

THE RELATIONSHIP BETWEEN BODY IMAGE AND DISORDERED EATING
IN INDIVIDUAL AND TEAM FEMALE COLLEGIATE SPORTS

A THESIS

Submitted to the Faculty of the School of Graduate Studies
and Research

of

California University of Pennsylvania in partial
fulfillment of the requirements for the degree of

Master of Science

by

Lacie Johnson

Research Advisor, Dr. Shelly F. DiCesaro

California, Pennsylvania
2012

CALIFORNIA UNIVERSITY of PENNSYLVANIA
CALIFORNIA, PA

THESIS APPROVAL

Graduate Athletic Training Education

We hereby approve the Thesis of

Lacie Johnson, ATC
Candidate for the degree of Master of Science

Date

Faculty

5-9-12

Shelly DiCesaro

Shelly P. DiCesaro, PhD, ATC, CSCS (Chair)

5/9/12

Carol Biddington

Carol Biddington, EdD

5/9/12

Laura Miller

Laura Miller, PhD

ACKNOWLEDGEMENTS

There are so many people in my life that mean so much to me and I wouldn't be here without them. First of all my family, they are my rock and backbone. They have helped me persevere through the past 20 some years of my life always telling me to reach for the stars. I love you Mom, Dad, Stephen, and Mollie!

Next, I would not have made it through the year if it weren't for the love of my life and fiancé Joe. Even though we are four and half hours apart, he has helped me tackle all of my troubles and been there through all of my achievements. They say distance makes the heart grow fonder, I believe our love has grown stronger because of this years experience. I cant wait to spend the rest of my life with him.

I would also like to thank Dr. Shelly DiCesaro, my thesis advisor, for all of her thoughtfulness and dedication, helping to make this project a successful one. I also need to thank my committee members, Dr. Carol Biddington and Dr. Laura Miller for their hard work and support as well.

I would like to especially thank all the student athletes from California University of Pennsylvania, Frostburg State University, Shippensburg University Lock Haven University, and their willingness to participate in my study.

To Jason Porterfield, and all the athletes and coaches at Trinity High School, thank you so much for the wonderful experience you have given me this year. I have truly loved every moment being your athletic trainer. Trinity will always hold a special place inside my heart. Go Hillers!

I would like to thank and send out love to all of my California graduate classmates. Thank you for all the laughs and fun memories. I wish you the best of luck with your future endeavors and hope that our paths will cross again sometime.

Finally to Annie Turner, Micayla Bowman, Hannah Ehlman, and Rachel Keil thank you for being some of the best friends a person can have! You guys always know how to put a smile on my face and I am so lucky to have you all as friends.

TABLE OF CONTENTS

	Page
SIGNATURE PAGE	ii
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	xi
INTRODUCTION	1
METHODS	6
Research Design	6
Subjects	6
Instruments	7
Procedures	9
Hypothesis (or Hypotheses)	10
Data Analysis	11
RESULTS	13
Demographic Data	13
Hypothesis Testing	16
Additional Findings	19
DISCUSSION	22
Discussion of Results	22
Conclusions	29
Recommendations	30

REFERENCES	32
APPENDICES	34
APPENDIX A: REVIEW OF LITERATURE	35
Body Composition	37
Calorie Expenditure and Nutritional Need	38
Body Image	39
Factors that Affect Body Image.	41
Disordered Eating	43
Anorexia Nervosa	43
Bulimia Nervosa	44
Causes of Disordered Eating	46
Prevalence in Athletics	49
Effects of Disordered Eating	52
Summary	55
APPENDIX B: The Problem	57
Statement of the Problem	58
Definition of Terms	59
Basic Assumptions	61
Limitations of the Study	62
Significance of the Study	62
APPENDIX C: Additional Methods	64
Survey Cover Letter (C1)	65
Demographic Questions (C2)	67
EAT-26 (C3).	70

BESAA (C4) 72

IRB: California University of Pennsylvania (C5) . . 74

REFERENCES 97

LIST OF TABLES

Table	Page
1. Frequency table of sports participation	14
2. Demographic information of subjects	15
3. Characteristics of Participants	15
4. BMI of subjects	15
5. Average scores on EAT-26 and BESAA	16
6. Pearson-Product Moment Correlation analysis between body image scores and disordered eating score	17
7. MANOVA for type of sports on the EAT-26 and BESAA and NCAA division II and division III on EAT-26 and BESAA scores	19
8. MANOVA for type of sports on the BESAA; Appearance, Weight, and Attribution	20
9. Pearson-Product Moment correlation for BMI and EAT-26	20
10. Pearson-Product Moment correlation for BMI and BESAA	20

LIST OF FIGURES

Figure	Page
1. Scatterplot of BESAA vs. EAT-26 scores	18

INTRODUCTION

In the sports arena today, the number of female athletes is on the rise. Regardless of gender, there is always the risk of injury or illness, but the risks associated with women may be different than those for men. The awareness of these injuries/illnesses, which are more specific to women, needs to become more ubiquitous.

For most women, participation in sports provides them with a positive experience. It can provide better health, well being, and of course a higher level of fitness. Unfortunately for some, this is not the case. They get trapped in the pressures to succeed and have the ideal body weight, which may result in restrictive eating and weight reduction behaviors that negatively affect performance, health, and well being.¹

Body image refers to the internal perception of one's own physical or outer appearance.² This can typically be measured as the difference between an individual's current and ideal body shape.³ This can be altered on many different occasions. Stresses can come from internal pressures or external stimuli. For example, it is seen that media influence and the desire to be

socially "thin" have the ability to cause a distorted body image.³ This study conducted by Steadman et al,³ also found that female athletes who participated in "lean" sports such as track and field, swimming and diving, etc. have a greater body image disturbance than those who did not. Even though the track athletes that participated in the survey had a lower body mass index than both that of the martial arts athletes and non athletes, they still saw themselves to have a significantly larger body size than what they actually had.³

A study done by Peden et al⁴ showed that athletes actually had a lower level of body dissatisfaction when surveyed about external pressures. Even though the external pressures of being an athlete were at a higher level; the rest of the population actually saw a higher amount of body dissatisfaction. This could be because they have no outlet such as exercise, like athletes do, so they turn all of their negative energy inward. It was also observed that there was a positive correlation in the athletic sample between competitiveness and body dissatisfaction.⁴ This feeling of inadequacy can lead to a multitude of disorders that are detrimental to a female athlete's health and performance.

Disordered eating is another issue that can be common within the female athletic population. Female athletes actually suffer from eating disorders more than the general population.⁵ It was found in a study done by Sundgot-Borgen and Torstveit⁵ that there was more incidence of subclinical and clinical eating disorders in the athletic population (14.3%) when compared to the control, which was the general population (4.6%). It was also found in this study that eating disorders are more prevalent in females than males.⁵

Altered dietary intake can harm an athlete in one way or another. Two common types of disordered eating are anorexia nervosa and bulimia nervosa. Anorexia nervosa is characterized by self-starvation while bulimia is a binge and purge syndrome in which huge quantities of food are consumed and then expelled through self-induced vomiting, use of diuretics or laxative, excessive exercise, or a combination of these methods.⁶ Both of these disorders are seen in the female athletic population. Some factors found to be possible causes of these negative actions were found in a study by Arthur-Cameselle and Quatromoni⁷. They included, negative mood states, low self esteem, perfectionism/ drive for achievement, desire

for control, negative influences on self-esteem, hurtful relationships, hurtful role models and sport performance.

A study completed by Hasse⁸ focused specifically on the associations between social physique anxiety and disordered eating in female athletes. Social physique anxiety is a subsection of social anxiety that specifically deals with a person's evaluation of themselves which can be directly related to body image.⁸ This relationship was looked at within team and individual sports. The results showed that individual sport athletes exhibited a higher level of social physique anxiety and bulimic behavior than team sport athletes. It was stated that involvement in these types of sports could in fact contribute to altered diet and bulimic symptoms.⁸

Body image and disordered eating have the capability of having a harmful affect on female athletes. While both can be totally separate from one another, there is the possibility of them coinciding. This study aims to see if there is any relationship as well as a link between body image and disordered eating. It will also evaluate these variables in a) team vs. individual sports and b) Division II and Division III NCAA athletics for body image and disordered eating. This was done by using a

2(team vs. individual) x 2(Division II vs. Division III)
factorial MANOVA for body image and disordered eating.

METHODS

The primary purpose of this study is to examine the relationship between body image and disordered eating in team and individual sports. This section will include the following subsections: research design, subjects, instruments, procedures, hypotheses, and data analysis.

Research Design

This study is a descriptive design using online surveys distributed through survey monkey to female athletes in the Pennsylvania State Athletic Conference and Capital Athletic Conference to gather data investigating the dependent variables body image and disordered eating. The independent variables in this study are the type of athlete, either team or individual as well as whether they compete at the NCAA division II or III level.

Subjects

The subjects for this study (N=106) were female collegiate athletes that participate in the PSAC and CAC.

There was a possibility of a total of 1326 surveys to be distributed. The following seven college/universities were used in this study; California University of Pennsylvania, Kutztown University, Bloomsburg University, Shippensburg University, Lock Haven University, Marymount University and Frostburg State University. The subjects were found to compete in team sports consisting of soccer, volleyball, basketball, lacrosse, softball, and field hockey and the individual sports, cross country, tennis, swimming/diving, track and field and golf. Prior to viewing the survey, there was a cover letter (appendix C1) each athlete read, which implied consent with participation. Each participant's identity remained confidential throughout the survey and is not included in the study.

Instruments

The instruments that were in this study included Demographic Questions (Appendix C2), the Eating Attitude Test (EAT-26) (Appendix C3), and The Body Esteem Scale for Adolescents and Adults (BESAA) (Appendix C4). Each of these were distributed via survey monkey.

The EAT-26 was used to evaluate eating attitudes of the subjects at hand. The EAT-26 has posted reliability coefficients ranging between .70 and .88.⁹ This test consists of 26 questions that require an option of "always", "usually", "often", "sometimes", "rarely", or "never". There are also five additional questions that ask about 1) eating binges, 2) self-induced vomiting, 3) the use of weight control substances, and 4) the use of exercise as a means of weight control and lastly 5) if the subject has lost 20 pounds in the past 6 months. There are a total of 26 items on the actual EAT-26 followed by a group of behavioral questions. "A score at or above 20 on the EAT-26 indicates a high level of concern about dieting, body weight or problematic eating behaviors".⁹ The higher the score the more of a chance disordered eating could be involved.

The Body Esteem survey for adolescents and adults was used to assess each subject's body image, or what they think of themselves. The BESAA tests in three different areas, appearance, attribution and weight. The internal consistency for the three were .92, .81, and .94 respectively.¹⁰ This scale consists of 23 questions in which the choices to respond are, "Never", "Seldom", "Sometimes", "Often", and "Always". It includes questions

that evaluate general feelings about oneself, evaluations attributed to others about one's body and appearance, and weight satisfaction.¹⁰ The scores on this survey can range from 0 to 92. The higher the score seen the more positive body image the subject has.¹⁰ These two instruments will allow for an evaluation of both body image and disordered eating.

Demographic questions included gender, age, height, current weight, highest and lowest adult weight, ideal weight, year in school, college or university they attend and the sport(s) they participate in.

Procedures

Prior to data collection, a cover letter asking for the female athletes participation in this study was sent to the 9 NCAA Division III Capital Athletic Conference and the 16 NCAA Division II Pennsylvania State Athletic Conference athletic directors. After receiving seven confirmed letter back saying they would participate, application was then made to the California University of Pennsylvania institutional review board (Appendix C5) for approval. Once permission was granted to continue with the study, a cover letter including a link to survey

monkey was sent to the athletic director's for them to forward to their female athletes. This link included a demographic questionnaire, the EAT-26 and the Body Esteem Scale for Adults and Adolescents. Consent was implied upon reading the cover letter and completion of the survey. This survey was strictly voluntary and participation could stop at any time. Two weeks into the survey, a reminder letter was sent to the athletic directors to once again forward on the link to the survey. After the surveys closed, all data was imported into an excel spread sheet and then put into the SPSS version 18.0 for the data analysis. All data was stored under password on the computer in Hammer all and all results are anonymous.

Hypotheses

The following hypotheses are based on previous research and the researcher's intuition after an exhaustive review of the literature.

1. There will be a negative correlation between body image score as measured by the BSEAA, and disordered eating as measured by the EAT-26.

2. There will be a significant difference between team and individual sports for a) Body Image Scores as measured by the BSEAA and b) disordered eating scores as measured by the EAT-26
3. There will be a significant difference between NCAA Division II and division III for a) body image score as measured by the BSEAA and b) disordered eating scores as measured by the EAT-26

Data Analysis

The level of significance was set to $\alpha=.05$ to test the acceptability of the stated hypothesis

The data was analyzed first using a Pearson Product moment correlation to see if there was a correlation between body image scores as measured by the BESAA and disordered eating scores as measured by the EAT-26. A 2 (team vs. individual) x 2 (Division II vs. Division III) factorial MANOVA was done to compare body image and disordered eating between a) team sport athletes and individual sport athletes and b) division II and division III athletes. All the data collected was imported into an

excel spreadsheet. The program SPSS version 18 was used to do all the data analysis.

RESULTS

The purpose of this study was to examine the relationship between body image and disordered eating in the world of female collegiate athletics. These two dependent variables were compared in team and individual sports as well as NCAA division II and division III. The following section contains the results that were collected through this study presented in three different subsections: Demographic Information, Hypothesis testing, and Additional Findings.

Demographic Information

A total of seven schools gave permission for participation for participation in this study. The surveys had the possibility of reaching 1326 female athletes. One hundred and thirty one surveys were received; however 106 surveys were completed in entirety and useable for data analysis. Responses were received from 5 of the 7. This was a response rate of 10%. Subjects completing the survey competed in the following

sports; soccer, volleyball, basketball, cross country, track and field, lacrosse, softball, field hockey, tennis, swimming/diving, and golf. Subjects were able to choose more than one sport but were asked to indicate the one that was their dominant sport. Table 1 displays the frequency of each sport.

Table 1. Frequency table of Sports participation.

Sport	N	Percent
Soccer	15	14%
Volleyball	14	13%
Cross Country	6	6%
Tennis	4	4%
Swimming/Diving	10	9%
Track and Field	24	23%
Basketball	1	1%
Lacrosse	3	3%
Softball	9	8%
Field Hockey	17	16%
Golf	3	3%

Soccer, volleyball, basketball, lacrosse, softball and field hockey were considered team sports while cross country, tennis, swimming/diving, track and field, and golf were classified as individual sports. There were 47 individual athletes and 59 team athletes that completed the survey. Table 2 shows the frequency of NCAA division II and NCAA division III athletes and classification of athletes.

Table 2. Demographic Information of subjects

Division	N	Percent
Division II	28	26%
Division III	78	74%
Individual	47	44%
Team	59	56%

With only receiving surveys from one division III school, the frequencies were asymmetrical with three times the number of surveys received from division II athletes as compared to division III. Finally within the demographic questioning, there was a section that asked for the subject's height, current weight, highest weight, lowest weight, and ideal weight. These characteristics can be seen below in table 3.

Table 3. Characteristics of Participants

Characteristic	Range	Mean
Height (M)	1.49-1.85	1.68±.08
Current Weight (kg)	45.36-108.86	65.67±11.61
Highest Weight (kg)	48.53-115.67	69.00±13.09
Lowest Weight (kg)	31.75-105.69	55.43±10.32
Ideal Weight (kg)	45.36-90.72	61.79±9.08

With this data it was possible to calculate body mass index (BMI) using the following formula $BMI = (\text{weight in pounds} \times 703) / (\text{height in inches})^2$. Table 4 shows the values that were observed.

Table 4. BMI of subjects

	Range	Mean
BMI	18.48-33.48	23.31±3.37

*BMI (Body Mass Index)

Hypothesis Testing

The level of significance used for testing each hypothesis was set at an alpha level of .05. Table 5 displays scores that were obtained on the EAT-26 and BESAA for both team and individual sport athletes.

Table 5. Average Scores on EAT-26 and BESAA.

	Sport Type	Mean	Std. Deviation	N
EAT-26	Individual	9.36	10.182	47
	Team	8.83	7.728	59
	All	9.07	8.859	106
BESAA	Individual	56.13	22.048	47
	Team	58.34	15.969	59
	All	57.36	18.843	106

Hypothesis 1: There will be a negative correlation between body image score as measured by the BSEAA, and disordered eating as measured by the EAT-26.

A Pearson Product moment correlation was obtained to determine if there was a relationship between body image as measured by the BSEAA and disordered eating as measured by the EAT-26.

Conclusion: From this analysis we are able to conclude that there is a moderately negative correlation between body image scores as measured by the BESAA and disordered eating as measured by EAT-26. The Pearson Product Moment correlation found a value a value of $-.528$

with a significance of $P < 0.001$. Table 6 provides the statistics that were derived from the Pearson Product Moment correlation.

Table 6. Pearson-Product Moment Correlation analysis between body image scores and disordered eating score

Variable	n	R	P
EAT-26 Score and BSEAA Score	106	-.528	.000*

* $P < .001$

This leads us to believe that within the population of collegiate female athletes, the higher the EAT-26 score examining disordered eating, a lower score on the body esteem survey for adolescents and adults can be expected meaning disordered eating and body image are inversely related. Figure 1 shows the scores of the EAT-26 and BESAA for each subject respectively, in a scatter plot form. A line of best fit was found at $y = -1.124x + 67.549$ with an r value of .528.

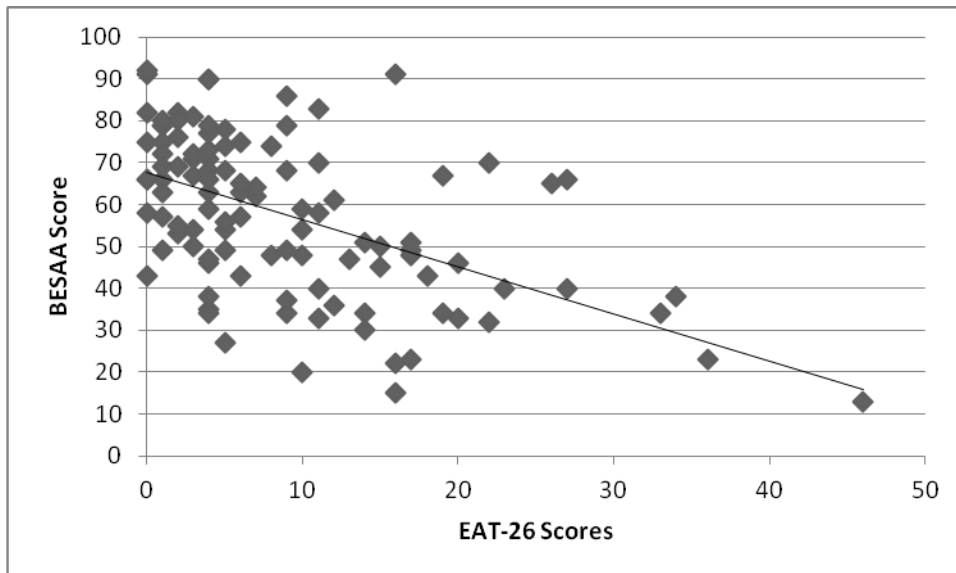


Figure 1. Scatterplot of BESAA Score vs. EAT-26 Scores

Hypothesis 2: There will be a significant difference between team and individual sports for a) B=body image scores as measured by the BSEAA and b) disordered eating scores as measured by the EAT-26

Hypothesis 3: There will be a difference between NCAA Division II and division III for a) body image score as measured by the BSEAA and b) disordered eating scores as measured by the EAT-26.

Conclusion: A 2 x 2 factorial MANOVA was calculated examining the effect of type of sport, individual or team and NCAA Division II v. III on the EAT-26 score and the BESAA score. No significant effect was found for either type of sport ($\Lambda_{2,101}=.990$, $P>.05$) or the division II v. division III ($\Lambda_{2,101}=.971$, $P>.05$). Neither the EAT-26 score

nor the BESAA score were significantly influenced by the independent variables type of sport or NCAA division.

Table 7 shows the results of the 2x2 factorial MANOVA.

Table 7. MANOVA for type of sports on the EAT-26 and BESAA and NCAA division II and division III on EAT-26 and BESAA scores

Source	Dependent Variable	Type III sum of squares	Df	MS	F	P
Team v. Individual						
	EAT-26	65.787	1	65.787	.840	.362
	BESAA	281.766	1	281.766	.785	.378
Division II v. Division III						
	EAT-26	226.021	1	226.021	2.885	.092
	BESAA	514.723	1	514.723	1.443	.234

*EAT-26 (Eating Attitudes test), BSEAA (Body esteem survey for adolescents and adults)

Additional Findings

The first additional finding of interest focused on the three subsections of the body esteem survey for adolescents and adults, weight, appearance and attribution within team and individual sports to see if there was a significant difference. The results of the MANOVA are shown in table 8.

Table 8. MANOVA for type of sports on the BESAA; Appearance, Weight, and Attribution

Team vs Individual	Type III sum of squares	df	Mean square	F	Significance
Appearance	11.656	1	11.656	.155	.695
Weight	.996	1	.996	.015	.904
Attribution	35.340	1	35.340	2.779	.099

When evaluated at a $p < .05$ significance level, there are no significant differences between team and individual sports for the three subsections of the Body esteem survey for adolescents and adults.

Another additional finding that was evaluated was looking at the Pearson product moment correlation between BMI, which was calculated using the height and current weight of each subject from the demographic section, and the EAT-26 and BESAA separately. Table 9 shows the results of the Pearson product moment correlation between BMI and the EAT-26 and Table 10 shows that of BMI and the BSEAA.

Table 9. Pearson-Product Moment correlation for BMI and EAT-26

Variable	n	R	P
BMI and EAT-26	106	.006	.951

* $P < .05$

Table 10. Pearson-Product Moment correlation for BMI and BESAA

Variable	n	R	P
BMI and BESAA	106	-.241*	.013

* $P < .05$

Conclusion: There is no significant correlation between BMI and scores obtained from the EAT-26 at an alpha level of $P < .05$. However there was a significant weak negative correlation between BMI and scores from the BESAA. This means that as higher body mass indexes are seen, we could expect to see lower scores on the BESAA.

DISCUSSION

Discussion of Results

This study focused on the relationship between body image and disordered eating in team and individual female collegiate athletes. The researcher examined whether there is a relationship between body image scores as measured by the Body Esteem Survey for Adolescents and Adults and disordered eating as measured by the EAT-26 were related, as well as if there were any differences seen between the scores in the type of sport they competed in.

Hypothesis 1 stated that there will be a negative correlation between body image score as measured by the BSEAA, and disordered eating as measured by the EAT-26. The researcher proposed that these two variables are related and do have an inverse influence on one another. There has also been past research conducted with consistencies that support this statement and that the two variables are in fact related.^{8,12}

Findings showed that there was a significant moderate negative correlation found when comparing these two variables, whereas 52.8% of the time a body image score can be predicted from a disordered eating score and

vice versa. Previous research found that female athletes who were unhappy with their weight experienced greater social physique anxiety as well as more signs of disordered eating.² Social physique anxiety is a subtype of social anxiety that involves one's personal evaluation involving ones physique.² This study by Hasse² found that athletes in fact do experience higher weight perceptions which was found to be associated with high perfectionism, SPA and greater disordered eating. These concerns were found to lead to situations that are often managed using unhealthy behaviors such as disordered eating or excessive exercise.¹² Weight perception is one of the three aspects of the body esteem scale for adolescents and adults and could have an effect on the total score seen.

Hypothesis 2 stated that there will be a difference between body image scores as measured by the BESAA and disordered eating scores as measured by the EAT-26 for team and individual athletes. The researcher proposed that individual sports would see lower body image scores and higher disordered eating scores as compared to those female athletes competing in team sports. This was concluded from past research and their findings.^{8,11-14}

No significant difference was found for individual athletes when compared to team sport athletes when comparing body image scores and disordered eating scores. Past research results revealed significantly higher social physique anxiety for individual sport athletes were significantly higher than team sport athletes.^{2,8,11} Hasse⁸ found that social physique anxiety was more strongly correlated with disordered eating correlates (dieting and bulimia subscales) for individual sport conditions as compared to team sport conditions. Review of these findings would leave you to believe that individual sport athletes would have lower body image scores and higher disordered eating scores when compared to team sport athletes. Reinking and Alexander¹¹ showed that 25% of lean sport athletes had more disordered eating symptoms and were at greater risk of developing an eating disorder compared to 2.9% in non-lean sports. "Lean sports" are those sports that place a competitive value on leanness, including sports such as running, diving, swimming gymnastics, and dance.¹¹ While athletes in these sports are competing for a team score, the events are predominantly individual. This would lead us to believe that higher distorted body image and higher instances of disordered eating would be seen in

individual sport athletes when compared to team sport athletes. Although no significant differences were found in this study between team and individual athletes for body image scores and disordered eating scores, the researcher believes that this area should continue to be evaluated due to prior findings. Studies have shown conflicting results. Our data is limited due to the number of participants in this study.

Hypothesis 3 stated that there would be a significant difference between body image scores as measured by the BESAA and disordered eating scores as measured by the EAT-26 for NCAA division II and division III. The researcher proposed that it could be possible that lower body image scores and higher disordered eating scores may be seen at the division II level because of the pressures of maintaining a scholarship. Some athletes at this level are scholarship dependent and have to perform to maintain their scholarship.

Our findings showed that there was no significant difference between body image score and disordered eating scores in division II and division III. Despite the lack of significance in the data, scholarship dependency could be crucial for screening those with a poor body image or

those that could be susceptible to dealing with disordered eating.

In addition to these findings, analyses were conducted looking at the scores of the BESAA in its three subsections; appearance, weight, and attribution. The researcher proposed that there would be differences in these scores when categorized into team and individual sport athletes. There were no significant differences between the three scores for team and individual sports. In past research, specifically track athletes, martial artists and non-athletes, there were no significant differences in the groups when asked about the body they want to possess.³ It was also shown that track athletes had a higher body dissatisfaction score than the martial artists and non athletes.³ Although there was no significant difference found in this study, the researcher believes that further research should be done to see if type of sport, team or individual, affects body image and the three subsections of the body esteem survey for adolescents and adults; appearance, weight, and attribution.

Another additional finding examined the correlation between BMI and both the EAT-26 and BESAA separately. It was discovered that no significant correlation was found

between BMI and EAT-26 scores; conversely a significant weak negative correlation was found between body mass index and BESAA scores. From this it can be concluded that it is possible that with a higher BMI a lower body image score could be observed. Body mass index is a calculation using strictly height and weight and does not incorporate body composition. A higher BMI could cause a female to have a lower body image, not realizing that the reason their BMI is higher is because it does not account for muscle mass. Just because they have a higher BMI does not mean that they are overweight or obese. In order to have a better idea of body composition, the researcher would recommend them getting a body composition analysis. This could help them to realize that they are in fact not overweight.

When examining the mean current weight of the subjects, 144.77 ± 25.59 compared to the mean ideal weight of the subjects, 136.23 ± 20.01 the researcher found it interesting that there was an eight and a half pound difference in the two meaning that the majority of the subjects are not happy with their weight. Also found in the demographic section was the BMI. This was able to be determined using the height in inches and weight in lbs.

The mean BMI found for subjects was 23.31. This is within the normal range of BMI scores.

Lastly eating disorders can have effects from the time of the eating disorder to later in life. A study done by Rubenstein et al¹⁵ found that attempts at weight loss at a younger age, made it more likely for them to have worse eating habits as an adult. These problematic habits may then be passed down to their children. It is important for children to establish proper eating habits at an early age for a multitude of reasons including proper growth, academic performance and general well being into adulthood. Disordered eating may also be a cause of low bone density.¹⁶ This can lead to a condition called osteoporosis which is often an early onset when coupled with disordered eating. This in turn may increase the chance of stress fractures at an earlier age.¹⁶ Finally, amenorrhea is another side effect associated with disordered eating. Amenorrhea and menstrual irregularities associated with disordered eating can lead to infertility and make it challenging if not impossible to have children.¹⁷ This is due to changes in ovulation with amenorrhea therefore changes in production of an egg to be fertilized. All of the aforementioned health issues

may be side effects from disordered eating that can affect adolescents into adulthood.

From the results of this study, it can be hypothesized that there is a relationship between body image and disordered eating in female collegiate athletes. Coaches and athletic trainers should strive to continue to educate themselves about the issues that may be affecting their female athletes.

Conclusions

Based on the results found in this study, there was a significant moderate negative correlation between body image scores and eating attitudes scores. As athletic trainers we need to be more aware of negative body image. This could include recognizing poor self esteem, or body dissatisfaction. Findings lead us to believe that in these cases, athletes could be predisposed to disordered eating. The results support previous research that shows that poor body image and body dissatisfaction can be related to disordered eating patterns.

It should also be noted that since there was no difference found between team and individual sports for the scores on the EAT-26 and BESAA, the type of sport the

athlete participates in is not a valid predictor of body image issues and disordered eating habits. Thus, athletic trainers, coaches, parents, and teammates must not be biased towards specific sport athletes but instead treat everyone equally, as if they could may be predisposed to these issues.

The demands of a female collegiate athlete coupled with the drive for perfection has lead to poor body image and behaviors associated with disordered eating for some athletes. These athletes may continue to practice these unhealthy behaviors without being treated and unrecognizing that they have a serious problem. These issues may not only have an impact on their sport life, but life after college athletics as well, such as adulthood and parenting.

Recommendations

The results from this study were derived from only five different schools with athletes participating in 11 different sports in a condensed demographic area.

Future research in this area should use all schools from different demographic regions as well as divisions. This would give you a better idea of female collegiate

athletes as a population. Additionally, more effective distribution would be beneficial. Having the survey sent directly to the female athletes may help to increase the response rate.

Further research should include the effect of the level of sport on body image and disordered eating, ranging from high school level athletes to elite level athletes. Furthermore, research could look at difference between male and female athletes in these two different areas of concern.

Lastly, focusing on just those who received a score of 20 or more on the EAT-26, which is indicative of an eating disorder may elicit different findings.

I think that it is important that as athletic trainers we inform our athletes about poor body image and disordered eating and the harm it can cause and also provide them resources so if they need help, they can get it.

REFERENCES

1. Beals K. Subclinical eating disorders in female athletes. *J Physical Education Recreation Dance*. 2000;71:23-29.
2. Hasse, AM.; Weight perception in female athletes: Association with disordered eating correlates and behavior; *Eating behaviors*: 2010;12:64-67.
3. Steadman L, Swami V, Tovee MJ, A comparison of body size ideals, body dissatisfaction, and media influence between female track athletes, martial artists, and non-athletes. *Psychology Sport Exercise*; 10(2009);609-614.
4. Peden J, Stiles B, Vandehey M, Diekhoff G. The effects of external pressures and competitiveness on characteristics of eating disorders and body dissatisfaction. *Sport Social Issues*. November 2008;32(4):415-429.
5. Sundgot-Borgen J, Torstveit M. Prevalence of eating disorders in elite athletes in higher than in general population. *Clinical Sports Medicine*. January 2004;14.
6. Thompson J, Heinberg L, Altabe M, Tantleff-Dunn S. *Exacting Beauty: Theory, assessment, and treatment of body image disturbance*. American Psychological Association. 1999.
7. Arthur-Cameselle JN, Quatromoni PA. Factors related to the onset of eating disorders reported by female collegiate athletes. *Sport Psychologist*. 2010;25: 1-7.
8. Hasse A. Physique anxiety and disordered eating correlates in female athletes: Differences in team and individual sports. *Clinical Sport Psychology*. September 2009;3(3):218-231.
9. Burnett K, Doninger G, Enders C. Validity evidence for eating attitudes test scores in a sample of

- female college athletes. *Measurement Physical Education Exercise Science*.2005;9:35-49.
10. Mendelson B, Mendelson M, White D. Body Esteem Scale for adolescents and adults. *Personality Assessment*. 2001;76:90-106.
 11. Reinking M, Alexander L. Prevalence of disordered eating behaviors in undergraduate female collegiate athletes and non-athletes. *Athletic Training*. 2005;40:47-51.
 12. Martin Ginis KA, Leary MR. Self-presentational processes in heath damaging behavior. *Applied Sport Psychology*. 2004;16:59-74
 13. Catikkas F, Koyuncu M, Meliha C, Derdar T A.; Body image satisfaction and dissatisfaction, social physique anxiety, self-esteem, and body fat ratio in female exercisers and non exercisers; *Social Behavior Personality*;2010;38(4):561-570.
 14. Greenleaf C, Petrie T, Carter J, Reel J. Female Collegiate Athletes: Prevalence of eating disorders and disordered eating behaviors. *American College Health*. March 2009;57(5):489-496.
 15. Rubinstein TB, McGinn AP, Wildman RP, Wylie-Rosett J. Disordered eating in adulthood is associated with reported weight loss attempts in childhood. *International Eating Disorder*. 2010;43(7): 663-666.
 16. Manore MM, Kam K, Loucks AB. The female athlete triad: components, nutrition issues, and health consequences. *Sport Sciences*. 2007;25(1):61-71.
 17. Maxwell M, Thornton L, Bulik C, et al. Life beyond the eating disorder: education, relationships, and reproduction. *International Eating Disorders*. April 2011;44(3):225-232.

APPENDICES

APPENDIX A

Review of Literature

REVIEW OF LITERATURE

Women compete at very high levels and overcome just as many obstacles as men as collegiate athletes, but in some ways it can be very different. Body image, by definition, is an opinion of one's physical appearance based on both the way one sees him/herself as well as opinions of others.¹ Research has shown that body image can have an effect on disordered eating including both anorexia nervosa and bulimia nervosa.²⁻⁴ These disorders could lead to body dissatisfaction and/or disordered eating because they feel the pressure to change.

In the following review of literature, body image and eating disorder will be discussed in the following sections: (1) Body Composition, (2) Calorie Expenditure and Nutritional Needs, (3) Body Image, and (4) Disordered Eating. Within disordered eating there are four subsections; anorexia nervosa, bulimia nervosa, factors that affect disordered eating, and prevalence. At the end of the literature review there will be a summary.

Body Composition

A test of body composition is a measure that determines the amounts of body fat versus lean muscle mass a person has. It is one of the many factors that influence performance capabilities in athletes with published normal ranges suggested for female and male athletes. Though optimal body fat percentages differ between athletes, sports, and positions, in 2000, estimated essential body fat for a male was approximately 5% while for a female it was 8 to 12 %.⁵ According to the American academy of sports medicine, numbers below this may be detrimental to an athlete's health.⁵ Low body fat percentage is often associated with disordered eating, hormonal disturbances, low bone density, sports injuries, and other health-related problems.⁵ In a 2006 study by Gibson et al,⁵ body fat levels were evaluated among many different male and female sports. It was seen that in male Nordic skiers, distance runners, and multi event track and field athletes that body fat percentages were low.⁵ This is concerning because these levels can be detrimental to their physical health. Body fat percentage levels were very fluctuating within women's sports as well. Those who participated in tennis, softball, rowing,

jumping and multi event track and field sports showed higher body fat percentages than normal while those in basketball, skiing, soccer, individual track and field events, swimming and diving, and volleyball showed lower than average.⁵ For athletes, body composition is a very important factor influencing performance capabilities and health status. It is important to monitor these values and note any unhealthy changes in any of the athletes.

Calorie Expenditure and Nutritional Needs

Athletes are not necessarily considered "average" people when it comes to calorie expenditure. With the rigor of competition and training, they burn up a significant amount more. Total energy expenditure and requirements are unique for each athlete and may be dependent on basal metabolic rate, thermic effect of food and activity, and in some cases growth.⁶ It is both important for activity as well as recovery that necessary measures are taken to ensure the health and well being of the athletes. A study conducted by Clark et al⁶ was done to report baseline dietary data, body composition and performance indices of division 1 soccer players during their rigorous two a day preseason and then in post-

competitive season. To measure baseline dietary data, three day food logs were kept by each of the subjects. It was observed that there was a greater intake of carbohydrates, protein and total caloric intake in the pre season phase compared to post season. Though their ingestions of carbohydrates increased during pre season, it was still not sufficient to provide for glycogen repletion, even though they were taking in an adequate amount of calories.⁶ Broad et al⁷ stated that there are some dietary programs that restore and can even super compensate muscle glycogen levels, which can enhance play, especially during tournaments. It is important that carbohydrates and protein are taken before and after training sessions to optimize recovery. Any athlete should be warned about taking in too little of an energy source because it can have a negative effect on metabolic, hormonal, and even immune system function.⁷ This could lead to more damaging effects on the body if not noticed and taken care of.

Body Image

Body image can be a trying issue in all athletes but is clearly more prevalent in female athletes.⁸ Body image

is classified as how someone feels about themselves based on their opinion and their interpretation of how others see them.⁹ There are a number of issues that can be wrong with a person's body according to oneself. Negative body image can lead to multiple issues that could in turn lead to unhealthy behaviors. There have been studies that have been done to attempt to find the source of body image distortions and what factors play into account. One study by Catikkas et al¹⁰ focused on the relationship between social physique anxiety, body image dissatisfaction, self-esteem and body fat ratio in female exercisers and non exercisers.¹⁰ There was a strong relationship found between these three variables, meaning that they do in fact affect one another. They have looked at interventions for those female athletes with distorted body image, with a desired response to decrease the pressures assumed in their respected playing fields. The study also worked on their attitudes on their appearance and self efficacy. After intervention, according to post-questionnaires the only difference seen was they recorded less pressure to be thin than the control group.¹⁰

Factors That Affect Body Image

There are many factors that can affect body image including internal stimuli or the external environment. Athletes are capable of being dissatisfied with their bodies, a behavior exhibited with image distortion and the way athletes see themselves. With societal pressure to be thin and the use of extremely thin models and actresses, society has a tendency to equate thin with beauty. Steadman et al.¹¹ did a study focusing on media influence on body dissatisfaction. It was used to examine body size ideals, body dissatisfaction, and media influence dependant on the subjects demographic information of being either a female recreational athlete or non athlete.¹¹ After looking at the results, there was no statistical difference found between athletes and non athletes when comparing ideal body size. It was seen that track athletes reported the highest incidence of body dissatisfaction as well as media influence. This finding leads us to believe that track athletes worry about their image and have the potential to be victims of social standards. For the total sample, the body mass index of a participant and the influence of the media were key factors in determining body dissatisfaction rather than

sport type. The results do support that those women participating in lean promoting sports experience higher body dissatisfaction than those who do not.¹¹

A study by Hasse¹² examined associations that exist between weight perception and disordered eating correlates (perfectionism and social physique anxiety (SPA)) and eating behaviors in female athletes. Social physique anxiety is a subsection of social anxiety that is a direct evaluation of oneself.¹² This evaluation has a direct link with body image. This study used the EAT-26, 9-item Social Physique Anxiety Scale, self reported height and weight, and weight perception were obtained from each of the subjects.¹² It was found that athletes who believed they were overweight reported negative perfectionism, higher social physique anxiety and disordered eating more than those who had normal weight perceptions.¹² This leads to the conclusion that a negative evaluation of weight has an affect on evaluation of oneself as a whole.

These are not the only sources of negative body image, they can come from a variety of different places as it has been seen. Negative body image has the possibility of leading to behaviors that may be detrimental to ones health and performance.

Disordered Eating

Disordered eating is a prevalent issue among female athletes that may present itself in many different ways.¹³⁻²¹ Two of the more common behaviors are anorexia nervosa (AN) and bulimia nervosa, patterns of restrained eating as well as binge eating. With disordered eating, hunger and fullness are usually ignored. In some cases it is hard to recognize signs of disordered eating because they are so discrete. Common signs and symptoms of disordered eating according to the National Eating Disorder Information Center could include repeated concerns about being fat, low self-esteem, extreme loss or fluctuation in weight, avoidance of eating in public, engaging in excessive exercise, etc.¹³ Any of these behaviors should send an alert that someone may be experiencing an eating disorder.

Anorexia Nervosa

Anorexia nervosa is characterized by the failure of a person to keep their minimum weight within 15% of normal body weight.¹⁴ There are many signs and symptoms associated with this condition including food restriction, concern about their weight and a fear of

gaining weight. Excessive exercising may also be used as well as laxative as a means of losing weight. This condition causes an obsession with ones weight to a dangerous extent.¹⁴

Salbach et al¹⁵ conducted a study to compare as well as look at the prevalence of, the signs and symptoms of disordered eating within rhythmic gymnasts, high school students and clinically diagnosed anorexia nervosa patients. They were looking for irregular eating habits, body image distortion, the presence of frequent exercising and amenorrhea. The height, weight and BMI of these subjects were taken into account as well. Even though rhythmic gymnasts had a lower BMI than high school students, they did not show any obvious signs of eating disorders when compared to the anorexia nervosa patients. Both high school students and rhythmic gymnasts showed signs of being amenorrheic.¹⁵ This proves that signs and symptoms of anorexia nervosa can be seen in multiple populations, from everyday students to rigorous athletes, and should be monitored and noted accordingly.

Bulimia Nervosa

Bulimia nervosa is another of the common eating disorders that has been studied widely. Bulimia nervosa

is a sickness in which a person feels like they lose control. It can consist of bingeing on food and/or having regular episodes of overeating and feeling a loss of control.¹⁶ There are several methods that can be used to prevent weight gain. The most common include self-induced vomiting or laxative abuse. Similar to anorexia nervosa there are specific symptoms that are indicative of bulimia nervosa. Some of these could include, eating binges that occur several times a day for many months, purging to prevent weight gain in the form of vomiting, excessive exercise, or laxatives, going to the bathroom right after meals, etc.¹⁶ This is also an eating disorder that requires medical and/or psychological attention and has the possibility to affect female athletes.

In a study by Brannan et al,¹⁷ 24% of the time it was found that body dissatisfaction and bulimic symptoms were related when looking at female collegiate athletes. The strength of this relationship saw an increase when concerns over making mistakes, being motivated to exercise to improve appearance and attractiveness, or to socialize and improve mood were used as moderators of body dissatisfaction and bulimic symptoms. Self esteem had a buffering effect on the relationship between body dissatisfaction and bulimic symptoms; it was able to

weaken the relationship between the two variables if the athlete had a positive self esteem.¹⁷ It was also shown in an earlier study by the same authors, that 42% of the cases reported, the psychosocial variable was the leading cause of the bulimic symptoms.¹⁸ Higher levels of body dissatisfaction, more dietary restraint, and stronger feelings of guilt were associated with bulimic symptomatology while feelings of fear, hostility, or sadness were unrelated.¹⁸ Bulimia nervosa can have a detrimental affect on athletes in multiple ways. These negative habits that are developed leading to an eating disorder typically have an underlying origin.

Causes of Disordered Eating

According to researchers, disordered eating may be an expression of internal turmoil. It has been reported that those affected only want a way out. There have been many of studies^{13,19-22} done to identify factors that are related to and contribute to disordered eating. Arthur-Cameselle and Quatromoni¹⁹ identified some of the factors discovered to be an influence on disordered eating after individual interviews. The factors included negative mood states, low self esteem, perfectionism/ drive for achievement, desire for control, negative influences on

self-esteem, hurtful relationships, hurtful role models and sport performance.¹⁹ There were similar factors that affected non athletes but it was found that being in the athletic arena posed a threat towards disordered eating habits. This could be due to comments by a coach, fellow athletes having an eating disorder, the pressure of sport performance and many more.

Social pressures seem to be a prevalent issue in female athletics when it comes to being a factor in disordered eating.¹⁹ d'Arripe-Longueville, Maiano, and Scoffier²⁰ used 227 elite level adolescent athletes and focused on the effects of social relationships of the athletes and acceptance of disturbed eating attitudes (DEA). Four different surveys were used to test the social relationships between their coach, friends and parents and the acceptance of their peers. From these surveys it was found that the relationship between the parents and athletes as well as peer acceptance had a negative influence on disturbed eating attitudes and acted as a protective factor. Conversely, the relationship between the coach and the athlete had the possibility of being a risk factor for the development on DEA.²⁰

Competitiveness is another factor that may possibly be an affect on disordered eating. The relationship

between external pressures to excel, competitiveness, eating disorder characteristics and body dissatisfaction were evaluated through the use of surveys.²¹ This study which was conducted by Peden et al²¹ consisted of both male and female athletes. It was found that external pressures and competitiveness both positively correlated with eating disorder characteristics and body dissatisfaction. It was also shown that the athletic sample received more external pressure yet they saw less eating disorder characteristics as well as body dissatisfaction. In this case there was no relationship between competitiveness and disordered eating.²¹

Media is another avenue that may contribute to disordered eating. Young women may feel the need to want to look like the beautiful, thin people that are portrayed in TV shows and movies. A study was done by Bissell et al²² to specifically investigate the exposure of two different types of media (entertainment and sports) and look at the correlations between it and body image distortion and eating disorders.²² There were 78 female athletes that participated in this study. They were each surveyed on how often they watch certain TV shows in the following categories, televised sports or sports media, entertainment media and thin media, as well

as body improvement magazines and their interest in these. The Eating Attitudes test, as well as the Eating Disorder Inventory survey were also given to each of the subjects to look at the dependent variable. The results showed that interest in "thin" TV shows and magazines was a significant predictor for disordered eating. Sports media only correlated with minor degrees of eating disorder symptomatology.²² This would prove that there is some desire for any person, even athletes to want to be like thinner people that they see on the television.

A final factor proven to have an affect on disordered eating is body dissatisfaction. As stated previously, Hasse¹³ did a study that look specifically at the associations between weight perception and disordered eating correlates and eating behavior in female athletes. The results showed that female athletes that believed they were overweight reported higher levels of disordered eating.¹³ This suggests negative body image may be associated with disordered eating. Disordered eating is not something that should be taken lightly.

Prevalence in Athletics

Disordered eating has become a prevalent issue in the world of female athletics. It has been found by

research that it is in fact more prevalent in athletics than the general population.²³⁻²⁶ Torstveit et al²³ did a study to examine female athletes and the percentage of them with disordered eating behaviors.²³ It also was used to investigate what the characteristics are of a typical athlete with an eating disorder. It was found that 32.8% of athletes and 21.4% of the controls or the general population were found to have a clinical eating disorder. There was more of a prevalence found in those athletes that competed in lean sports compared to non-lean sports when it came to disordered eating.²³

Another study by Gordon et al²⁴ focused on the difference in eating disorder symptoms between women in different levels of athletic ability from undergraduate varsity athletes to non exercisers. There were 274 subjects that completed the necessary surveys to gather data. It was once again found that it was more common to see symptoms of disordered eating in women who were athletes when compared to non exercisers. In higher levels of competition it was seen that there was more anxiety and therefore more cases seen of bulimic symptoms and the drive to be thin. Also body dissatisfaction correlated directly with higher levels of sport anxiety.²⁴

This comes to prove that there is a relationship between pressure on athletes and disordered eating symptoms.

There is a drastic difference between collegiate athletes and non athletes when it comes to personality. Collegiate athletes are spending numerous hours at practice, as well as with their classes, while the non athlete mainly just has school and extracurricular activities. A study overseen by Reinking et al²⁵ was done to compare disordered eating symptoms in female collegiate athletes versus non athletes. The subjects were either NCAA division 1 athletes or residence hall females who volunteered for the study. Though there is a difference seen between the two, it is more important to be aware that it is possible for disordered eating to appear in all females.²⁵ There was another study done by Williams et al²⁶ to exam eating behaviors as well as body image concerns and its prevalence in this population. Data was gathered using a convenience sample from nine different colleges/universities. The survey consisted of three different sections, one simply to examine age, athletic activity and other general demographic data. The second was self reported weight and height as well as desired weight and height. It also recorded any weight control behaviors and the reasons for them. It also

contained the EAT-26. The final section consisted of the Eating attitudes test which took a look at body image, drive for thinness, and body dissatisfaction to name a few. It was found that 20.1% were classified as having a subclinical eating disorder, the mean age of this group being 19.4 years old. There was no single sport that the overall mean was at an at-risk criterion for desired thinness or body dissatisfaction. Diving scored the highest in both of these categories.²⁶

We should be aware that at a higher level, the level of competition and pressure is driving to disordered eating. All in all it is important to know who you are dealing with and the possibility of disordered eating arising. Disordered eating has the possibility of contributing to what we call the female athlete triad.

Effects of Disordered Eating

Disordered eating can be very harmful to an athlete's body. There are many health conditions that it can lead to that can affect many things in the future. Athletes with disordered eating consume less energy than that required of the physical demands of the sport they are competing in.²⁷ When energy is low, the amount of macro and micro nutrients that the athlete is getting is

also probably low. This reduced intake of macronutrients, especially the essential amino acids and essential fatty acids, can decrease the body's ability to build bone, maintain muscle mass, repair damaged tissue and recover from injury.²⁷ Micronutrients are important for building bones and muscles tissue, replacing red blood cells, and providing co-factors for the energy producing metabolic pathways.²⁷ Not getting enough of these will make these processes inefficient.

Menstrual irregularities and poor bone health are both common effects of disordered eating.²⁷⁻²⁹ Amenorrhea, or lack of a menstrual cycle is one of the side effects of disordered eating.²⁸ While it is common for a late onset in high intensity level athletes, it has been suggested that it is also results from low energy availability. If this level imbalance is extreme or persistent, it causes the body to suppress physiological functions that are necessary for normal growth and development. In this case, the hypothalamus turns off the reproductive system leading to amenorrhea.²⁹

The combination of both amenorrhea and malnutrition associated with disordered eating can lead to loss of bone mineral density.²⁸ Low bone mineral density can lead to numerous complications such as an increase in stress

fractures as well as the long term health problem of osteoporosis.²⁸ This condition is caused by low energy availability and decreased endogenous estrogen due to amenorrhea because without estrogen, bone resorption exceeds bone formation causing low bone mass. These three conditions, disordered eating, amenorrhea, and low bone density, combined make up the female athlete triad and can be very detrimental to athletes both now and in the future.

A study done by Thompson²⁹ examined the characteristics of the female athlete triad in collegiate cross country runners. It was found that 19.3% of the subjects surveyed said they perceived or had been told that they had an eating disorder.²⁹ 23% of the women reported current menstrual dysfunction. More than 50% of these women reported not taking in an adequate amount of calcium and there is a positive relationship between calcium intake and premenopausal bone density.²⁹

The effects of disordered eating can be both damaging now as well as later in life. A study done by Rubenstein et al³⁰ examined the relationship between attempts to lose weight as an adolescent to disordered eating habits as an adult. There was a positive relationship found between those who attempted weight

loss strategies as an adolescent and disordered eating as an adult. This is important to notice because it would be easy to pass these practices down to their children. Another serious side effect of disordered eating is osteoporosis that can develop from low bone density.²⁸ This can increase the risk of stress fractures during adulthood into the elderly. Finally Maxwell et al³⁰ examined the association of menstrual irregularities with the inability to reproduce when disordered eating was involved. The findings were noteworthy and that women who have suffered from menstrual irregularities and disordered eating are less likely to reproduce. This is due to the fact that during amenorrhea, a female does not ovulate, therefore not creating an egg to be fertilized.³¹ All of these issues are long term effects of disordered eating that are detrimental to the health of adults.

Summary

The female athlete is a unique individual who can experience both benefits as well as consequences of participation in sport. Two consequences that can be seen are distorted body images and disordered eating.

Distorted body image can be the effect of many different precursors. From perfectionism and the pressures of high level competition to what is seen in the media and social norms. It can occur in the most sound minded of athletes. Distorted body image can lead to unhealthy behaviors that can have an affect on their athletics as well as just normal every day life.

Disordered eating is just one of these unhealthy habits that can occur from having a poor body image. This topic can be combined with excessive exercise and dieting techniques. Disordered eating includes anorexia nervosa, bulimia nervosa, and any other form of food limitation. The effects of disordered eating can haunt someone for the rest of their life because they are so detrimental.

Body image and disordered eating are just two variables that can be harmful to female athletes, and two go hand in hand with each other. There is not just one cause of distorted body image and disordered eating but a knowledgeable athletic trainer should be able to recognize signs and symptoms of these two conditions and identify the source of the issue.

APPENDIX B
The Problem

STATEMENT OF THE PROBLEM

The purpose of this study is to examine the relationship between body image and disordered eating in female collegiate athletes. It has been found that there is a prevalence of disordered eating as well as body image disturbances that are seen in the female athletic population.^{2-4,8-12,15,17-26} Some of these studies have focused on the factors that effect body image and disordered eating individually. They have looked at multiple levels of athletes from NCAA division I to club level and intramural sport athletes.

This study will examine the correlation between body image and disordered eating as measured by the body esteem survey for adolescents and adults and the EAT-26 respectively. It will also examine the differences of these two variables in team and individual sport athletes. It is important to examine this relationship because if we find that the two affect one another we may be able to reduce the occurrences of negative body image and disordered eating in female athletes. Disordered eating can be very detrimental to an athlete on a physical and emotional level.

Definition of Terms

The following definitions of terms will be defined for this study:

1. Anorexia Nervosa- according to the Diagnostic and Statistic Manual of the American Psychiatric Association, anorexia nervosa is defined as
 - a. Refusal to maintain body weight at or about a minimal normal weight for age and height (e.g., weight loss leading to maintenance of body weight less than 85% of that expected; or failure to make expected weight gain during period of growth, leading to body weight less than 85% or expected
 - b. Intense fear of gaining weight or becoming fat even when underweight.
 - c. Disturbance in the way one's body weight or shape is perceived; undue influence of body weight or shape on self-evaluation, or denial of the seriousness of current low body weight
 - d. In post-menarchal females, a woman is considered to have amenorrhea if her periods occur only following hormone, e.g., estrogen, and administration

2. Body Image- Is an opinion of one's physical appearance based on both the way one sees him/herself as well as opinions of others
3. Bulimia Nervosa (BN) - according to the Diagnostic and Statistical Manual of the American Psychiatric Association, bulimia nervosa is defined as
 - a. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following
 - i. Eating in a discrete period (e.g., within any two-hour period) amount of food that is definitely larger than most people would eat during a similar period of time and under similar circumstances, and
 - ii. A sense of lack of control over eating during the episode(e.g., a feeling that one cannot stop eating or control what or how much one is eating).
 - b. Recurrent, inappropriate compensatory behavior to prevent weight gain, such as self-induced vomiting, misuse of laxative, diuretics, or other medication, fasting, or excessive exercise

- c. The binge eating and compensatory behaviors both occur, on average, at least twice a week for three months.
 - d. Self-evaluation is unduly influenced by body shape and weight
 - e. The disturbance does not occur exclusively during episodes of anorexia nervosa.
4. Disordered eating- a term that places emphasis on the spectrum of pathological patterns of eating. A person does not consume the healthy amount of nutrients needed to sustain life.
5. Eating Disorder- harmful practices of weight control that result in undue harm to the body.
6. Individual Sport- Refers to a sport where participants compete as individuals.
7. Team Sport- a sport that involves competition between teams of players.

Basic Assumptions

The following are basic assumptions of this study:

- 1) The use of a valid and reliable assessment tool (EAT-26) will be a valid and reliable predictor of individuals who currently possess a risk for eating

disorders due to symptoms, behaviors and attitudes of disordered eating.

- 2) The use of a valid and reliable assessment tool (The Body Esteem Scale for Adolescents and Adults) will be a valid and reliable predictor of an individual's body image.
- 3) It is assumed that the female athletes will answer all questions honestly and completely and will not look for input from others.

Limitations of the Study

The following are possible limitations of the study:

- 1) The study will consist of Division II and III collegiate female athletes.
- 2) The study will be restricted to those sports specific to the schools that participate.

Significance of the Study

Athletic trainers should have an adequate amount of knowledge on this topic when working with female athletics. Distorted body images as well as disordered eating are both prevalent in this arena. These conditions require proper and prompt management, and in order for

this to happen it requires athletic trainers to be educated on the conditions of female athletes.

This study will evaluate the body images as well as eating attitudes of female athletes from both individual and team sports.

This study is important to female athletes and athletic trainers. An increase in known prevalence of distorted body image and disordered eating habit will increase awareness of both parties.

APPENDIX C

Additional Methods

APPENDIX C1

Survey Cover Letter

Dear Student -athlete:

My name is Lacie Johnson and I am currently a graduate student at California University of Pennsylvania pursuing a Master of Science in Athletic Training. Part of the graduate study curriculum is to complete a research thesis. I am conducting survey research to determine if there is a relationship between body image and disordered eating among female collegiate athletes at division II and division III universities.

Your participation is voluntary and you have the right to choose not to participate. You also have the right to discontinue participation at any time during the survey completion process at which time your data will be discarded. The California University of Pennsylvania Institutional Review Board has reviewed and approved this project. The approval is effective 1-26-2012 and expires 1-25-2013.

All survey responses are anonymous and will be kept confidential. Informed consent to use the data collected will be assumed upon return of the survey. Aggregate survey responses will be housed in a password protected file on the CalU campus. Minimal risk is posed by participating as a subject in this study. I ask that you please take this survey at your earliest convenience as it will take approximately 10 minutes to complete. If you have any questions regarding this project, please feel free to contact the primary researcher, Lacie Johnson as joh5004@calu.edu. You can also contact the faculty advisor for this research, Shelly Fetchen DiCesaro, PhD, ATC, CSCS, 724-938-4562, dicesaro@calu.edu. Thanks in advance for your participation. Please click the following link to access the survey <https://www.surveymonkey.com/s/YST89RV>.

Thank you for taking the time to take part in my thesis research

Sincerely,

Lacie Johnson, ATC
Primary Researcher
California University of Pennsylvania
250 University Ave
California, PA 15419
Joh5004@calu.edu

APPENDIX C2

Demographic Questions

Demographic Questions

1. Are you male or female?
2. Are you over the age of 18?
3. What college or university do you attend?
 - a. California University of Pennsylvania
 - b. Bloomsburg University
 - c. Kutztown University
 - d. Marymount University
 - e. Shippensburg University
 - f. Frostburg State University
 - g. Lock Haven University
4. What year are you in school?
 - a. Freshman
 - b. Sophomore
 - c. Junior
 - d. Senior
 - e. Graduate
5. What sport(s) do you play?
 - a. Soccer
 - b. Volleyball
 - c. Cross country
 - d. Tennis
 - e. Swimming/diving
 - f. Track and Field

- g. Basketball
- h. Softball
- i. Field Hockey
- j. Gymnastics
- k. Lacrosse
- l. Water Polo
- m. Other

- 6. Height?
- 7. Current Weight?
- 8. Highest weight (after 12 years of age)?
- 9. Lowest weight (after 12 years of age)?
- 10. Ideal Weight?

APPENDIX C3

Eating Attitudes Test (EAT-26)

Eating Attitudes Test (EAT-26)[®]

Instructions: This is a screening measure to help you determine whether you might have an eating disorder that needs professional attention. This screening measure is not designed to make a diagnosis of an eating disorder or take the place of a professional consultation. Please fill out the below form as accurately, honestly and completely as possible. There are no right or wrong answers. All of your responses are confidential.

Part A: Complete the following questions:

1) Birth Date	Month: _____	Day: _____	Year: _____	2) Gender:	Male <input type="checkbox"/>	Female <input type="checkbox"/>
3) Height	Feet: _____	Inches: _____			<input type="checkbox"/>	<input type="checkbox"/>
4) Current Weight (lbs.):	5) Highest Weight (excluding pregnancy):					
6) Lowest Adult Weight:	7) Ideal Weight:					

Part B: Check a response for each of the following statements:

	Always	Usually	Often	Some times	Rarely	Never
1. Am terrified about being overweight.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Avoid eating when I am hungry.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Find myself preoccupied with food.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Have gone on eating binges where I feel that I may not be able to stop.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Cut my food into small pieces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Aware of the calorie content of foods that I eat.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Feel that others would prefer if I ate more.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Vomit after I have eaten.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Feel extremely guilty after eating.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Am preoccupied with a desire to be thinner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Think about burning up calories when I exercise.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Other people think that I am too thin.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Am preoccupied with the thought of having fat on my body.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Take longer than others to eat my meals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Avoid foods with sugar in them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Eat diet foods.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Feel that food controls my life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Display self-control around food.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Feel that others pressure me to eat.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Give too much time and thought to food.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Feel uncomfortable after eating sweets.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Engage in dieting behavior.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Like my stomach to be empty.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Have the impulse to vomit after meals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Enjoy trying new rich foods.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Part C: Behavioral Questions:
In the past 6 months have you:**

	Never	Once a month or less	2-3 times a month	Once a week	2-6 times a week	Once a day or more
A. Gone on eating binges where you feel that you may not be able to stop? *	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Ever made yourself sick (vomited) to control your weight or shape?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Ever used laxatives, diet pills or diuretics (water pills) to control your weight or shape?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Exercised more than 60 minutes a day to lose or to control your weight?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Lost 20 pounds or more in the past 6 months	Yes <input type="checkbox"/>		No <input type="checkbox"/>			

* Defined as eating much more than most people would under the same circumstances and feeling that eating is out of control

[®] Copyright: EAT-26: (Garner et al. 1982, *Psychological Medicine*, 12, 871-878); adapted by D. Garner with permission.

APPENDIX C3

Body Esteem Survey for Adolescents and Adults (BESAA)

Body-Esteem Scale for Adolescents and Adults
Beverley K. Mendelson, Donna R. White, and Morton J. Mendelson

Indicate how often you agree with the following statements ranging from "never" (0) to "always" (4). Circle the appropriate number beside each statement.

	Never	Seldom	Some- times	Often	Always
1. I like what I look like in pictures.	0	1	2	3	4
2. Other people consider me good looking.	0	1	2	3	4
3. I'm proud of my body.	0	1	2	3	4
4. I am preoccupied with trying to change my body weight.	0	1	2	3	4
5. I think my appearance would help me get a job.	0	1	2	3	4
6. I like what I see when I look in the mirror.	0	1	2	3	4
7. There are lots of things I'd change about my looks if I could.	0	1	2	3	4
8. I am satisfied with my weight.	0	1	2	3	4
9. I wish I looked better.	0	1	2	3	4
10. I really like what I weigh.	0	1	2	3	4
11. I wish I looked like someone else.	0	1	2	3	4
12. People my own age like my looks.	0	1	2	3	4
13. My looks upset me.	0	1	2	3	4
14. I'm as nice looking as most people.	0	1	2	3	4
15. I'm pretty happy about the way I look.	0	1	2	3	4
16. I feel I weigh the right amount for my height.	0	1	2	3	4
17. I feel ashamed of how I look.	0	1	2	3	4
18. Weighing myself depresses me.	0	1	2	3	4
19. My weight makes me unhappy	0	1	2	3	4
20. My looks help me to get dates.	0	1	2	3	4
21. I worry about the way I look.	0	1	2	3	4
22. I think I have a good body.	0	1	2	3	4
23. I'm looking as nice as I'd like to.	0	1	2	3	4

Three subscales: BE-Appearance (1, 6, 7*, 9*, 11*, 13*, 15, 17*, 21*, 23); BE-Weight (3, 4*, 8, 10, 16, 18*, 19*, 22); and BE-Attribution (2, 5, 12, 14, 20). [* negative items, which must be recoded for scoring by reversing the scale (i.e., 0 = 4, 1 = 3, 2 = 2, 3 = 1, 4 = 0).]

APPENDIX C4

Institutional Review Board -
California University of Pennsylvania



California University
of Pennsylvania

Proposal Number

Date Received

PROTOCOL for Research Involving
Human Subjects

Institutional Review Board (IRB) approval is required before beginning any research and/or data collection involving human subjects

(Reference IRB Policies and Procedures for clarification)

Project Title The Relationship between body image and disordered eating in individual and team female collegiate sports

Researcher/Project Director Lacie Johnson

Phone # 3019918972

E-mail Address joh5004@calu.edu

Faculty Sponsor (if required) Shelly F. DiCesaro

Department Health Science

Project Dates January 1, 2012 to December 31, 2012

Sponsoring Agent (if applicable) n/a

Project to be Conducted at California University of Pennsylvania (via the internet)

Project Purpose: *Thesis* *Research* *Class Project* *Other*

Keep a copy of this form for your records.

Please attach a typed, detailed summary of your project AND complete items 2 through 6.

1. *Provide an overview of your project-proposal describing what you plan to do and how you will go about doing it. Include any hypothesis(es) or research questions that might be involved and explain how the information you gather will be analyzed. For a complete list of what should be included in your summary, please refer to Appendix B of the IRB Policies and Procedures Manual.*

The purpose of this study is to examine the relationship between body image and disordered eating in female collegiate athletes. The study will examine differences between team and individual sport athletes for body image and disordered eating. Differences between division 2 and division 3 athletes for body image and disordered eating will also be examined. It is important to examine this relationship because we may be able to reduce the occurrences of negative body image and disordered eating in female athletes. Additionally it would be beneficial to see if there is a correlation between the prevalence of distorted body image and disordered eating. Distorted body image and disordered eating can be very detrimental to an athlete on a physical and emotional level.

Prior to data collection and upon request of the IRB, a letter asking for the female athletes participation in this study will be sent to the 9 NCAA Division III Capital Athletic Conference and the 17 NCAA Division II Pennsylvania State Athletic Conference athletic directors. Application will be made to the California University of Pennsylvania institutional review board for approval. Once permission is granted to continue with the study, a cover letter including a link to survey monkey will be sent to the athletic director's for them to forward to their female athletes. This link will include a demographic questionnaire, the EAT-26 and the Body Esteem Scale. Consent will be implied upon completion of the survey. This survey is strictly voluntary and participation can be stopped at any time. After the surveys close, all data will be imported into an excel spread sheet and then put into the SPSS version 18.0 for the data analysis. All results will be anonymous.

The following hypotheses were based on previous research and the researcher's intuition based on a review of the literature.

1. There will be a positive correlation between body image scores as measured by the body esteem scale for adolescents and adults and disordered eating as measured by the EAT-26.
2. There will be a difference between team and individual sports for a) body image scores and b) disordered eating scores.
3. There will be a difference between Division II and Division III athletes for a) body image scores and b) disordered eating scores.

A pearson product-moment correlation will be used to determine the relationship between body image scores and disordered eating scores. A MANOVA will also be done to determine if there are differences between team and individual sports for body image scores and disordered eating scores as well as differences between Division II and Division III for body image scores and disordered eating scores. All of the data will be analyzed on a .05 alpha level.

2. *Section 46.11 of the Federal Regulations state that research proposals involving human subjects must satisfy certain requirements before the IRB can grant approval. You should describe in detail how the following requirements will be satisfied. Be sure to address each area separately.*
 - a. *How will you insure that any risks to subjects are minimized? If there are potential risks, describe what will be done to minimize these risks. If there are risks, describe why the risks to participants are reasonable in relation to the anticipated benefits.*

There are minimal risks to the subjects in this study. The possible risks that that could accompany this is the release of the information that is obtained in the surveys. To ensure that this doesn't happen, names will not be obtained by the researcher so the participants will be kept anonymous.

3

Information that is gathered will be stored in a file on University Servers and will be password protected.

- b. *How will you insure that the selection of subjects is equitable? Take into account your purpose(s). Be sure you address research problems involving vulnerable populations such as children, prisoners, pregnant women, mentally disabled persons, and economically or educationally disadvantaged persons. If this is an in-class project describe how you will minimize the possibility that students will feel coerced.*

In case the email can only be sent to all student-athletes, the first question will be used to eradicate all male athletes. Then, in order to eliminate any female athletes that are under the age of 18, the first question that will be asked for is age. From here, any females over the age of 18 will continue with the surveys, while males and those under the age of 18 will be sent then end where there will be a thank you for participating page.

- c. *How will you obtain informed consent from each participant or the subject's legally authorized representative and ensure that all consent forms are appropriately documented? Be sure to attach a copy of your consent form to the project summary.*

Consent will be implied when the subject completes the survey's provided. A cover letter will accompany the surveys and will explain all the details.

- d. *Show that the research plan makes provisions to monitor the data collected to insure the safety of all subjects. This includes the privacy of subjects' responses and provisions for maintaining the security and confidentiality of the data.*

This is an anonymous survey and upon submission, the name of the subject will not be recorded. Once the survey has been collected electronically through survey monkey, it will be downloaded and the information will be kept strictly confidential. The data will be kept in a secure location; inside a locked filing cabinet in the program directors (Dr. Tom West) office, where only the researcher and Thesis Chair (Dr. Shelly DiCesaro) will have access.

3. *Check the appropriate box(es) that describe the subjects you plan to use.*

<input checked="" type="checkbox"/> <i>Adult volunteers</i>	<input type="checkbox"/> <i>Mentally Disabled People</i>
<input checked="" type="checkbox"/> <i>CAL University Students</i>	<input type="checkbox"/> <i>Economically Disadvantaged People</i>
<input checked="" type="checkbox"/> <i>Other Students</i>	<input type="checkbox"/> <i>Educationally Disadvantaged People</i>
<input type="checkbox"/> <i>Prisoners</i>	<input type="checkbox"/> <i>Fetuses or fetal material</i>
<input type="checkbox"/> <i>Pregnant Women</i>	<input type="checkbox"/> <i>Children Under 18</i>
<input type="checkbox"/> <i>Physically Handicapped People</i>	<input type="checkbox"/> <i>Neonates</i>

4. *Is remuneration involved in your project?* *Yes* or *No*. *If yes, Explain here.*
5. *Is this project part of a grant?* *Yes* or *No*. *If yes, provide the following information:*
Title of the Grant Proposal ____
Name of the Funding Agency ____
Dates of the Project Period ____

Approved, September 12, 2005 / (updated 02-09-09)

4

6. Does your project involve the debriefing of those who participated? Yes or No

If Yes, explain the debriefing process here.

7. *If your project involves a questionnaire interview, ensure that it meets the requirements of Appendix ___ in the Policies and Procedures Manual.*

California University of Pennsylvania Institutional Review Board
Survey/Interview/Questionnaire Consent Checklist (v021209)

This form MUST accompany all IRB review requests

Does your research involve ONLY a survey, interview or questionnaire?

- YES**—Complete this form
 NO—You MUST complete the “Informed Consent Checklist”—skip the remainder of this form

Does your survey/interview/questionnaire cover letter or explanatory statement include:

- (1) Statement about the general nature of the survey and how the data will be used?
- (2) Statement as to who the primary researcher is, including name, phone, and email address?
- (3) FOR ALL STUDENTS: Is the faculty advisor’s name and contact information provided?
- (4) Statement that participation is voluntary?
- (5) Statement that participation may be discontinued at any time without penalty and all data discarded?
- (6) Statement that the results are confidential?
- (7) Statement that results are anonymous?
- (8) Statement as to level of risk anticipated or that minimal risk is anticipated? (NOTE: If more than minimal risk is anticipated, a full consent form is required—and the Informed Consent Checklist must be completed)
- (9) Statement that returning the survey is an indication of consent to use the data?
- (10) Who to contact regarding the project and how to contact this person?
- (11) Statement as to where the results will be housed and how maintained? (unless otherwise approved by the IRB, must be a secure location on University premises)
- (12) Is there text equivalent to: “Approved by the California University of Pennsylvania Institutional Review Board. This approval is effective nn/nn/nn and expires mm/mm/mm”? (the actual dates will be specified in the approval notice from the IRB)?
- (13) FOR ELECTRONIC/WEBSITE SURVEYS: Does the text of the cover letter or explanatory statement appear before any data is requested from the participant?
- (14) FOR ELECTRONIC/WEBSITE SURVEYS: Can the participant discontinue participation at any point in the process and all data is immediately discarded?

**California University of Pennsylvania Institutional Review Board
Informed Consent Checklist (v021209)**

This form MUST accompany all IRB review requests

Does your research involve ONLY a survey, interview, or questionnaire?

YES—DO NOT complete this form. You MUST complete the “Survey/Interview/Questionnaire Consent Checklist” instead.

NO—Complete the remainder of this form.

1. Introduction (check each)

- (1.1) Is there a statement that the study involves research?
- (1.2) Is there an explanation of the purpose of the research?

2. Is the participant. (check each)

- (2.1) Given an invitation to participate?
- (2.2) Told why he/she was selected.
- (2.3) Told the expected duration of the participation.
- (2.4) Informed that participation is voluntary?
- (2.5) Informed that all records are confidential?
- (2.6) Told that he/she may withdraw from the research at any time without penalty or loss of benefits?
- (2.7) 18 years of age or older? (if not, see Section #9, Special Considerations below)

3. Procedures (check each).

- (3.1) Are the procedures identified and explained?
- (3.2) Are the procedures that are being investigated clearly identified?
- (3.3) Are treatment conditions identified?

4. Risks and discomforts. (check each)

- (4.1) Are foreseeable risks or discomforts identified?
- (4.2) Is the likelihood of any risks or discomforts identified?
- (4.3) Is there a description of the steps that will be taken to minimize any risks or discomforts?
- (4.4) Is there an acknowledgement of potentially unforeseeable risks?
- (4.5) Is the participant informed about what treatment or follow up courses of action are available should there be some physical, emotional, or psychological harm?
- (4.6) Is there a description of the benefits, if any, to the participant or to others that may be reasonably expected from the research and an estimate of the likelihood of these benefits?
- (4.7) Is there a disclosure of any appropriate alternative procedures or courses of treatment that might be advantageous to the participant?

5. Records and documentation. (check each)

- (5.1) Is there a statement describing how records will be kept confidential?
- (5.2) Is there a statement as to where the records will be kept and that this is a secure location?
- (5.3) Is there a statement as to who will have access to the records?

6. For research involving more than minimal risk (check each),

- (6.1) Is there an explanation and description of any compensation and other medical or counseling treatments that are available if the participants are injured through participation?
- (6.2) Is there a statement where further information can be obtained regarding the treatments?
- (6.3) Is there information regarding who to contact in the event of research-related injury?

7. Contacts (check each)

- (7.1) Is the participant given a list of contacts for answers to questions about the research and the participant's rights?
- (7.2) Is the principal researcher identified with name and phone number and email address?
- (7.3) FOR ALL STUDENTS: Is the faculty advisor's name and contact information provided?

8. General Considerations (check each)

- (8.1) Is there a statement indicating that the participant is making a decision whether or not to participate, and that his/her signature indicates that he/she has decided to participate having read and discussed the information in the informed consent?
- (8.2) Are all technical terms fully explained to the participant?
- (8.3) Is the informed consent written at a level that the participant can understand?
- (8.4) Is there text equivalent to: "Approved by the California University of Pennsylvania Institutional Review Board. This approval is effective nn/nn/nn and expires mm/mm/mm"? (the actual dates will be specified in the approval notice from the IRB)

9. Specific Considerations (check as appropriate)

- (9.1) If the participant is or may become pregnant is there a statement that the particular treatment or procedure may involve risks, foreseeable or currently unforeseeable, to the participant or to the embryo or fetus?
- (9.2) Is there a statement specifying the circumstances in which the participation may be terminated by the investigator without the participant's consent?
- (9.3) Are any costs to the participant clearly spelled out?
- (9.4) If the participant desires to withdraw from the research, are procedures for orderly termination spelled out?
- (9.5) Is there a statement that the Principal Investigator will inform the participant or any significant new findings developed during the research that may affect them and influence their willingness to continue participation?
- (9.6) Is the participant is less than 18 years of age? If so, a parent or guardian must sign the consent form and assent must be obtained from the child
 - Is the consent form written in such a manner that it is clear that the parent/guardian is giving permission for their child to participate?
 - Is a child assent form being used?
 - Does the assent form (if used) clearly indicate that the child can freely refuse to participate or discontinue participation at any time without penalty or coercion?
- (9.7) Are all consent and assent forms written at a level that the intended participant can understand? (generally, 8th grade level for adults, age-appropriate for children)

California University of Pennsylvania Institutional Review Board
Review Request Checklist (v021209)

This form MUST accompany all IRB review requests.
 Unless otherwise specified, ALL items must be present in your review request.

Have you:

(1.0) FOR ALL STUDIES: Completed ALL items on the Review Request Form?

Pay particular attention to:

- (1.1) Names and email addresses of all investigators
 - (1.1.1) FOR ALL STUDENTS: use only your CalU email address)
 - (1.1.2) FOR ALL STUDENTS: Name and email address of your faculty research advisor
- (1.2) Project dates (must be in the future—no studies will be approved which have already begun or scheduled to begin before final IRB approval—NO EXCEPTIONS)
- (1.3) Answered completely and in detail, the questions in items 2a through 2d?
 - 2a: NOTE: No studies can have zero risk, the lowest risk is “minimal risk”. If more than minimal risk is involved you MUST:
 - i. Delineate all anticipated risks in detail;
 - ii. Explain in detail how these risks will be minimized;
 - iii. Detail the procedures for dealing with adverse outcomes due to these risks.
 - iv. Cite peer reviewed references in support of your explanation.
 - 2b. Complete all items.
 - 2c. Describe informed consent procedures in detail.
 - 2d. NOTE: to maintain security and confidentiality of data, all study records must be housed in a secure (locked) location ON UNIVERSITY PREMISES. The actual location (department, office, etc.) must be specified in your explanation and be listed on any consent forms or cover letters.
- (1.4) Checked all appropriate boxes in Section 3? If participants under the age of 18 years are to be included (regardless of what the study involves) you MUST:
 - (1.4.1) Obtain informed consent from the parent or guardian—consent forms must be written so that it is clear that the parent/guardian is giving permission for their child to participate.
 - (1.4.2) Document how you will obtain assent from the child—This must be done in an age-appropriate manner. Regardless of whether the parent/guardian has given permission, a child is completely free to refuse to participate, so the investigator must document how the child indicated agreement to participate (“assent”).
- (1.5) Included all grant information in section 5?
- (1.6) Included ALL signatures?

(2.0) FOR STUDIES INVOLVING MORE THAN JUST SURVEYS, INTERVIEWS, OR QUESTIONNAIRES:

- (2.1) Attached a copy of all consent form(s)?
- (2.2) FOR STUDIES INVOLVING INDIVIDUALS LESS THAN 18 YEARS OF AGE: attached a copy of all assent forms (if such a form is used)?
- (2.3) Completed and attached a copy of the Consent Form Checklist? (as appropriate—see that checklist for instructions)

- (3.0) FOR STUDIES INVOLVING ONLY SURVEYS, INTERVIEWS, OR QUESTIONNAIRES:
- (3.1) Attached a copy of the cover letter/information sheet?
 - (3.2) Completed and attached a copy of the Survey/Interview/Questionnaire Consent Checklist? (see that checklist for instructions)
 - (3.3) Attached a copy of the actual survey, interview, or questionnaire questions in their final form?
- (4.0) FOR ALL STUDENTS: Has your faculty research advisor:
- (4.1) Thoroughly reviewed and approved your study?
 - (4.2) Thoroughly reviewed and approved your IRB paperwork? including:
 - (4.2.1) Review request form,
 - (4.2.2) All consent forms, (if used)
 - (4.2.3) All assent forms (if used)
 - (4.2.4) All Survey/Interview/Questionnaire cover letters (if used)
 - (4.2.5) All checklists
 - (4.3) IMPORTANT NOTE: Your advisor's signature on the review request form indicates that they have thoroughly reviewed your proposal and verified that it meets all IRB and University requirements.
 - (5.0) Have you retained a copy of all submitted documentation for your records?

Project Director's Certification
Program Involving HUMAN SUBJECTS

The proposed investigation involves the use of human subjects and I am submitting the complete application form and project description to the Institutional Review Board for Research Involving Human Subjects.

I understand that Institutional Review Board (IRB) approval is required before beginning any research and/or data collection involving human subjects. If the Board grants approval of this application, I agree to:

1. Abide by any conditions or changes in the project required by the Board.
2. Report to the Board any change in the research plan that affects the method of using human subjects before such change is instituted.
3. Report to the Board any problems that arise in connection with the use of human subjects.
4. Seek advice of the Board whenever I believe such advice is necessary or would be helpful.
5. Secure the informed, written consent of all human subjects participating in the project.
6. Cooperate with the Board in its effort to provide a continuing review after investigations have been initiated.

I have reviewed the Federal and State regulations concerning the use of human subjects in research and training programs and the guidelines. I agree to abide by the regulations and guidelines aforementioned and will adhere to policies and procedures described in my application. I understand that changes to the research must be approved by the IRB before they are implemented.

Professional Research

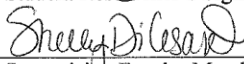
Project Director's Signature

Department Chairperson's Signature

Student or Class Research



Student Researcher's Signature



Supervising Faculty Member's
Signature if required



Department Chairperson's Signature

ACTION OF REVIEW BOARD (IRB use only)

The Institutional Review Board for Research Involving Human Subjects has reviewed this application to ascertain whether or not the proposed project:

1. provides adequate safeguards of the rights and welfare of human subjects involved in the investigations;
2. uses appropriate methods to obtain informed, written consent;
3. indicates that the potential benefits of the investigation substantially outweigh the risk involved.
4. provides adequate debriefing of human participants.
5. provides adequate follow-up services to participants who may have incurred physical, mental, or emotional harm.

Approved [_____]

Disapproved

Chairperson, Institutional Review Board

Date



California University of Pennsylvania

December 16, 2011

Dear Student -athlete:

My name is Lacie Johnson and I am currently a graduate student at California University of Pennsylvania pursuing a Master of Science in Athletic Training. Part of the graduate study curriculum is to complete a research thesis. I am conducting survey research to determine if there is a relationship between body image and disordered eating among female collegiate athletes at division II and division III universities.

Your participation is voluntary and you have the right to choose not to participate. You also have the right to discontinue participation at any time during the survey completion process at which time your data will be discarded. The California University of Pennsylvania Institutional Review Board has reviewed and approved this project. The approval is effective nn/nn/nn and expires mm/mm/mm (IRB WILL GIVE YOU THESE DATES AFTER APPROVAL).

All survey responses are anonymous and will be kept confidential. Informed consent to use the data collected will be assumed upon return of the survey. Aggregate survey responses will be housed in a password protected file on the CalU campus. Minimal risk is posed by participating as a subject in this study. I ask that you please take this survey at your earliest convenience as it will take approximately 10 minutes to complete. If you have any questions regarding this project, please feel free to contact the primary researcher, Lacie Johnson as joh5004@calu.edu. You can also contact the faculty advisor for this research, Shelly Fetchen DiCesaro, PhD, ATC, CSCS, 724-938-4562, dicesaro@calu.edu. Thanks in advance for your participation. Please click the following link to access the survey <https://www.surveymonkey.com/s/YST89RV>.

Thank you for taking the time to take part in my thesis research

Sincerely,

Lacie Johnson, ATC
Primary Researcher
California University of Pennsylvania
250 University Ave
California, PA 15419
Joh5004@calu.edu

Dear Student -athlete:

My name is Lacie Johnson and I am currently a graduate student at California University of Pennsylvania pursuing a Master of Science in Athletic Training. Part of the graduate study curriculum is to complete a research thesis. I am conducting survey research to determine if there is a relationship between body image and disordered eating among female collegiate athletes at division II and division III universities.

Your participation is voluntary and you have the right to choose not to participate. You also have the right to discontinue participation at any time during the survey completion process at which time your data will be discarded. The California University of Pennsylvania Institutional Review Board has reviewed and approved this project. The approval is effective nn/nn/nn and expires mm/mm/mm (IRB WILL GIVE YOU THESE DATES AFTER APPROVAL).

All survey responses are anonymous and will be kept confidential. Informed consent to use the data collected will be assumed upon return of the survey. Aggregate survey responses will be housed in a password protected file on the CalU campus. Minimal risk is posed by participating as a subject in this study. I ask that you please take this survey at your earliest convenience as it will take approximately 10 minutes to complete. If you have any questions regarding this project, please feel free to contact the primary researcher, Lacie Johnson as joh5004@calu.edu. You can also contact the faculty advisor for this research, Shelly Fetchen DiCesaro, PhD, ATC, CSCS, 724-938-4562, dicesaro@calu.edu. Thanks in advance for your participation. Please click the following link to access the survey <https://www.surveymonkey.com/s/YST89RV>. Thank you for taking the time to take part in my thesis research

Sincerely,

Lacie Johnson, ATC
Primary Researcher
California University of Pennsylvania
250 University Ave
California, PA 15419
Joh5004@calu.edu

***1. Are you male or female?**

Male

Female

***2. Are you over the age of 18 years old?**

Yes

No

3. What college or university do you attend?

- California University of Pennsylvania Marymount University
 Bloomsburg University Kutztown University
 Shippensburg University Lock Haven University
 Frostburg State University

4. What year are you in school?

- Freshman Senior
 Sophomore Graduate Student
 Junior

5. What sport do you play?

- | | | |
|--|--|-------------------------------------|
| <input type="checkbox"/> Soccer | <input type="checkbox"/> Track and Field | <input type="checkbox"/> Golf |
| <input type="checkbox"/> Volleyball | <input type="checkbox"/> Basketball | <input type="checkbox"/> Gymnastics |
| <input type="checkbox"/> Cross Country | <input type="checkbox"/> Lacrosse | <input type="checkbox"/> Water Polo |
| <input type="checkbox"/> Tennis | <input type="checkbox"/> Softball | <input type="checkbox"/> Other |
| <input type="checkbox"/> Swimming/Diving | <input type="checkbox"/> Field Hockey | |

6. Height

Feet

Inches

7. Current Weight (lbs)**8. Highest Weight: after 12 years of age (lbs)****9. Lowest Weight: after 12 years of age (lbs)****10. Ideal Weight (lbs)**

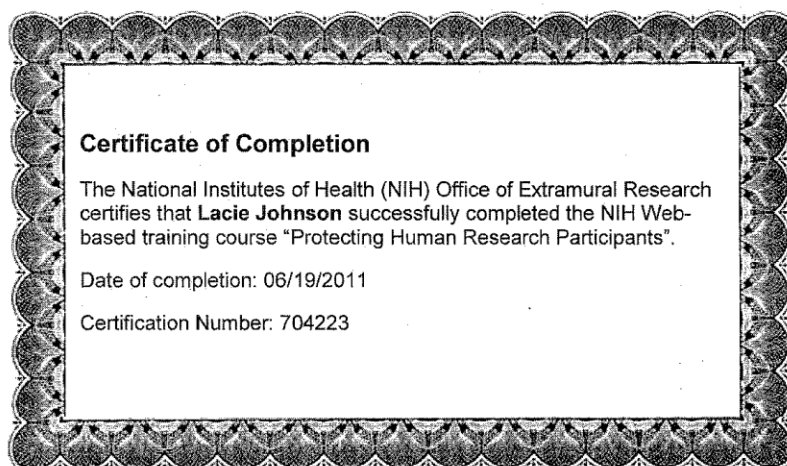
16. Indicate how often you agree with the following statements ranging from "never" (0) to "always" (4).

	Never	Seldom	Sometimes	Often	Always
I like what I look like in pictures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other people consider me good looking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm proud of my body.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think my appearance would help me get a job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like what I see when I look in the mirror.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am satisfied with my weight.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I really like what I weigh.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People my own age like my looks.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm as nice looking as most people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm pretty happy about the way i look.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel i weight the right amount for my height.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My looks help me to get dates.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think i have a good body.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm looking as nice as I'd like to.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. Indicate how often you agree with the following statements ranging from "never" (0) to "always" (4).

	Never	Seldom	Sometimes	Often	Always
I am preoccupied with trying to change my body weight.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are lots of things I'd change about my looks if I could.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wish I looked better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wish I looked like someone else.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My looks upset me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel ashamed of how I look.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weighing myself depresses me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My weight makes me unhappy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worry about the way I look.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Thank You for Your Participation!



**Institutional Review Board
California University of Pennsylvania
Morgan Hall, Room 310
250 University Avenue
California, PA 15419
instreviewboard@calu.edu
Robert Skwarecki, Ph.D., CCC-SLP, Chair**

Dear Lacie Johnson:

Please consider this email as official notification that your proposal titled "The relationship between body image and disordered eating in individual and team female collegiate sports" (Proposal #11-035) has been approved by the California University of Pennsylvania Institutional Review Board as submitted, The effective date of the approval is 1-26-2012 and the expiration date is 1-25-2013. These dates must appear on the consent form .

Advisory note: For an individual with an eating disorder, completion of this survey may increase self awareness or other personal introspection. It is recommended that the survey include a brief statement providing information to such a participant about how to obtain help. (e.g. a statement that they should contact their physician, psychologist, or other appropriate health care practitioner). Any factual information should be derived from peer-reviewed sources only. Please note that Federal Policy requires that you notify the IRB promptly regarding any of the following:

- (1) Any additions or changes in procedures you might wish for your study (additions or changes must be approved by the IRB before they are implemented)**
- (2) Any events that affect the safety or well-being of subjects**
- (3) Any modifications of your study or other responses that are necessitated by any events reported in (2).**
- (4) To continue your research beyond the approval expiration date of 1-25-2013 you must file additional information to be considered for continuing review. Please contact instreviewboard@calu.edu**

Please notify the Board when data collection is complete.

Regards,

**Robert Skwarecki, Ph.D., CCC-SLP
Chair, Institutional Review Board**

REFERENCES

1. Thompson J, Heinberg L, Altabe M, Tantleff-Dunn S. Exacting Beauty: Theory, assessment, and treatment of body image disturbance. *American Psychological Association*. 1999.
2. Ziegler P, Khoo C, Sherr B, Nelson J, Larson W, Drewnowski A. Body image and dieting behaviors among elite figure skaters. *International Eating Disorders*. December 1998;24(4):421-427.
3. Buchholz A, Mack H, McVey G, Feder S, Barrowman N. Bodysense: An evaluation of a positive body image intervention on sport climate for female athletes. *Eating Disorders: Treatment Prevention*. July 2008;16(4):308-321.
4. Schwarz H, Gairrett R, Aruguete M, Gold E. Eating Attitudes, Body Dissatisfaction, and Perfectionism in Female College Athletes. *North American Psychology*. December 2005;7(3):345-352.
5. Gibson A, Mermier C, Wilmerding V, Bentzur K, McKinnon M. Body Fat Estimation in Collegiate Athletes: An Update. *Athletic Therapy Today*. May 2009;14(3): 13-16.
6. Clark M, Reed D, Crouse S, Armstrong R. Pre- and post-season dietary intake, body composition, and performance indices of NCAA Division I female soccer players. *International Sport Nutrition Exercise Metabolism*. September 2003;13(3):303-319.
7. Broad N, Burke LM, Loucks AB. Energy and carbohydrate for training and recovery. *Sports Sciences*. July 2006;24(7): 675-685.
8. Forrest K, Stuhldreher W. Patterns and correlates of body image dissatisfaction and distortion among college students. *American Health Studies*. March 2007;22(1):18-25.
9. Hasse, A M.; Weight perception in female Athletes: Association with disordered eating correlates and behavior; *Eating Behaviors*:2010;12:64-67

10. Catikkas F, Koyuncu M, Meliha C, Derdar T A.; Body image satisfaction and dissatisfaction, social physique anxiety, self-esteem, and body fat ratio in female exercisers and non exercisers; *Social Behavior Personality*;2010;38(4):561-570.
11. Steadman L, Swami V, Tovee M J. A comparison of body size ideals, body dissatisfaction, and media influence between female track athletes, martial artists, and non-athletes; *Psychology Sport Exercise*;10(2009);609-614.
12. Haase A. Physique anxiety and disordered eating correlates in female athletes: Differences in team and individual sports. *Clinical Sport Psychology*. September 2009;3(3):218-231.
13. Definitions. National Eating Disorder Information Centere. 2011.
www.nedic.ca/knowthefacts/definitions.shtml.
14. Anorexia Nervosa. PubMed Health. April 18, 2011.
<http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001401>.
15. Salbach H, Klinkowski N, Pfeiffer E, Lehmkuhl U, Korte A. Body image and attitudinal aspects of eating disorders in rhythmic gymnasts. *Psychopathology* . September 2007;40(6):388-393.
16. Bulimia. PubMed Health. April 18, 2011.
<http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001401>.
17. Brannan M, Petrie T, Greenleaf C, Reel J, Carter J. The relationship between body dissatisfaction and bulimic symptoms in female collegiate athletes. *Clinical Sport Psychology*. June 2009;3(2):103-126.
18. Greenleaf C, Petrie T, Carter J, Reel J. Female Collegiate Athletes: Prevalence of eating disorders and disordered eating behaviors. *American College Health*. March 2009;57(5):489-496.
19. Arthur-Cameselle J N., Quatromoni P A., Factors related to the onset of eating disorders reported by female collegiate athletes. *Sport Psychologist*. 2010;25:1-7.

20. d'Arripe-Longueville, F, Maiano C, Scoffier S, The effects of social relationships and acceptance on disturbed eating attitudes in elite adolescent female athletes: The mediating role of physical self-perceptions; *International Eating Disorders*;2010;43(1):65-71.
21. Peden J, Stiles B, Vandehey M, Diekhoff G. The effects of external pressures and competitiveness on characteristics of eating disorders and body dissatisfaction. *Sport Social Issues*. November 2008;32(4):415-429.
22. Bissell, K; Sports model/sports mind: The relationship between entertainment and sports media exposure, sports participation, and body image distortion in division 1 female athletes; *Mass Communication Society*; 2004;7(4):453-473.
23. Torstveit M, Rosenvinge J, Sundgot-Borgen J. Prevalence of eating disorders and the predictive power of risk models in female elite athletes: a controlled study. *Scandinavian Medicine Science Sports*. February 2008;18(1):108-118.
24. Gordon K H., Holm-Denoma J M., Joiner Jr T E.; Scaringi V, Van Orden K A. Eating disorder symptoms among undergraduate varsity athletes, club athletes, independent exercisers, and nonexercisers; *International Eating Disorders*;2009;42(1):47-53.
25. Reinking M, Alexander L. Prevalence of disordered-eating behaviors in undergraduate female collegiate athletes and non-athletes. *Athletic Training*. January 2005;40(1):47.
26. Williams P, Sargent R, Valois R, Drane J, Para-Medina D, Durstine L. Prevalence of subclinical eating disorders in collegiate female athletes. *Women in Sport Physical Activity*.2003;12(2):127-145.
27. Sherman R, Thompson RA. Practical use of the international Olympic committee medical commission position stand on the female athlete triad: a case example. *International Eating Disorders*. 2006;39(3):193-201

28. Manore MM, Kam K, Loucks AB. The female athlete triad: components, nutrition issues, and health consequences. *Sport Sciences*. 2007;25(1):61-71.
29. Thompson S. Characteristics of the female athlete triad in collegiate cross-country runners. *American College Health*. 2007; 56(2): 129-136.
30. Maxwell M, Thornton L, Bulik C, et al. Life beyond the eating disorder: education, relationships, and reproduction. *International Eating Disorders*. April 2011;44(3):225-232.

ABSTRACT

Title: THE RELATIONSHIP BETWEEN BODY IMAGE AND DISORDERED EATING IN INDIVIDUAL AND TEAM FEMALE COLLEGIATE SPORTS

Researcher: Lacie N. Johnson

Advisor: Dr. Shelly DiCesaro

Date: May 2012

Research Type: Master's Thesis

Purpose: The purpose of this study was to determine a relationship between body image and disordered eating and observe and differences between individual sport and team sport athletes.

Problem: Distorted body image and disordered eating are prevalent in world of female collegiate athletics. It is important to examine and determine if the two are in fact related to each other.

Method: A descriptive type of research was conducted. One hundred and six female athletes from California University of Pennsylvania, Frostburg State University, Kutztown University, Shippensburg University, and Lock Haven University, who participated in volleyball, soccer, track and field, basketball, lacrosse, field hockey, tennis, swimming and diving, cross country, softball, and golf volunteered. The instruments that were used were the 26 question Eating Attitudes test and the Body esteem survey for adolescents and adults.

Findings: There was a significant moderate negative correlation between body image scores and disordered eating score. There was no significant difference established between scores found for individual and team sport athletes.

Conclusion: Body image and disordered eating are related in female collegiate athletics.