorder signs and symptoms and the risk factors associated with anorexia, bulimia nervosa, and EDNOS (Biesecker & Martz, 1999; Hawes, 1999; Heffner et al., 2003, Steiner et al., 2003).

Turk et al. (1999) surveyed 258 collegiate coaches to identify the knowledge of coaches regarding eating disorders. Findings from this study revealed that less than half (44%) of the college coaches involved in the study had ever attended an educational program regarding eating disorders. Also, the results revealed coaches employed on the collegiate level “have a great deal of influence over athletes, so they are in a position to
play a primary role in the prevention and management of eating disorders in athletes” (Turk et al., 1999, p. 19). As such, these researchers identified five eating disorder domains. The domains included etiology, identifying signs and symptoms, management and treatment, risk factors, and education and prevention of eating disorders. Importantly, the results indicated that the education and prevention domain had the lowest percentage of correct answers (Turk et al., 1999). As such, the researchers confirmed the importance of establishing “appropriate educational programs to increase the active role of coaches in the prevention and management of eating disorders in athletes” (Turk et al., 1999, p. 20).

In this regard, coaches and other athletic personnel reported literature was the most common eating disorder resource made available to them by their respective athletic departments (A. Thompson et al., 2007; Turk et al., 1999). Also, eating disorder training and educational materials such as videos, literature, group seminars, workshops, and educational programs have been found to be beneficial in the education of coaches on the collegiate level. Therefore, it is important for coaches to obtain these materials and participate in proper training programs to better understand eating disorders (Turk et al., 1999).

Coaches should approach student-athletes with good listening skills, make referrals to a designated professional, and make sure confidentiality is insured when coaches recognize a change in behavior or attitude among their student-athletes (NCAA, 2002; Trattner-Sherman et al., 2005; Turk et al., 1999). Studies conducted by Turk et al. (1999) and A. Thompson et al. (2007) recommended more training and education for
coaches and certified athletic trainers, respectively, in regard to eating disorders. An increase in training and an increase in educational programming were found to be necessary. Athletic departments need to be responsible for providing educational programs for their athletic personnel. Coaches, certified athletic trainers, and even student-athletes will benefit from training and education regarding eating disorders. As previously discussed, student-athletes with eating disorders can be negatively influenced by coaches. Coaches, therefore, need to be better educated to recognize the importance of being sensitive to the role that they play in focusing unnecessary attention on weight and body image (Trattner-Sherman et al., 2005; Turk et al., 1999).

Further, the research has confirmed that coaches and even certified athletic trainers should assess their own values and attitudes about weight, dieting, nutrition, and body image so that they do not inadvertently influence their student-athletes in a negative manner (Heffner et al., 2003; Trattner-Sherman et al., 2005; Turk et al., 1999). Instead, coaches and other athletic personnel should try to understand their role in promoting positive self-image and self-esteem among their student-athletes. Turk et al. (1999) confirmed that “coaches who have a high level of confidence in their knowledge but actually have a low knowledge score could pose more of a threat than an individual with a high knowledge and low confidence score” (p. 22). Athletic personnel should approach student-athletes with a nonjudgmental and caring manner when addressing health concerns related to anorexia, bulimia nervosa, and EDNOS. Along with a caring, nonjudgmental personality, athletic personnel need to increase their knowledge in regard to eating disorders (NEDA, n.d.; Trattner-Sherman et al., 2005; Turk et al., 1999).
Athletes With Eating Disorders

Research conducted by Burckes-Miller and Black (1988) included male and female student-athletes ($N = 695$) from 22 midwestern institutions. Results revealed that college athletes were two to three times more likely than non-athletes to display characteristics of disordered eating. Further, results from the Sundgot-Borgen (1999) study revealed that 67% of the 319 male and female athletes in the study were diagnosed with an eating disorder. The researcher reported athletes were dieting on the advice of their coaches (Sundgot-Borgen, 1999).

Further, DePalma et al. (2002) confirmed through their research an “additional variable increased the predictive value of the discrimination function for athletes: the impact of the athletic environment” (p. 48). Through the results of the Survey of Eating Disorders Among Athletes (SEDA), the impact of the athletic environment was discovered to be an influence on athletes (DePalma et al., 2002). Eating disorders have been documented to not only affect an athlete’s physical performance, but they also take a toll on an athlete’s mental and emotional wellbeing. O’Dea and Maloney (2000) confirmed professionals should therefore be able to identify athletes at the greatest risk of developing eating disorders.

As a consequence, in their respective eating disorder position statements, the American College of Sports Medicine (ACSM) and the National Collegiate Athletic Association (NATA) recommend specific guidelines to be implemented when addressing the issue of eating disorders among athletes. Both of these professional organizations use position statements to disseminate recommendations in regard to athletes and eating
disorders. These position statements contain recommendations for professionals in the field of sports medicine to better understand anorexia, bulimia nervosa, and EDNOS. These recommendations are directed at the prevention, detection, and management of eating disorders among athletes (Bonci et al., 2008; Nattiv et al., 2007).

**Collegiate Student-Athletes With Eating Disorders**

An athlete competing on different levels of competition experience eating disorders and the collegiate level is no exception. College athletes have exhibited signs and symptoms of disordered eating such as anorexia, bulimia nervosa, and EDNOS. Further, eating disorders occur among a wide range of collegiate athletes. According to the NCAA survey administered by Dick (1993) to 801 athletic administrators, there were about a tenth of the student-athletes on the collegiate level that had experienced eating disorders at colleges and universities throughout the United States in the years preceding the study.

The pressure to perform, to be successful, and even to look good can be very significant on the collegiate level. When an athlete makes the initial transition from high school to college these concerns can be significant to the student-athlete. Student-athletes at the beginning of their college careers believe that their scholarships could be revoked if they are not successful (Bergandi & Wittig, 1984; DePalma et al., 2002; Engel et al., 2003). As student-athletes progress through their athletic careers, DePalma et al. (2002) reported the athletes start dieting to try to improve their athletic performance. In particular, it is common for cross-country runners to want to lose weight to be lighter and faster. Also, it is not unusual for gymnasts to want to lose weight because they believe
judges will base their scores on body size and shape. Gymnasts also tend to believe that scores will improve in general if they are leaner (Engel et al., 2003; Johnson et al., 1999). Performance can improve initially with weight loss, but eventually the caloric restrictions and/or purging habits will take a toll on the athlete’s nutritional condition and so athletic performance (Engel et al., 2003; Heffner et al., 2003; Johnson & Tobin, 1991).

In a study conducted by Johnson et al. (1999) of 1,445 student-athletes on the collegiate level, research was conducted to assess the risk of athletes developing anorexia. The NCAA supported this study. The results revealed that 25% of female athletes and 9.5% of male athletes were at risk of developing anorexia. Results were based on information obtained through the administration of a 133-item questionnaire. Further, a significant percentage (9.2%) of the student-athletes who participated in this study were found to be at risk of developing bulimia nervosa (Johnson et al., 1999). Studies have reported as few as 1% of student-athletes being diagnosed with eating disorders on the collegiate level to 62% of the student-athletes on the collegiate level displaying signs and symptoms of anorexia, bulimia nervosa, and EDNOS (Byrne & McLean, 2001; Johnson et al., 1999; Reinking & Alexander, 2005).

Research has revealed that eating disorders are prevalent in a wide range of collegiate student-athletes and within a number of diverse sports. Athletic department personnel must therefore keep in mind that student-athletes who experience eating disorders are not just female athletes. As reported by DePalma et al. (2002), in a study previously discussed, 319 male athletes encountered eating disorders. Among both male and female athletes, the results revealed that the sports environment contributed to the
development of eating disorders. There was no significant difference in the male and female subjects “with regard to the frequency of the practice of pathogenic eating behaviours” (DePalma et al., 2002, p. 48).

Although less common, Ransone and Hughes in 2004 confirmed that male athletes are at risk of developing anorexia, bulimia nervosa, and EDNOS. As a consequence, it is important that intervention programs addressing eating disorders be established with both male and female student-athletes in mind. Both male and female student-athletes limit caloric intake on a daily basis because they believe the thinner and leaner they are the more likely they are to be successful in their particular sports. This thought process concerning a decrease in one’s caloric intake is far from the truth though since athletes require the proper amount of calories on a daily basis to maintain their energy level and metabolism (DePalma et al., 2002; Johnson et al., 1999; Ransone & Hughes, 2004; Stephenson, 1991; A. Thompson & Trattner-Sherman, 1999).

**Eating Disorder Education and Collegiate Athletics**

Whether addressing eating disorders in general or supplement use and social norming, educational material is not only made available by the NCAA for student-athletes, but educational material and resources are also made available from other professional organizations. The National Eating Disorder Association (NEDA, n.d.) has specifically developed criteria to address eating disorders. The NEDA disseminates information to athletic departments to help the athletic personnel better recognize and address specific risk factors that make an athlete more susceptible to developing an eating disorder. The risk factors established by the NEDA emphasize
sports such as gymnastics, swimming and diving, wrestling, and running. The NEDA reiterates the belief that a lower body weight will improve athletic performance is unfounded (NEDA, n.d.). Recommendations made by the NEDA include working with a coach that focuses on the athlete and not upon success and performance, focusing on athletes with low self-esteem, and recognizing peer, family and cultural pressures to be thin.

The NEDA (n.d.) also has recognized protective factors to help athletes avoid or at least minimize their risk of developing eating disorders. These recommendations include:

- Focusing on positive, position-oriented coaching.
- Recognizing the necessity for coaches who emphasize factors such as motivation and enthusiasm.
- Encouraging healthy attitudes toward size and shape.

**Eating Disorder Prevention and College Athletics**

Along with recognizing risk factors, there is a need for education to address inappropriate weight loss methods. Education must focus on all three eating disorders: anorexia, bulimia nervosa, and EDNOS. In terms of preventing eating and body image problems among collegiate student-athletes, athletic directors, coaches, certified athletic trainers, and even the student-athletes require training and education to help them better understand eating issues, training in effective and safe preventive techniques, and access to counseling and referral services (Sherman et al., 2005; A. Thompson et al., 2007; Turk et al., 1999).
Karin Kratina, PhD, MPE, RD, LD (Kratina, 2005) recommended specific criteria for coaches to use to help them prevent eating disorders among their athletes. All athletic personnel though can benefit by learning how to implement these criteria when addressing issues of eating disorders. As previously mentioned, research conducted by DePalma et al. (2002) emphasized the need for criterion to prevent eating disorders among athletes. As revealed by the results from this study, these criterions include de-emphasizing weight by not weighing athletes and focusing instead on areas in which athletes have more control in which to improve their athletic performance. The emphasis can then be placed on strength training and aerobic activities to enhance athletic performance. Further, emphasis can be placed upon improving mental aspects of athletics. Coaches, certified athletic trainers, and even student-athletes benefit from education and prevention training regarding eating disorders as revealed by research (DePalma et al., 2002; NEDA, n.d.; A. Thompson et al., 2007; Turk et al., 1999).

In the A. Thompson et al. (2007) study, it was stated that athletic departments should be able to guarantee their education and training programs provide adequate resources and efficient policies for coaches and athletic trainers to use for eating disorder prevention programs with their student-athletes. The education and training made available should include the awareness of promoting proper nutrition and learning to not ignore disordered eating behaviors among student-athletes (A. Thompson et al., 2007; Trattner-Sherman et al., 2005; Turk et al., 1999; Vaughan et al., 2004). Those involved with athletics on a day-to-day basis can be an important source of assistance to
student-athletes who have the potential to develop or do develop eating disorders (Bonci et al., 2008; A. Thompson et al., 2007; Turk et al., 1999).

**Eating Disorder Intervention and College Athletics**

As coaches, certified athletic trainers, and athletic directors become better educated about anorexia, bulimia nervosa, and EDNOS, they should take warning signs and symptoms of disordered eating behaviors seriously. Specifically, coaches and certified athletic trainers should try to understand their role in prevention and recognition of eating disorders as they become more familiar with the signs and symptoms that their student-athletes exhibit when struggling with an eating disorder (Johnson & Tobin, 1991; NEDA, n.d.; A. Thompson et al., 2007).

It is important for athletic departments, college health centers, and community psychological and counseling facilities to work together to help identify and treat student-athletes with health concerns such as eating disorders (Dick, 1991; NCAA, 2002). The better educated coaches, certified athletic trainers, and athletic directors become, the more they can support and encourage their student-athletes to engage in healthy habits. Once athletic department personnel recognize student-athletes displaying disordered eating behaviors, Trattner-Sherman et al. (2005) suggested student-athletes receive proper intervention, referral, and treatment. Therefore, a referral system should be established to assist athletic personnel in obtaining assistance for their student-athletes so these student-athletes receive the proper and necessary treatment for their eating disorders (Beals, 2003; Trattner-Sherman et al., 2005). The Trattner-Sherman et al. (2005) study “reported that symptomatic athletes were most often identified by
teammates (30.8%), athletic trainers (23.7%), and coaches (21.2%)” (p. 453). Athletic department personnel and student-athletes should, therefore, attend educational programs and have access to an appropriate referral system at their respective institutions. “Given the apparent risks of disordered eating for collegiate athletes, not only are primary prevention strategies needed, but also secondary prevention approaches that facilitate early identification of, and intervention for, eating related difficulties in athletes” (Trattner-Sherman et al., 2005, p. 448).

Athletic departments therefore need to establish and implement an organized set of policies, procedures, and programs designed to protect and promote the health and well-being of student-athletes at their specific institutions. Findings from the Trattner-Sherman et al. (2005, p. 447) study “indicated that athletic trainers, teammates, and coaches are frequently involved in identification” of athletes with eating disorders such as anorexia and bulimia nervosa. Therefore, educational material and training should be made available to athletic department personnel and student-athletes. The material can then be used to help decrease the prevalence of eating disorders among college athletes (Bonci et al., 2008; A. Thompson et al., 2007; Trattner-Sherman et al., 2005; Turk et al., 1999; Zabloski, 2004).

Athletic personnel also need to be educated on the proper referral process for their specific institution. Referral is a necessity when student-athletes display signs and symptoms of eating disorders, chronic dieting, or even mildly abnormal eating behaviors (DePalma et al., 2002; Trattner-Sherman et al., 2005). Athletic personnel should have access to an established referral system so they are better able to help their
student-athletes obtain the assistance from appropriate health care professionals. These health care experts should include professionals with experience working with athletes, especially with athletes diagnosed with anorexia, bulimia nervosa, and EDNOS (NEDA, n.d.). It is necessary to refer these student-athletes to professionals such as sports medicine experts, dietitians, general therapists, or eating disorder specialists so as to be able to take a multidisciplinary approach to treating these athletes. Several of these professionals can be involved in the intervention and treatment of a student-athlete since an eating disorder is a multidimensional issue (Dick, 1991; Heffner et al., 2003; Trattner-Sherman et al., 2005).

In addition, pressures from sports’ participation should be noted by coaches, certified athletic trainers, athletic administrators, health care providers, health educators, and health services personnel. Education efforts regarding prevention, recognition, and treatment of disordered eating must be encouraged (Bonci et al., 2008; NCAA, 2002; A. Thompson et al., 2007; Turk et al., 1999). Therefore, recommendations have been established by the NEDA (2005), which emphasize the education of athletic personnel in regard to student-athletes with eating disorders. The following suggestions from the NEDA should be considered when planning an eating disorder prevention, educational, and intervention program:

- Eliminate group weigh-ins and criticism regarding body size, weight, or shape.
- Recognize individual differences in body frame and shape.
- Address basic nutrition information with all athletes.
Grandjean (1991) also established recommendations to help reduce the incidence of eating disorders among athletes. The recommendations include:

- Emphasizing the role of overall, long-term good nutrition practices; providing a total nutrition program that includes general nutrition counseling as well as helping in appropriate methods for weight loss and weight gain; never suggesting or encouraging purging behaviors; if weigh-ins are necessary, using private weigh-ins to reduce anxiety and stress; referring an athlete suspected of having a disordered eating habit; evaluating policies, procedures, and behaviors of the athletic staff to ensure that they are not contributing to the development of disordered eating. (p. 110)

As such, it has been recognized that a supportive environment within the athletic department needs to be developed and maintained on the collegiate level so that student-athletes are less likely to develop an eating disorder. If a student-athlete does develop an eating disorder, the athlete will be more willing to seek help from those involved in the athletic department if the athletic personnel have been able to develop and maintain a supportive environment. Support from an athletic director, coach, and certified athletic trainer is associated with lower incidents of eating disorders among student-athletes (Bonci et al., 2008; A. Thompson et al., 2007; Turk et al., 1999; Zabloski, 2004).

It is important to decide what training, education, resource team, and referral system is necessary for athletic personnel, especially on the Division II level since this division has not been as frequently studied as Division I institutions (DePalma et al.,
2002; Dick, 1991; Heffner et al., 2003; A. Thompson et al., 2007). For student-athletes on the collegiate level, the NCAA (2002) emphasizes that “decisions regarding sport participation of the student-athlete with an eating disorder should be made by the healthcare treatment team and can be a way to motivate the student-athlete in treatment” (www.ncaa.org, 2009). The healthcare treatment team should include the athletic director, certified athletic trainer, coach, team physician, sport psychologist, counselor, and the student-athlete (Bonci et al., 2008; A. Thompson et al., 2007; Trattner-Sherman et al., 2005; Turk et al., 1999; Zabloski, 2004).

High Risk Sports and Eating Disorders

As documented by Dick (1991), Trattner-Sherman et al. (2005), and DePalma et al. (2002), as previously discussed, athletes who seem especially vulnerable to eating disorders and excessive exercise participate in specific sports and physical activities that require a lean body. Athletes participating in all sports are susceptible to eating disorders, but disordered eating is found in some sports more often than others (DePalma et al., 2002; Trattner-Sherman et al., 2005). Athletes at greater risk of suffering from eating disorders are ballet dancers, gymnasts, cheerleaders, figure skaters, divers, wrestlers, distance runners, rowers, and swimmers and divers. Further, the aesthetic sports including gymnastics, diving, cheerleading, figure skating, and dancing are more likely to have athletes participating in them who are preoccupied with body image and obsessed with food they consume (DePalma et al., 2002; Engel et al., 2003; Trattner-Sherman & Thompson, 2004).
The study conducted by Trattner-Sherman and Thompson (2004) revealed that high-risk sports on the collegiate level emphasize not only thinness (cross country), but also involve judging (gymnastics, diving), have weight classes (rowing), or use revealing sport attire (swimming). The Trattner-Sherman et al. (2005) study reported the necessity of dividing collegiate sports “into ‘high-risk’ and ‘lower risk’ sports. High-risk sports included cross country, gymnastics, rowing, and swimming/diving. All other sports were designated as lower risk” (pp. 449-450). High-risk sports contribute to college athletes developing anorexia, bulimia nervosa, and EDNOS. Along with the sport in which the athlete is participating, social norms also are of concern when student-athletes on the college level are diagnosed with eating disorders (Sherman & Thompson, 2004; Trattner-Sherman et al., 2005).

College Athletes and Social Norming

Along with specific sports influencing the eating habits of college athletes, social norms related to peer pressure also contribute to disordered eating behaviors among this population. The social norms approach is a theory used to address human behavior. In this context, people’s perceptions and assumptions about their peers can be explained by the social norm theory. The assumptions made by people about their peers influences people’s behaviors as do biological, personal, cultural, and familial variables. As its basis the social norm theory predicts that behavior is influenced by false perceptions of how other individuals in our social environment think and act. The social norming theory confirms that a person’s behavior is influenced by perceptions that are not accurate about other members of the individual’s social group. Therefore, in an effort to avoid isolation,
individuals will then base their own behavior upon false norms based on these assumptions (Perkins & Berkowitz, 1986).

Inappropriate weight loss methods such as the use of supplements are influenced by social norms. Research conducted by Martin et al. (1998) involving 371 subjects revealed that nonprescription weight loss supplement use has the potential to become a health concern among college athletes. Over 50% of these subjects believed that nonprescription weight loss supplement use was important to help them feel good both mentally and physically. Also, 25% of the subjects stated that nonprescription weight loss supplement use was important to athletic performance (Martin et al., 1998).

As such, ephedra is a dietary supplement that assists an individual in losing weight. Peters et al. (2005) revealed that 43 of the 75 student-athletes in their study had used ephedra to promote weight loss and to try to improve athletic ability. The student-athletes used the weight loss product while participating in college athletics. Some of the leading beliefs reported by student-athletes in the study conducted by Peters et al. revealed the use of a dietary supplement due to subjects experiencing social norming. Female athletes in the Peters et al. study were found to use ephedra for weight loss purposes. Female subjects stated that they were concerned with their appearance. Male athletes though stated that they used ephedra to enhance their athletic performance. As such, males were concerned about stopping the use of ephedra because they felt that their athletic performance would decrease. The male athletes also believed that they would gain weight if they no longer used the supplement. Student-athletes in the study stated, “people are worried about what they look like on the outside rather than the
inside” (p. 128). Also, related to appearance one student-athlete affirmed that “people are not concerned with what’s going on as long as they look good” (p. 128). In addition, another athlete in the study acknowledged that ephedra use was started because “my friend was using it,” again confirming the social norming theory (p. 128).

The 427 subjects in the Giles et al. (2007) study completed a body-esteem instrument focused on assessing social norms. These subjects answered questions designed specifically for this study to measure the influence of peer norms and even parent norms on student-athletes. The researchers examined how the transition from high school to college and specifically how the college environment impacts an individual’s body perception (Giles et al., 2007). Through the study’s results, it was demonstrated that peer acceptability norms were related to body esteem. Also, it was revealed that peer acceptability norms were significantly related to disordered eating intentions among the subjects (Giles et al., 2007).

As such, results from this study conducted by Giles et al. (2007) confirmed results obtained from the Mendelson, Mendelson, and White (2001) study. The Mendelson et al. study revealed that university women who overestimated what their female and male peers viewed as a thin ideal were more likely than their counterparts to be dissatisfied with their body, to be concerned with appearance, and to have engaged in disordered eating. The traditional collegiate environment provides a unique environment in which social norms are created. These assumptions then influence students and their behaviors as confirmed by Giles et al. (2007), as previously discussed. It is important, therefore, to examine how the “transition from high school to college and integration into the college
environment can impact individual’s perceptions of their bodies through exposure to campus norms regarding body-thinness and beauty ideals and how these ideals can influence disordered eating behaviors” (Giles et al., 2007, p. 399).

A progression of this perception follows the idea that peer norms directly affect body esteem. Body esteem then affects behaviors such as disordered eating. College students engaged in more body comparisons when they believed thinness was important to their peers and parents. These comparisons can lead to lower body esteem (Giles et al., 2007; Mendelson et al., 2001). Mendelson et al. concluded that subjects’ perceptions of themselves are influenced by how they think they look to other people. Giles et al. (2007) also confirmed that an individual’s perception of a social group’s acceptance or rejection of a behavior influences intentions of disordered eating. The study also revealed that body esteem is related to peer acceptance (Giles et al., 2007).

Individuals with low body esteem who thought their peers were accepting of disordered eating behaviors were more likely to report intentions to engage in disordered eating behaviors than individuals with low body esteem who thought that disordered eating was not acceptable to their peers. Conversely, individuals with high body esteem and low norms for peer acceptability of disordered eating were significantly less likely to report disordered eating intentions than individuals with high body esteem and high norms for acceptability. (Giles et al., 2007, p. 405)

Participants in the Lewis (2008) study included 211 student-athletes at a university in the southeastern United States. This research revealed that effective social
norming campaigns specifically geared toward college athletes are necessary because “campuses that implement broad-based, campus-wide normative interventions based on ‘typical student’” (p. 9) behavior can miss the important influence that proximal norms have on behaviors of specific groups (student-athletes, members of a fraternity or sorority). Further, this study revealed that a proximal norm experienced between close friends appears to be more influential than distal norms (other students on campus). Therefore, it has been confirmed social norms influence student-athletes and their eating habits (Lewis, 2008).
CHAPTER III
RESEARCH METHODS AND PROCEDURES

Purpose of the Study

The purpose of this study was to analyze the differences in perceptions about institutional policies, procedures, and educational programming in regard to eating disorders between athletic directors and student-athletes participating in selected sports at National Collegiate Athletic Association (NCAA) Division II (DII) designated institutions.

Identification of the Subjects

At colleges and universities involved in athletics within the NCAA, students participate in sports within one of three divisions. These divisions include Division I (DI), Division II (DII), and Division III (DIII). Institutions within these divisions administer their athletic programs based on the NCAA constitution, bylaws, and other legislation. These criteria include sport’s sponsorship, scheduling, and game attendance requirements. Once sports are classified and able to participate in a particular division, then recruiting practices and availability of scholarships must be adhered to based on the division the sport participates (NCAA, 2002).

Within the NCAA, DII institutions are required to sponsor at least five sports for men and five for women (or four for men and six for women), with two team sports for each sex. According to the NCAA (2006), on the DII level, there were approximately 52,441 male and 36,086 female or close to 90,000 student-athletes engaged in sanctioned varsity sports in 2006. Athletic teams within DII include football, baseball, softball,
men’s and women’s basketball, men’s and women’s cross country, men’s and women’s
golf, women’s gymnastics, women’s lacrosse, men’s and women’s soccer, men’s and
women’s swimming, men’s and women’s tennis, men’s and women’s track, women’s
volleyball, and wrestling (NCAA, 2010). If the DII institution sponsors a football team,
the NCAA authorizes the college or university to have more male athletes than female.
If, however, the institution does not have a football team on campus, the male to female
ratio of student-athletes must be more equal in number with regard to the participants in
all sanctioned sports. A football roster can include up to 100 athletes whereas the
basketball team or softball team could have a roster of 20 players (NCAA, 2002, 2009;
TitleIX and Athletics, 2009).

As previously stated, about 300 colleges and universities were involved in DII
athletics across the United States. Specifically, 302 member institutions were involved in
DII athletics. These included both public and private institutions of higher education. To
analyze the perceptions of collegiate athletic directors and student-athletes concerning
eating disorders, these institutions have been included to define the size of the study
population (see Appendix A).

**Athletic Director (AD) Sampling**

The method used to include ADs was a simple systematic method such as all 302
college and university head ADs involved in DII athletics were invited to participate.
The AD portion of the study was conducted as a population study; therefore, all ADs at
DII institutions were invited to participate. Conducting research on an entire population
eliminated the need to use inferential statistics and allowed the researcher to gather
information directly about the characteristics of the population rather than by assumption. Statistics derived from samples would require inference, as the entire population would not be examined. Therefore, statistics derived from an entire population provides more power than those of a sample because inferences are not required (McDermott & Sarvela, 1999; Portney & Watkins, 2000).

All of the head ADs on the NCAA DII level were included in the research process for the study, as previously mentioned. Instruments were mailed to all 302 head ADs on the NCAA DII level. This style of research allowed the researcher to gather information directly about the population rather than just making generalizations (Portney & Watkins, 2000).

**Student-Athlete Sampling**

As previously mentioned, approximately 90,000 student-athletes participated in athletics on NCAA DII sports teams within 23 athletic conferences across the United States. It was advantageous to use a sample of the student-athletes as the subject pool for the athlete portion of the study. Due to the complexity of the structure and the size of the population of student-athletes at DII institutions, a multi-stage sampling method was used in the sample selection. Multi-stage sampling is a form of cluster sampling in which a number of units are embedded one in the other (Fraenkel & Wallen, 2003). It is a common sampling method used by several national surveys such as Youth Risk Behavior Surveillance Survey (YRBSS; CDC, n.d.).

In this study, the unit of samples at each stage was the conference, the college/university within the conference, the sports teams in the selected
colleges/universities, and finally student-athletes participating on the sports teams. The multi-stage research design method was necessary to be able to include a representative sample of students participating in athletics on the DII level at the institutions across the United States (NCAA, 2002). The total number of student-athlete samples needed determined the number of samples in each stage and the final data collection method is described in the data collection section.

It had been calculated that it was necessary to include close to 400 student-athletes when taking into consideration an appropriate response rate. In this context, the sample size for this study was determined by setting the confidence level at 95 and the confidence interval at 5; the appropriate sample size generated by *The Survey System by Creative Research Systems* (2008) was a sample size of 382 subjects. This sample size was the minimal acceptable return rate for student-athlete instruments. The subjects were over sampled ($N = 500$) to obtain the appropriate sample size while accounting for the potential for non-respondents.

In DII, it is estimated that colleges/universities have approximately 100 student-athletes participating in the specific fall/winter sports. These sports include men’s and women’s soccer, men’s and women’s cross country, women’s volleyball, and women’s field hockey. Also, high-risk sports wrestling, swimming, gymnastics, and track were included. The choice of fall/winter sports was because data for this study were collected in fall 2010 and winter 2010-2011. Since student-athletes were over sampled ($N = 500$), in order to obtain a guaranteed return of at least 382 instruments by subjects, it was necessary for six collegiate institutions to be included in the study.
In NCAA DII, colleges/universities are already divided into clusters since they are dispersed throughout 23 conferences. In order to proportionally select the six collegiate institutions, a simple random sample of five conferences was selected from the 23 NCAA DII athletic conferences, which represented 22% of the conferences. In the next stage, a sample college/university was then randomly selected from each conference. A simple random sampling method was used in this stage of sample selection. Finally, team sports in fall/winter 2010-2011 and high-risk sports for eating disorders and their student-athletes at each of the selected institutions were included as study samples. This data collection period spanned two semesters, fall 2010 through winter 2011 to accommodate participation among athletes participating in sports during the fall, winter, and spring seasons. The specific time frame for data collection from student-athletes ran from November 2010 through March 2011.

**Instrumentation**

The instruments were administered to ADs and student-athletes involved with athletics at NCAA DII institutions. Copies of the instruments were able to reach a considerable number of subjects by mail. Student-athlete instruments were mailed to certified athletic trainers and administered to athletes during the fall and spring semesters due to the Federal Education Rights and Privacy Act (FERPA). Both the student-athlete and the AD instruments have been included in the Appendices B and D.

**Athletic Director (AD) Instrument**

A four-page, 23-item instrument was developed to assess perceptions, beliefs, and education of ADs on the collegiate level in regard to student-athletes and eating disorders
(Appendix D). The AD instrument was designed to assess policies, perceptions, resources, access to educational material, and the referral system at institutions concerning student-athletes with eating disorders or with the potential to develop eating disorders.

A significant concern on the collegiate level is the availability of prevention, intervention, and referral services at NCAA DII institutions for student-athletes in regard to eating disorders. Due to the lack of similar published studies, the data collection instruments were developed and adapted in design of the 2003 *NCAA Questionnaire for Collegiate Coaches of Female Student-Athletes* (Trattner-Sherman et al., 2005). Both the AD and student-athlete instruments were designed to capture the variables suggested by the research questions.

Several classifications of items on the instrument were used to assess behavior, attitude, and perceptions of ADs with respect to student-athletes and anorexia, bulimia nervosa, and EDNOS. These classifications allowed the researcher to gain factual and cognitive information about attitudes, beliefs, and perceptions about eating disorders.

Subscales of this instrument allowed subjects the opportunity to reflect on a variety of policies, guidelines, and procedures regarding eating disorders. Included in the AD instrument were items about policies and education (items 1-8) and perceptions (items 9-15). Also, included on the instrument were information items (items 16-18). Concluding the instrument were demographic items (items 19-24). The response options for the items were developed in accordance with the Dillman Tailored Design Method (TDM) and were described for each of the subscales (Dillman, 2007).
Policies and education. “Policies and education” was a subscale of the AD instrument that allowed the subjects the opportunity to reflect on policies, procedures, and education. This subscale pertained to education, educational material, training, and policies on the collegiate level. This subscale allowed ADs the opportunity to report the formal education, training, and procedures available at specific institutions, athletic conferences, and throughout the NCAA in which DII athletic teams participate. Nine items (items 1-8) were included in the subscale to allow an opportunity for subjects to provide pertinent information concerning the availability of educational opportunities and also policies and procedures to address eating disorder concerns on the collegiate level among student-athletes. Two items (item 1 and 5) in this subscale included answers, which were dichotomous and were answered by a yes or a no response. Dichotomous items are also known as closed ended questions. A closed ended question has coded answers. The items asked subjects about policies, guidelines, and formal education (items 1 and 5). In particular, one item (item 1) allowed ADs to reflect on intervention methods used when a student-athlete displays signs and symptoms of an eating disorder.

Further, included within this subscale were items regarding the availability of educational opportunities and materials for members of the athletic department (items 2, 3, 4, and 6). Items 3 and 4, specifically, inquired about eating disorder training programs. The response set for both of these items included no one, male student-athletes, female student-athletes, coaches of male sports, coaches of female sports, athletic administrative staff, athletic trainers, and others. The responses to the items (items 3 and 4) were coded
as seven different items since each item included directions to the subjects indicating that more than one response could be chosen (*mark all that apply*).

Finally, an additional item (item 8) included in the policies and education subscale was an item pertaining to signs and symptoms that serve as indicators of a possible eating disorder. The answers listed as possible indicators of an eating disorder included eating in secret, rapid decrease in athletic performance, loss of menstruation, distorted body image, restricts fluid intake, self-induced vomiting, and laxative use (item 8). Eating disorder knowledge was assessed using this item (item 8). The response set included in this item was also coded as seven different items to be able to adhere to the directions for this item, which included *mark all that apply*.

**Perceptions.** A second subscale of this instrument included perceptions of the ADs pertaining to eating disorders. An item (item 12) which specifically focused on institutional athletic department rules and regulations was measured using a five point Likert scale which used the *Very Satisfied* response set to the *Not at all Satisfied* response. A Likert scale is a rating scale that can require the subject to indicate the degree of satisfaction or dissatisfaction with a statement. It is also known as a summative scale, which is most often used to assess attitudes or values (Portney & Watkins, 2000). A response of 1 indicated that the respondent was very satisfied with the content of the item. The middle score of 3 was titled *neither satisfied nor dissatisfied*. *Neither satisfied nor dissatisfied* could be selected if the respondents were not familiar with the statement subject matter or with how they felt regarding the issue at hand. Subjects who do not have strong feelings about a particular topic should be given a neutral option to express
that attitude (Dillman, 2007; Portney & Watkins, 2000). Further, a score of 5 indicated a
not at all satisfied response.

Finally, within this subscale, a specific item (item 14) allowed the subjects an
opportunity to provide reflections about rules and regulations established by the NCAA
concerning eating disorders. There were items on the instrument, which served as an
example of a closed ended dichotomous item with selected options. The selected options
for item 14 were yes and no. If the response was yes, an additional item was asked. This
item read: Are you aware of the guidelines that the NCAA has established to address
eating disorders among college athletes? This component of the item (item 14) was
measured using a five point Likert scale. This specific Likert scale is an example of a
five point scale which was used wherein subjects were given five response choices
including Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, and Strongly
Disagree.

Further, a specific five point Likert scale included nine statements that were
compiled in the table for item 13. As an example, one component of item 13 read, There
are appropriate NCAA guidelines to allow university personnel to intervene when a
student-athlete is suspected of having an eating disorder. The subject was then able to
choose between five response sets (strongly agree, agree, neither agree nor disagree,
agree, and strongly disagree), which were included in the response table for item 13.

**Demographics.** Demographics were the final subscale of the AD instrument
(items19-24). This final subscale (6 items) identified background and demographic
characteristics among subjects. Demographics were included on the instrument for
accurate data analysis. The demographics included sex (gender) and age for athletic directors. Further, degree earned was assessed on the AD instrument. Finally, the varsity sports offered at each institution concluded the demographic variables.

The following demographic information was collected on the AD instrument. Also, this instrument’s demographic items and research hypotheses are presented in Table 1.

- **Sex**: measured as a nominal dichotomous variable with two options: (a) Male or (b) Female. Item 19.
- **Age**: measured as an interval variable, subjects’ options were: (a) 20-29, (b) 30-39, (c) 40-49, (d) 50-59, (e) 60-69, or (f) 70-older. Item 20.
- **Qualifications**: measured as an ordinal variable the five options given were: (a) Bachelor’s Degree, (b) Master’s Degree, (c) Post-Master’s Study, (d) Doctoral Degree, or (e) Other, specify. Item 21.
- **Years as an athletic director (AD)**: measured as an interval variable the six options given were: (a) Less than 1 year, (b) 1 to 4 years, (c) 5 to 9 years, (d) 10 to 14 years, (e) 15 to 19 years, or (f) 20 or more years. Item 22.
- **Years at current institution**: measured as an interval variable the six options given were: (a) Less than 1 year, (b) 1 to 4 years, (c) 5 to 9 years, (d) 10 to 14 years, (e) 15 to 19 years, or (f) 20 or more years. Item 23.

**Student-Athlete Instrument**

The student-athlete instrument was designed to assess policies, perceptions, resources, access to educational material, and the referral system at institutions in regard
### Table 1

**Research Hypotheses and Items**

<table>
<thead>
<tr>
<th>Research Hypotheses</th>
<th>Student-athlete Instrument Items</th>
<th>AD Instrument Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. There will be no statistically significant association between having received formal education about eating disorders and respondent status as a student-athlete or athletic director (AD).</td>
<td>Item(s): 1</td>
<td>Item (s): 5</td>
</tr>
<tr>
<td>2. There will be no statistically significant association between the forms of eating disorder education as reported by student-athletes as compared to their athletic director (AD) counterparts.</td>
<td>Item(s): 2A, 3, 4, 5, 7</td>
<td>Item(s): 2, 3, 4, 6</td>
</tr>
<tr>
<td>3. The knowledge level of student-athletes and athletic directors (ADs) about eating disorders will not be statistically significantly different.</td>
<td>Item(s): 11</td>
<td>Item(s): 8</td>
</tr>
<tr>
<td>4. Educational opportunities such as eating disorder reading materials, seminars, and guest speakers will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.</td>
<td>Item(s): 13</td>
<td>Item(s): 10</td>
</tr>
<tr>
<td>5. Eating disorder policies, procedures, and guidelines will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.</td>
<td>Item(s): 2B, 9, 10</td>
<td>Item(s): 1, 14</td>
</tr>
<tr>
<td>6. The referral process for athletes with eating disorders will not be perceived differently by student-athletes compared to athletic directors (ADs) at NCAA Division II (DII) institutions.</td>
<td>Item(s): 6</td>
<td>Item(s): 7</td>
</tr>
<tr>
<td>7. The perceptions of NCAA Division II (DII) student-athletes and athletic directors (ADs) in regard to eating disorder prevention and support received will not be statistically significantly different.</td>
<td>Item(s): 12, 15</td>
<td>Item(s): 9, 13 (partial)</td>
</tr>
<tr>
<td>8. Prevalence rates of eating disorders will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.</td>
<td>Item(s): 17, 18</td>
<td>Item(s): 16, 17</td>
</tr>
</tbody>
</table>

*(table continues)*
Table 1 (continued)

Research Hypotheses and Items

<table>
<thead>
<tr>
<th>Research Hypotheses</th>
<th>Student-athlete Instrument Items</th>
<th>AD Instrument Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. There will be no statistically significant association between the perceived influence that eating disorders have upon athletic performance and respondent status as a student-athlete or athletic director (AD).</td>
<td>Item(s): 15 (partial)</td>
<td>Item(s): 13 (partial)</td>
</tr>
<tr>
<td>10. Who is influential/needed in the prevention of eating disorders among athletes will not be perceived differently by student-athletes compared to athletic directors (ADs) at NCAA Division II (DII) institutions.</td>
<td>Item(s): 16</td>
<td>Item(s): 15</td>
</tr>
</tbody>
</table>

To eating disorders (Appendix B). As previously mentioned, due to the lack of similar published studies, the data collection instruments were developed and adapted in design of the *2003 NCAA Questionnaire for Collegiate Coaches of Female Student-Athletes* (Trattner-Sherman et al., 2005). Both the AD and student-athlete instruments were designed to capture the variables suggested by the research questions.

To analyze student-athletes’ beliefs and perceptions about eating disorders, a four page, 22-item instrument was developed, according to the Dillman Tailored Design Method (TDM; Dillman, 2007). Two main subscales composed the student-athlete instrument. Demographics were then included at the end of the instrument. The student-athlete instrument was divided into two subscales. The first scale, which consisted of 11 items (items 1-11), denoted information regarding policies and education. The second subscale, comprised of seven items (items 12-18), referred to athletes’ perceptions of eating disorders in general.
Demographics were included at the end of the instrument. The demographic items (item 19-22) identified background and characteristics among subjects.

**Information.** The information subscale (items 1-11) pertained to education, educational material, training, and rules and regulations. This subscale allowed student-athletes the opportunity to report the formal education and information gathering methods used at their specific institutions.

Eleven items (items 1-11) were included in the information subscale to allow an opportunity for subjects to provide pertinent information regarding availability of educational opportunities and policies and procedures to address eating disorder concerns. Included were items regarding rules and regulations within athletic conferences and at specific institutions to authorize university personnel to intervene when a student-athlete displays signs and symptoms of an eating disorder (items 9 and 10). These items included answers, which were dichotomous and answered by a *yes* or a *no* response.

Also, included within this information subscale were items regarding the availability of training and educational opportunities for student-athletes to learn about eating disorders (items 1-4). Further, some of the items on the student-athlete instrument were designed and based on a Likert scale. A Likert scale is a rating scale that requires the subject to indicate the degree of agreement or disagreement with an item, as previously discussed (Dillman, 2007). As an example, a five-point Likert scale was used wherein subjects were given five response choices including *Strongly Agree, Agree, Neither agree nor Disagree, Disagree,* and *Strongly Disagree.* Item 8 on the
student-athlete instrument, which included this response set read, *Do you agree that your college cafeterias give student-athletes enough healthy foods to choose from on a daily basis?*

Finally, an additional item (item 11) included in the information subscale was a knowledge item pertaining to signs and symptoms, which serve as indicators of a possible eating disorder. The indicators included eating in secret, rapid decrease in athletic performance, loss of menstruation, distorted body image, restricts fluid intake, self-induced vomiting, and laxative use. Eating disorder knowledge was assessed by using this item (item 8). The response set included in this item was coded as seven different items to be able to adhere to the directions for this item that included mark *all that apply.*

**Perceptions.** The perception subscale (items 12-19) focused on student-athletes and allowed subjects the opportunity to provide reflections on a variety of policies and practices that are implemented on the collegiate level concerning eating disorders. Using previously mentioned item classifications, this subscale focused on beliefs and perceptions of college athletes pertaining to support and encouragement necessary to help prevent or at least minimize eating disorders.

Item 12 allowed subjects to reflect upon the support perceived to be necessary to help prevent eating disorders among student-athletes. The response set available to subjects included a response of *1* which indicates that the subject believes support is very much needed, and the response of *2* indicates that the subject believes support is somewhat needed to prevent eating disorders. A response of *3* indicated that the subject
believes support is already being provided. Finally, a response of 4 indicates that the subject believes that no support is needed by student-athletes concerning the prevention of eating disorders.

A five-point Likert scale was used for item 14 pertaining to educational methods and materials used to educate coaches and student-athletes. The Likert scale is a rating scale that can require the subject to indicate the degree of satisfaction or dissatisfaction with a statement, as previously discussed. A response of 1 indicates that the respondent is very satisfied with the content of the item. The middle score of 3 is titled neither satisfied nor dissatisfied. The neither satisfied nor dissatisfied response most often will be selected if the respondent is not familiar with the item subject matter or if subjects are unsure of their feelings regarding the issue at hand (Dillman, 2007). Finally, a score of 5 indicates a not at all satisfied response.

Also, a five-point Likert scale pertaining to agreement or disagreement with specific statements was used in item 15 to address health concerns and the role of friends and peers in regard to eating disorders, athletics, and performance. The specific Likert scale for this item is an example of a five point scale which was used wherein subjects were given five response choices including Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, and Strongly Disagree.

Further, a closed ended item was included on the student-athlete instrument. This item had coded answers. For example, as previously mentioned, a coded item is known as a dichotomous item in which the subject answers yes or no. On the student-athlete
instrument, item 18 read as a dichotomous item, such as, *Do you believe that you are suffering from an eating disorder?*

Finally, background information known as demographics concluded the student-athlete instrument (items 19-22). Demographics were discussed in detail as the student-athlete instrument had been presented.

**Demographics.** As previously mentioned, demographics were included on both instruments for accurate data analysis. The demographics included sex (gender) and age. Academic year in college was included on the student-athlete instrument.

The following demographic variables were analyzed on the student-athlete instrument:

- **Sex:** measured as a nominal dichotomous variable with two options: (a) Male or (b) Female. Item 20.
- **Age:** measured as an interval variable, subjects’ options were (a) 17-18, (b) 19-20, (c) 21-22, (d) 23-24, or (e) 25-older. Item 21.
- **Academic year:** measured as an ordinal variable with five options: (a) Freshman, (b) Sophomore, (c) Junior, (d) Senior, or (e) Graduate student. Item 22.
- **Sport:** measured as an ordinal variable the options provided were: (a) men’s soccer, (b) women’s soccer, (c) men’s cross country, (d) women’s cross country, (e) women’s volleyball, (f) women’s field hockey. Also, high-risk sports included (g) wrestling, (h) men’s and women’s swimming, (j) men’s and women’s track, and (k) women’s gymnastics. Item 23.
This instrument’s items and their corresponding research hypotheses are also presented in Table 1.

**Psychometric Analysis of the Instruments**

In order to test the feasibility of data collection and gain comments about the instruments, they were pilot tested. The pilot tests were administered after gaining Institutional Review Board (IRB) approval through Kent State University (Appendix G). Both of the instruments were pilot tested by using a small sample of both populations: ADs and student-athletes. Division III (DIII) ADs were used to pilot test the AD instrument. Further, a convenience sample of student-athletes at a DII institution in northwestern Pennsylvania was included as the population in which to conduct the student-athlete instrument pilot test.

The pilot test of the student-athlete instrument was conducted in March 2010 using a convenience sample of athletes at a northwestern Pennsylvania university, as previously mentioned. There were 29 student-athletes included in the pilot test. All of the instruments were returned to the primary investigator, which represents a 100% response rate in the pilot study.

Using the *Statistical Package for the Social Sciences (SPSS)*, version 18, data analysis software, the frequency of responses across each item was examined. These data confirmed that there was variation in the responses for each item on the student-athlete instrument. Further, to determine the extent to which the student-athlete instrument was able to provide consistent results, as previously mentioned, a test of reliability was conducted. The analyses confirmed that all of the variables generated a moderate
reliability based on Cronbach’s Alpha (.608) on the student-athlete instrument. The components of this instrument, which included education and training, rules and regulations, knowledge, perceptions, support, and prevalence (.795), produced reliable and consistent data over time with subjects from this population. Therefore, no items were excluded from the final student-athlete instrument.

Further, the pilot test of the AD instrument was conducted through a mailing of the instrument to NCAA DIII ADs in three athletic conferences. This sample population of DIII ADs from colleges and universities in three athletic conferences in Ohio and Pennsylvania were administered the instrument through the mail to conduct the pilot test for the AD assessment as previously stated. Thirty instruments were mailed to DIII ADs. Eleven instruments were returned in the self-addressed stamped envelopes made available to the subjects, which represent a 36.6% response rate.

Once again, using the Statistical Package for the Social Sciences (SPSS), version 18, data analysis software, the frequency of responses across each instrument item was examined. These data confirmed variation in the responses for the items on the AD instrument. Further, to determine the extent to which the AD instrument was able to provide consistent results, a test of reliability was conducted. The analyses confirmed that all variables generated a moderate reliability based on Cronbach’s Alpha (.693) for the AD instrument. No revisions were made to the instruments due to the results of the pilot test.

Results obtained from the pilot test provided information to help the primary researcher to be able to calculate both of the instruments’ reliability. The results from the
pilot test indicated that the items were reliable suggesting that the instruments have the ability to produce consistent results when the same units are measured under the same conditions. Therefore, reliability shows the extent to which a measurement is consistent and free from error (Portney & Watkins, 2000).

**Research Design**

The study was a cross-sectional study using instruments to collect data. Two separate instruments were administered. One instrument was developed to collect responses from collegiate student-athletes. The second instrument was developed to collect data from ADs in DII institutions. In this descriptive research, data were analyzed to test hypotheses focused on eating disorders among collegiate student-athletes in context of institutional policies and procedures for prevention and intervention practices.

**Operationalizing the Variables**

In order to test the hypotheses, the following variables were used:

1. The ADs and student-athletes with *formal education within the athletic department* regarding eating disorders: measured as a nominal variable on the AD instrument the six options were: no formal education, guest speaker, lecture, in-service seminar, workshop, and other. On the student-athlete instrument the options included yes and no in regard to *formal education within the athletic department*. The variables were converted to dichotomous variables and analyzed using chi square and Logistic Regression.

2. The *form of education* available regarding eating disorders: there were four items on the student-athlete instrument and also four items on the AD
instrument which were categorical and were analyzed by using descriptive statistics, chi square, and Logistic Regression.

3. The knowledge level of ADs and student-athletes in regard to eating disorders: measured as a nominal variable the seven response set options on both instruments were eating in secret, rapid decrease in athletic performance, loss of menstruation, distorted body image, athlete restricts fluid intake, self-induced vomiting, and laxative use. These variables were analyzed using \( t \) test.

4. The assistance, information, education, and training beneficial to identifying and managing eating disorders: measured as a nominal variable the seven options on both instruments were NCAA reading material, other reading material, NCAA website, conferences, consultants, speakers, referral resources, and other. These variables were analyzed using chi square and Logistic Regression.

5. The policies, training programs, and educational materials for eating disorder prevention: the study variable was the confirmation of policies, programs, and materials. The variable was then analyzed using descriptive statistics, chi square, and Logistic Regression.

6. The available intervention options when a student-athlete is suspected of having an eating disorder: measured as a nominal variable the nine options on both instruments included nothing, refer to dietitian, refer to sports medicine personnel, refer to general counselor or psychologist, withhold from training
and competition, refer to eating disorder specialist, read relevant materials, contact parent(s), and other. These variables are categorical and were analyzed by using a rank order test such as a chi square.

7. The perceptions in regard to eating disorder prevention and support: there were three items on the student-athlete instrument and two items on the AD instrument pertaining to this variable. These composite scores were analyzed using descriptive statistics and t test.

8. The prevalence rates of eating disorders among collegiate athletes: there was one item on each instrument pertaining to the prevalence rate of eating disorders. These prevalence rates were to be analyzed using chi square. In this study statistical analysis could not be conducted for the eating disorder prevalence rates. There was a lack of distribution among AD responses in regard to prevalence rates.

9. The perceptions regarding eating disorders and athletic performance: measured as an ordinal variable the options included strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree. These categorical variables were analyzed using chi square and Logistic Regression.

10. The individuals who are influential or needed in the prevention of eating disorders among college athletes: measured as rank order these categorical variables were analyzed using chi square and Logistic Regression.
Data Collection Protocol

Like the instrument organization, the data collection protocol followed in this study was consistent with the recommendations of the Dillman Tailored Design Method (TDM). The Dillman TDM is a procedure used for collecting research data (Dillman, 2007).

Athletic directors (ADs) included in the study were contacted by using the NCAA directory. The database includes the name and contact information for ADs employed at DII colleges and universities.

To obtain access to student-athletes at DII institutions, certified athletic trainers were contacted and asked to assist in the administration of the student-athlete instrument. The certified athletic trainers were contacted by using the National Athletic Trainers Association (NATA) Directory.

Athletic Directors (ADs)

As previously stated, the primary researcher contacted ADs at DII institutions by mailing ADs the instrument and cover letter. ADs that consented to participate in the study were identified by the return of their instruments.

The AD instruments were initially mailed to ADs during November 2010. The data collection procedure and instrument preparation for the AD instrument followed guidelines developed by Dillman (2007). In accordance with the Dillman TDM, the instruments were sent using a wave mailing procedure (Dillman, 2007). Kent State University letterhead was used for the cover letter (Appendix E). Responses were voluntary and confidential. The initial mailing included a cover letter, an instrument, and
a self-addressed stamped return envelope (Dillman, 2007). In addition, the instrument itself was organized to be consistent with the recommendations of the Dillman TDM (Dillman, 2007). As such, the instrument was blue in color, printed in a four-page booklet format. Finally, Kent State University letterhead was used.

All instruments were coded so that subjects did not receive unnecessary repeated mailings. Responses were voluntary and confidential (Dillman, 2007). After one week, a thank-you/reminder card was sent to the non-responders (Appendix F). Two weeks after the reminder cards, a second mailing including a replacement instrument was forwarded to the non-responders. As with the first mailing, this mailing included an instrument, a stamped return envelope, and a cover letter. All correspondence was sent using first-class postage (Dillman, 2007).

**Student-Athletes**

Contact was established with student-athletes through the head certified athletic trainer at their respective institutions. Contact with certified athletic trainers on the collegiate level was established through e-mail and telephone contact. Through the athletic department, the student-athlete instrument was administered to athletes participating in sports within the NCAA on the DII level during the time period, which ran November 2010 through March 2011. A request was made of the certified athletic trainers to distribute the student-athlete instrument to the athletes at their institutions. An e-mail of intention was sent to head certified athletic trainers for their support; once they agreed to participate, they were sent a package of instruments and instructions. Each
participating certified athletic trainer was given written instructions for administration of the student-athlete instrument (Appendix H).

As a convenience sample, athletic trainers administered the instrument to student-athletes in season for the following fall sports: men’s and women’s soccer, men’s and women’s cross country, women’s volleyball, and women’s field hockey. Also, athletes demonstrated to be at a high-risk for eating disorders including those who participated in sports including wrestling, swimming, gymnastics, and track were included in the subject pool. The proper sample size of student-athletes were administered the instrument to obtain the approximately 400 subjects needed for the proper sample size. This final process of team and student-athlete sample selection occurred based on the assistance of the specific certified athletic trainers who agreed to administer the instrument to student-athletes at their respective institutions.

In addition, the instrument itself was organized to be consistent with the recommendations of the Dillman TDM (Dillman, 2007). As such, the student-athlete instrument was blue in color, printed in a four-page booklet format. Finally, Kent State University letterhead was used for the cover letter (Appendix E).

The instruments were sent in a bulk mailing to the certified athletic trainers administering the instruments. The instruments were then administered to the student-athletes in a group setting. The group setting technique helped to ensure a higher return response rate. Each instrument was placed in an individual envelope, which the student-athlete was then, upon completion, to return to the envelope. The sealed envelope was then returned to the certified athletic trainer who had distributed the
instrument. As stated, the certified athletic trainers were mailed the student-athlete instruments with a self-addressed stamped envelope for a return of all of the instruments distributed by the certified athletic trainers at their respective colleges and universities. Again, all correspondences were sent using first-class postage.

All returned instruments were kept in the locked office of the Kent State Research Bureau. When the data collection process was completed, all instruments were destroyed. The Human Institutional Review Board (IRB) at Kent State University (Appendix G) approved the process, and no data collection of any kind began prior to receiving full approval.

**Data Analysis**

Data was entered into and analyzed by using the *Statistical Package for Social Sciences (SPSS)*, version 18. Due to the nature of the cross-sectional research design, data were analyzed using both descriptive and inferential statistics. Descriptive statistics were first studied (frequencies, range of scores, means, and standard deviations) in order to describe the subjects in regard to their demographics and other characteristics. With descriptive research, the primary investigator reported the numerical results for one or more variables obtained from the results from the subjects involved in the study.

Most variables and items included in the instruments were categorical variables. The final variables directly involved in statistical tests and their scales (discrete and continues) were determined after the data were obtained since the analyses depended on the responses obtained for each relevant item.
Analysis of the Hypotheses

Based on the research questions posed previously, this study analyzed the relationship between specific demographic variables and policies and practices on the collegiate level in regard to student-athletes and eating disorders. The following hypotheses were then tested in data analysis:

1. There will be no statistically significant association between having received formal education about eating disorders and respondent status as a student-athlete or athletic director (AD).

2. There will be no statistically significant association between the forms of eating disorder education as reported by student-athletes as compared to their athletic director (AD) counterparts.

3. The knowledge level of student-athletes and athletic directors (ADs) about eating disorders will not be statistically significantly different.

4. Educational opportunities such as eating disorder reading materials, seminars, and guest speakers will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA DII institutions.

5. Eating disorder policies, procedures, and guidelines will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA DII institutions.

6. The referral process for athletes with eating disorders will not be perceived differently by student-athletes compared to athletic directors (ADs) at NCAA DII institutions.
7. The perceptions of NCAA DII student-athletes and athletic directors (ADs) in regard to eating disorder prevention and support received will not be statistically significantly different.

8. Prevalence rates of eating disorders will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.

9. There will be no statistically significant association between the perceived influence that eating disorders have upon athletic performance and respondent status as a student-athlete or athletic director (AD).

10. Who is influential/needed in the prevention of eating disorders among athletes will not be perceived differently by student-athletes compared to athletic directors (ADs) at NCAA DII institutions.

Principle statistical analyses methods for each item by each research hypothesis are summarized in Table 2.

**Limitations**

In this study, several limitations existed. A major concern included the limitation of a convenient sampling of the student-athlete population.

For ADs, in particular, a limitation was a low response rate. A low response rate can threaten the external validity of study findings. Further, a concern was the bias that can occur due to ADs being from all 23 conferences with hundreds of institutions whereas student-athletes were from a small number of colleges and universities.
**Table 2**

*Instrumentation and Variables*

<table>
<thead>
<tr>
<th>Research Hypotheses</th>
<th>Student-athlete Instrument Items</th>
<th>AD Instrument items</th>
<th>Variable in Analysis</th>
<th>Analysis Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. There will be no statistically significant association between having received formal education about eating disorders and respondent status as a student-athlete or athletic director (AD).</td>
<td>Item(s): 1</td>
<td>Item (s): 5</td>
<td>both variables can be converted to be dichotomous</td>
<td>chi square test and Logistic Regression</td>
</tr>
<tr>
<td>2. There will be no statistically significant association between the forms of eating disorder education as reported by student-athletes as compared to their athletic director (AD) counterparts.</td>
<td>Item(s): 2A, 3, 4, 5, 7</td>
<td>Item(s): 2, 3, 4, 6</td>
<td>All variables are categorical</td>
<td>Descriptive statistics, chi square test, and Logistic Regression</td>
</tr>
<tr>
<td>3. The knowledge level of student-athletes and athletic directors (ADs) about eating disorders will not be statistically significantly different.</td>
<td>Item(s): 11</td>
<td>Item(s): 8</td>
<td>scores will be calculated</td>
<td>$t$ test</td>
</tr>
<tr>
<td>4. Educational opportunities such as eating disorder reading materials, seminars, and guest speakers will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.</td>
<td>Item(s): 13</td>
<td>Item(s): 10</td>
<td>categorical</td>
<td>chi square test and Logistic Regression</td>
</tr>
<tr>
<td>5. Eating disorder policies, procedures, and guidelines will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.</td>
<td>Item(s): 2B, 9, 10</td>
<td>Item(s): 1, 14</td>
<td>Percent of reporting yes will be the variable of study</td>
<td>Descriptive statistics, chi square test, and Logistic Regression</td>
</tr>
</tbody>
</table>

*(table continues)*
### Table 2 (continued)

**Instrumentation and Variables**

<table>
<thead>
<tr>
<th>Research Hypotheses</th>
<th>Student-athlete Instrument Items</th>
<th>AD Instrument items</th>
<th>Variable in Analysis</th>
<th>Analysis Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. The referral process for athletes with eating disorders will not be perceived differently by student-athletes compared to athletic directors (ADs) at NCAA Division II (DII) institutions.</td>
<td>Item(s): 6</td>
<td>Item(s): 7</td>
<td>categorical variables</td>
<td>Rank order test such as chi square</td>
</tr>
<tr>
<td>7. The perceptions of NCAA Division II (DII) student-athletes and athletic directors (ADs) in regard to eating disorder prevention and support received will not be statistically significantly different.</td>
<td>Item(s): 12, 15 (partial)</td>
<td>Item(s): 9, 13 (partial)</td>
<td>composite score will be deducted for comparison purpose</td>
<td>Descriptive statistics, t test</td>
</tr>
<tr>
<td>8. Prevalence rates of eating disorders will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.</td>
<td>Item(s): 16, 17</td>
<td>Item(s): 16, 17</td>
<td>reported prevalence rate</td>
<td>Chi square test</td>
</tr>
<tr>
<td>9. There will be no statistically significant association between the perceived influence that eating disorders have upon athletic performance and respondent status as a student-athlete or athletic director (AD).</td>
<td>Item(s): 15 (partial)</td>
<td>Item(s): 13 (partial)</td>
<td>categorical variables</td>
<td>chi square test and Logistic Regression</td>
</tr>
<tr>
<td>10. Who is influential/needed in the prevention of eating disorders among athletes will not be perceived differently by student-athletes compared to athletic directors (ADs) at NCAA Division II (DII) institutions.</td>
<td>Item(s): 12</td>
<td>Item(s): 15</td>
<td>categorical variables</td>
<td>chi square test and Logistic Regression</td>
</tr>
</tbody>
</table>
Therefore, findings about comparisons can be biased by the differences in location, institution, and team size.

Since the mailed instruments were of the self-reported nature, the data can be over or under reported in regards to policies, procedures, and practices regarding college athletes and eating disorders. This limitation could be due to a perceived pressure to respond to the items in a socially desirable manner.

The primary researcher had no control over the number of ADs or student-athletes who returned their respective instruments. Further, the primary researcher chose to include subjects involved in athletics on only the NCAA DII level.

Further, to the extent that an important item has not been included on the instruments there could be a threat to internal validity. The populations were selected to include ADs and student-athletes representative of NCAA DII athletics. Thus, the results of this study are unable to be generalized to other NCAA divisions.
CHAPTER IV

ANALYSIS OF THE DATA

Purpose of the Study

The purpose of this study was to analyze the differences in perceptions about institutional policies, procedures, and educational programming in regard to eating disorders between athletic directors and student-athletes participating in selected sports at National Collegiate Athletic Association (NCAA) Division II (DII) designated institutions.

Data Collection

NCAA DII Athletic Director (AD) Sampling

The athletic director (AD) portion of this study was conducted as a population study. As such, all 302 head ADs at NCAA DII colleges and universities in the United States constituted the potential subject pool. AD subjects from all 302 DII institutions were contacted by mail. Consistent with protocol approved by the Kent State University Institutional Review Board (IRB), ADs who consented to participate in the study were identified by the return of the completed instrument content in this initial mailing.

The data collection procedure and instrument preparation for the AD instrument followed the Dillman Tailored Design Method (TDM). Consistent with the Dillman TDM, instruments were sent using a wave mailing procedure (Dillman, 2007). The initial mailing sent in November 2010 included a cover letter, an instrument, and a self-addressed stamped return envelope (Dillman, 2007). After one week, a thank-you/reminder postcard was sent to the ADs. Two weeks after the reminder postcard was sent,
a follow-up mailing including a replacement instrument was sent to the non-respondents. As with the initial, this mailing included a cover letter and a stamped return envelope. All correspondence was sent using first-class postage (Dillman, 2007).

Due to the low response rate to the first and second mailings, a third mailing containing a cover letter and a stamped return envelope was sent on January 10, 2011. Following this mailing a final fourth mailing was sent on January 27. These dates correspond with recommendations of the Dillman TDM (2007) that includes the suggestion to avoid holidays when mailing instruments. When the data collection process was completed, a total of 108 (35.8%) of a possible 302 AD respondents had returned instruments.

**NCAA DII Student-Athlete (SA) Sampling**

During the 2010-2011 academic year, approximately 90,000 student-athletes participated in NCAA DII sports. Over this same period, there were 23 NCAA DII athletic conferences across the United States. Due to the size of this population of potential subjects, it was necessary to use a sampling protocol to identify potential student-athletes to participate in this portion of the study. A multi-stage sampling method was employed in the selection process to encompass each DII athletic conference, the specified institution in which student-athletes (SAs) were enrolled. The sample size of SAs for this study was calculated by setting the confidence level at 95% and the confidence interval at 5. Through this calculation, the minimum acceptable sample size generated by *The Survey System by Creative Research Systems, an on-line sample size calculator* (2008) was determined to be 382 subjects. To increase the likelihood that this
minimum number of responses would be reached, subjects were oversampled \((n = 500)\).

When the data collection process was completed, a total of 383 SAs had provided responses. This number of responses represents over 100% of the calculated minimum acceptable sample size, and 76.6% of the oversampled population \((n = 500)\).

The SA instrument was administered to athletes who were “in season” for the following fall sports: men’s and women’s soccer, men’s and women’s cross-country, women’s volleyball, and women’s field hockey. In addition, athletes confirmed in the literature to be at a high-risk for eating disorders (wrestling, swimming, gymnastics, and track) were included in the potential subject pool. The data collection period for SA subjects spanned two semesters, running between November 2010 and March 2011.

An e-mail of intent was sent via the Internet to head certified athletic trainers at six randomly selected NCAA DII colleges and universities to request their cooperation and to seek access to SA subjects at their institutions. Follow-up telephone conversations were pursued with those athletic trainers who requested additional information about this study.

The following specific steps were taken to collect data from the SA subjects:

1. Each head certified athletic trainer who agreed to administer the instrument was mailed a prepared package containing instructions for the administration of the instrument (see Appendix H). In addition, the package contained sealable manila envelopes with instruments for each SA respondent. A self-addressed, postage-paid box also was included for return of the envelopes containing completed instruments.
2. The certified athletic trainers were asked to administer the instruments to the SAs in a group setting. Group setting techniques help to ensure a higher return response rate (Dillman, 2007).

3. Upon completion, the SA was instructed to seal the instrument into the provided return envelope. The sealed envelope then was returned to the certified athletic trainer who had distributed the instrument.

4. The certified athletic trainer returned all completed instruments in the postage-paid mailing box.

5. All correspondence was returned to the researcher using first class postage (Dillman, 2007).

Description of the Sample

NCAA DII Athletic Directors (ADs)

Included in the instrument to collect data from AD subjects were items focused on eating disorder policies and education (items 1-8) and perceptions about eating disorders (items 9-15). These items focused on enabling the ADs to reflect on eating disorder policies developed by the athletic conference and the institutional athletic department. Eating disorder education items focused on programs and materials made available to athletic personnel and athletes. Items that focused on perceptions included reflections such as how ADs viewed eating disorders among college athletes. In addition the instrument included information items (items 16-18) that were focused on ADs reflections about the percent of athletes on their campuses who had eating disorders and
the sports in which these athletes participated. Concluding the instrument were demographic items (items 19-24).

**NCAA DII athletic director (AD) demographics.** Seventy-one (67.0%) of the ADs reported their sex as male. Only 35 (33.0%) of the AD respondents reported that they were females. There were two missing responses from this demographic item. In this context, responses suggest that there were nearly twice as many male ADs as female respondents (Table 3).

Table 3

*Sex of Responding DII Athletic Directors (ADs)*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex of ADs</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Athletic Directors (ADs)</td>
<td>71</td>
<td>67.0</td>
</tr>
</tbody>
</table>

*n = 106; Missing cases (n = 2) not included in analysis.

The variable age of ADs was measured on a categorical scale. These age categories ranged from: 20-29, 30-39, 40-49, 50-59, 60-69, and 70-older years of age. The majority of ADs reported that their age fell in the response categories of 40-49 (n = 31, 29.5%) and 50-59 (n = 37, 35.2%) years old. The combination of responses in these two categories made up 64.7% (n = 68) of the respondents. There were seven ADs (6.7%) who reported that their age fell between 20 and 29 years, and 18 (17.1%) who reported their age fell in the 30-39 response category. In addition, there were 11 (10.5%) ADs who reported their age fell between 60 and 69 years, and only one (1.0%) AD
reported his or her age to be 70-older. There were three cases in which athletic directors ADs did not respond to this item (Table 4).

Table 4

*Age of Responding DII Athletic Directors (ADs)*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>20-29</th>
<th>30-39</th>
<th>40-49</th>
<th>50-59</th>
<th>60-69</th>
<th>70-older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of ADs</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Athletic Directors (ADs)</td>
<td>7</td>
<td>6.7</td>
<td>18</td>
<td>17.1</td>
<td>31</td>
<td>29.5</td>
</tr>
</tbody>
</table>

*n = 105; Missing cases (n = 3) not included in analysis.

The variable advanced degree received was measured on the instrument by using a categorical scale. Response categories included Bachelor’s, Master’s, Post-Master’s study, Doctoral degree and Other. The majority of subjects reported that they possessed a Master’s degree. In specific, 76 (71.7%) ADs reported that they possessed a Master’s degree. Fourteen (13.2%) reported having received a Doctoral degree, and 10 (9.4%) reported that they had completed Post-Master’s study. Only 5 (4.7%) AD subjects reported that they had obtained a Bachelor’s degree, and one (0.9%) subject responded to this item with the response of other. No further information was available about the meaning of the response of other (Table 5).
Table 5

Advanced Degree of Responding DII Athletic Directors (ADs)*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Bachelor</th>
<th>Master</th>
<th>Post-Master</th>
<th>Doctoral</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Advanced degree of ADs</td>
<td>5</td>
<td>4.7</td>
<td>76</td>
<td>71.7</td>
<td>10</td>
</tr>
</tbody>
</table>

*n = 106; Missing cases (n = 2) not included in analysis.

The variable describing the number of years as an athletic director on the collegiate level was measured on a categorical scale. Response categories included: (a) Less than 1 year, (b) 1 to 4 years, (c) 5 to 9 years, (d) 10 to 14 years, (e) 15 to 19 years, (f) 20 or more years. In response to this item, the majority of subjects reported that they had been employed on this level either 1 to 4 years (n = 32, 30.8%) or 5 to 9 years (n = 25, 24.0%). With regard to this item, 54.8% (n = 57) of the responses fell in the categories of 1 to 4 years (n = 32, 30.8%) and 5 to 9 years (n = 25, 24.0%). Only six (5.8%) ADs reported that they had less than one year of collegiate level experience. Sixteen (15.4%) respondents reported having had between 10 and 14 years of collegiate level experience. In addition, 10 (9.6%) subjects reported having between 15 and 19 years of collegiate level work experience. Further, 15 (14.4%) of the respondents reported that they had 20 or more years of collegiate level athletic director experience. There were four cases in which ADs did not respond to this item (Table 6).
Table 6

*Years Reported as an Athletic Director on the Collegiate Level*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Less than 1</th>
<th>1 to 4</th>
<th>5 to 9</th>
<th>10 to 14</th>
<th>15 to 19</th>
<th>20+ years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Athletic Directors (ADs)</td>
<td>6</td>
<td>5.8</td>
<td>32</td>
<td>30.8</td>
<td>25</td>
<td>24.0</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>22.9</td>
<td>31</td>
<td>30.6</td>
<td>30</td>
<td>29.8</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>15.4</td>
<td>10</td>
<td>9.6</td>
<td>15</td>
<td>14.4</td>
</tr>
</tbody>
</table>

*n = 104; Missing cases (n = 4) not included in analysis.

The variable years at current institution was measured by using a categorical scale. Response categories included: (a) Less than 1 year, (b) 1 to 4 years, (c) 5 to 9 years, (d) 10 to 14 years, (e) 15 to 19 years, (f) 20 or more years at current institution. The majority of ADs reported that they had between 1 and 4 years of experience at their current institution (n = 42, 40.8%). Only eight (7.8%) respondents reported that they had been at their current institution less than one year. One-fifth of the subjects (n = 22, 21.4%) reported that they had 5 to 9 years of experience at their current institution. In addition, 14 (13.6%) of the respondents reported having had 10 to 14 years of experience at their current institution, and only 6 (5.8%) reported having had 15 to 19 years of experience at their current institution. Finally, 10.7% (11) of subjects reported having had 20 plus years of experience at their current institution (Table 7).
Table 7

*Years at Current Institution of Responding DII Athletic Directors (ADs)*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Less than 1</th>
<th>1 to 4</th>
<th>5 to 9</th>
<th>10 to 14</th>
<th>15 to 19</th>
<th>20+ years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Years at Current Institution of ADs</strong></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Athletic Directors</td>
<td>8</td>
<td>7.8</td>
<td>42</td>
<td>40.8</td>
<td>22</td>
<td>21.4</td>
</tr>
</tbody>
</table>

*n = 103; Missing cases (n = 5) not included in analysis.

**NCAA DII Student-Athletes (SAs)**

The student-athlete (SA) instrument was designed to assess perceptions about policies, resources, access to educational material, and the referral system at institutions available to these subjects about eating disorders. Included in the instrument to collect data from SA subjects were items focusing on eating disorder policies and education (items 1-11). These items focused on enabling the SAs to reflect on eating disorder policies and educational activities that were developed and implemented by the athletic conference and the institutional athletic department. In addition, the eating disorder education items focused on programs and materials made available to SAs and athletic personnel. Further, SAs were asked to reflect upon their perceptions about eating disorders by responding to seven items (items 12-18). Finally, the demographic items (items 19-22) identified background characteristics among SA subjects.

**NCAA DII student-athletes’ demographics.** Two hundred and seven (54.8%) SAs reported their sex as female. Fewer respondents reported that they were males (n = 171, 45.2%). There were five cases in which SAs did not respond to this item (Table 8).
Table 8

*Sex of Responding DII Student-Athletes*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex of SAs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(n)</td>
<td>(%)</td>
</tr>
<tr>
<td>Student-athletes</td>
<td>171</td>
<td>45.2</td>
</tr>
</tbody>
</table>

*\(n = 378\); Missing cases \((n = 5)\) not included in analysis.*

The variable age of SAs was measured by using an open-ended item. Subjects reported responses ranging from 17-34 years of age on the SA instrument. Only three (0.8%) subjects reported their age was 17 years. There were 61 (16.3%) SAs who reported their age was 18 years. The majority of subjects reported their age to be 19 \((n = 94, 25.1\%)\) or 20 \((n = 97, 25.3\%)\) years. The combination of responses in these two categories made up 50.4\% \((n = 191)\) of the responses. There were 60 (15.7%) SAs who reported their age was 21 years, and 36 (9.6%) reported their age was 22 years. In addition, nine (2.4%) of the subjects reported their age was 23 years. Further, 6 (1.6%) of the respondents reported their age was 24 years, and 5 subjects (1.3%) reported their age was 25 years. One (0.3%) SA reported age as 26, 29, and 34 years respectively on the open-ended item. Finally, there were nine cases in which SA did not respond to this item (Table 9).
Table 9

*Age of Responding DII Student-Athletes*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>22</th>
<th>23-34</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Age of SAs</em></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Student-athletes</td>
<td>3</td>
<td>0.8</td>
<td>61</td>
<td>16.3</td>
<td>94</td>
<td>25.1</td>
<td>97</td>
</tr>
</tbody>
</table>

*n = 374; Missing cases (n = 9) not included in analysis.

The academic year variable on the SA instrument was measured by using a categorical scale. Response categories included freshman, sophomore, junior, senior, and graduate. The majority of subjects reported they were freshmen (*n* = 125, 33.2%). The second largest number of respondents reported they were juniors (*n* = 101, 26.9%). In addition, 85 (22.6%) reported they were sophomores. Seniors constituted 16.0% (*n* = 60) of the SA respondents. Only 5 (1.3%) respondents reported they were graduate students. Finally, there were seven cases in which SAs did not respond to this item (Table 10).

Table 10

*Academic Year of Responding DII Student-Athletes*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Freshman</th>
<th>Sophomore</th>
<th>Junior</th>
<th>Senior</th>
<th>Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Academic Year of SAs</em></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Student-athletes</td>
<td>125</td>
<td>33.2</td>
<td>85</td>
<td>22.6</td>
<td>101</td>
</tr>
</tbody>
</table>

*n = 376; Missing cases (n = 7) not included in analysis.*
Subjects were asked to identify the primary sport in which they participated including: cross-country, soccer, swimming, track, field hockey, volleyball, or wrestling. Male cross-country runners constituted 14.9% (56) of the SA respondents whereas 9.3% (35) of the respondents reported they were female cross-country runners. There were 34 (9.1%) subjects who reported they were male soccer players, and 50 (13.3%) who reported they were female soccer players. In addition, 22 (5.9%) male SAs reported they were swimmers whereas 23 (6.1%) of the female SAs reported they participated in this sport. Forty-five (12.0%) of the male SA subjects reported they participated in track whereas 49 (13.1%) of the female respondents reported they participated in track.

Only female SAs participated in field hockey and volleyball whereas only males engaged in wrestling. Only 3 (0.8%) female respondents reported their primary sport was field hockey. There were 44 (11.7%) female subjects who reported volleyball was their primary sport. In addition, 14 (3.7%) male SA respondents reported wrestling was their primary sport. Finally, there were eight cases in which SAs did not respond to this item (Table 11).

**Eating Disorder Education Reported by SA and AD Subjects**

**Formal education about eating disorders within the athletic department reported by SA and AD subjects.** Findings reported about the item to which subjects were asked about the extent to which they received formal education about eating disorders within their athletic department are presented in Table 12. When asked to provide responses, 110 (29.3%) SAs reported that they had received such formal education provided by the athletic department. Conversely, 265 (70.7%) of the SA
Table 11

*Primary Sport of Responding DII Student-Athletes*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Cross-Country</td>
<td>56</td>
<td>14.9</td>
</tr>
<tr>
<td>Soccer</td>
<td>34</td>
<td>9.1</td>
</tr>
<tr>
<td>Swimming</td>
<td>22</td>
<td>5.9</td>
</tr>
<tr>
<td>Track</td>
<td>45</td>
<td>12.0</td>
</tr>
<tr>
<td>Field Hockey</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Volleyball</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Wrestling</td>
<td>14</td>
<td>3.7</td>
</tr>
</tbody>
</table>

*n = 375; Missing cases (n = 8) not included in analysis.

respondents reported that they had not received formal education about eating disorders within the athletic department (Table 12).

By contrast, more than half of the AD subjects (n = 59, 57.3%) reported that they had received formal education about eating disorders provided within their athletic department. Among AD respondents, 44 (42.7%) reported that they had not received such educational programming. As such, nearly twice the percent of ADs reported having received formal eating disorder education within their athletic departments than their SA counterparts (Table 12).
Table 12

*Formal Eating Disorder Education Within the Athletic Department Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n*</td>
<td>%</td>
</tr>
<tr>
<td>Formal eating disorder education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal education</td>
<td>110</td>
<td>29.3</td>
</tr>
<tr>
<td>No formal education</td>
<td>265</td>
<td>70.7</td>
</tr>
<tr>
<td>Total</td>
<td>375</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*n = 375, student-athletes (SAs); n = 103, athletic directors (ADs); Missing cases (n = 8 and n = 5, respectively) not included in analysis.

Form of eating disorder education provided within the athletic department reported by SA and AD subjects. Findings about the form of eating disorder education provided within the athletic department are presented in Table 13. Among SA subjects who provided a response to this item, the highest number (n = 51, 37.2%) stated that lecture was the form of education that was made available within their athletic department. In addition, 44 (32.1%) reported that speaker was the form of eating disorder education that was made available to them. Also, 5.8% (n = 8) of the SAs reported in-service as the form of education that they received. The lowest number of SA respondents (n = 3, 2.2%) reported that workshops were the form of education provided. Only 31 (n = 22.6%) responded other to the item (Table 13). Importantly, it should be noted that only 35.5% (n = 137) of the SAs responded to this item.
Table 13

*Form of Eating Disorder Education Provided Within the Athletic Department Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Forms of eating disorder education</em></td>
<td><em>n</em></td>
<td>%</td>
</tr>
<tr>
<td>Lecture</td>
<td>51</td>
<td>37.2</td>
</tr>
<tr>
<td>Workshop</td>
<td>3</td>
<td>2.2</td>
</tr>
<tr>
<td>Speaker</td>
<td>44</td>
<td>32.1</td>
</tr>
<tr>
<td>In-service</td>
<td>8</td>
<td>5.8</td>
</tr>
<tr>
<td>Other</td>
<td>31</td>
<td>22.6</td>
</tr>
</tbody>
</table>

*n = 137, student-athletes (SAs); n = 29, athletic directors (ADs); Missing cases (n = 246 and n = 29, respectively) not included in analysis.

AD (n = 27, 34.2%) respondents reported that the most common form of eating disorder education provided within the athletic department was *speaker*. In addition, 19% (n = 15) of the ADs reported that *lecture* and *in-service* were the form of eating disorder education that had been provided to them. Also, 13 (16.5%) ADs responded *other*. The fewest ADs reported that *workshops* (n = 9, 11.4%) were the form of education being provided about eating disorders within the athletic department. Among AD subjects, there were 29 who did not respond to this item (Table 13).

**Eating disorder educational materials within the athletic department reported by SA and AD subjects.** From a list of options provided for this item, SA and AD subjects could check more than one response as a foundation for calculating the
variables. In Table 14, the $n$ and percent columns (%) depict the actual number and percent of subjects from both subject groups who responded to each listed option.

When asked to provide responses to this item, the highest number of SA subjects ($n = 185, 48.3\%$) reported that *campus resources* were provided to help educate athletes and sports personnel about eating disorders. In addition, $33.2\%$ ($n = 127$) of the subjects stated that *reading materials* were made available. Also, $117 (30.5\%)$ SA respondents that *local resources* were available whereas $91 (23.8\%)$ reported that the *NCAA Website* was a source of educational material available to them. Further, $26 (6.8\%)$ reported the use of the *NCAA Video*, and the fewest SA respondents ($n = 21, 5.5\%)$ identified that *other videos* were made available to them (Table 14).

The greatest number of AD respondents ($n = 72, 66.7\%)$ reported that *campus resources* were provided to help educate athletes and sports personnel about eating disorders. In addition, $47.2\%$ ($n = 51$) of the ADs reported the availability of the *NCAA Website* as an educational resource. Also, $24 (22.2\%)$ subjects reported that both the *NCAA Video* and *reading materials* were available educational materials. Among AD respondents, $33.3\% (n = 36)$ identified *local resources* while the lowest number of ADs ($n = 4, 3.7\%)$ selected *other videos* as an educational resource within their athletic departments.

Differences were revealed between SA and AD respondents concerning the availability of eating disorder educational materials within the athletic department. In specific, nearly five times as many ADs identified the availability of the *NCAA Handbook* as an eating disorder resource than their SA counterparts (Table 14).
Table 14

*Eating Disorder Educational Materials Within the Athletic Department Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eating disorder educational materials</strong></td>
<td>n*</td>
<td>%</td>
</tr>
<tr>
<td>NCAA Video</td>
<td>26</td>
<td>6.8</td>
</tr>
<tr>
<td>Other Video</td>
<td>21</td>
<td>5.5</td>
</tr>
<tr>
<td>NCAA Website</td>
<td>91</td>
<td>23.8</td>
</tr>
<tr>
<td>NCAA Handbook</td>
<td>41</td>
<td>10.7</td>
</tr>
<tr>
<td>Reading Materials</td>
<td>127</td>
<td>33.2</td>
</tr>
<tr>
<td>Campus Resources</td>
<td>185</td>
<td>48.3</td>
</tr>
<tr>
<td>Local Resources</td>
<td>117</td>
<td>30.5</td>
</tr>
</tbody>
</table>

*n = 383, student-athletes (SAs); n = 108, athletic directors (ADs). Note. Respondents could select more than one item.

**Eating disorder education recipients within the athletic department reported by SA and AD subjects.** From a list of options provided for this item, SA and AD subjects could check more than one response as a foundation for calculating the variables. In Table 15, the n and percent columns (%) depict the actual number and percent of subjects from both subject groups who responded to each listed option.

When asked to provide responses to this item, the majority of SA subjects (*n = 197, 51.4%*) reported that eating disorder education was being made available to *no one*. The highest number of SAs (*n = 81, 21.1%*) reported that eating disorder education was being made available to *female student-athletes*. In addition, 70 (18.3%) SA respondents
reported that male student-athletes were receiving eating disorder education. Also, 12.3% \((n = 47)\) of the SAs reported that the athletic administration was receiving eating disorder education while 12.8% \((n = 49)\) reported that certified athletic trainers were provided with eating disorder education. Finally, the lowest number of SA respondents \((n = 44, 11.5\%)\) reported that coaches of male and female sports were receiving education about eating disorders (Table 15).

AD \((n = 34, 31.5\%)\) respondents reported that certified athletic trainers were receiving eating disorder education within the athletic department. In addition, 31 \((28.7\%)\) ADs reported that female student-athletes were receiving eating disorder education whereas 27 \((25.0\%)\) reported that male student-athletes were receiving such education. Also, 30.6% \((n = 33)\) of the ADs reported that coaches of female student-athletes were receiving eating disorder education while 25.0% \((n = 27)\) reported that coaches of male student-athletes were receiving this education. Further, 19 \((17.6\%)\) reported that the athletic administration was provided with eating disorder education within the athletic department. Finally, when contrasted with their SA counterparts, the fewest number of AD \((n = 10, 9.3\%)\) subjects reported that no one was receiving such eating disorder education. In this context, nearly five times as many SAs as ADs reported that eating disorder education was not being made available within their respective athletic departments (Table 15).
Table 15

*Eating Disorder Education Recipients Within the Athletic Department Reported by SAs and ADs* *

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n*</td>
<td>%</td>
</tr>
<tr>
<td>No one</td>
<td>197</td>
<td>51.4</td>
</tr>
<tr>
<td>Male student-athletes</td>
<td>70</td>
<td>18.3</td>
</tr>
<tr>
<td>Female student-athletes</td>
<td>81</td>
<td>21.1</td>
</tr>
<tr>
<td>Coaches of male athletes</td>
<td>44</td>
<td>11.5</td>
</tr>
<tr>
<td>Coaches of female athletes</td>
<td>44</td>
<td>11.5</td>
</tr>
<tr>
<td>Athletic Administration</td>
<td>47</td>
<td>12.3</td>
</tr>
<tr>
<td>Certified athletic trainers</td>
<td>49</td>
<td>12.8</td>
</tr>
</tbody>
</table>

*n = 383, student-athletes (SAs); n = 108, athletic directors (ADs). Note. Respondents could select more than one item.

**Mandatory eating disorder education recipients within the athletic department reported by SA and AD subjects.** From a list of options provided for this item, SA and AD subjects could check more than one response as a foundation for calculating the variables. In Table 16, the n and percent columns (%) depict the actual number and percent of subjects from both subject groups who responded to each listed option.

When asked to provide responses to this item, the highest number of SA subjects (n = 240, 62.7%) reported that *no one* was required to engage in mandatory eating disorder education within the athletic department. Forty-nine (12.8%) SA subjects did
report that *male student-athletes* were receiving mandatory eating disorder education whereas 55 (14.4%) reported that *female student-athletes* were receiving mandatory education. In addition, 6.3% \((n = 24)\) of the SAs reported that *coaches of male student-athletes* were provided mandatory eating disorder education within the athletic department whereas 7.0% \((n = 27)\) reported that *coaches of female student-athletes* received such education. Also, 16 (4.2%) reported that the *athletic administration* was receiving mandatory eating disorder education. Finally, 5.0% \((n = 19)\) of the SA subjects reported that *certified athletic trainers* were receiving mandatory education.

There were 15 (13.9%) ADs who reported that *male student-athletes* were receiving mandatory eating disorder education within the athletic department whereas 17 (15.7%) reported that *female student-athletes* were receiving mandatory education. In addition, 11.1% \((n = 12)\) of the AD subjects reported that *coaches of male student-athletes* were provided education whereas 13.9% \((n = 15)\) revealed that *coaches of female student-athletes* received such education. Also, 10 (9.3%) subjects reported that the *athletic administration* was receiving mandatory eating disorder education from the athletic department. Finally, 15.7% \((n = 17)\) of the ADs reported that *certified athletic trainers* were receiving mandatory education.

In contrast to their SA counterparts, only 25.0% \((n = 27)\) of the AD respondents reported that *no one* was required to engage in mandatory eating disorder education. These data revealed that two-thirds of the AD respondents \((n = 81, 75.0\%)\) reported that mandatory eating disorder education was being made available within the athletic
department, which showed a dramatic disparity between the responses of ADs and SAs (Table 16).

Table 16

*Mandatory Eating Disorder Education Recipients Within the Athletic Department Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandatory eating disorder education recipients</td>
<td>(\text{n}^*)</td>
<td>(%)</td>
</tr>
<tr>
<td>No one</td>
<td>240</td>
<td>62.7</td>
</tr>
<tr>
<td>Male student-athletes</td>
<td>49</td>
<td>12.8</td>
</tr>
<tr>
<td>Female student-athletes</td>
<td>55</td>
<td>14.4</td>
</tr>
<tr>
<td>Coaches of male athletes</td>
<td>24</td>
<td>6.3</td>
</tr>
<tr>
<td>Coaches of female athletes</td>
<td>27</td>
<td>7.0</td>
</tr>
<tr>
<td>Athletic Administration</td>
<td>16</td>
<td>4.2</td>
</tr>
<tr>
<td>Certified athletic trainers</td>
<td>19</td>
<td>5.0</td>
</tr>
</tbody>
</table>

\(^*n = 383,\) student-athletes (SAs); \(n = 108,\) athletic directors (ADs). *Note.* Respondents could select more than one item.

**Eating Disorder Knowledge Level Among SA and AD Subjects**

From a list of options provided for this item, SA and AD subjects could check more than one response as a foundation for calculating the variables. In Table 17, the \(n\) and percent columns (\%) depict the actual number and percent of subjects from both subject groups who responded to each listed option.
When asked to provide responses to this item, the highest number of SA subjects ($n = 332, 86.7\%$) was able to correctly report \textit{vomiting} as a sign of an eating disorder. In contrast only $66.1\%$ ($n = 253$) of the SA subjects could correctly report the \textit{loss of menses} as a sign of an eating disorder. In addition, only $66.8\%$ ($n = 256$) of the SAs correctly reported that \textit{eating in secret} is an indication of an eating disorder. In addition, $81.7\%$ ($n = 313$) of the subjects were able to correctly answer that a \textit{distorted body image} is a sign of an eating disorder. Also, $67.4\%$ ($n = 258$) of the SAs correctly answered that \textit{laxative use} is an indicator of an eating disorder whereas only $48.6\%$ ($n = 186$) of the respondents reported \textit{fluid restriction} as an indicator, which is important to note since \textit{fluid restriction} is not a sign of an eating disorder. Finally, in actuality, SA subjects ($n = 264, 68.9\%$) also incorrectly reported \textit{rapid loss of performance} as a sign of an eating disorder when in fact it is not an indication of an eating disorder (Table 17).

The majority of AD subjects ($n = 102, 94.4\%$) were also able to correctly report \textit{vomiting} as a sign of an eating disorder as did their SA counterparts. In addition, $83.3\%$ ($n = 90$) of the AD respondents were able to correctly report the \textit{loss of menses} as a sign of an eating disorder whereas $83.3\%$ ($n = 90$) correctly reported that \textit{eating in secret} is an indication of an eating disorder. Also, $92.6\%$ ($n = 100$) of the subjects were able to correctly answer that a \textit{distorted body image} is a sign of an eating disorder whereas $81.5\%$ ($n = 88$) of the ADs correctly answered that \textit{laxative use} is an indicator of an eating disorder. Only $64.8\%$ ($n = 70$) of the respondents reported \textit{fluid restriction} as an indicator, which is important to note, as previously mentioned, since \textit{fluid restriction} is not a sign of an eating disorder. Further, $88 (81.5\%)$ ADs were able to correctly report
that the *use of laxatives* is a sign of an eating disorder. Among AD respondents, though, 70.4% (*n* = 76) incorrectly reported *rapid loss of athletic performance* as a sign of an eating disorder when in fact it is not an indicator as did their SA counterparts (Table 17).

Table 17

*Eating Disorder Knowledge Level Among SAs and ADs* *\(^\text{*} \)*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>n</em></td>
<td>%</td>
</tr>
<tr>
<td>Eating disorder knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eating in secret</td>
<td>256</td>
<td>66.8</td>
</tr>
<tr>
<td>Loss of menses</td>
<td>253</td>
<td>66.1</td>
</tr>
<tr>
<td>Distorted body image</td>
<td>313</td>
<td>81.7</td>
</tr>
<tr>
<td>Vomiting</td>
<td>332</td>
<td>86.7</td>
</tr>
<tr>
<td>Laxative use</td>
<td>258</td>
<td>67.4</td>
</tr>
<tr>
<td>Rapid loss of athletic performance</td>
<td>264</td>
<td>68.9</td>
</tr>
<tr>
<td>Fluid restriction</td>
<td>186</td>
<td>48.6</td>
</tr>
</tbody>
</table>

*\(^*\)n = 383, student-athletes (SAs); n = 108, athletic directors (ADs). Note. Respondents could select more than one item.

**Eating disorder educational opportunities within the athletic department** reported by SA and AD subjects. From a list of options provided for this item, SA and AD subjects could check more than one response as a foundation for calculating the variables. In Table 18, the *n* and percent columns (%) depict the actual number and percent of subjects from both subject groups who responded to each listed option.
When asked to provide responses to this item, the highest number of SA subjects ($n = 252, 65.8\%$) reported *speakers* as the main educational opportunity available within the athletic department to help educate athletes and sports personnel about eating disorders. In addition, $28.2\% (n = 108)$ of the SA subjects reported the availability of *reading material* as an educational opportunity. Also, $161 (42.0\%)$ SAs reported that *NCAA reading material* was provided whereas $152 (39.7\%)$ subjects reported the use of the *NCAA Website*. Further, about one-third of the SAs reported that *conferences* and *referral information* were provided as educational opportunities within the athletic department ($38.4\%$ and $39.2\%$, respectively). Finally, the fewest SA subjects ($n = 44, 11.5\%)$ reported the *other* category in response to the educational opportunities’ item (Table 18).

In comparison, the highest number of AD respondents ($n = 78, 72.2\%)$ also reported *speakers* as the eating disorder educational opportunity most often available as did their SA counterparts. In addition, the majority ($n = 76, 70.4\%)$ of ADs reported the availability of *NCAA reading material* whereas $72 (66.7\%)$ subjects reported the use of the *NCAA Website*. Also, ADs reported that *conferences* and *referral information* were provided as educational opportunities ($42.6\%$ and $63.0\%$, respectively). Further, $33.3\% (n = 36)$ of the AD subjects reported the availability of *reading material*. Finally, the fewest AD subjects ($n = 7, 6.5\%)$ reported the *other* response for the educational opportunities’ item. The SA and AD subjects appeared to be in agreement regarding some of the most commonly reported educational opportunities regarding eating disorders available within their respective athletic departments (Table 18).
Table 18

_Eating Disorder Educational Opportunities Within the Athletic Department Reported by SAs and ADs*_

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Eating disorder educational opportunities</em></td>
<td>n*</td>
<td>%</td>
</tr>
<tr>
<td>NCAA reading material</td>
<td>161</td>
<td>42.0</td>
</tr>
<tr>
<td>Reading material</td>
<td>108</td>
<td>28.2</td>
</tr>
<tr>
<td>NCAA website</td>
<td>152</td>
<td>39.7</td>
</tr>
<tr>
<td>Conferences</td>
<td>147</td>
<td>38.4</td>
</tr>
<tr>
<td>Speakers</td>
<td>252</td>
<td>65.8</td>
</tr>
<tr>
<td>Referral information</td>
<td>150</td>
<td>39.2</td>
</tr>
<tr>
<td>Other</td>
<td>44</td>
<td>11.5</td>
</tr>
</tbody>
</table>

*n = 383, student-athletes (SAs); n = 108, athletic directors (ADs). Note. Respondents could select more than one item.

**Mandatory eating disorder education within the athletic department reported by SA and AD subjects.** Findings about the extent to which mandatory eating disorder education is required within the athletic department are presented in Table 19. Among subjects who responded to this item, 34.3% (*n* = 49) reported that eating disorder education was _mandatory_ to help educate athletes and sports personnel about such concerns. By contrast, 65.7% (*n* = 94) of the subjects reported that eating disorder education was _not mandatory_ within their respective athletic departments. When asked to provide responses to this item, only 37.3% (*n* = 143) of the SA subjects responded (Table 19).
When contrasted with their SA counterparts \((n = 143, 37.3\%)\), 81 (75.0\%) AD subjects reported the availability of \textit{mandatory} education, whereas, only 25\% \((n = 27)\) of the AD respondents reported that eating disorder education was \textit{not mandatory} within their respective athletic departments. As such, AD subjects were more than twice as likely to report that eating disorder education was mandatory within their athletic departments for athletes and athletic personnel as their SA counterparts (Table 19).

Table 19

\textit{Mandatory Eating Disorder Education Reported by SAs and ADs*}

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mandatory eating disorder education</strong></td>
<td>(n^*)</td>
<td>%</td>
</tr>
<tr>
<td>Mandatory</td>
<td>49</td>
<td>34.3</td>
</tr>
<tr>
<td>Not mandatory</td>
<td>94</td>
<td>65.7</td>
</tr>
<tr>
<td>Total</td>
<td>143</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*\(n = 143\), student-athletes (SAs); \(n = 108\), athletic directors (ADs); Missing cases \((n = 240\) and \(n = 0\), respectively) not included in analysis.

Eating Disorder Policies, Procedures, Guidelines Reported by SA and AD Subjects

\textbf{NCAA Conference rules and regulations reported by SA and AD subjects.}

Findings about the availability of NCAA conference rules and regulations concerning eating disorders are presented in Table 20. In large numbers, SA subjects \((n = 344, 91.2\%)\) reported there were no \textit{NCAA conference rules and regulations} available to address concerns associated with collegiate athletes and eating disorders. Only 8.8\% of
SAs ($n = 33, 8.8\%) reported that there were *NCAA conference rules and regulations* in existence (Table 20).

In response to this item, 96 AD subjects (88.9\%) reported there were not *NCAA conference rules and regulations* in existence to address eating disorder concerns just as did their SA counterparts. Among AD subjects, 12 (11.1\%) reported there were such *NCAA conference rules and regulations* (Table 20).

Table 20

*NCAA Eating Disorder Conference Rules and Regulations Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>NCAA eating disorder conference rules and regulations</em></td>
<td>$n^*$ 8%</td>
<td>$n^*$ 11.1%</td>
</tr>
<tr>
<td>NCAA conference rules and regulations</td>
<td>33 8.8%</td>
<td>12 11.1%</td>
</tr>
<tr>
<td>No NCAA conference rules or regulations</td>
<td>344 91.2%</td>
<td>96 88.9%</td>
</tr>
<tr>
<td>Total</td>
<td>377 100.0%</td>
<td>108 100.0%</td>
</tr>
</tbody>
</table>

* $n = 377$, student-athletes (SAs); $n = 108$, athletic directors (ADs); Missing cases ($n = 6$ and $n = 0$, respectively) not included in analysis.

**Institutional athletic department rules and regulations reported by SA and AD subjects.** Findings about the availability of institutional athletic department rules and regulations regarding eating disorders are presented in Table 21. When asked to provide responses to this item, the majority of SA subjects ($n = 343, 89.6\%) reported there were not rules and regulations in existence within their institutional athletic
departments to address eating disorder concerns among athletes. Among SA respondents, 34 (8.9%) reported such rules and regulations did exist (Table 21).

By contrast, AD respondents \((n = 39, 36.4\%)\) reported there were institutional athletic department rules and regulations to address eating disorder concerns among athletes. As revealed in Table 21, AD subjects were four times as likely to report that institutional athletic department rules and regulations existed then did their SA counterparts. Among AD respondents, 68 (63.6%) reported such rules and regulations. Even though AD respondents were more likely to report the availability of institutional athletic department rules and regulations compared to SAs, the largest number of AD subjects reported there were no such rules and regulations available to address eating disorder concerns (Table 21).

Table 21

Institutional Athletic Department Eating Disorder Rules and Regulations Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rules and Regulations</td>
<td>34 10.3</td>
<td>39 36.4</td>
</tr>
<tr>
<td>No Rules or Regulations</td>
<td>296 89.7</td>
<td>68 63.6</td>
</tr>
<tr>
<td>Total</td>
<td>330 100.0</td>
<td>107 100.0</td>
</tr>
</tbody>
</table>

*\(n = 330\), student-athletes (SAs); \(n = 107\), athletic directors (ADs); Missing cases \((n = 53\) and \(n = 1\), respectively) not included in analysis.
Eating Disorder Referral Process Within the Athletic Department Reported by SA and AD Subjects

Findings about the extent of the eating disorder referral process within the athletic department are presented in Table 22. When asked to provide responses to this item, one-third of the SA respondents ($n = 107, 32.4\%$) reported that *nothing* was being done at their institutions for an athlete who was suspected of suffering from an eating disorder. When a referral did occur, SA subjects ($n = 71, 21.5\%$) reported that athletes were being referred to *sports medicine personnel*. By contrast, the lowest number of SA respondents ($n = 10, 3.0\%$) reported that the least likely referral process to occur was a referral to an *eating disorder specialist*. There were 50 (15.2\%) SAs who reported that an athlete suspected of suffering from eating disorder was referred to a *dietitian*. In addition, 22 (6.7\%) respondents reported athletes were being *withheld from training and competition*, whereas, 11 (3.3\%) SA subjects reported the *parent(s)* of the athlete were being contacted when the athlete was suspected of suffering from an eating disorder. Also, 49 (14.8\%) SAs reported athletes were referred to a *counselor or psychologist*. Finally, 10 (3.0\%) subjects reported that relevant eating disorder *reading material* was being provided when an athlete was suspected of suffering from an eating disorder (Table 22).

The highest number of AD respondents ($n = 57, 54.3\%$) reported that referral process that was implemented for an athlete suspected of suffering from an eating disorder was a referral to *sports medicine personnel*. In addition, 34.3\% (36) of the time ADs reported that an athlete suspected of suffering from an eating disorder was referred to a *counselor or psychologist*. The combination of responses from these two referral
Table 22

*Eating Disorder Referral Process Within the Athletic Department Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( n^* )</td>
<td>( % )</td>
</tr>
<tr>
<td><strong>Eating disorder referral process</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>107</td>
<td>32.4</td>
</tr>
<tr>
<td>Refer to dietitian</td>
<td>50</td>
<td>15.2</td>
</tr>
<tr>
<td>Refer to sports medicine personnel</td>
<td>71</td>
<td>21.5</td>
</tr>
<tr>
<td>Refer to counselor or psychologist</td>
<td>49</td>
<td>14.8</td>
</tr>
<tr>
<td>Withheld from training and competition</td>
<td>22</td>
<td>6.7</td>
</tr>
<tr>
<td>Read relevant material</td>
<td>10</td>
<td>3.0</td>
</tr>
<tr>
<td>Refer to eating disorder specialist</td>
<td>10</td>
<td>3.0</td>
</tr>
<tr>
<td>Contact parent(s)</td>
<td>11</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>330</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*\( n = 330 \), student-athletes (SAs); \( n = 105 \), athletic directors (ADs); Missing cases \( n = 53 \) and \( n = 3 \), respectively) not included in analysis.

categories made up 88.6\% \( (n = 93) \) of the responses reported by AD subjects. Further, only one (1.0\%) AD reported that nothing was done when an athlete was suspected of suffering from an eating disorder, and only one (1.0\%) reported that relevant eating disorder reading material was being provided. Three (2.9\%) AD subjects reported that the parent(s) of an athlete were contacted when the athlete was suspected of suffering from an eating disorder whereas only 5 (4.8\%) reported the referral of the athlete as being made to an eating disorder specialist. Only two of the AD \( (n = 2, 1.9\%) \) subjects
reported that the referral of an athlete was to a dietitian. Finally, by contrast, AD respondents \((n = 0, 0\%)\) compared to their SA counterparts \((n = 22, 6.7\%)\) reported that athletes were not being withheld from training and competition when suspected of suffering from eating disorders (Table 22).

Eating Disorder Prevention and Support Reported by SA and AD Subjects

Responsible for support of student-athletes reported by SA and AD subjects.

Findings about the parties that are responsible for support of student-athletes in regard to eating disorders are reported in Table 23. When asked to provide responses to this item, the highest number of SA subjects reported that coaches \((n = 304, 81.3\%)\) and friends and peers \((n = 304, 81.3\%)\) were responsible for being supportive of athletes. In addition, 76.2\% \((n = 285)\) of the SA subjects reported that certified athletic trainers are responsible for being supportive of athletes who are suspected of suffering from eating disorders. Finally, the lowest number of SA respondents \((n = 232, 62.0\%)\) reported that athletic departments are responsible to be supportive of athletes with eating disorders (Table 23).

Among ADs, 100.0\% \((n = 108)\) of the subjects reported that certified athletic trainers are responsible in offering support to an athlete that is suspected of suffering from an eating disorder. In addition, 89.8\% \((n = 97)\) of the AD respondents reported that a coach is responsible to offer an athlete support. Further, 66.7\% \((n = 72)\) of the ADs reported that friends and peers are responsible in offering support to an athlete. Finally, the fewest AD respondents \((n = 46, 42.6\%)\), as did their SA counterparts, reported that
athletic departments are responsible in offering support to an athlete that is suspected of suffering from an eating disorder (Table 23).

Table 23

*Table 23

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n*</td>
<td>%</td>
</tr>
<tr>
<td>Responsible for support of student-athletes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Athletic Department</td>
<td>232</td>
<td>62.0</td>
</tr>
<tr>
<td>Certified Athletic Trainer</td>
<td>285</td>
<td>76.2</td>
</tr>
<tr>
<td>Coach</td>
<td>304</td>
<td>81.3</td>
</tr>
<tr>
<td>Friends and Peers</td>
<td>304</td>
<td>81.3</td>
</tr>
</tbody>
</table>

*n=374, student-athletes (SAs); n=108, athletic directors (ADs). Missing cases (n=9 and n=0, respectively) not included in analysis. Note. Respondents could select more than one item.

Friends and Peers: Participation, Contribution, and Support of Student-Athletes

Reported by SA and AD Subjects

Findings about friends and peers attributing to the participation, contribution, and support of student-athletes are presented in Table 24. When asked to provide responses to this item concerning friends and peers: participation, contribution, and support of student-athletes, the highest number of SA respondents (n = 333, 88.6%) reported that athletes valued support from friends and peers while involved in collegiate athletics. In addition, 84.0% (n = 316) of the SA respondents reported that friends and peers influence athletes in regard to participation in sports while attending college. Finally, the lowest
number of SA respondents \((n = 205, 54.5\%)\) reported that friends and peers can contribute to the development of an eating disorder in a collegiate athlete (Table 24).

The highest number of ADs \((n = 101, 93.5\%)\), as did SA respondents, reported that athletes value support from friends and peers while involved in athletics while attending college. In addition, 87 \((80.6\%)\) AD subjects reported that friends and peers influence athletes to participate in collegiate sports. Finally, the lowest number of AD subjects \((n = 81, 75.0\%)\), as did their SA counterparts, reported that friends and peers can contribute to the development of an eating disorder in an athlete (Table 24).

Table 24

*Friends and Peers: Participation, Contribution, and Support of Student-Athlete Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n^*)</td>
<td>(%)</td>
</tr>
<tr>
<td>Friends and peers participation, contribution, support of student-athletes</td>
<td>316</td>
<td>84.0</td>
</tr>
<tr>
<td>Participation</td>
<td>333</td>
<td>88.6</td>
</tr>
<tr>
<td>Support</td>
<td>205</td>
<td>54.5</td>
</tr>
</tbody>
</table>

\(n = 376\), student-athletes (SAs); \(n = 108\), athletic directors (ADs); Missing cases \((n = 7\) and \(n = 0\), respectively) not included in analysis. *Note.* Respondents could select more than one item.
Prevalence Rate of Eating Disorders at their Respective Institutions Reported by SA and AD Subjects

Findings about the prevalence rate of eating disorders reported by SAs and ADs at their institutions are reported in Table 25. When asked to provide responses to this item, the highest number of SA subjects ($n = 306, 81.0\%$) reported $0\% - 25\%$ of athletes at their institutions have suffered from eating disorders. Further, $55 (14.6\%)$ SAs reported that $26\% - 50\%$ of athletes have suffered from eating disorders. Also, only $13 (3.4\%)$ respondents reported that $51\% - 75\%$ of athletes had suffered from eating disorders. The lowest number of SA respondents ($n = 4, 1.1\%)$ reported that $76\% - 100\%$ of athletes have suffered from eating disorders at their respective institutions (Table 25).

AD respondents were provided the opportunity to write in a qualitative answer for the prevalence rate instrument item since it was an open-ended item on the AD instrument. In contrast to their SA counterparts, the highest number of AD ($n = 70, 64.8\%)$ respondents reported that $0\%$ to $15\%$ of athletes have suffered from eating disorders at their respective institutions. Within the qualitative responses, there were $14 (13.0\%)$ AD subjects who reported that zero athletes had ever been diagnosed with an eating disorder at their respective institutions. Some of the responses to this qualitative item were found to be irrelevant to the prevalence rate of eating disorders. Also, some responses were not legible (Table 25).
Table 25

*Prevalence Rate of Eating Disorders at their Respective Institutions Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n*</td>
<td>%</td>
</tr>
<tr>
<td>Prevalence rate of eating disorders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-25%</td>
<td>306</td>
<td>81.0</td>
</tr>
<tr>
<td>26-50%</td>
<td>55</td>
<td>14.6</td>
</tr>
<tr>
<td>51-75%</td>
<td>13</td>
<td>3.4</td>
</tr>
<tr>
<td>76-100%</td>
<td>4</td>
<td>1.1</td>
</tr>
<tr>
<td>Other</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Total</td>
<td>378</td>
<td>100.0</td>
</tr>
</tbody>
</table>

* = n = 378, student-athletes (SAs); n = 70, athletic directors (ADs); Missing cases (n = 5 and n = 38, respectively) not included in analysis.

Eating Disorders and a Decrease in Athletic Performance Reported by SA and AD Subjects

Findings about eating disorders and a decrease in athletic performance are presented in Table 26. When asked to provide responses to this item, the highest number of SA subjects (n = 332, 89.0%) was able to correctly report that athletes suffering from eating disorders can experience a decrease in athletic performance. Only 11.0% of the SAs (n = 41, 11.0%) reported there is no decrease in athletic performance when an athlete is suffering from an eating disorder (Table 26).
The highest number of AD respondents \((n = 103, 95.4\%)\) correctly reported, as did their SA counterparts, that athletes that suffer from eating disorders can experience a *decrease in athletic performance*. Only five \((4.6\%)\) of the AD subjects incorrectly reported that there is *no decrease in athletic performance* (Table 26).

**Table 26**

*Eating Disorders and a Decrease in Athletic Performance Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decrease in athletic performance due to an eating disorder</td>
<td>(n^*) 332 89.0</td>
<td>103 95.4</td>
</tr>
<tr>
<td>No Decrease in athletic performance</td>
<td>41 11.0</td>
<td>5 4.6</td>
</tr>
<tr>
<td>Total</td>
<td>373 100.0</td>
<td>108 100.0</td>
</tr>
</tbody>
</table>

\(*n = 373, \text{ student-athletes (SAs)}; n = 108, \text{ athletic directors (ADs)}; \text{ Missing cases (} n = 10 \text{ and } n = 0, \text{ respectively) not included in analysis.}\)*

**Parties Influential in a Student-Athlete Developing or Not Developing an Eating Disorder Reported by SA and AD Subjects**

From a list of options provided for this item, SA and AD subjects could check more than one response as a foundation for calculating the variables. In Table 27, the \(n\) and percent columns \(\%\) depict the actual number and percent of subjects from both subject groups who responded to each listed option.

When asked to provide responses to this item, the highest number of SA respondents \((n = 309, 82.4\%)\) reported that *fellow athletes* are most influential of other
athletes in regard to developing or not developing eating disorders. In addition, there were 304 (80.9%) SAs who reported that friends and peers influence athletes while 63% (n = 237) of the subjects reported that a coach can influence an athlete in regard to developing or not developing an eating disorder. Also, there were 66 (17.6%) subjects who reported that athletic departments are influential. Further, there were 149 (39.8%) SA respondents who reported that certified athletic trainers are influential in regard to an athlete developing or not developing an eating disorder. The lowest number of SA subjects (n = 45, 12.0%) reported that athletic directors are influential toward athletes in regard to developing or not developing eating disorders (Table 27).

The highest number of AD subjects (n = 89, 83.2%) reported that fellow athletes were likely to influence student-athletes in regard to developing or not developing eating disorders. In addition, 26 (24.3%) ADs reported that athletic departments are influential in regard to athletes developing or not developing eating disorders. Also, there were 16 (15.0%) AD respondents who reported that certified athletic trainers are influential. Further, there were 86 (80.4%) subjects who reported that a coach can influence an athlete in regard to developing or not developing an eating disorder while 88 (82.2%) reported that friends and peers can influence an athlete. The lowest number of ADs (n = 16, 15.0%), as did their SA counterparts, reported that athletic directors were influential in regard to an athlete developing or not developing an eating disorder (Table 27).
Table 27

*Parties Influential in a Student-Athlete Developing or Not Developing an Eating Disorder Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n*</td>
<td>%</td>
</tr>
<tr>
<td>Athletic Department</td>
<td>66</td>
<td>17.6</td>
</tr>
<tr>
<td>Athletic Director (AD)</td>
<td>45</td>
<td>12.0</td>
</tr>
<tr>
<td>Certified Athletic Trainer</td>
<td>149</td>
<td>39.8</td>
</tr>
<tr>
<td>Coach</td>
<td>237</td>
<td>63.0</td>
</tr>
<tr>
<td>Fellow Athletes</td>
<td>309</td>
<td>82.4</td>
</tr>
<tr>
<td>Friends and Peers</td>
<td>304</td>
<td>80.9</td>
</tr>
</tbody>
</table>

*n = 375, student-athletes (SAs); n = 107, athletic directors (ADs); Missing cases (n = 8 and n = 1, respectively) not included in analysis. Note. Respondents could select more than one item.

Analysis of Hypotheses

Ten hypotheses were analyzed in this study. Specific statistical tests used to analyze these hypotheses included two-tailed Independent Sample T-Tests and Chi-Square test.

Hypothesis 1

Null hypothesis: There will be no statistically significant association between having received formal education about eating disorders and respondent status as a student-athlete or athletic director (AD).
Alternative hypothesis: There will be a statistically significant association between having received formal education about eating disorders and respondent status as a student-athlete or athletic director (AD).

In order to test this hypothesis, a chi-square analysis was conducted. This analysis revealed that there was a statistically significant association between having received formal education about eating disorders and respondent status as a SA or AD ($\chi^2(1, n = 483) = 22.49, p < 0.001$). As such, the null hypothesis was rejected, and the alternative hypothesis was retained. AD respondents were statistically significantly more likely to report having had formal education about eating disorders than did their SA counterparts. In fact, among these subjects, AD ($n = 59, 57.3\%$) respondents were nearly twice as likely to report having received such formal education as their SA ($n = 110, 29.3\%$) counterparts. In this study, data about having received formal education about eating disorders are presented in Table 28 in a 2x2 contingency table format.

Table 28

Formal Eating Disorder Education Status Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal eating disorder education status</td>
<td>$n^*$</td>
<td>%</td>
</tr>
<tr>
<td>Formal education</td>
<td>110</td>
<td>29.3</td>
</tr>
<tr>
<td>No formal education</td>
<td>265</td>
<td>70.7</td>
</tr>
<tr>
<td>Total</td>
<td>375</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Chi square test with $\chi^2(1, n = 483) = 22.49, p < 0.001$, and Cramer’s $V = 0.221$. Missing cases were excluded.
Hypothesis 2

Null hypothesis: There will be no statistically significant association between the forms of eating disorder education as reported by student-athletes as compared to their athletic director (AD) counterparts.

Alternative hypothesis: There will be a statistically significant association between the forms of eating disorder education as reported by student-athletes as compared to their AD counterparts.

In order to test this hypothesis, a chi-square analysis was conducted. The chi-square test revealed a statistically significant association between the forms of eating disorder education as reported by SAs as compared to their AD counterparts \( \chi^2(4, n = 216) = 22.23, p = 0.001 \). As such, the null hypothesis was rejected, and the alternative hypothesis was accepted. As Table 29 shows, more AD \( n = 9, 11.4\% \) respondents than their SA \( n = 3, 2.2\% \) counterparts reported that workshops were an available form of eating disorder education. Also, AD \( n = 15, 19.0\% \) subjects more often reported that in-service education was provided compared to SAs \( n = 8, 5.8\% \). The guest speaker responses were approximately equal for SA \( n = 44, 32.1\% \) and AD \( n = 27, 34.2\% \) subjects. In addition, SA \( n = 51, 37.2\% \) respondents were nearly twice as likely to report that lecture was the form of eating disorder education provided compared to their AD \( n = 15, 19.0\% \) counterparts. Finally, SAs \( n = 31, 22.6\% \) more often reported other forms of eating disorder education compared to the AD \( n = 13, 16.5\% \) respondents. When taking into consideration the total number of subjects who responded to this item, AD \( n = 79, 73.1\% \) respondents were more likely to report that at least one
form of eating disorder education was being provided compared to their SA \((n = 137, 35.5\%)\) counterparts. Only a little over one-third of the SA subjects reported that eating disorder education was even being provided through the available forms of education. The results of this analysis can be found in Table 29.

Table 29

*Forms of Eating Disorder Education Reported SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n^*)</td>
<td>%</td>
</tr>
<tr>
<td>Formal eating disorder education provided</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lecture</td>
<td>51</td>
<td>37.2</td>
</tr>
<tr>
<td>Workshop</td>
<td>3</td>
<td>2.2</td>
</tr>
<tr>
<td>Guest Speaker</td>
<td>44</td>
<td>32.1</td>
</tr>
<tr>
<td>In-service</td>
<td>8</td>
<td>5.8</td>
</tr>
<tr>
<td>Other</td>
<td>31</td>
<td>22.6</td>
</tr>
<tr>
<td>Total</td>
<td>137</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Chi square text with \(x^2(4, n = 216) = 22.23, p = 0.001\), and Cramer’s \(V = 0.3208\). Missing cases were excluded.

To better understand the perceptions of SA and AD respondents regarding the forms of eating disorder education being provided, eating disorder training formats that had been made available were also analyzed. Specifically, training formats listed on the instruments included *NCAA video, other video, NCAA website, NCAA handbook, reading materials, campus resources*, and/or *local resources*. An aggregate measure was created
to compare the variation in the accessibility of eating disorder training formats as reported by SA and AD subjects. A chi-square analysis was conducted to test if the training formats that were reported had an association with which subjects reported them. The results from this analysis were found to be statistically significant ($\chi^2(6, n = 873) = 53.9, p < 0.001$). AD respondents were more likely to report the availability of the NCAA video and NCAA handbook for eating disorder education compared to their SA counterparts (9.1% vs. 4.3%, and 20.4% vs. 6.7%, respectively). In addition, the AD and SA subjects more equally reported that the NCAA website and campus resources were provided as educational training formats (19.2% vs. 15.0%, and 27.2% vs. 30.4%, respectively). However, SA respondents were more than twice as likely as their AD counterparts to report Other Video (3.5% vs. 1.5%, respectively) as the training format made available for eating disorder education. Finally, training formats such as reading materials and local resources were reported more often by SAs than their AD counterparts (20.9% vs. 9.1%, and 19.2% vs. 13.6%, respectively). The data for this analysis can be found in Table 30.

**Hypothesis 3**

Null hypothesis: The knowledge level of student-athletes and athletic directors (ADs) about eating disorders will not be statistically significantly different.

Alternative hypothesis: The knowledge level of student-athletes and athletic directors (ADs) about eating disorders will be statistically significantly different.
Table 30

*Frequency Distribution of Available Eating Disorder Training Formats Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n*</td>
<td>%</td>
</tr>
<tr>
<td>Eating disorder training formats</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCAA Video</td>
<td>26</td>
<td>4.3</td>
</tr>
<tr>
<td>Other Video</td>
<td>21</td>
<td>3.5</td>
</tr>
<tr>
<td>NCAA Website</td>
<td>91</td>
<td>15.0</td>
</tr>
<tr>
<td>NCAA Handbook</td>
<td>41</td>
<td>6.7</td>
</tr>
<tr>
<td>Reading Materials</td>
<td>127</td>
<td>20.9</td>
</tr>
<tr>
<td>Campus Resources</td>
<td>185</td>
<td>30.4</td>
</tr>
<tr>
<td>Local Resources</td>
<td>117</td>
<td>19.2</td>
</tr>
<tr>
<td>Total</td>
<td>608</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Chi square test with \( x^2(6, n = 873) = 53.39, p < 0.001, \) and Cramer’s \( V = 0.247 \). Since respondents could answer “all that apply”, the grand total is larger than the number of respondents.

Knowledge was measured by using an item with seven questions, which were included on the SA and AD instrument. The item included indicators that can be present when an athlete is suffering from an eating disorder with five of the questions being correct and two being incorrect. The range of scores representing eating disorder knowledge for any one subject was seven with the minimum statistic being 7 and the maximum statistic being 14. The higher the score obtained indicated that the subject was more knowledgeable about eating disorders than a subject that obtained a lower score. Among the 383 student-athlete respondents the mean score on the knowledge item was
9.03 (sd = 1.99); for 108 athletic director respondents the mean score was 6.94 (sd = 1.46).

In order to test this hypothesis, a two-tailed independent sample \( t \)-test analysis was conducted. The results from this analysis revealed a statistically significant difference in regard to the knowledge scores of SA and AD respondents regarding eating disorders \((t = 12.06, p < 0.001)\). As such, the null hypothesis was rejected, and the alternative hypothesis was accepted. Therefore, this analysis confirmed that the mean knowledge score of SA respondents was significantly higher than the mean knowledge score of AD respondents. The results of this analysis can be found in Table 31.

Table 31

*Descriptive Statistics of Eating Disorder Knowledge Scores by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-athletes</td>
<td>9.0349</td>
<td>1.99229</td>
<td>383</td>
</tr>
<tr>
<td>Athletic Directors (ADs)</td>
<td>6.9444</td>
<td>1.45867</td>
<td>108</td>
</tr>
</tbody>
</table>

*Result of independent \( t \)-test for the means was \( t=12.06 \), and \( p<0.001 \).

**Hypothesis 4**

Null hypothesis: Educational opportunities such as eating disorder reading materials, seminars, and guest speakers will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.
Alternative hypothesis: Educational opportunities such as eating disorder reading materials, seminars, and guest speakers will be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.

In order to test this hypothesis, a chi-square analysis was conducted to determine if a statistically significant association existed between eating disorder educational opportunities that were reported by SAs compared to AD respondents. The results from this analysis revealed that there was a statistically significant association between reported educational opportunities such as eating disorder reading material, speakers, conferences, and other and respondent status: SA or AD subjects ($\chi^2(6, n = 1397) = 15.5$, $p = 0.017$). As such, the null hypothesis was rejected, and the alternative hypothesis was accepted.

As Table 32 shows, SAs ($n = 252, 24.9\%$) were more likely to report the availability of speakers as an educational opportunity compared to ADs ($n = 78, 20.4\%$). Also, SAs more often revealed the use of conferences as opportunities to educate athletes and athletic personnel about eating disorders compared to their AD counterparts (14.5% vs. 12.0%, respectively).

In addition, several educational opportunities among the self-reported responses were more likely to be reported by ADs in comparison to their SA counterparts: NCAA reading material (19.8% vs. 15.9%, respectively), NCAA website (18.8% vs. 15.0%, respectively), and referral information (17.8% vs. 14.8%, respectively). In regard to the availability of general reading material, nearly equal percent of responses were reported
by SAs and ADs (10.7% vs. 9.4%, respectively). The results from this analysis can be found in Table 32.

Table 32

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating disorder educational opportunities</td>
<td>n*</td>
<td>%</td>
<td>n*</td>
</tr>
<tr>
<td>NCAA reading material</td>
<td>161</td>
<td>15.9</td>
<td>76</td>
</tr>
<tr>
<td>Reading material</td>
<td>108</td>
<td>10.7</td>
<td>36</td>
</tr>
<tr>
<td>NCAA website</td>
<td>152</td>
<td>15.0</td>
<td>72</td>
</tr>
<tr>
<td>Conferences</td>
<td>147</td>
<td>14.5</td>
<td>46</td>
</tr>
<tr>
<td>Speakers</td>
<td>252</td>
<td>24.9</td>
<td>78</td>
</tr>
<tr>
<td>Referral information</td>
<td>150</td>
<td>14.8</td>
<td>68</td>
</tr>
<tr>
<td>Other</td>
<td>44</td>
<td>4.3</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>1014</td>
<td>100.0</td>
<td>383</td>
</tr>
</tbody>
</table>

*Chi square test with $\chi^2(6, n=1397) =15.5, p=0.017, and Cramer’s V=0.097. Since respondents could answer “all that apply”, the grand total is larger than the number of respondents.

Hypothesis 5

Null hypothesis: Eating disorder policies, procedures, and guidelines will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.
Alternative hypothesis: Eating disorder policies, procedures, and guidelines will be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.

First, the awareness of existing *NCAA Conference Rules and Regulations* related to eating disorder policies, procedures, and guidelines was examined within this hypothesis. In order to test this hypothesis, a chi-square analysis was conducted. A similar proportion of SA ($n = 33, 8.8\%$) subjects and AD ($n = 12, 11.1\%$) respondents reported an awareness of existing *NCAA Conference Rules and Regulations* being implemented to address eating disorders. These data have been shown in Table 33. This analysis revealed that there was no significant statistical association between SA and AD respondents in regard to their awareness of existing *NCAA Conference Rules and Regulations* related to eating disorder policies, procedures, and guidelines ($\chi^2(1, n = 485) = 0.55, p = 0.458$). As such, the null hypothesis was retained, and the alternative hypothesis was rejected even though only 8.8% of the SA respondents and 11.1% of the AD respondents reported that they were aware of *NCAA Conference Rules and Regulations* being made available to address eating disorder concerns. The results of this analysis can be found in Table 33.

Second, the awareness of existing *institutional athletic department rules and regulations* related to eating disorder policies, procedures, and guidelines was examined by using a chi-square test. The results of this analysis revealed that there was a statistically significant association between SA and AD subjects in regard to the reported availability of *institutional athletic department rules and regulations* related to eating
Table 33

*NCAA Conference Rules and Regulations Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NCAA conference rules and regulations</strong></td>
<td>n*</td>
<td>%</td>
</tr>
<tr>
<td>NCAA conference rules and regulations</td>
<td>33</td>
<td>8.8</td>
</tr>
<tr>
<td>No NCAA conference rules or Regulations</td>
<td>344</td>
<td>91.2</td>
</tr>
<tr>
<td>Total</td>
<td>377</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Chi square test with $\chi^2(1, n = 485) = 0.55, p = 0.458$, and Cramer’s $V = 0.034$. Missing cases were excluded.

disorder policies, procedures, and guidelines ($\chi^2(1, n = 438) = 39.02, p < 0.001$). As such, the null hypothesis was rejected, and the alternative hypothesis accepted. Only 10.3% ($n = 34$) of SA subjects reported that institutional athletic department rules and regulations related to eating disorder policies, procedures, and guidelines were being implemented within the athletic department, whereas, 36.4% of AD ($n = 39$) respondents reported that institutional rules and regulations related to eating disorder policies, procedures, and guidelines were being implemented within athletic departments. In fact, among these subjects, AD respondents were nearly three times as likely to report having such awareness than was reported by SA respondents (36.4% vs. 10.3%, respectively). The results of this analysis can be found in Table 34.
Table 34

*Institutional Athletic Department Rules and Regulations Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional athletic department rules and regulations</td>
<td>n*</td>
<td>%</td>
</tr>
<tr>
<td>Rules and Regulations</td>
<td>34</td>
<td>10.3</td>
</tr>
<tr>
<td>No Rules or Regulations</td>
<td>296</td>
<td>89.7</td>
</tr>
<tr>
<td>Total</td>
<td>330</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Chi square test with $x^2(1, n = 438) = 39.02, p < 0.001$, and Cramer’s $V = 0.298$. Missing cases were excluded.

**Hypothesis 6**

Null hypothesis: The referral process for athletes with eating disorders will not be perceived differently by student-athletes compared to athletic directors (ADs) at NCAA Division II (DII) institutions.

Alternative hypothesis: The referral process for athletes with eating disorders will be perceived differently by student-athletes compared to athletic directors (ADs) at NCAA Division II (DII) institutions.

In order to test this hypothesis, a chi-square test was conducted. This analysis revealed that there was a statistically significant association between the perceived referral process utilized for an athlete suspected of suffering from an eating disorder and respondent status: SA or AD ($x^2(4, n = 388) = 83.57, p < 0.001$). Only one ($n = 1$) AD respondent reported that no referral process was available for an athlete who was
suspected of suffering from an eating disorder, whereas 37.3% \((n = 107)\) of the SA subjects reported that they were unaware of a referral process being made available. The majority of AD subjects reported that the referral process for an athlete who was suspected of suffering from an eating disorder fell in the response categories of *sports medicine personnel* \((n = 57, 56.4\%)\) or *counselor or psychologist* \((n = 36, 35.6\%)\). The combination of responses in these two categories made up 92.0% \((n = 93)\) of the AD subjects’ responses. In addition, 50 \((17.4\%)\) of the SA respondents reported that an athlete suspected of suffering from an eating disorder was referred to a dietitian, whereas, only two \((2.0\%)\) AD subjects reported the referral of an athlete to a dietitian as compared to their SA counterparts. Further, only 3.5% \((n = 10)\) of the SA subjects reported the referral of an athlete to an eating disorder specialist. Finally, there were only five \((5.0\%)\) of the AD respondents who reported that an athlete suspected of suffering from an eating disorder was referred to an eating disorder specialist. The results of this analysis can be found in Table 35.

**Hypothesis 7**

Null hypothesis: The perceptions of NCAA Division II (DII) student-athletes and athletic directors (ADs) in regard to eating disorder prevention and support received will not be statistically significantly different.

Alternative hypothesis: The perceptions of NCAA Division II (DII) student-athletes and athletic directors (ADs) in regard to eating disorder prevention and support received will be statistically significantly different.
Table 35

*Frequency Distribution of the Eating Disorder Referral Process Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n*</td>
<td>%</td>
</tr>
<tr>
<td>Eating disorder referral process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>107</td>
<td>37.3</td>
</tr>
<tr>
<td>Refer to dietitian</td>
<td>50</td>
<td>17.4</td>
</tr>
<tr>
<td>Refer to sports medicine personnel</td>
<td>71</td>
<td>24.7</td>
</tr>
<tr>
<td>Refer to counselor or psychologist</td>
<td>49</td>
<td>17.1</td>
</tr>
<tr>
<td>Refer to eating disorder specialist</td>
<td>10</td>
<td>3.5</td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Chi square test $x^2(4, n = 388) = 83.57, p < 0.001,$ and Cramer’s $V = 0.464.$ Missing cases were excluded.

In order to test this hypothesis, a $t$-test analysis was conducted. The results from this analysis revealed a statistically significant difference in regard to the perception of SA and AD respondents in regard to eating disorder prevention and support that was reported as a necessity for athletes who were suspected of suffering from an eating disorder ($t = -32.48, p < 0.001$). Among 366 SA respondents the mean score was 7.65 (sd = 2.82); for 105 AD subjects the mean score for this analysis was 21.72 (sd = 4.172). As such, the null hypothesis was rejected, and the alternative hypothesis was accepted. These data confirmed that AD respondents compared to their SA counterparts had a higher mean score in regard to prevention and support needed for an athlete suspected of suffering from an eating disorder.
As previously mentioned, the mean score for SAs was 7.65 and for ADs the mean score was 21.72 out of a range of supportive parties of 4 to 28. As such, ADs were significantly more likely than their SA counterparts to reveal the need for support from such parties as athletic directors, certified athletic trainers, coaches, and friends and peers in the quest for prevention of eating disorders among athletes. The results of this analysis can be found in Table 36.

Table 36

*Descriptive Statistics of Prevention and Support Status by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-athletes</td>
<td>7.6557</td>
<td>2.8200</td>
<td>366</td>
</tr>
<tr>
<td>Athletic Directors (ADs)</td>
<td>21.7238</td>
<td>4.17293</td>
<td>105</td>
</tr>
</tbody>
</table>

*Result of independent t-test for the means was $t = -32.48$, $p < 0.001$.

**Hypothesis 8**

Null hypothesis: Prevalence rates of eating disorders will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.

Alternative hypothesis: Prevalence rates of eating disorders will be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.
Due to the lack of distribution within the AD prevalence rate responses, statistical analysis could not be conducted to analyze this hypothesis. AD respondents had been given the opportunity to complete the prevalence item with written qualitative answers.

Among 378 SA respondents, 81.0% \((n = 306)\) of the respondents reported that 0 to 25% of athletes at participant institutions had suffered from an eating disorder. Of 87 AD subjects who responded to the same item addressing the prevalence rate of eating disorders, 73 (83.9%) reported that less than 25% of the athletes at participant institutions had suffered from an eating disorder. These data can be found in Table 37.

Table 37

*Prevalence Rate of Eating Disorders at their Respective Institutions Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n^*)</td>
<td>%</td>
</tr>
<tr>
<td>Prevalence rate of eating disorders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-25%</td>
<td>306</td>
<td>81.0</td>
</tr>
<tr>
<td>26-50%</td>
<td>55</td>
<td>14.6</td>
</tr>
<tr>
<td>51-75%</td>
<td>13</td>
<td>3.4</td>
</tr>
<tr>
<td>76-100%</td>
<td>4</td>
<td>1.1</td>
</tr>
<tr>
<td>Other</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Total</td>
<td>378</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\(n^* = 378,\) student-athletes (SAs); \(n = 70,\) athletic directors (ADs); Missing cases were excluded \((n = 5\) and \(n = 38,\) respectively).
Hypothesis 9

Null hypothesis: There will be no statistically significant association between the perceived influence that eating disorders have upon athletic performance and respondent status as a student-athlete or athletic director (AD).

Alternative hypothesis: There will be a statistically significant association between the perceived influence that eating disorders have upon athletic performance and respondent status as a student-athlete or athletic director (AD).

In order to test this hypothesis, a chi-square analysis was conducted. The chi-square test revealed a statistically significant association between the perceptions about decreases in athletic performance specifically in relationship to eating disorders and respondent status as an SA and AD. This analysis revealed that there was not a statistically significant association \( (\chi^2(1, n = 481) = 3.22, p = 0.073) \). As such, the null hypothesis was retained, and the alternative hypothesis was rejected.

As Table 38 shows, a similar proportion of SA \( (n = 332, 89.0\%) \) and AD \( (n = 103, 95.4\%) \) respondents reported an awareness of an eating disorder potentially causing a decrease in athletic performance. However, SAs \( (n = 41, 11.0\%) \) had more of a tendency to report that there was not a decrease in athletic performance when an athlete suffers from an eating disorder than did their AD \( (n = 5, 4.6\%) \) counterparts. The results of this analysis can be found in Table 38.
Table 38

*Decrease in Athletic Performance Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decrease in athletic performance</td>
<td>$n^*$ 89.0%</td>
<td>$n^*$ 95.4%</td>
</tr>
<tr>
<td>No Decrease in athletic performance</td>
<td>41 11.0%</td>
<td>5 4.6%</td>
</tr>
<tr>
<td>Total</td>
<td>373 100.0%</td>
<td>108 100.0%</td>
</tr>
</tbody>
</table>

*Chi square test $\chi^2(1, n = 481) = 3.22, p = 0.073$, and Cramer’s V = 0.090. Missing cases were excluded.

**Hypothesis 10**

Null hypothesis: Who is influential/needed in the prevention of eating disorders among athletes will not be perceived differently by student-athletes compared to athletic directors (ADs) at NCAA Division II (DII) institutions.

Alternative hypothesis: Who is influential/needed in the prevention of eating disorders among athletes will be perceived differently by student-athletes compared to athletic directors (ADs) at NCAA Division II (DII) institutions.

To test this hypothesis, a chi-square analysis was conducted to determine whether or not there was a statistically significant association between SA and AD respondents and their perceptions of various influential/needed parties in the prevention of eating disorders. The results from this analysis revealed that there was a statistically significant association between SA and AD respondents and their perceptions about influence and
needs ($\chi^2(4, n = 1,488) = 10.9, p = 0.028$). As such, the null hypothesis was rejected, and the alternative hypothesis was accepted.

As Table 39 shows, SA subjects more often reported than did their AD counterparts that fellow athletes and friends and peers are influential and needed in the prevention of eating disorders in college athletes (27.8\% vs. 23.5\%, and 27.4\% vs. 23.3\%, respectively). The athletic director response was perceived approximately equal by SAs and ADs (4.1\% vs. 4.2\%, respectively) in regard to the influence needed in the prevention of eating disorders. However, AD ($n = 86, 22.8\%$) subjects slightly more often reported that coaches are influential and needed in the prevention of eating disorders among athletes than did their SA ($n = 237, 21.4\%$) counterparts. In addition, ADs ($n = 26, 6.9\%$) more often reported that the athletic department as a whole was influential and needed in the prevention of eating disorders compared to SAs ($n = 66, 5.9\%$). Finally, AD ($n = 73, 19.3\%$) respondents more often reported that certified athletic trainers were influential/needed than other parties than their SA counterparts ($n = 149, 13.4\%$). The results of this analysis can be found in Table 39.

**Summary of Findings**

In this chapter, 10 hypotheses were analyzed using a variety of statistical tools. These tools included: Two-tailed Independent Sample T-Tests, and Chi-Square analyses.

**Hypothesis 1**

There will be no statistically significant association between having received formal education about eating disorders and respondent status as a student-athlete or athletic director (AD).
Table 39

*Parties Influential/Needed in the Prevention of Eating Disorders Reported by SAs and ADs*

<table>
<thead>
<tr>
<th>Instrument items</th>
<th>Student-Athletes (SAs)</th>
<th>Athletic Directors (ADs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parties influential/needed in the prevention of eating disorders</strong></td>
<td><strong>n</strong></td>
<td><strong>%</strong></td>
</tr>
<tr>
<td>Athletic Department</td>
<td>66</td>
<td>5.9</td>
</tr>
<tr>
<td>Athletic Director (AD)</td>
<td>45</td>
<td>4.1</td>
</tr>
<tr>
<td>Certified Athletic Trainer</td>
<td>149</td>
<td>13.4</td>
</tr>
<tr>
<td>Coach</td>
<td>237</td>
<td>21.4</td>
</tr>
<tr>
<td>Fellow Athletes</td>
<td>309</td>
<td>27.8</td>
</tr>
<tr>
<td>Friends and Peers</td>
<td>304</td>
<td>27.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,110</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Chi square test $\chi^2(4, n = 1,488) = 10.9, p = 0.028$, and Cramer’s $V = 0.086$. Since respondents could answer “all that apply,” the grand total is larger than the number of respondents.

Findings from this analysis revealed a statistically significant association between SA and AD respondents that reported having had formal eating disorder education. In particular, these data revealed that formal eating disorder education is not being made readily available as reported by SA subjects. Among SA subjects only 29.3% of the respondents reported the availability of formal eating disorder education compared to their AD (57.3%) counterparts.

AD respondents were significantly more likely to report having had formal education about eating disorders than did their SA counterparts. In fact, among these
subjects, AD respondents were nearly twice as likely to report that they had received formal education as was reported by SA respondents. These results can be a concern if athletes in particular are not receiving formal eating disorder education.

**Hypothesis 2**

There will be no statistically significant association between the forms of eating disorder education as reported by student-athletes as compared to their AD counterparts.

Findings from this analysis revealed a statistically significant association between SA and AD respondents in regard to the reported forms of eating disorder education being provided to athletes and athletic directors. These data were noteworthy since AD (73.1%) respondents were almost twice as likely as were their SA (35.8%) counterparts to report the available forms of eating disorder education as *lectures, workshops, in-services, guest speakers, and other* forms of eating disorder education.

Further, the availability of eating disorder training formats was also found to be significant in regard to *NCAA video, other video, NCAA website, NCAA handbook, reading materials, campus resources, and local resources* usage. These eating disorder training formats are used to train and educate athletes and athletic personnel about eating disorders.

**Hypothesis 3**

The knowledge level of student-athletes and athletic directors (ADs) about eating disorders will not be statistically significantly different.

Findings from this analysis revealed that there was a statistically significant difference between the knowledge level of SA and AD respondents in regard to eating
disorders. Therefore, there could be a concern that athletes and athletic directors are not receiving adequate education to improve their knowledge level about eating disorders. It is noteworthy, with the difference revealed in formal education and the forms of eating disorder education being made available that the data potentially suggests that the knowledge level of SA and AD respondents could have been influenced by the availability of eating disorder education and the forms of education being provided.

**Hypothesis 4**

Educational opportunities such as eating disorder reading materials, seminars, and guest speakers will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.

Findings from this analysis revealed that there was a statistically significant association between eating disorder educational opportunities that were being provided as conveyed by SA and AD respondents. Therefore, there is a concern that athletes and athletic directors are not being provided appropriate educational opportunities regarding eating disorders. It is noteworthy, that AD respondents more often reported the use of NCAA reading material, the NCAA website, and referral information for educational purposes compared to their SA counterparts.

**Hypothesis 5**

Eating disorder policies, procedures, and guidelines will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.
Findings from this analysis revealed there was no significant statistical association between SA and AD respondents in regard to their awareness of existing *NCAA Conference Rules and Regulations* related to eating disorder policies, procedures, and guidelines. Consequently, both SA and AD subjects reported that there were not adequate *NCAA Conference Rules or Regulations* related to policies, procedures, and guidelines available to address eating disorders among collegiate athletes.

Findings from this analysis did reveal though that there was a statistically significant association between SA and AD respondents in regard to *institutional rules and regulations* being implemented within athletic departments at participant institutions in regard to eating disorder policies, procedures, and guidelines. Therefore, there could be a concern that *institutional rules and regulations* are being perceived differently by ADs in comparison to their SA counterparts. SA (89.7%) subjects reported more often than did their AD counterparts (63.6%) that there are not appropriate institutional rules and regulations related to policies, procedures, and guidelines being implemented within athletic departments to address eating disorders concerns.

**Hypothesis 6**

The referral process for athletes with eating disorders will not be perceived differently by student-athletes compared to athletic directors (ADs) at NCAA Division II (DII) institutions.

Findings from this analysis revealed that there was a significant statistical association between SA and AD respondents in regard to the reported referral process utilized for athletes suspected of suffering from eating disorders. Therefore, there could
be a concern that institutions do not have appropriate referral processes for athletes with eating disorders as revealed by SA respondents compared to their AD counterparts. Among the SA respondents, 27% reported that no referral process was being made available for athletes with eating disorders compared to their AD counterparts. Only one AD respondents reported that no referral process was being implemented when an athlete was suspected of suffering from an eating disorder.

**Hypothesis 7**

The perceptions of NCAA Division II (DII) student-athletes and athletic directors (ADs) in regard to eating disorder prevention and support received will not be statistically significantly different.

Findings from this analysis revealed a statistically significant difference in regard to the perception of SA and AD respondents in regard to eating disorder prevention and support that was reported as a necessity for athletes who were suspected of suffering from an eating disorder. The results revealed that AD respondents perceived the need for prevention and support significantly different than did their SA counterparts. It is noteworthy that the mean scores were statistically significantly different in regard to perceptions of necessary prevention and support for an athlete with an eating disorder as reported by AD (M = 21.72) respondents compared to their SA (M = 7.65) counterparts.

**Hypothesis 8**

Prevalence rates of eating disorders will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.
As previously stated, due to the lack of distribution within the AD respondent data, a statistical test could not be conducted. There was a confirmed difference in the perception of the prevalence rate of eating disorders as reported by SAs compared to their AD counterparts. It is noteworthy that 19.0% of the SA subjects reported more than 25% of the athletes at participant institutions had suffered from an eating disorder compared to zero of their AD counterparts.

**Hypothesis 9**

There will be no statistically significant association between the perceived influence that eating disorders have upon athletic performance and respondent status as a student-athlete or athletic director (AD).

Findings from this analysis revealed that there was not a statistically significant association between SAs and ADs and their perceptions of eating disorders and the influence such disorders have upon athletic performance. Consequently, SA and AD respondents appeared to be in agreement that eating disorders do influence athletic performance in a negative manner.

**Hypothesis 10**

Who is influential/needed in the prevention of eating disorders among athletes will not be perceived differently by student-athletes compared to athletic directors (ADs) at NCAA Division II (DII) institutions.

Findings from this analysis revealed there was a statistically significant association between SA and AD respondents in regard to who is influential/needed in the prevention of eating disorders. Results showed that SA respondents perceived who is
influential/needed in the prevention of eating disorders differently compared to their AD counterparts. It is noteworthy that AD subjects reported more often that certified athletic trainers, coaches, and the athletic department were influential/needed in the prevention of eating disorders compared to the self-reported perceptions of their SA counterparts.
CHAPTER V

DISCUSSION AND RECOMMENDATIONS

Purpose of the Study

The purpose of this study was to analyze the differences in perceptions about institutional policies, procedures, and educational programming in regard to eating disorders between athletic directors and student-athletes participating in selected sports at National Collegiate Athletic Association (NCAA) Division II (DII) designated institutions.

Discussion of Findings in Context of Body of Literature

Eating disorders including anorexia nervosa, bulimia nervosa, and eating disorders not otherwise specified (EDNOS) represent a spectrum of health issues that have been documented to threaten the health and quality of life of many including teenagers and young adults (Ackard et al., 2007; Neumark-Sztainer & Hannan, 2000). Of particular interest, is the emerging evidence suggesting that disordered eating is prevalent among college athletes (Heffner et al., 2003; Turk et al., 1999; Zablocki, 2004). In support of this assertion, a range of higher education and health promotion professionals have documented that students who suffer or have suffered from eating disorders simultaneously engage in a range of intercollegiate athletic pursuits (Beals, 2003; Martin et al., 1998; Ransone & Hughes, 2004; Turk et al., 1999; Vaughan et al., 2004).

According to a 1993 NCAA survey, approximately 10% of athletes competing on the collegiate level throughout the United States have experienced eating disorders including anorexia and bulimia nervosa (Dick, 1991). Although early work revealed that
as few as 1% of college athletes were diagnosed with eating disorders, more current findings suggest that up to 62% of athletes on the collegiate level evidence signs and symptoms of anorexia, bulimia nervosa, and EDNOS (Byrne & McLean, 2001; Johnson et al., 1999; Reinking & Alexander, 2005).

In context of the findings of this study, when asked about the eating disorder prevalence on their campuses, SAs reported the belief that high rates of eating disorders were prevalent among peer athletes. In fact, close to 20% of SA respondents indicated that as few as 26% and as many as 100% of their peer athletes had been affected by eating disorders. By contrast, athletic director subjects in this analysis reported that only 15% or fewer of the athletes at their institutions were affected by such conditions.

Over 1,000 colleges and universities in the U.S. sponsor athletic teams under the purview and sanction of the NCAA. Such colleges and universities participate in one of three defined athletic divisions (NCAA, 2002). These include: Division I (DI), Division II (DII), and Division III (DIII). Criteria to qualify for categorization within a particular division are defined in context of sponsorship, scheduling, and game attendance. In this context, DI institutions are required to sponsor at least seven sports for both men and women (or six for men and eight for women), two of which must be team sports offered for each sex. DII institutions are required to sponsor at least five sports for both men and women (or four for men and six for women), two of which must be team sports. DIII institutions also must sponsor at least five sports for both men and women athletes. Two of these offering for both men and women must be team sports. Importantly, DIII schools differ from their DII counterparts in that no financial support may be offered to
student-athletes. Consistent with these criteria, 302 colleges and universities represent DII.

As an intercollegiate athletic sanctioning body, the NCAA has established guidelines, policies, and procedures to be implemented on affiliated campuses to enrich the general health and well-being of athletes. As a foundation for compliance, institutional athletic personnel are responsible for disseminating health messages and establishing mechanisms to implement health promotion policies and practices on their campuses. As part of this agenda, the NCAA supports a range of activities intended to promote behaviors among athletes that reinforce optimal mental and physical health.

As part of this larger health promotion agenda, the NCAA has established specific guidelines and procedures to help prevent, identify, intervene, and treat athletes who have eating disorders (NCAA, 2002). For example, the NCAA has developed and distributed a variety of videotapes, posters, manuals, and other materials focused on eating disorder risk reduction to member institutions across all divisions (Hawes, 1999; NCAA, 2002).

Specific university athletic personnel who collaborate to support NCAA compliance at their institutions include athletic directors, coaches, and certified athletic trainers. These professionals have daily contact with athletes, including those who exhibit eating disorders, excessive exercise habits, and other risky dietary behaviors (A. Thompson et al., 2007; Turk et al., 1999; Zablocki, 2004). In this context, a robust body of literature reinforces the important role that athletic personnel at postsecondary institutions play in the prevention, recognition, and intervention of disordered eating
among the athletes under their supervision (NCAA, 2002; A. Thompson et al., 2007; Trattner-Sherman et al., 2005; Turk et al., 1999; Zablocki, 2004).

Heffner and colleagues (2003) have recommended that such athletic personnel adopt a team approach to prevent and manage complex eating disorders among SAs. In specific, these colleagues have suggested that such a “treatment team” should include athletic directors, certified athletic trainers, coaches, physicians, sports nutritionists, and psychologists who work collaboratively to provide targeted support for student-athletes about sports nutrition and the range of related issues (Heffner et al., 2003).

Sadly, the body of research documenting support for this call is very limited. In particular, the body of literature focusing on the role of athletic directors in developing prevention, recognition, and treatment options for collegiate athletes with eating disorders is sparse.

**Discussion of Hypothesis Test Findings**

**Hypothesis 1**

Null hypothesis: There will be no statistically significant association between having received formal education about eating disorders and respondent status as a student-athlete or athletic director (AD).

Findings from the analysis of this hypothesis revealed that there was a statistically significant association between having received formal education about eating disorders and respondent status as a SA or AD. These data confirmed that AD subjects more often reported being provided formal eating disorder education than their SA counterparts.
The body of literature confirms that it is important to educate both collegiate athletic department personnel and student-athletes about eating disorders and other health concerns that are encountered by athletes (Heffner et al., 2003; Gallagher & Reindl, 2010; A. Thompson & Trattner-Sherman, 1999; Turk et al., 1999; Vaughan et al., 2004; Zablocki, 2004). At higher education institutions, athletic directors are among those athletic professionals most likely to receive proper training and have access to specific educational materials related to eating disorders and their impact on the health of SAs. ADs who receive such training are uniquely positioned to establish timely and persistent programming to meet the needs of their colleagues and SAs (Branch, 1990; Zablocki, 2004). “Despite a lack of concrete documentation, experts agree that education is a primary tool for minimizing the risk of eating disorders and that coaches, parents, athletes, and sport-related personnel should all be included in educational programs” (Turk et al., 1999, p. 21).

In addition to the critical role identified for ADs, Vaughan and colleagues (2004) have studied the capacity of certified athletic trainers to engage in eating disorder prevention and intervention. These researchers confirmed that less than half of the certified athletic trainer subjects at DI institutions were enriched by formal eating disorder education on their campuses. Athletes though more often were offered such eating disorder training and education at DI institutions as reported by the certified athletic trainer subjects (Vaughan et al., 2004).

Further, Trattner-Sherman and colleagues (2005) have studied the importance of eating disorder education for members of the coaching ranks. The work of these
researchers confirms that only half (51%) of the coaches among the 2,894 subjects from DI, DII, and DIII NCAA member institutions had received training and education in regard to recognition and management of eating disorders among their athletes (Trattner-Sherman et al., 2005). In the current study, findings from the formal eating disorder education analysis revealed that 57.3% of ADs were provided such formal education, which is close to the 51% of coaches that Trattner-Sherman and colleagues (2005) reported provided with such training and education.

**Hypothesis 2**

Null hypothesis: There will be no statistically significant association between the forms of eating disorder education as reported by student-athletes as compared to their athletic director (AD) counterparts.

Findings from the analysis for this hypothesis revealed that there was a statistically significant association between the forms of eating disorder education as reported by SAs as compared to their AD counterparts. As confirmed by the literature, the forms of eating disorder education provided by athletic departments include reading material, videos, group seminars, workshops, lecture, and educational programs addressing eating disorder issues and concerns. In specific, researchers suggest that reading materials are a particularly common form of education offered at higher education institutions to inform athletes and athletic personnel about eating disorders (Gallagher & Reindl, 2010; A. Thompson & Trattner-Sherman, 1999; A. Thompson et al., 2007; Turk et al., 1999). Consistent with the literature, subjects in this study reported that *reading material* was a common educational opportunity available to them on their
campuses. However, AD respondents more often reported the availability of the *NCAA video* and *NCAA Handbook* for eating disorder education than their SA counterparts. In this study, SA respondents were more likely to report that *Other Video* and *local resources* were provided as eating disorder education training formats. Although this study confirmed that eating disorder education and support programs were offered through several mediums, ADs and SAs did not agree on the avenue of delivery in that ADs were more likely to report having access to national resources while SAs reported that local materials were more often provided.

The body of literature has confirmed that along with receiving printed educational materials, athletic personnel found it important to attend eating disorder workshops and lectures. Certified athletic trainers more often reported that they had attended eating disorder programs at a rate of 66.0% compared to 44.5% of collegiate coaches who reported having attended such eating disorder educational programs (A. Thompson et al., 2007; Turk et al., 1999). Vaughn et al. (2004) have studied the education, knowledge, and experience that certified athletic trainers possess when working with athletes suffering from eating disorders. Importantly, only a small percent of the certified athletic trainers involved in this study reported feeling confident to work with athletes with eating disorders. Although certified athletic trainer subjects were found to be concerned with passing along erroneous information about eating disorders, subjects reported that they needed to be provided with proper educational materials and resources by their respective institutions to help them to better address health concerns among their athletes (Vaughn et al., 2004).
In addition, Turk and colleagues (1999) have studied collegiate coaches and their participation in eating disorder educational programming. Findings from the body of the literature suggest that only 27.0% of coaches had attended eating disorder educational programs sponsored by their respective athletic department whereas only 44.5% of the coaches attended such a program ever. The forms of eating disorder education made available to these coaches included literature and videos and other educational programs that were offered outside of their athletic department. In addition, only 38.6% of the subjects reported that the teams that they were coaching had participated in such eating disorder educational programs. Since the athletic department serves as the organizational body that oversees athletes and athletic personnel when addressing the over-all well-being of student-athletes, these researchers concluded that such a low rate of attendance at eating disorder educational programs on and off campus presents a concern for coaches and athletes.

**Hypothesis 3**

Null hypothesis: The knowledge level of student-athletes and athletic directors (ADs) about eating disorders will not be statistically significantly different.

Findings from the analysis for this hypothesis revealed that there was a statistically significant difference between mean knowledge scores of SA and AD subjects. Data confirmed that the mean knowledge score of SAs was higher than their AD counterparts.

As confirmed by the literature, researchers have found it valuable to assess the perceptions and knowledge of athletic personnel in regard to eating disorders. As
previously mentioned, Vaughan and colleagues (2004) studied the importance of certified athletic trainers and the eating disorder education, knowledge, and experience that they possessed. In addition, the work of A. Thompson et al. (2007) confirmed that when eating disorder resources were made available to certified athletic trainers by their respective athletic departments than there was a statistically significant relationship to the percent of correct answers on the instrument. Further, the researchers revealed that the more eating disorders resources made available to certified athletic trainers the higher their knowledge scores.

By contrast, Turk and colleagues (1999) suggested that coaches still have a lot of knowledge left to obtain in regard to eating disorders and the health concerns associated with them. In specific, the work of these researchers confirmed that one-third of the coaches had scored under 70% on the Eating Disorders Questionnaire implemented by the researchers while only 4.3% scored 90% or better on this questionnaire associated with eating disorder knowledge (Turk et al., 1999).

**Hypothesis 4**

Null hypothesis: Educational opportunities such as eating disorder reading materials, seminars, and guest speakers will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.

The results from the analysis of this hypothesis revealed that there was a statistically significant association between reported educational opportunities such as eating disorder reading material, NCAA reading material, NCAA website, referral information, speakers, conferences, and other and respondent status: SA or AD subjects.
Among the self-reported responses, several educational opportunities were statistically significantly more likely to be reported by ADs than SAs: *NCAA reading material, NCAA website, and referral information.*

In this study, SA and AD respondents were able to report the educational opportunities made available to them at their respective institutions. These educational opportunities mirror the eating disorder education and programming findings consistent with the literature. By comparison, the SA and AD subjects appeared to be in agreement in regard to the most common educational opportunities provided to them on their campuses: *speakers, reading material, and conferences.* Importantly, research needs to be conducted to examine the discrepancies regarding educational opportunities that are not being readily reported, but that have been established to address eating disorders. These educational opportunities include *NCAA reading material, the NCAA website, and referral information.* In conclusion, whereas findings confirmed a statistically significant association about the fact that eating disorder education and support programs were offered through several mediums, ADs and SAs did not agree on the avenue of delivery.

As confirmed by the literature, eating disorder training and educational materials are beneficial for the education of athletes, coaches, and other athletic personnel at higher education institutions (Gallagher & Reindl, 2010; A. Thompson & Trattner-Sherman, 1999; A. Thompson et al., 2007; Turk et al., 1999). Importantly, researchers suggest that athletic personnel obtain such materials and participate in educational opportunities to help them better understand and address eating disorder concerns among their student-athletes (Turk et al., 1999).
Importantly, the body of literature confirms that members of the collegiate athletic community have the unique opportunity to promote the health and well-being of athletes. In specific, under the scope of the NCAA, athletic departments at colleges and universities have the opportunity to improve the education of athletic personnel in direct contact with athletes about health topics and other mental and physical concerns (Heffner et al., 2003; Turk et al., 1999; Zablocki, 2004). Conversely, reducing the risk of eating disorders in the athletic environment requires educational and preventative approaches to be provided to both student-athletes and athletic personnel (A. Thompson & Trattner-Sherman, 1999). Researchers suggest that establishing and implementing more eating disorder educational opportunities would benefit both collegiate athletic personnel and athletes. Importantly, both athletes and athletic personnel need information specific to anorexia, bulimia nervosa, and EDNOS (Heffner et al., 2003; A. Thompson & Trattner-Sherman, 1999; Turk et al., 1999; Zablocki, 2004).

**Hypothesis 5**

Null hypothesis: Eating disorder policies, procedures, and guidelines will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.

First, this study examined the awareness of existing *NCAA Conference Rules and Regulations* related to eating disorder policies, procedures, and guidelines. The results of the analysis of this hypothesis revealed that there was no statistically significant association in regard to the reported awareness of existing *NCAA Conference Rules and Regulations*.
Regulations related to eating disorder policies, procedures, and guidelines and respondent status: SA and AD.

Second, the awareness of existing institutional athletic department rules and regulations related to eating disorder policies, procedures, and guidelines was analyzed. The results of this analysis revealed that there was a statistically significant association in regard to the reported awareness of institutional athletic department rules and regulations related to eating disorder policies, procedures, and guidelines and respondent status: SA and AD.

The findings from the analysis of this hypothesis are generally consistent with the literature. Importantly, the NCAA is the governing organization that helps direct and inform collegiate athletic departments. Sadly, there are no specific rules and regulations established by the NCAA to address eating disorder concerns among athletes at sanctioned colleges and universities. In specific, there are only general policies, procedures, and guidelines that have been established to address such mental and physical health concerns. Health concerns include eating disorders and other issues such as drug use, alcohol abuse, and also academic demands (NCAA, 2002). In addition, there are guidelines in the NCAA sports medicine handbook that have been established in regard to athletes, eating disorders, nutrition, and athletic performance. Finally, the NCAA encourages athletic directors, certified athletic trainers, and coaches to follow and implement the guidelines, policies, and procedures established in regard to the health and welfare of athletes on their campuses (Sports Medicine Handbook, 2002).
As confirmed by the literature, athletic departments have the opportunity to improve the knowledge and education of the athletic personnel in direct contact with athletes at higher education institutions about health topics and other physical and mental concerns. In specific, researchers have confirmed that certified athletic trainers possess a higher eating disorder knowledge score when the athletic department at their respective institution had established and implemented specific policies and procedures to address such health concerns among their athletes (Heffner et al., 2003; Turk et al., 1999; Zablocki, 2004).

Importantly, athletic directors are the administrators at colleges and universities that oversee and guide the athletic department at these institutions. In specific, these administrators establish and implement policies and procedures to protect athletes on their campuses. In particular, these policies and procedures should be established and implemented to prevent, intervene, and treat athletes with eating disorders (Branch, 1990; Zablocki, 2004). On the contrary, very little literature has been published that focuses on athletic directors and the athletes that could suffer from eating disorders at their respective institutions. A gap in literature has occurred since no published research exists related to the ability of athletic directors to develop guidelines, policies, and procedures to address mental and physical health concerns among collegiate athletes. Finally, additional research could be conducted to further examine the availability of established institutional athletic department rules and regulations and their benefits at NCAA sanctioned colleges and universities, especially at DII institutions.
Hypothesis 6

Null hypothesis: The referral process for athletes with eating disorders will not be perceived differently by student-athletes compared to athletic directors (ADs) at NCAA Division II (DII) institutions.

The analysis of this hypothesis revealed that there was a statistically significant association between the reported referral process implemented to help athletes suspected of suffering from eating disorders and respondent status: SA and AD subjects. Importantly, only one AD respondent reported that no referral process was available for an athlete suffering from an eating disorder. By contrast, one-third of the SA subjects reported that they were unaware of a referral process being made available to athletes with eating disorders. The majority of AD subjects reported that the referral process for an athlete who was suspected of suffering from an eating disorder fell in the response categories of sports medicine personnel or counselor or psychologist. The combination of responses in these two categories made up 92.0% of the AD responses.

The findings from the analysis of this hypothesis are generally consistent with the literature. As confirmed by the body of literature, athletic personnel should obtain education regarding the referral processes available to them to address issues and concerns when an athlete displays signs and symptoms of chronic dieting, mildly abnormal eating behaviors or eating disorders in specific. In this study, ADs were more likely to report the referral of an athlete suspected of suffering from an eating disorder to a professional such as sports medicine personnel or a counselor or psychologist whereas SAs were more likely to report that athletes were being referred to dietitians. What
seems to be important is that all athletic personnel and athletes should have access to an established referral system on their campuses so that athletes with eating disorders are better able to gain assistance from appropriate health care professionals. These health care professionals should include individuals with an expertise in eating disorders (DePalma et al., 2002; Dick, 1991; Heffner et al., 2003; Trattner-Sherman et al., 2005).

In specific, researchers suggest that athletes displaying signs and symptoms of an eating disorder should be referred to professionals that include sports medicine personnel, a dietitian, a general therapist, and an eating disorder specialist so as to be able to take a multidisciplinary approach to treating athletes with eating disorders. These professionals should be involved in the prevention, intervention, and treatment of athletes since eating disorders have been found to be a multidimensional issue (Dick, 1991; Heffner et al., 2003; Trattner-Sherman et al., 2005).

**Hypothesis 7**

Null hypothesis: The perceptions of NCAA Division II (DII) student-athletes and athletic directors (ADs) in regard to eating disorder prevention and support received will not be statistically significantly different.

The results from the analysis of this hypothesis revealed a statistically significant difference between the perceptions of subjects in regard to eating disorder prevention and support that was a necessity for athletes who were suspected of suffering from an eating disorder and respondent status: SA and AD. Importantly, ADs were statistically significantly more likely than their SA counterparts to report the need for support from
such parties as _athletic directors, certified athletic trainers, coaches, and friends and peers_ in the quest for prevention of eating disorders among collegiate athletes.

In specific, in terms of preventing eating and body image problems among collegiate athletes, researchers suggest that athletic directors, coaches, certified athletic trainers, and even athletes themselves should obtain training and education to help them better understand eating issues, effective training, and safe preventative techniques associated with eating disorders (A. Thompson et al., 2007; Trattner-Sherman et al., 2005; Turk et al., 1999). In specific, researchers emphasize the need for particular criteria in the prevention of eating disorders. Karin Kratina, a nutrition specialist, developed criteria for coaches to implement when they are trying to help prevent eating disorders among their athletes (Kratina, 2005). Importantly, these criteria include de-emphasizing weight, not weighing athletes, and emphasizing strength and aerobic activities. In addition, along with these criteria, emphasis should be placed upon the improvement of the mental aspects associated with participating in athletics. As confirmed by the literature, coaches, certified athletic trainers, and athletes benefit from eating disorder education and prevention training (DePalma et al., 2002; NEDA, n.d.; A. Thompson et al., 2007; Turk et al., 1999). In specific, researchers have studied the importance of athletic departments ensuring that their programs provide resources and establish policies for coaches and athletic trainers to implement when trying to prevent eating disorders among their athletes. In conclusion, these athletic personnel involved with athletes on a day-to-day basis can be an important source of assistance to prevent eating disorders among athletes who have the potential to develop anorexia, bulimia
nervosa, or EDNOS (Bonci et al., 2008; A. Thompson et al., 2007; Trattner-Sherman et al., 2005; Turk et al., 1999; Vaughan et al., 2004).

**Hypothesis 8**

Null hypothesis: Prevalence rates of eating disorders will not be perceived differently by athletic directors (ADs) compared to student-athletes at NCAA Division II (DII) institutions.

This hypothesis was established to compare the estimated eating disorder prevalence rates as reported by SAs and ADs. The data found that all AD subjects reported that the prevalence rate was between 0% and 15% whereas 20% of SAs estimated that the rate was greater than 25%.

Due to the lack of distribution within the AD prevalence rate responses, statistical data tests could not be conducted to analyze this hypothesis. The lack of distribution might have occurred since AD respondents had been given the opportunity to complete the prevalence item with written qualitative answers whereas SAs were provided with a quantitative response set. Importantly, this hypothesis is further discussed in Recommendations for Further Research.

**Hypothesis 9**

Null hypothesis: There will be no statistically significant association between the perceived influence that eating disorders have upon athletic performance and respondent status as a student-athlete or athletic director (AD).

The results from the analysis of this hypothesis revealed that a high percent of both SA and AD respondents reported eating disorder can affect athletic performance
(89.0% and 95.4%, respectively). However, SAs had more of a tendency to report that there was not a decrease in athletic performance.

In comparison, the findings from these data are generally consistent with the literature. DePalma and colleagues (2002) studied the importance of athletes in changing their eating behaviors to improve their athletic performance, not decrease their body weight. Sadly, performance can initially improve when a slight loss of weight occurs, but the caloric restrictions and purging habits that are associated with eating disorders will take a toll on an athlete’s nutritional condition and then athletic performance. In specific, athletes suffering from eating disorders limit their caloric intake on a daily basis because they tend to believe that the thinner and leaner that they become the more likely they are to be successful in their respective sports. This thought process is far from the truth since athletes need the proper amount of calories and nutrients to maintain their energy level and metabolism or they will suffer a decrease in athletic performance (DePalma et al., 2002; Engel et al., 2003; Heffner et al., 2003; Johnson et al., 1999; Johnson & Tobin, 1991; A. Thompson & Trattner-Sherman, 1999). Athletic personnel and athletes must come to a realization that reducing body fat or weight through caloric restrictions will not enhance athletic performance. Conversely, the joint position statement addressing eating disorders that was established by the American College of Sports Medicine (ACSM), the American Dietetic Association (ADA), and the Dietitians of Canada recognizes that a change in body weight and body composition can negatively affect athletic performance. Importantly, these two factors should not be used as the criteria to coach and train athletes (ADA, 2001).
Hypothesis 10

Null hypothesis: Who is influential/needed in the prevention of eating disorders among athletes will not be perceived differently by student-athletes compared to athletic directors (ADs) at NCAA Division II (DII) institutions.

The results from the analysis of this hypothesis revealed a statistically significant association between SAs and ADs and their perceptions about influence and needs in the prevention of eating disorders among athletes. The frequency of responses was associated with respondent status and the reported parties that are influential and needed in the prevention of eating disorders. In specific, AD respondents were more likely to report the influence of certified athletic trainers, coaches, and the athletic department in the prevention of eating disorders. SAs, though, more often reported fellow athletes and friends and peers as the influence needed in the prevention of eating disorders.

The body of literature confirms that coaches, certified athletic trainers, and athletic directors should become better educated about eating disorder concerns, and they should also learn to recognize the signs and symptoms associated with anorexia, bulimia nervosa, and EDNOS. In specific, researchers suggest that athletic personnel should understand their role in the prevention and recognition of eating disorders as they become more familiar and better educated about such disorders. Importantly, as athletic personnel become better educated the more they are able to support and encourage their athletes in regard to such health issues (Dick, 1991; Johnson & Tobin, 1991; NCAA, 2002; NEDA, n.d.; A. Thompson et al., 2007). In addition, research findings have shown that it is important for athletic departments, college health centers, and even community
psychological and counseling centers to work together to help aid in prevention, identification, and treatment of athletes in regard to such health concerns as eating disorders (Beals, 2003; Trattner-Sherman et al., 2005). Trattner-Sherman and colleagues (2005) studied the importance of coaches, teammates, and athletic trainers being able to identify athletes with the potential to develop eating disorders or who have developed eating disorders. Notably, athletic personnel and athletes should become aware of secondary prevention approaches that aid in the early identification of and intervention of eating disorders among athletes. In specific, support from an athletic director, coach, and certified athletic trainer has been found to be associated with lower incidents of eating disorders among athletes at higher education institutions (Bonci et al., 2008; A. Thompson et al., 2007; Trattner-Sherman, 2005, Turk et al., Zablocki, 2004). As confirmed by the body of literature, recommendations have been established to help athletic personnel and athletes reduce the incidence of eating disorders. Finally, Grandjean (1991) studied the importance of the necessity to be able to evaluate “policies, procedures, and behaviors of the athletic staff to ensure that they are not contributing to the development of disordered eating” (p. 110).

Importantly, researchers have confirmed that the impact of the athletic environment might contribute to an athlete developing an eating disorder. In specific, social norms associated with peer pressure might contribute to the development of disordered eating behaviors. Findings from social norming research have confirmed that a person’s behaviors can be influenced by perceptions that are erroneous about other social group members (Burckes-Miller & Black, 1988; DePalma et al., 2002). Based on
the findings from this study, SAs reported being aware of the influence that *fellow athletes* and *friends* and *peers* might have upon peer athletes. SAs were statistically significant more likely than ADs to report that *fellow athletes* and *friends and peers* are influential and needed in the prevention of eating disorders among collegiate athletes. The body of literature confirms these findings.

**Recommendations for Further Research**

Based on the findings of this study and in context of the preexisting literature, the following areas for future research are recommended:

- The body of literature confirms that much of the research conducted about eating disorders on the collegiate level reflects the perspective of the college athletes, not university personnel (Hinton & Kubas, 2005; Martin et al., 1998; Nagel et al., 2000; Ransone & Hughes, 2004). In addition, when college athletic personnel are the focus of investigation it has been common for researchers to target inquiry about eating disorders. As such, the body of literature focused on the perceptions and practices of ADs is very limited particularly as it pertains to the issue of eating disorders among athletes. As such, little has been documented about the capacity of athletic directors to develop prevention, recognition, and referral options for either college athletes with eating disorders or to support the work of the athletic personnel that address athletes’ needs (Dick, 1991; Trattner-Sherman et al., 2005; Turk et al., 1999; Zablocki, 2004). In this context, further research is needed to inform the capacity of athletic directors to engage resources and engender support for
evidence-based practices to meet the needs of college athletes challenged by eating disorders on their campuses. In particular, the role of ADs in eating disorder recognition, prevention, referral, and management at all NCAA sanctioned institutions merits further exploration.

- In the current literature, athletes who compete on the NCAA DII level are underrepresented (Beals, 2003; Martin et al., 1998; Ransone & Hughes, 2004; Turk et al., 1999; Vaughan et al., 2004). With particular relevance to this analysis, studies examining such health concerns as eating disorders most often are conducted among DI athletes. For example, in a landmark study conducted by DePalma et al. (2002) only DI and DII athletes were the subjects of inquiry. Interestingly, these researchers noted the potential limitations of this work by not recruiting NCAA DII athletes for analysis about eating disorders (DePalma et al., 2002). Since only DI and DIII athletes were included as subjects in the study, the results could not be generalized nor inference drawn about practices and risks of eating disorders among DII athletes.

Similarly, research conducted by DePalma et al. (1993) recruited only student-athlete subjects from the NCAA DIII level. Again, these researchers could not infer the generalizability of their results to the other two NCAA athletic divisions (DePalma et al., 1993).

While the findings of this study cannot be generalized to other NCAA athletic divisions they do provide a starting place for examination of
guidelines, policies, and procedures associated with eating disorders among DII athletes. Importantly, the body of literature and evidence-based practice would be enriched by expanding representation of DII athletes in rigorous research agendas. Finally, this study needs to be replicated with DII athletes representing different demographics and geographic regions.

- With a particular focus on this analysis, further investigation is needed about the other response category on both the SA and AD instruments in this study, subjects were given the option to report other as their response to several items. For example, when asked about the form of eating disorder education to which they had been exposed, the response options for both AD and SA subjects included lecture, workshop, speaker, in-service, and other. Importantly, SA subjects indicated their response as other over one-fifth (22.6%) of the time. Further, 16.5% of the AD respondents chose the other response category for this item. In addition, when asked about the eating disorder educational opportunities to which both ADs and SAs had been exposed, a response option for AD and SA subjects included NCAA reading material, reading material, NCAA website, conferences, speakers, referral information, and other. SA subjects reported that other educational opportunities had been made available to them 11.5% of the time whereas 6.5% of AD respondents identified this as their response of choice. These data call for further study to clarify understanding and interpretation of the meaning of the other response option. In particular, findings could be
enriched by qualitative or mixed methodological approaches to inquiry about this matter.

- One item on the AD instrument use in this study was focused on the extent to which the subject received formal education about eating disorders somewhere other than at their respective institution. Unfortunately a comparable item was not included on the SA instrument to enrich comparative understanding. Future research is needed to evaluate the perspective of SAs about this matter. In addition, it is recommended that analysis of perspectives of other athletic professionals and athletes on all athletic teams be expanded about this important health issue be included in future research.

- In this study, statistical tests could not be conducted on the eating disorder prevalence rate item. Since this item was open-ended, ADs provided written qualitative responses. Unfortunately, a quantitative response set was included on the SA instrument. As a result, some of the responses submitted by ADs were found to be irrelevant to the prevalence issue. In addition, some AD responses were not legible. As a consequence, it is recommended that future research include quantitative, qualitative, and mixed methodological approaches to inquiry.

- Conduct additional studies that include athlete subjects who are unconventional (those who are not typically demonstrated in the literature to be challenged with eating disorders: women throwers, basketball players, etc.).
• Examine the impact of policies, procedures, supervision, and associated enforcement matters that reinforce the antonymous role of coaches.

• Examine the impact of the campus location of athletic counseling services. If they are housed in athletic departments, examine to what extent their efforts on behalf of student athletes are compromised by competing forces. It might be more beneficial if they are located in student health services.

• The role of University Presidents as institutional representatives to the NCAA, and concerns about their involvement and ability to influence athletic department policies and practices may be compromised given the influence of money in collegiate athletics.

• Finally, it is suggested that campus-based policy and practice about eating disorders could be enriched through examination of evidenced-based education and program options made available to ADs and SAs. Such a research agenda is particularly important since ADs reported that specific educational opportunities and programming were being established and implemented while their SA counterparts reported that they were not the beneficiaries of such educational opportunities and programming.

**Limitations**

Two types of limitations were specifically examined for this study. They are described in the following sections.
Survey-Related Limitations

An important limitation of this study is based on the analysis of self-reported responses from subjects. These types of reports might be problematic because of potential misrepresentation or exaggerated perceptions. Importantly, subjects who intentionally or unintentionally provided distorted responses could represent a source of bias in understanding or application of findings. In addition, inaccurate responses might be attributable to varied sources of influence over subjects providing them. Finally, recall bias and pressure to select socially desirable responses could represent additional sources of error.

Limitations in Sampling

To gain access to student-athletes, institutions were purposively selected to represent only NCAA DII colleges and universities. Then the pool of potential subject institutions from DII was stratified and randomized from which institutions for this study were selected. SA subjects representing six such randomly selected DII institutions provided responses to instrument items. However, unlike the sampling process of SA subjects, since one AD per eligible institution was invited to participate in the study, AD subjects were systematically selected from all DII colleges and universities. Unless both SA and AD samples of this study were considered truly representative of their relative population, comparisons of the survey data between these two populations might involve extra sample errors due to different sampling approaches.
APPENDIX A

DIVISION II (DII) COLLEGES AND UNIVERSITIES
## Appendix A

### Division II (DII) Colleges And Universities

<table>
<thead>
<tr>
<th>Institution</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abilene Christian University</td>
<td>ACU Box 27916</td>
</tr>
<tr>
<td>Academy of Art University</td>
<td>79 New Montgomery St. 6th Floor</td>
</tr>
<tr>
<td>Adams State College</td>
<td>208 Edgemont Blvd.</td>
</tr>
<tr>
<td>Adelphi University</td>
<td>1 South Ave. P.O. Box 701</td>
</tr>
<tr>
<td>University of Alabama in Huntsville</td>
<td>Athletics 205 Spragins Hall</td>
</tr>
<tr>
<td>University of Alaska Anchorage</td>
<td>Athletics 3211 Providence Dr.</td>
</tr>
<tr>
<td>University of Alaska Fairbanks</td>
<td>Athletics 211 Patty Center Box 757440</td>
</tr>
<tr>
<td>Albany State University Georgia</td>
<td>Athletics 504 College Dr.</td>
</tr>
<tr>
<td>Alderson-Broaddus College</td>
<td>101 College Hill Dr.</td>
</tr>
<tr>
<td>American International College</td>
<td>1000 State St.</td>
</tr>
<tr>
<td>Anderson University - South Carolina</td>
<td>Athletics 316 Boulevard</td>
</tr>
<tr>
<td>Angelo State University</td>
<td>Athletics 2601 W. Ave. N.</td>
</tr>
<tr>
<td>University of Arkansas, Fort Smith</td>
<td>5210 Grand Ave. P.O. Box 3649</td>
</tr>
<tr>
<td>Arkansas Tech University</td>
<td>Hull Bld 1306 N. El Paso Ave.</td>
</tr>
<tr>
<td>University of Arkansas, Monitcello</td>
<td>UAM Box 3499 663 University Dr.</td>
</tr>
<tr>
<td>Armstrong Atlantic State University</td>
<td>Athletics 11935 Abercorn St.</td>
</tr>
<tr>
<td>Ashland University</td>
<td>Athletics Kates Gym 401 College Ave.</td>
</tr>
<tr>
<td>Assumption College</td>
<td>Athletics 500 Salisbury St.</td>
</tr>
<tr>
<td>Augustana College - South Dakota</td>
<td>Athletics 2001 S. Summit</td>
</tr>
<tr>
<td>Augusta State</td>
<td>2500 Walton Way</td>
</tr>
<tr>
<td>Barry University</td>
<td>11300 NE 2nd Ave.</td>
</tr>
<tr>
<td>Barton College</td>
<td>Athletics P.O. Box 5000</td>
</tr>
<tr>
<td>Bellarmine University</td>
<td>Athletics 2001 Newburg Rd.</td>
</tr>
<tr>
<td>Belmont Abbey College</td>
<td>100 Belmont-Mt. Holly Rd.</td>
</tr>
<tr>
<td>Bemidji State University</td>
<td>1500 Birschmont Dr. NE</td>
</tr>
<tr>
<td>Benedict College</td>
<td>1600 Harden St.</td>
</tr>
<tr>
<td>Bentley University</td>
<td>Athletics 107 Forest St.</td>
</tr>
<tr>
<td>Blacks Hills State University</td>
<td>Athletics 1200 University St. Unit 9424</td>
</tr>
<tr>
<td>Bloomfield College</td>
<td>Athletics 467 Franklin St.</td>
</tr>
<tr>
<td>Bloomsburg University of Pennsylvania</td>
<td>Athletics 400 E. Second St.</td>
</tr>
<tr>
<td>College</td>
<td>Address</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------------------------------------------</td>
</tr>
<tr>
<td>Bluefield State College</td>
<td>Athletics 219 Rock St.</td>
</tr>
<tr>
<td>Bowie State University</td>
<td>Athletics 14000 Jericho Park Rd.</td>
</tr>
<tr>
<td>Brevard College</td>
<td>One Brevard College Dr.</td>
</tr>
<tr>
<td>Brigham Young University-Hawaii</td>
<td>Athletics 55-220 Kulanui St.</td>
</tr>
<tr>
<td>University of Bridgeport</td>
<td>Athletics 126 Park Ave.</td>
</tr>
<tr>
<td>Bryant University</td>
<td>Athletics 1150 Douglas Pike</td>
</tr>
<tr>
<td>C.W. Post Campus/Long Island University</td>
<td>Athletics 720 Northern Blvd.</td>
</tr>
<tr>
<td>Caldwell College</td>
<td>Athletics 120 Bloomfield Ave.</td>
</tr>
<tr>
<td>California Baptist University</td>
<td>8432 Magnolia Ave.</td>
</tr>
<tr>
<td>California State Polytechnic University, Pomona</td>
<td>Athletics Bld. 43 Rm. 116 3801 West Temple Ave.</td>
</tr>
<tr>
<td>California State University, Monterey Bay</td>
<td>100 Campus Center Bld. 84F</td>
</tr>
<tr>
<td>California State University, Chico</td>
<td>Athletics 400 West First St.</td>
</tr>
<tr>
<td>California State University, Dominguez Hills</td>
<td>Athletics 1000 East Victoria St.</td>
</tr>
<tr>
<td>California State University, Los Angeles</td>
<td>Athletics 5151 State University Dr.</td>
</tr>
<tr>
<td>California State University, San Bernardino</td>
<td>Athletics 5500 University Parkway</td>
</tr>
<tr>
<td>California State University, Stanislaus</td>
<td>Athletics One University Circle</td>
</tr>
<tr>
<td>California University of Pennsylvania</td>
<td>Athletics 250 University Ave.</td>
</tr>
<tr>
<td>Cameron University</td>
<td>Athletics 2800 West Gore Blvd.</td>
</tr>
<tr>
<td>Carson-Newman College</td>
<td>Athletics 2130 S. Branner Ave.</td>
</tr>
<tr>
<td>Catawba College</td>
<td>Athletics 2300 West Innes St.</td>
</tr>
<tr>
<td>Cedarville University</td>
<td>251 North Main St.</td>
</tr>
<tr>
<td>University of Central Missouri</td>
<td>Multipurpose Bld. Suite 203 P.O. Box 800</td>
</tr>
<tr>
<td>University of Central Oklahoma</td>
<td>100 North University Dr.</td>
</tr>
<tr>
<td>Central State University</td>
<td>P.O. Box 1004 1400 Brush Row Rd.</td>
</tr>
<tr>
<td>Central Washington University</td>
<td>Nicholson Pvl. 400 E. University Way</td>
</tr>
<tr>
<td>Chadron State College</td>
<td>1000 Main St.</td>
</tr>
<tr>
<td>Chaminade University</td>
<td>3140 Waialae Ave.</td>
</tr>
<tr>
<td>University of Charleston- West Virginia</td>
<td>2300 Maccorkle Ave. SE</td>
</tr>
<tr>
<td>Chestnut Hill College</td>
<td>Athletics 9601 Germantown Ave.</td>
</tr>
<tr>
<td>Cheyney University of Pennsylvania</td>
<td>1837 University Circle P.O Box 200</td>
</tr>
<tr>
<td>Chowan University</td>
<td>Athletics One University Place</td>
</tr>
<tr>
<td>Christian Brothers University</td>
<td>Athletics 650 East Parkway South</td>
</tr>
<tr>
<td>Claflin University</td>
<td>Athletics 400 Magnolia St.</td>
</tr>
<tr>
<td>Clarion University of Pennsylvania</td>
<td>840 Wood St.</td>
</tr>
<tr>
<td>Clark Atlanta University</td>
<td>Athletics 223 James P. Brawley Dr.</td>
</tr>
</tbody>
</table>
Clayton State University
Coker College
Colorado Christian University
Colorado School of Mines
Colorado State University - Pueblo
University of Colorado, Colorado Springs
Columbus State University
Concord University
Concordia College - New York
Concordia University, St. Paul
Converse College
Dallas Baptist University
Davis and Elkins College
Delta State University
University of the District of Columbia
Dixie State College of Utah
Dominican College (New York)
Dominican University of California
Dowling College
Drury University
East Central University
East Stroudsburg University of Pennsylvania
Eastern New Mexico University
Eckerd College
Edinboro University of Pennsylvania
Elizabeth City State University
Emporia State University
Erskine College
Fairmont State University
Fayetteville State University
Felician College
Ferris State University
University of Findlay
Flagler College
Florida Gulf Coast University
Athletics 2000 Clayton State Blvd.
Athletics 300 East College Ave.
Athletics 8787 W. Alameda Ave.
Athletics 1500 Illinois St.
Athletics 2200 Bonforte Blvd.
Athletics 1420 Austin Bluffs Parkway
Athletics 4225 University Ave.
Athletics Vermillion St. P.O. Box 1000
Athletics 171 White Plains Rd.
Athletics 275 Syndicate St. North
Athletics 580 East Main St.
Athletics 3000 Moutain Creek Parkway
Athletics 100 Campus Dr.
Athletics c/o Chadwick-Dickson DSU Box A3
4200 Connecticut Ave. NW
225 South 700 East
470 Western Highway
Athletics 50 Acacia Ave.
150 Idle Hour
900 North Benton Ave.
1100 East 14th St.
Athletics Smith & Normal Streets
Station 17 1500 South Ave. K
4200 54th Ave. South
EUP McComb Fieldhouse
1704 Weeksville Rd. Campus Box 900
1200 Commercial Campus Box 4020
P.O. Box 338
1201 Locust Ave.
1200 Murchison Rd.
223 Montross Ave.
Sports Complex 210 Sports Dr.
1000 North Main St.
74 King St.
10501 FGCU Blvd.
| Florida Institute of Technology | 150 West University Blvd. |
| Florida Southern College | 111 Lake Hollingsworth Dr. |
| Fort Hays State University | 600 Park St. |
| Fort Lewis College | 100 Rim Dr. |
| Fort Valley State University | P.O. Box 5319 1005 State University Dr. |
| Francis Marion University | Athletics P.O. Box 100547 |
| Franklin Pierce University | 20 College Rd. |
| Gannon University | 109 University Square |
| Georgia College & State University | Campus Box 65 |
| Georgia Southwestern State University | 800 GSW State University Dr. |
| Georgian Court University | 900 Lakewood Ave. |
| Glenville State College | 200 High St. |
| Goldey - Beacom College | 4701 Limestone Rd. |
| Grand Canyon University | 3300 W. Camelback Rd. |
| Grand Valley State University | 192 Fieldhouse |
| Harding University | HU Box 12281 |
| University of Hawaii at Hilo | 200 W. Kawili St. |
| Hawaii Pacific University | 1060 Bishop St. PH |
| Henderson State University | 1100 Henderson St. HSU Box 7630 |
| Hillsdale College | 201 Oak St. |
| Holy Family University | 9801 Frankford Ave. |
| Humboldt State University | 1 Harpst St. |
| University of Illinois at Springfield | Athletics One University Plaza MS REC 2004 |
| University of the Incarnate Word | 4301 Broadway CPO #288 |
| Indiana University of Pennsylvania | 107 Memorial Fieldhouse 660 South 11th St. |
| University of Indianapolis | 1400 E. Hanna Ave. |
| Johnson C. Smith University | Upo Box 1065 100 Beatties Ford Rd. |
| Kentucky State University | 400 East Main St. |
| Kentucky Wesleyan College | 3000 Frederica St. |
| King College | 1350 King College Rd. |
| Kutztown University of Pennsylvania | 114 Keystone Hall |
| Lake Erie College | 391 West Washington St. |
| Lake Superior State University | 650 West Easterday Ave. |
| Lambuth University | Athletics 705 Lambuth Blvd. |
| Lander University | Campus Box 6016 320 Stanley Ave. |
Lane College 545 Lane Ave.
Le Moyne College 1419 Salt Springs Rd.
Lees - McRae College 191 Main St.
LeMoyne-Owen College 807 Walker Ave.
Lenoir-Rhyne University Stasavich Place NE Shuford Memorial Gym
Lewis University One University Parkway Unit #166
Limestone College 1115 College Dr.
Lincoln Memorial University 6965 Cumberland Gap Parkway
Lincoln University - Missouri 202A Jason Hall
Lincoln University - Pennsylvania 1570 Baltimore Pike P.O. Box 179
Lindenwood University 209 S. Kings Highway
Livingstone College 701 West Monroe St.
Lock Haven University of Pennsylvania Thomas Fieldhouse #213
Lynn University 3601 North Military Trail
Malone University 2600 Cleveland Ave. NW
Mansfield University of Pennsylvania Decker Gym 70 South Stadium Dr.
Mars Hill College 100 Athletic St.
University of Mary 7500 University Dr.
McKendree University 701 College Rd.
University of Massachusetts at Lowell 1 University Ave.
Mercy College 555 Broadway
Mercyhurst College 501 E. 38th St.
Merrimack College 315 Turnpike St.
Mesa State College Athletics 1100 North Ave.
Metropolitan State College of Denver P.O. Box 173362 Campus Box 9
Michigan Technological University 1400 Townsend Dr.
Midwestern State University Athletics 3410 Taft Blvd.
Miles College Athletics 5500 Myron Massey Blvd.
Millersville University of Pennsylvania 1 South George St. P.O. Box 1002
Minnesota State University, Mankato Athletics
Minnesota State University, Moorhead 1104 7th Ave.
University of Minnesota, Crookston 139 Sports Center 2900 University Ave.
University of Minnesota, Duluth 170 Sports & Health Center 1216 Ordean Court
Minot State University Athletics 500 University Ave. W
Missouri University of Science and Technology 705 West 10th St.
<table>
<thead>
<tr>
<th>University Name</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missouri Southern State University</td>
<td>3950 East Newman Rd.</td>
</tr>
<tr>
<td>Missouri Western State University</td>
<td>4525 Downs Dr.</td>
</tr>
<tr>
<td>University of Missouri, St. Louis</td>
<td>One University Bld. 225 Mark Twain Bld.</td>
</tr>
<tr>
<td>Molloy College</td>
<td>Athletics 1000 Hempstead Ave. P.O. Box 5002</td>
</tr>
<tr>
<td>Montana State University-Billings</td>
<td>1500 University Dr.</td>
</tr>
<tr>
<td>University of Montevallo</td>
<td>Athletics 75 College Dr.</td>
</tr>
<tr>
<td>Morehouse College</td>
<td>830 Westview Dr. SW</td>
</tr>
<tr>
<td>Mount Olive College</td>
<td>634 Henderson St.</td>
</tr>
<tr>
<td>University of Nebraska at Kearney</td>
<td>2501 15th Ave.</td>
</tr>
<tr>
<td>University of Nebraska at Omaha</td>
<td>Sapp Fieldhouse 6001 Dodge St.</td>
</tr>
<tr>
<td>University of New Haven</td>
<td>Charger Gym 300 Boston Post Rd.</td>
</tr>
<tr>
<td>New Mexico Highlands University</td>
<td>Athletics Box 9000</td>
</tr>
<tr>
<td>New York Institute of Technology</td>
<td>Athletics Northern Blvd. P.O. Box 8000</td>
</tr>
<tr>
<td>Newberry College</td>
<td>2100 College St.</td>
</tr>
<tr>
<td>Newman University</td>
<td>3100 McCormick Ave.</td>
</tr>
<tr>
<td>University of North Alabama</td>
<td>Athletics UNA Box 5071</td>
</tr>
<tr>
<td>North Carolina Central University</td>
<td>McDonald Gym 1801 Fayetteville St.</td>
</tr>
<tr>
<td>University of North Carolina at Pembroke</td>
<td>One University Dr. Jones Center</td>
</tr>
<tr>
<td>University of North Dakota</td>
<td>2751 2nd Ave. Hyslop Rm. 120 Stop 9013</td>
</tr>
<tr>
<td>North George College &amp; State University</td>
<td>112 Memorial Hall</td>
</tr>
<tr>
<td>North Greenville University</td>
<td>P.O. Box 1892</td>
</tr>
<tr>
<td>Northeastern State University</td>
<td>603 North Grand Ave.</td>
</tr>
<tr>
<td>Northern Kentucky University</td>
<td>The Bank of Kentucky Center 500 Nunn Dr.</td>
</tr>
<tr>
<td>Northern Michigan University</td>
<td>237 PEIF 1401 Presque Isle</td>
</tr>
<tr>
<td>Northern State University</td>
<td>1200 South Jay St.</td>
</tr>
<tr>
<td>Northwest Missouri State University</td>
<td>800 University Dr. Lamkin Activity Center #112</td>
</tr>
<tr>
<td>Northwest Nazarene University</td>
<td>623 Holly St.</td>
</tr>
<tr>
<td>Northwood University (Michigan)</td>
<td>4000 Whiting Dr.</td>
</tr>
<tr>
<td>Notre Dame College (Ohio)</td>
<td>4545 College Rd.</td>
</tr>
<tr>
<td>Notre Dame de Namur University</td>
<td>1500 Ralston Ave.</td>
</tr>
<tr>
<td>Nova Southeastern University</td>
<td>3301 College Ave.</td>
</tr>
<tr>
<td>Nyack College</td>
<td>1 South Blvd.</td>
</tr>
<tr>
<td>Oakland City University</td>
<td>Johnson Center 138 N. Lucretia St.</td>
</tr>
<tr>
<td>Ohio Valley University</td>
<td>1 Campus View Dr.</td>
</tr>
<tr>
<td>Ohio Dominican University</td>
<td>1216 Sunbury Rd.</td>
</tr>
<tr>
<td>University Name</td>
<td>Address</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Oklahoma Panhandle State University</td>
<td>P.O. Box 430</td>
</tr>
<tr>
<td>Ouachita Baptist University</td>
<td>Box 3788 OBU</td>
</tr>
<tr>
<td>Pace University</td>
<td>861 Bedford Rd. Goldstein Fitness Center</td>
</tr>
<tr>
<td>Paine College</td>
<td>1235 15th St.</td>
</tr>
<tr>
<td>Palm Beach Atlantic University</td>
<td>901 S. Flagler Dr.</td>
</tr>
<tr>
<td>Pfeiffer University</td>
<td>48380 US Hwy 52 N.</td>
</tr>
<tr>
<td>Philadelphia University</td>
<td>4201 Henry Ave.</td>
</tr>
<tr>
<td>Pittsburg State University</td>
<td>1701 S. Broadway</td>
</tr>
<tr>
<td>University of Pittsburgh, Johnstown</td>
<td>450 Schoolhouse Rd. Sports Center</td>
</tr>
<tr>
<td>Post University</td>
<td>800 Country Club Rd.</td>
</tr>
<tr>
<td>Presbyterian College</td>
<td>Athletics 105 Ashland Ave.</td>
</tr>
<tr>
<td>University of Puerto Rico, Bayamon</td>
<td>170 Industrial Millillas Carr 174</td>
</tr>
<tr>
<td>University of Puerto Rico, Mayaguez Campus</td>
<td>P.O. Box 9000</td>
</tr>
<tr>
<td>University of Puerto Rico, Rio Piedras</td>
<td>P.O. Box 23353</td>
</tr>
<tr>
<td>Queens College (New York)</td>
<td>65-30 Kissena Blvd.</td>
</tr>
<tr>
<td>Queens University of Charlotte</td>
<td>1900 Selwyn Ave.</td>
</tr>
<tr>
<td>Quincy University</td>
<td>1800 College Ave.</td>
</tr>
<tr>
<td>Regis University (Colorado)</td>
<td>3333 Regis Blvd. F-20</td>
</tr>
<tr>
<td>Rockhurst University</td>
<td>1100 Rockhurst Rd.</td>
</tr>
<tr>
<td>Rollins College</td>
<td>1000 Holt Ave. - 2730</td>
</tr>
<tr>
<td>Saginaw Valley State University</td>
<td>7400 Bay Rd.</td>
</tr>
<tr>
<td>Salem International University</td>
<td>223 West Main St.</td>
</tr>
<tr>
<td>San Francisco State University</td>
<td>1600 Holloway Ave. Gym 102</td>
</tr>
<tr>
<td>University of the Sciences in Philadelphia</td>
<td>600 S. 43rd St.</td>
</tr>
<tr>
<td>Seattle Pacific University</td>
<td>3307 3rd Ave. W.</td>
</tr>
<tr>
<td>Seattle University</td>
<td>901 12th Ave.</td>
</tr>
<tr>
<td>Seton Hill University</td>
<td>One Seton Hill Dr.</td>
</tr>
<tr>
<td>Shaw University</td>
<td>118 E. South St.</td>
</tr>
<tr>
<td>Shepherd University</td>
<td>P.O. Box 5000</td>
</tr>
<tr>
<td>Shippensburg University of Pennsylvania</td>
<td>1871 Old Main Dr.</td>
</tr>
<tr>
<td>Simon Fraser University</td>
<td>8888 University Dr. Burnaby, B.C.</td>
</tr>
<tr>
<td>University of Sioux Falls</td>
<td>Athletics Stewart Center 1101 W. 22nd St.</td>
</tr>
<tr>
<td>Slippery Rock University of Pennsylvania</td>
<td>102 Morrow Field House</td>
</tr>
<tr>
<td>Sonoma State University</td>
<td>1801 East Cotati Ave.</td>
</tr>
<tr>
<td>University of South Carolina Aiken</td>
<td>471 University Parkway</td>
</tr>
<tr>
<td>University</td>
<td>Address</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Truman State University</td>
<td>100 E. Normal</td>
</tr>
<tr>
<td>Tuskegee University</td>
<td>Athletics 321 James Center</td>
</tr>
<tr>
<td>Tusculum College</td>
<td>Athletics 60 Shiloh Rd.</td>
</tr>
<tr>
<td>Upper Iowa University</td>
<td>Athletics P.O. Box 187 605 Washington St.</td>
</tr>
<tr>
<td>Urbana University</td>
<td>579 College Way</td>
</tr>
<tr>
<td>Ursuline College</td>
<td>2550 Lander Rd.</td>
</tr>
<tr>
<td>Valdosta State University</td>
<td>1500 North Patterson St.</td>
</tr>
<tr>
<td>Virginia State University</td>
<td>P.O. Box 9058</td>
</tr>
<tr>
<td>Virginia Union University</td>
<td>1500 N. Lombardy St.</td>
</tr>
<tr>
<td>Walsh University</td>
<td>2020 East Maple St. NW</td>
</tr>
<tr>
<td>Washburn University of Topeka</td>
<td>Athletics 1700 College SW</td>
</tr>
<tr>
<td>Washington Adventist University</td>
<td>7600 Flower Ave.</td>
</tr>
<tr>
<td>Wayne State University (Michigan)</td>
<td>5101 John C. Lodge, 101 Matthael</td>
</tr>
<tr>
<td>Wayne State College (Nebraska)</td>
<td>1111 Main St.</td>
</tr>
<tr>
<td>University of West Alabama</td>
<td>UWA Station 5</td>
</tr>
<tr>
<td>West Chester University of Pennsylvania</td>
<td>220 Sturzebecker Fieldhouse</td>
</tr>
<tr>
<td>University of West Florida</td>
<td>11000 University Parkway</td>
</tr>
<tr>
<td>University of West Georgia</td>
<td>1601 Maple St.</td>
</tr>
<tr>
<td>West Liberty University</td>
<td>P.O. Box 295 CSC 103</td>
</tr>
<tr>
<td>West Texas A&amp;M University</td>
<td>WTAMU Box 60049</td>
</tr>
<tr>
<td>West Virginia State University</td>
<td>210 Fleming Hall P.O. Box 1000</td>
</tr>
<tr>
<td>West Virginia Wesleyan College</td>
<td>59 College Ave. Campus Box 74</td>
</tr>
<tr>
<td>Western New Mexico University</td>
<td>1000 College Ave. P.O. Box 680</td>
</tr>
<tr>
<td>Western Oregon University</td>
<td>345 N. Monmouth Ave.</td>
</tr>
<tr>
<td>Western State College of Colorado</td>
<td>One College Heights 600 North Adams St.</td>
</tr>
<tr>
<td>Western Washington University</td>
<td>516 High St. Carver 100</td>
</tr>
<tr>
<td>William Jewell College</td>
<td>500 College Hill</td>
</tr>
<tr>
<td>Wheeling Jesuit University</td>
<td>316 Washington Ave.</td>
</tr>
<tr>
<td>Wilmington University (Delaware)</td>
<td>320 N. Dupont Highway</td>
</tr>
<tr>
<td>Wingate University</td>
<td>230 N. Camden Rd.</td>
</tr>
<tr>
<td>Winona State University</td>
<td>Johnson &amp; Sanborn P.O. Box 5838</td>
</tr>
<tr>
<td>Winston-Salem State University</td>
<td>601 Martin Luther King Jr. Dr.</td>
</tr>
<tr>
<td>University of Wisconsin, Parkside</td>
<td>900 Wood Rd. Box 2000</td>
</tr>
</tbody>
</table>
APPENDIX B

STUDENT-ATHLETE INSTRUMENT
Appendix B

Student-Athlete Instrument

Division II (DII) Student-athletes: Issues Surrounding Eating Disorders

Directions: Please indicate appropriate responses for the following items. Your responses are completely confidential and will be seen only by the researcher.

A. Information

1. Does the athletic department at your institution provide formal education about eating disorders (i.e., in-service seminars, workshops, guest speaker)?
   ___ Yes    ___ No

2-A. If you have had eating disorder training from the athletic department at your institution, which of the following formats have you had for the training? Mark all that apply.
   ___ Lecture    ___ Workshop    ___ Guest speaker    ___ In-service seminar    ___ Other

2-B. Was the training mandatory?
   ___ Yes    ___ No

3. To your knowledge, within the athletic department at your institution, for whom was the formal eating disorder training program (i.e., in-service seminars, workshops, guest speaker) provided? Mark all that apply.
   ___ No one    ___ Coaches of female sports
   ___ Male student-athletes    ___ Athletic administrative staff
   ___ Female student-athletes    ___ Athletic Trainers
   ___ Coaches of male sports

4. For whom is the eating disorder training program mandatory? Mark all that apply.
   ___ No one    ___ Coaches of female sports
___ Male student-athletes  ___ Athletic administrative staff
___ Female student-athletes  ___ Athletic Trainers
___ Coaches of male sports

5. What eating disorder educational materials are made available to you as a member of the athletic department? **Mark all that apply.**
   ___ NCAA Video or DVD resources
   ___ Other Video or DVD resources
   ___ Reading material
   ___ NCAA website
   ___ NCAA Sports Medicine Handbook
   ___ Campus resources (i.e., student health, counseling)
   ___ Local resources (i.e., hospital, clinic)

6. What is most frequently done when a student-athlete at your institution is suspected of having an eating disorder? **Mark only ONE (1).**
   ___ Nothing
   ___ Refer to a dietitian
   ___ Refer to sports medicine personnel
   ___ Refer to a general counselor or psychologist
   ___ Withhold from training and competition
   ___ Refer to an eating disorder specialist
   ___ Have them read relevant materials
   ___ Contact parent(s)

7. What does the athletic department at your institution do to make student-athletes aware of eating disorders? **Mark all that apply.**
___ Nothing
___ Provide educational materials such as brochures, videos/DVDs
___ Display posters on walls
___ Provide NCAA Sports Medicine Handbook
___ Others

8. Do you agree that your college cafeteria gives student-athletes enough healthy foods to choose from on a daily basis?

___ Strongly Agree
___ Agree
___ Neither agree nor disagree
___ Disagree
___ Strongly Disagree

9. Do you know if there are athletic conference rules and regulations to allow university personnel to intervene when a student-athlete has an eating disorder?

___ Yes
___ No

10. Do you know if there are rules and regulations within the athletic department at your institution to allow university personnel to intervene when a student-athlete has an eating disorder?

___ Yes
___ No

11. Which of the following are indicators that a student-athlete has an eating disorder? 

Mark all that apply.

___ Eating in secret
___ A rapid decrease in athletic performance
___ Loss of menstruation in a female
___ A distorted body image
___ The athlete restricts fluid intake
___ Self-induced vomiting
___ Laxative use
B. Perceptions

12. In your opinion to help prevent an eating disorder, student-athletes need more support from:

Circle the number that corresponds with your best response.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athletic Directors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certified Athletic Trainers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coaches</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friends and peers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. What type(s) of assistance, information, education, or training would be most helpful to you and other student-athletes to identify and manage eating disorders? Mark all that apply.

___ Have reading materials provided by the NCAA
___ Have other reading materials available
___ Have materials available on the NCAA website
___ Attend conferences about college athletes and eating disorders
___ Have consultants come to campus to work with the athletic department
___ Have speakers come to campus to talk with athletes
___ Have information on referrals to appropriate resources
___ Others
14. How satisfied are you with: **Circle the number that corresponds with your best response.**

<table>
<thead>
<tr>
<th></th>
<th>Very satisfied</th>
<th>Some what satisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Not very satisfied</th>
<th>Not at all satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>The educational methods in which your institution uses to educate coaches about eating disorders?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The educational methods in which your institution uses to educate student-athletes about eating disorders?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The educational material in which the NCAA uses to educate coaches about eating disorders?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The educational material in which the NCAA uses to educate student-athletes about eating disorders?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

15. Do you agree with the following statements? **Circle the number that corresponds with your best response.**

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither agree nor disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe that an eating disorder is a serious health concern.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I believe that a certain percent of student-athletes at my institution currently have or have experienced an eating disorder.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I am concerned that I will develop an eating disorder.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I believe that a student-athlete’s performance suffers when the athlete experiences an eating disorder.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Friends and peers play a role in students participating in athletics while attending college.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>College athletes value the support and encouragement that they receive from their friends and peers while participating in athletics.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Friends and peers play a role in college athletes developing eating disorders.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
16. When it comes to a student athlete developing or not developing an eating disorder, how influential is each of the following parties? **Circle the numbers to correspond with answers.**

<table>
<thead>
<tr>
<th>Least Influential</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Most influential</th>
</tr>
</thead>
<tbody>
<tr>
<td>The athletic department</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>The athletic director (AD)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>A certified athletic trainer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>The coach</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Fellow athletes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Friends and peers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

17. By your observations, what percent of student-athletes at your institution are experiencing an eating disorder?

___ 0 to 25%   ___ 26 to 50%   ___ 51 to 75%   ___ 76 to 100%

18. By your observations, what percent of student-athletes at your institution have ever experienced an eating disorder to your knowledge?

___ 0 to 25%   ___ 26 to 50%   ___ 51 to 75%   ___ 76 to 100%

19. Do you believe that you are suffering from an eating disorder?

___ Yes   ___ No

C. Demographics

20. Indicate your gender   ___ Male   ___ Female

21. Please indicate your age in years _________

22. Indicate your academic year   ___ Freshman

___ Sophomore

___ Junior

___ Senior

___ Graduate student
23. Indicate the primary sport in which you participate:

____ Men’s soccer  ______ Women’s soccer
____ Men’s cross country ______ Women’s cross country
____ Men’s swimming ______ Women’s swimming
____ Men’s track ______ Women’s track
____ Wrestling ______ Women’s field hockey
____ ______ Women’s volleyball
____ ______ Women’s gymnastics

Thank you for completing and returning this instrument.

Please, return the instrument to the envelope in which you received it. Seal the envelope and return it to your athletic trainer.
APPENDIX C

SAMPLE STUDENT-ATHLETE COVER LETTER
Appendix C

Sample Student-Athlete Cover Letter

Training and Perceptions of Student-Athletes on the Collegiate Level Regarding Eating Disorders

The following instrument is being used to gain a better understanding of eating disorders among collegiate student-athletes. The research being conducted will focus on the significance of education, guidelines, and policies being established and implemented at collegiate institutions by athletic personnel to prevent and treat eating disorders among student-athletes. Mary L. McDade is using the research to elaborate upon an extensive literature review that has been completed and research that has been conducted over the past two years to work toward completing a dissertation at Kent State University toward a doctoral degree.

When you choose to participate, you are doing so by completing the instrument that has been included. The instrument will take you approximately 15-20 minutes to complete. By completing this instrument, you are consenting to participate in this research project. It is highly encouraged though that you participate so that the most valid information can be collected. There are no penalties associated with not participating in this study. Data collected from this instrument will be kept confidential. There are no identifying factors associated with completing this instrument.

There will be no identifying variables associated with participating in this study so, therefore, anonymity can be assured, even if the results from this study are published. There are no risk factors associated with this research project beyond everyday life experiences. If you would like more information about this project, please feel free to contact:

Mary L. McDade
B17 Crawford Center
Edinboro University
Edinboro, PA 16444
mmcdade@edinboro.edu
(814)732-1444

Faculty advisor: Dr. Cindy Symons
Kent State University
140 Nixson Hall
Kent, OH 44242
csymons@kent.edu
(330)672-0681

The Kent State University rules for research can be obtained from Dr. Sonia Alemagno, Vice President for Research (330)672-6501.
APPENDIX D

ATHLETIC DIRECTOR (AD) INSTRUMENT
Appendix D

Athletic Director (AD) Instrument

Division II (DII) Athletic directors (ADs): Issues Surrounding Eating Disorders

Directions: Please indicate appropriate responses for the following items.

A. Policies and Education

1-A. Have written policies been established at your institution to intervene when a student-athlete has an eating disorder or is suspected of having an eating disorder?

___ Yes  ___ No (if no, skip to #2)

1-B. If yes, please, indicate how involved you are in establishing and maintaining an eating disorder education program for the athletic department at your institution.

___ Very involved
___ Some what involved
___ Neutral
___ Not very involved
___ Not at all involved

2. What eating disorder training and/or educational programs are made available to those associated with the athletic department (i.e., coaches, student-athletes, athletic trainers)? Mark all that apply.

___ No formal educational program (skip to #5)  ___ Lecture  ___ Workshop
___ Guest speaker  ___ In-service seminar  ___ Other

3. For whom is the eating disorder training program provided? Mark all that apply.

___ No one  ___ Coach of female sports
___ Male student-athletes  ___ Athletic administrative staff
___ Female student-athletes  ___ Athletic Trainers
___ Coaches of male sports
4. For whom is the eating disorder training program mandatory? **Mark all that apply.**

___ No one ___ Coach of female sports
___ Male student-athletes ___ Athletic administrative staff
___ Female student-athletes ___ Athletic Trainers
___ Coaches of male sports

5. Have you personally ever received formal education (i.e., seminar, workshop):

**Circle the number that corresponds with your best response.**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>About eating disorders?</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>On how to intervene when a student-athlete has an eating disorder?</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>On the referral process for a student-athlete with an eating disorder?</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

6. What eating disorder educational materials are made available for members of the athletic department? **Mark all that apply.**

___ No such materials available ___ Reading material
___ NCAA Video or DVD resources ___ Campus resources (i.e., student health, counseling)
___ Other Video or DVD resources ___ Local resources (i.e., hospital, clinic)
___ NCAA website ___ NCAA Sports Medicine Handbook ___ Others

7. What is most frequently done when a student-athlete at your institution is suspected of having an eating disorder? **Mark only ONE (1).**

___ Nothing ___ Refer to a general counselor or psychologist
___ Refer to sports medicine personnel ___ Refer to an eating disorder specialist
___ Withhold from training and competition ___ Contact parent(s)
___ Have them read relevant materials ___ Others
___ Refer to a dietitian
8. Which of the following are indicators that a student-athlete has an eating disorder? **Mark all that apply.**

___ Eating in secret  
___ A rapid decrease in athletic performance  
___ Loss of menstruation in a female  
___ A distorted body image  
___ The athlete restricts fluid intake  
___ Self-induced vomiting  
___ Laxative use

B. Perceptions

9. When it comes to being supportive of an athlete with an eating disorder, which of the following parties are more responsible in providing support? **Circle the number that corresponds with your best response.**

<table>
<thead>
<tr>
<th></th>
<th>Least responsible</th>
<th></th>
<th>Most responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>The athletic department</td>
<td>1 2 3 4 5 6</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>The athletic director (AD)</td>
<td>1 2 3 4 5 6</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>A certified athletic trainer</td>
<td>1 2 3 4 5 6</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>The coach</td>
<td>1 2 3 4 5 6</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Fellow athletes</td>
<td>1 2 3 4 5 6</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Friends and peers</td>
<td>1 2 3 4 5 6</td>
<td></td>
<td>7</td>
</tr>
</tbody>
</table>

10. What type(s) of assistance, information, education, or training would be most beneficial to you and your athletic department to help identify and manage student-athletes with eating disorders? **Mark all that apply.**

___ Have reading materials provided by the NCAA  
___ Have other reading materials available  
___ Have materials available on the NCAA website  
___ Attend conferences about college athletes and eating disorders  
___ Have speakers come to campus to talk with athletes  
___ Have information on referrals to appropriate resources  
___ Others
11. At your institution, to what extent do you feel the following individuals need more education about eating disorders and related topics? Circle the number that corresponds with your best response.

<table>
<thead>
<tr>
<th></th>
<th>To a great extent</th>
<th>Moderate extent</th>
<th>Small extent</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-athletes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Coaches</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Certified athletic trainers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>You, the athletic director</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

12. How satisfied are you with the rules and regulations that the athletic department at your institution has established to educate: Circle the number that corresponds with your best response.

<table>
<thead>
<tr>
<th></th>
<th>Very satisfied</th>
<th>Some what satisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Not very satisfied</th>
<th>Not at all satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-athletes about eating disorders?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Coaches about eating disorders?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Certified athletic trainers about eating disorders?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Athletic directors about eating disorders?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

13. How much do you agree with the following statements?

SA=strongly agree    A=agree    N=Neither agree nor disagree    D=disagree    SD=strongly disagree

Circle the number that corresponds with your best response.

<table>
<thead>
<tr>
<th></th>
<th>SA</th>
<th>A</th>
<th>N</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are appropriate NCAA guidelines to allow university personnel to intervene when a student-athlete is suspected of having an eating disorder.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>There are appropriate athletic conference rules and regulations to allow university personnel to intervene when a student-athlete is suspected of having an eating disorder.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>There are appropriate rules and regulations at your institution to allow university personnel to intervene when a student-athlete is suspected of having an eating disorder.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
A student-athlete’s athletic performance suffers when an athlete experiences an eating disorder.  

<table>
<thead>
<tr>
<th>A student-athlete’s athletic performance suffers when an athlete experiences an eating disorder.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

Eating disorders are a significant problem among college athletes.  

<table>
<thead>
<tr>
<th>Eating disorders are a significant problem among college athletes.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

Eating disorders are a significant problem among student-athletes at your *institution*.  

<table>
<thead>
<tr>
<th>Eating disorders are a significant problem among student-athletes at your <em>institution</em>.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

Friends and peers play a role in students participating in athletics while attending college.  

<table>
<thead>
<tr>
<th>Friends and peers play a role in students participating in athletics while attending college.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

College athletes value the support and encouragement that they receive from their friends and peers while participating in athletics.  

<table>
<thead>
<tr>
<th>College athletes value the support and encouragement that they receive from their friends and peers while participating in athletics.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

Friends and peers can contribute to the development of an eating disorder in an athlete.  

<table>
<thead>
<tr>
<th>Friends and peers can contribute to the development of an eating disorder in an athlete.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

14-A. Are you aware of the guidelines that the NCAA has established to address eating disorders among college athletes? ____ Yes  ____ No (If no, skip to #15)

14-B. If yes, how satisfied are you with the guidelines the NCAA utilizes to educate:

**Circle the number that corresponds with your best response.**

<table>
<thead>
<tr>
<th></th>
<th>Very satisfied</th>
<th>Some what satisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Not very satisfied</th>
<th>Not at all satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-athletes about eating disorders?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Coaches about eating disorders?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Certified athletic trainers about eating disorders?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Athletic directors about eating disorders?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
15. When it comes to a student athlete developing or not developing an eating disorder, how influential is each of the following parties? **Circle the number that corresponds with your best response.**

<table>
<thead>
<tr>
<th></th>
<th>Least Influential</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>The athletic department</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>The athletic director (AD)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>A certified athletic trainer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>The coach</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Fellow athletes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Friends and peers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

C. Information

16. In the past 12 (twelve) months what percent of student-athletes have been diagnosed with an eating disorder at your institution? ______

17. What percent of student-athletes have ever been diagnosed with an eating disorder at your institution? ______

18. Which sport(s) have had an individual diagnosed with an eating disorder in the past 12 (twelve) months at your institution? **Mark all that apply.**

___ Men’s soccer
___ Men’s cross country
___ Men’s swimming
___ Men’s track
___ Wrestling
___ Women’s soccer
___ Women’s cross country
___ Women’s swimming
___ Women’s track
___ Women’s field hockey
___ Women’s volleyball
___ Women’s gymnastics
D. Demographics

19. Indicate your gender  ___ Male  ___ Female

20. Please indicate your age bracket
   ___ 20-29  ___ 30-39  ___ 40-49  ___ 50-59  ___ 60-69  ___ 70-older

21. Indicate the most advanced degree you have received.
   ___ Bachelor’s Degree  ___ Master’s Degree  ___ Post-Master’s Degree
   ___ Doctoral Degree  ___ Other

22. How many years have you been an athletic director on the collegiate level?
   ___ Less than 1 year  ___ 1 to 4 years  ___ 5 to 9 years
   ___ 10 to 14 years  ___ 15 to 19 years  ___ 20 or more years

23. How many years have you been an athletic director at your current institution?
   ___ Less than 1 year  ___ 1 to 4 years  ___ 5 to 9 years
   ___ 10 to 14 years  ___ 15 to 19 years  ___ 20 or more years

24. Which of the following varsity sports are offered at your institution? **Mark all that apply.**
   ___ Men’s Basketball  ___ Women’s Basketball
   ___ Men’s Cross Country  ___ Women’s Cross Country
   ___ Men’s Track  ___ Women’s Track
   ___ Men’s Soccer  ___ Women’s Soccer
   ___ Men’s Golf  ___ Women’s Golf
   ___ Men’s Tennis  ___ Women’s Tennis
   ___ Baseball  ___ Softball
   ___ Football  ___ Women’s Field Hockey
   ___ Wrestling  ___ Women’s Volleyball
   ___ Men’s Swimming  ___ Women’s Swimming
   ___ Men’s Lacrosse  ___ Women’s Lacrosse
   ___ ___ Women’s Gymnastics

Thank you for completing and returning this instrument. Please, return the completed instrument to:

Mary L. McDade, MA, ATC  102 Evergreen Dr.  Edinboro, PA 16412

A self-addressed stamped envelope has been included for your convenience. Thank you for your participation.
APPENDIX E

SAMPLE ATHLETIC DIRECTOR (AD) COVER LETTER
Appendix E

Sample Athletic Director (AD) Cover Letter

Training and Perceptions of Collegiate Athletic Directors Regarding Eating Disorders

The following instrument is being used to gain a better understanding of eating disorders among collegiate student-athletes. The research being conducted will focus on the significance of education, guidelines, and policies being established and implemented at collegiate institutions by athletic personnel to prevent and treat eating disorders among student-athletes. Mary L. McDade is using the research to elaborate upon an extensive literature review that has been completed and research that has been conducted over the past two years to work toward completing a dissertation at Kent State University toward a doctoral degree.

When you choose to participate, you are doing so by completing the instrument that has been included. The instrument will take you approximately 15-20 minutes to complete. By completing this instrument, you are consenting to participate in this research project. It is highly encouraged though that you participate so that the most valid information can be collected. There are no penalties associated with not participating in this study. Data collected from this instrument will be kept confidential. There are no identifying factors associated with completing this instrument.

There will be no identifying variables associated with participating in this study so, therefore, anonymity can be assured, even if the results from this study are published. There are no risk factors associated with this research project beyond everyday life experiences. If you would like more information about this project, please feel free to contact:

Mary L. McDade
B17 Crawford Center
Edinboro University
Edinboro, PA 16444
mmcdade@edinboro.edu
(814) 732-1444

Faculty advisor: Dr. Cindy Symons
Kent State University
140 Nixson Hall
Kent, OH 44242
csymons@kent.edu
(330) 672-0681

The Kent State University rules for research can be obtained from Dr. Sonia Alemagno, Vice President for Research (330) 672-6501.
APPENDIX F

SAMPLE THANK YOU/REMINDER POSTCARD
Appendix F
Sample Thank You/Reminder Postcard

*Front of postcard:*
Mary L. McDade, MA, ATC
P.O. Box 1006
Edinboro, PA 16412

*Different Athletic Director Addresses*

*Back of postcard:*

November 2010

A few days ago, you should have received in the mail a request to complete an instrument regarding student-athletes and eating disorders. Division II (DII) athletic directors were mailed the instrument.

If you have already completed and returned the instrument to me, please accept my sincere thanks. If you have not yet completed and returned your instrument, please do so today.

If you did not receive an instrument, or if it was misplaced, please call (814) 732-1444. Another instrument will be mailed to you.

Sincerely,

Mary L. McDade, MA, ATC
Kent State University
APPENDIX G

HUMAN SUBJECTS REVIEW APPROVAL FORM
Appendix G

Human Subjects Review Approval Form

March 31, 2010
Mary McGuire
ACHVE

Re: #10-107: “A Comparison of Perceptions of Athletic Directors and Student-Athletes on the Collegiate Level Regarding Eating Disorders”

I am pleased to inform you that the Kent State University Institutional Review Board has reviewed and approved your Application for Approval to Use Human Research Participants as Level II Exempt research. This application was approved on February 26, 2010. Your research project involves minimal risk to human subjects and meets the criteria for the following category of exemption under federal regulations:

☐ Exemption 1: Research conducted in established or commonly accepted educational settings, involving normal educational practices.

☑ Exemption 2: Research involving the use of educational tests, surveys, interviews, or observation of public behavior.

☐ Exemption 3: Research involving the use of educational tests, surveys, interview procedures, or observation of public behavior not exempt under category 2, but subjects are elected or appointed public officials or candidates for public office.

☐ Exemption 4: Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens.

☐ Exemption 5: Research and demonstration projects conducted by or subject to approval of department or agency heads, and which are designated to study, evaluate, or otherwise examine public programs or benefits.

☐ Exemption 6: Taste and food quality evaluation and consumer acceptance studies.

Submission of annual review reports is not required for exempt projects. If any modifications are made in research design, methodology, or procedures that increase the risks to subjects or include activities that do not fall within the approved exemption category, those modifications must be submitted to and approved by the IRB before implementation. Please contact the IRB administrator to discuss the changes and whether a new application must be submitted.

Kent State University has a Federal Wide Assurance on file with the Office for Human Research Protections (OHRP): FWA Number 00001853.

If you have any questions or concerns, please contact me by phone at 330-672-2704 or by email at Pwashko@kent.edu.

Sincerely,

Paulie Washko
Manager, Research Compliance, Communications and Initiatives
cc: Dr. Cindy Symons, Dr. Kele Ding

Division of Research and Sponsored Programs
Office of Research Safety and Compliance
(330) 672-2704 Fax: (330) 672-2658
P.O. Box 3400, Kent, Ohio 44242-0034
APPENDIX H

INSTRUMENT WRITTEN INSTRUCTIONS
Appendix H

Instrument Written Instructions

10/25/2010

1. The primary researcher is studying the following college sports in regard to eating disorders: men’s and women’s cross country, men’s and women’s soccer, women’s volleyball, wrestling, gymnastics, men’s and women’s track, men’s and women’s swimming, and women’s field hockey.

2. Please, read aloud the following statement explaining the purpose of the study:

3. Please, distribute one envelope to each student-athlete.

4. Have the student-athlete return the completed instrument to the envelope. Then have the student seal the envelope and return the instrument by placing it into a box so the instrument is not handed back to you as the athletic trainer.

5. Please, obtain all of the instruments and return them to the primary researcher.

Mary L. McDade
102 Evergreen Dr.
Edinboro, PA 16412

Thank you,
Mary L. McDade, MA, ATC
REFERENCES
REFERENCES


