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Influences of Eating Disorders and Behaviors on College Cross Country and Track Runners

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Influences of Eating Disorders and Behaviors on
College Cross Country and Track Runners

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Arts

By

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2008
Wright State University

WRIGHT STATE UNIVERSITY
SCHOOL OF GRADUATE STUDIES

June 3, 2008

I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY SUPERVISION BY Kimberly Louise Ricker ENTITLED Influences of Eating Disorders and Behaviors on College Cross Country and Track Runners BE ACCEPTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF Master of Arts.

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Abstract

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Outside sources can be a large influence on athlete's perceptions of themselves, including their body image. Men and women face the same issues and influences from outside sources. The SCOFF questionnaire was used to determine if an athlete has the possibility of developing or already has an eating disorder. An eight question survey was also used to see what outside sources influence the eating behaviors of college cross country and track runners.

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INTRODUCTION

Certified athletic trainers are in charge of preventing and treating injuries for the athletic population. If an athlete is depriving their body of the proper nutrients that are needed to replenish the body, more injuries can occur. The more injuries that occur, the more involved the athletic trainer becomes. As a certified athletic trainer, it is important to know the physical and psychological signs of an eating disorder. Seeing an athlete walk into an athletic training room who is noticeably underweight is hard to handle. It is important to understand why the athlete may have developed an eating disorder and if there are outside influences affecting them. It is the certified athletic trainers' job to protect the athlete from injuries and that includes the injuries that can be caused by the athlete themselves.

Outside sources of influence can be peers, coaches, parents, television, magazines, or any other type of media. These sources can have strong influences on athletes allowing them to believe they need to stop eating or start purging in order to weigh what others feel they need to weigh. The outside influences may also encourage an athlete to develop an eating disorder in order to look a certain way. Models on television and in magazines can give off a certain perception of what individuals should look like and influence the population on the way they feel they "should" look.

Eating disorders have been increasing over the past several years in the athletic and nonathletic population. Anorexia nervosa, bulimia nervosa, and binge-eating disorder are the three main eating disorders an individual may develop. All three have their own physical signs, psychological signs, and complications that develop because of the toll the disorders take on the body. Males and females are both affected by these

eating disorders. Approximately seven million females, or 5% of the US population, and one million men have anorexia, bulimia, or the binge-eating disorder (Anderson 2001).

“Male wrestlers, boxers, gymnasts and body builders have been starving, bingeing, purging for as long as females have been doing it” (Fairbanks 1987).

“Collegiate athletes participating in certain sports are believed to be at greater risk for disordered eating. The “lean sports” are those sports that place a competitive or aesthetic value on leanness, including distance running and swimming, gymnastics, dance, and diving” (Reinking 2005). Similar findings by Sandrod-Martens et al (2005) showed that the participation in athletics, particularly in sports that emphasize leanness, competitiveness, and/or body image, is associated with the increased incidence of eating disorders among some athletes. As the competitive level increases, athletes may begin to experience more intense training, which may provide a greater possibility of developing an eating disorder.

RESEARCH QUESTION:

As the prevalence of eating disorders continues to increase, it is the purpose of the study to determine the impact of outside influences on individuals developing an eating disorder. It also helps determine what outside influence is of the greatest amount and one that should be focused on more to eliminate in an athlete’s life.

DEFINING TERMS:

1. Anorexia nervosa, or self-starvation, involves having an “Intense fear of gaining weight, history of repeated dieting attempts and excessive weight loss” (Montenegro 2006).

2. Bulimia nervosa is “. . . uncontrolled or binge eating followed by induced vomiting; use of laxatives, diuretics, or diet pills; and excessive exercise or fasting in an attempt to burn off large amount of food ingested” (Montenegro 2006).
3. Binge-Eating Disorder - These individuals have lost a significant amount of weight from dieting and begin to “. . . engage in uncontrolled eating that does not stop until they are uncomfortably full” (Montenegro 2006).

REVIEW OF LITERATURE:

A. EATING DISORDERS:

Anorexia Nervosa

Anorexia nervosa, or self-starvation, involves having an “Intense fear of gaining weight, history of repeated dieting attempts and excessive weight loss” (Montenegro 2006). It has also been described as “. . . a preoccupation with low body weight, a drive for thinness, body-dissatisfaction and eating patterns that are harmful to the growth and development of the body” (Fairbanks 1987). Anorexia has been known to start between the ages of eleven and eighteen in young girls (Fairbanks 1987). This does not indicate that only young girls develop anorexia, but that older adults develop anorexia as well. There are individuals in the world today who have developed anorexia in their mid-thirties, as well as in their mid-forties. Age does not matter in this case, as well as gender does not matter.

Some physical findings to look for in an individual who demonstrates the potential of having anorexia nervosa are a reduction in body weight, a decline in their performance, fatigue, dizziness, and dehydration. They also have the ability of developing amenorrhea, which is the halt of the menstrual cycle. They may also exhibit

hyperactivity, rough and/or dry skin, vellus hair on their back and extremities, atrophy of breast tissue, a low heart rate and blood pressure, and the loss of their scalp hair (Montenegro 2006).

Some psychological signs these individuals may allocate are the refusal to eat a diet sufficient to maintain their activity level, preoccupation with their body image, as well as consuming the desire to be the best in their activities. They may also show signs of having a fear of gaining weight and have a distorted body image. Other important signs and symptoms to look for in an individual you may feel is at risk of developing or has already developed an eating disorder are taking in high amounts of caffeine-containing beverages or sugar free gum. They may also distribute signs of lightheadedness, constipation, bloating, compulsive exercising, anxiety at bedtime, extreme sensitivity to cold, or sleep disturbances (Fairbanks 1987).

Individuals with anorexia nervosa are normally those individuals who are high achievers and perfectionists. They have very low self-esteem and self-confidence, which may lead to the development of depression as well as alter their moods. Anorexia nervosa can increase ones' risk of developing electrolyte imbalances, self-defeating behaviors, and cardiac arrhythmias. These individuals believe "The fastest way to lose weight is to stop eating and drinking for a day" (Fairbanks 1987).

Bulimia Nervosa

Bulimia nervosa is ". . . uncontrolled or binge eating followed by induced vomiting; use of laxatives, diuretics, or diet pills; and excessive exercise or fasting in an attempt to burn off large amount of food ingested" (Montenegro 2006). Like anorexics,

bulimics “. . . are frequently driven by a distorted body image, low self-esteem, and other psychological and emotional issues” (Anderson 2001).

A physical sign to look for in an individual who has the risk of developing or who has developed bulimia is puffiness of the face. This is caused by the parotid or salivary gland enlargement. They may also distribute frequent weight fluctuations, teeth marking on their knuckles from induced vomiting, a loss of tooth enamel, and bad breath. A decrease in weight may not be as noticeable as those individuals with anorexia because bulimics tend to maintain their normal or above normal weight. The reasoning behind this is because even though they are purging, they have allowed some nutrients to enter their body. Whether they are vomiting, using laxatives or diuretics, or excessively exercising, food is being consumed allowing some nutrients to be absorbed into the body systems (Montenegro 2006).

Other signs and symptoms to pay attention to in order to determine if an individual is bulimic is fatigue, complaints of a sore throat or chest pain, difficulty swallowing and retaining food, constipation or diarrhea, bloating and abdominal pain, and irregular menses. Precisely like anorexics, bulimics are also obsessed with their body appearance and may develop depression. They can also develop anxiety or obsessive-compulsive disorder. Complications that may and can develop from bulimia nervosa is the “. . . high risk of suffering from heart arrhythmias because of the electrolyte imbalance that results from repetitive vomiting” (Montenegro 2006).

Binge-Eating Disorder

Binge-eating disorder is “Believed to be the most common eating disorder”

(Montenegro 2006). These individuals have lost a significant amount of weight from dieting and begin to “. . . engage in uncontrolled eating that does not stop until they are uncomfortably full” (Montenegro 2006). Problems that can develop from the binge-eating disorder are increased cholesterol levels, diabetes, high blood pressure, gallbladder disease, and heart disease. Reasonably like both anorexia nervosa and bulimia nervosa, individuals with the binge-eating disorder also have the ability to develop depression. Binge-eating disorder has the “. . . highest rates of depression” (Montenegro 2006). Similarly to bulimics, individuals with binge-eating disorder have above average weight or are overweight. They experience “. . . a more difficult time losing weight and maintaining average healthy weights” (Something Fishy 2007).

“Athletes often engage in this type of behavior in preparation for events” (Montenegro 2006). It is more common for athletes to develop disordered eating than any other disorder. This is because “It includes abnormal eating behaviors such as restrictive dieting, bingeing, or purging that occurs less frequently and less severely than required to meet full DSM-IV-TR criteria for diagnosis of an eating disorder” (Montenegro 2006).

B. SCOFF

In a study performed by Morgan et al. using the SCOFF questionnaire; “. . . 16 women aged 18-40 years who were confirmed as having either anorexia nervosa (n=68) or bulimia (n=48), according to the criteria specified in the Diagnostic and Statistical Manual of Mental Disorders, fourth edition” (Morgan 1999) were chosen to take the questionnaire. Also, 96 women ages 18-39 were recruited as controls, meaning they have

no history of an eating disorder.

Of these 116 women with an eating disorder, and 96 women with no eating disorder, there was a sensitivity of 100% for anorexia and bulimia. All cases had 96.9-100%, bulimic cases were 92.6-100%, and anorexic cases were 94.7-100%. Specificity for the controls was 87.5% (70.2-93.4%). From these results (sensitivity and specificity), “the SCOFF questionnaire seems highly effective as a screening instrument for detecting eating disorders” (Morgan 1999).

In another previous study performed by Luck et al (2002), the SCOFF questionnaire was used in the primary care setting. 341 women, ages 18-50 years old, were asked to take the five question questionnaire. Of the 341 women, 3.8% of them had an eating disorder where one had anorexia nervosa, three had bulimia nervosa, and nine had an unspecified eating disorder. In the remaining 328 women, 34 possessed a false positive. “The number of false positive results (34 of 328) . . . [is] more a function of low disease prevalence than the effectiveness of the tool. . .” (Luck 2002). The value of identifying these treatable illnesses in younger women outweighs the false positive rate when you are using the SCOFF questionnaire. “The 5 item SCOFF questionnaire detected most cases of eating disorder in women in a primary care setting . . . and “The results of the study by Luck et al indicate that the 2 minute SCOFF questionnaire can detect and rule out eating disorders in primary care” (Luck 2002).

The SCOFF questionnaire has been compared to the Eating Attitudes Test (“. . . the gold standard instrument for eating disorders” (Noma 2006) in patients with eating disorders in previous research performed by Noma et al (2006). During the comparison

of the SCOFF and the Eating Attitudes Test (EAT-26), 80 patients with eating disorders who attended Kyoto University Hospital or related Hospitals were used as the subjects. The study discovered that “. . . the SCOFF precisely reflect[s] the characteristics of patients with eating disorders, because scores of the SCOFF were strongly correlated with those of the EAT-26, and there were no significant differences in the detection rates between the SCOFF and the EAT-26 for all subjects and for subjects with each subtype of eating disorder” (Noma 2006). The six subgroups they are presenting are:

1. Patients who had no fear of gaining weight and whose body weight was less than 85% of standard body weight
2. Patients without body weight loss who had a fear of becoming fat and abnormal eating patterns like those of patients with anorexia nervosa restricting type
3. Patients without body weight loss who binged and purged less than twice a week
4. Patients without body weight loss who had the habit of self-induced vomiting
5. Patients without body weight loss who binged in the absence of inappropriate compensatory behaviors
6. Others

In conclusion of the study, it was “. . . found that the SCOFF questionnaire is exceedingly valid for screening eating disorders, especially anorexia nervosa and bulimia nervosa” (Noma 2006).

Research performed by Cotton et al compared the SCOFF questionnaire to the Eating Disorder Screen for Primary Care (ESP). 233 participants were used as subjects and 12% were discovered to have an eating disorder. Both the SCOFF and the ESP were used and “. . . accurately detected eating disorders when they existed in university students and primary care patients” (Cotton 2003). The ESP was better at ruling out the eating disorder diagnoses, but the SCOFF did not differ from the ESP in ruling in eating disorders. It was discovered “Both the SCOFF and ESP are more appropriate screening tools for eating disorders than traditional study questionnaires such as the Eating Disorder Inventory or the Eating Attitudes Test” (Cotton 2003).

C. MEDIA

Slay et al in 1998 performed a study on “Motivations for Running and Eating Attitudes in Obligatory Versus Nonobligatory Runners.” Running was stated to help improve physical health, psychological well-being, and goal achievement. Running, though, can threaten an individual’s well-being when it is undertaken in a driven, compulsive way, or when it becomes excessive. These runners continue to run even when it interferes with work, social, and family responsibilities (Slay 1998). These type of runners can develop into Obligatory Runners, which stated by Slay et al are individuals who experience extreme guilt when their running schedule is violated, increase their exercise to make up for lapses, are rigid in their training or expectations, and generally structure their lives around running. Pasman and Thompson (1988) found that obligatory runners had “. . . higher levels of eating disturbances than did a sedentary group on a measure of anorexic tendencies, and that women generally had greater body

dissatisfaction than men” (Slay 1998).

Nonobligatory runners are recreational runners. These individuals find motivation in “. . . challenge, fitness, elevated mood, time to be alone, competition, enjoyment, identity of self as runner, weight control, the opportunity to meet people, and well-being” (Slay 1998). The negative factors, like addiction and fear of being fat, are not as prominent in these runners.

Hunger and emotions both play an important role in driving and maintaining eating difficulties, as stated by Brown et al in the article “Socially driven eating and restriction in the eating disorders” (Brown 2003). Previous evidence has shown a link between emotions and binge eating and bulimic attitudes. In the study by Brown et al, 143 female undergraduates were placed in the nonclinical group, while 107 female undergraduates were placed in the clinical group. The diagnoses for this group were made by experienced clinicians using a structured interview based on the DSM-IV criteria. 31 were discovered to have restrictive anorexia nervosa, 25 with binge-purging anorexia nervosa, and 10 have binge-eating disorder.

Williams et al (2003) looked at media use and anorexia in the article: “Looking for an accurate mirror: A model for the relationship between media use and anorexia.” It was discovered that social and cultural forces have been identified as being factors in the development of eating disorders. The prevalence of eating disorders is increasing worldwide based on a shared media experience. “Media images play an important role in gender role learning and identifying information as well as development of values and beliefs about body image” (Williams 2003). Findings suggested that women with

anorexia nervosa use fashion magazine articles and images for specific functions related to their eating disorder. Other studies have suggested that women who are already sensitive or anxious about their bodies will be influenced more by the media (Williams 2003). The study consisted of 28 female outpatients who were receiving treatment for anorexia nervosa at an eating disorder treatment facility in the western US. These women were from the ages of 18 to 43 years. “As the young women grew more dependent on control of eating as a solution to life’s challenges, they also turned more frequently to the media in an effort to find solutions to their problems or to strengthen their resolve to control their eating. Their use of the media was often directed at learning ways to perpetuate the disorder (Williams 2003). Media was seen as a part of a compulsive ritualization and women spoke of “needing” the media for management of their emotions. The preliminary results of the study suggested the relationship between the media use and anorexia is a circular relationship and that reliance on the media occurred after the initial onset of anorexia.

D. ATHLETES AND EATING DISORDERS

Sanford-Martens et al (2005) performed research in their study “Clinical and Subclinical Eating Disorders: An Examination of Collegiate Athletes. There were a total of 489 participants and 325 of them were involved in collegiate athletics. A questionnaire from the Eating Disorder Diagnoses was used and the results indicated that more females than males exhibited eating behaviors that were classified as diagnostic or symptomatic of an eating disorder (Sanford-Martens 2005). “In addition, a greater number of non-athletes than athletes were both symptomatic or met diagnostic criteria for

an eating disorder. Last, results indicated that athletes participating in sports that emphasized leanness and body aesthetic (lean) did not report more problematic eating behaviors than their non-lean athlete peers” (Sanford-Martens 2005).

“Eating Disorder Prevalence and Symptoms for Track and Field athletes and Nonathletes” by Hausenblas and McNally researched 217 male and female track and field athletes, compared with 195 male and female nonathletes. More women than men were discovered to be classified as having an eating disorder or symptomatic of an eating disorder. “Track and field athletes did not report more eating disorder symptoms and prevalence than the higher and lower-active nonathletes” (Hausenblas 2004). This allows the consideration, stated by Hausenblas, for the link between exercise and eating disorders may rely on an individual’s motivation for exercise. Those individuals who are exercising for the weight and appearance aspects rather than for the health and fitness aspect may be at the risk of an eating disorder.

“Losing To Win” by Anderson published in Sports Illustrated for Women offered several personal insights on eating disorders and the pressures of the running world. It was stated by Anderson that 7 million women (5% of the US population) and 1 million men have anorexia, bulimia, or a binge-eating disorder. Among athletes, the incidence appears to be higher with several studies showing 30% of female athletes have disordered eating behaviors. It is the “. . . qualities that make an athlete successful – discipline, focus, competitiveness, perfectionism, sacrifice – that allow eating disorders to flourish” (Anderson 2001). As stated by one athlete: “They are so perfectionistic, they’ll do anything to please a coach, they’ll do anything to be successful” (Anderson 2001).

METHODS:

Surveys based on the SCOFF questionnaire were distributed to two Division 1 universities in the Mid-West area to 110 student-athletes. These student-athletes are between the ages of 18 and 24, ranging between freshman and 5th year seniors in college/universities. Prior to the distribution of the surveys, the Institutional Review Board (IRB) was presented with the thesis and the surveys. The IRB then decided the surveys were qualified to be distributed to the student-athletes. The IRB has the best interest of the athlete in their minds and ensures the identity of these individuals will be protected.

SURVEY:

The SCOFF questionnaire is a five question tool used to detect eating disorders. “It is designed to raise suspicion of a likely case rather than to diagnose” (Morgan 1999). The questionnaire is short and easy to administer because the individuals only need to answer five questions on a sheet of paper and then turn it in to the administrator.

The questions consist of:

1. Do you make yourself Sick because you feel uncomfortably full?
2. Do you worry you have lost Control over how much you eat?
3. Have you recently lost more than One stone (14 pounds) in a 3 month period?
4. Do you believe yourself to be Fat when others say you are too thin?
5. Would you say that Food dominates your life?

Once the questionnaire is completed, the scoring is very simple. As stated by Morgan et al (1999), one point is given for every “yes” answered. A score of ≥ 2 indicates a likely

case of anorexia nervosa or bulimia nervosa.

DESIGN AND ANALYSIS PROCEDURES:

The data were collected in-person from the student-athletes. They placed their finished surveys in a sealed box after folding them into quarters. Each individual was given the same color of ink pen to fill in the surveys, as to allow the individuals to remain anonymous. The finished surveys were not looked at until the principal investigator arrived home, away from the student-athletes and supporting staff. This allowed the student-athletes to remain anonymous as well because their responses were not seen by other student-athletes, as well as by other individuals in the room.

Once the responses were reviewed, the 5 SCOFF questions were scored. Each “yes” response was given one point and each “no” was given zero points. If the final score was two points or more, the possibility of the individual to have a case of an eating disorder or the possibility of developing a case of an eating disorder was greater.

The other responses (age, diet, weight, etc.) were used to compare the student-athletes to each other. Those individuals who had the risk of developing or already had an eating disorder (≥ 2 points) were compared to those individuals who did not have or have the risk of developing an eating disorder (< 2 points). This allowed the differences between the two groups to be noticed and will provide a standard for other health care providers to look at in order to discover if their student-athletes have an eating disorder or the risk of developing an eating disorder.

RESULTS:

A. DATA ANALYSIS

The data were analyzed using the chi-square test in order to develop the probabilities. The Chi-Square consisted of a 2x2 contingency where one side was 'male' and 'female.' The other side consisted of 'low' and 'high.' The 'low' reflected combined answers 1, 2, and 3 of the scale, while 'high' reflected combined answers 4 and 5 on the same scale. These two groups were developed because if they were run separately as 1, 2, 3, 4, and 5; then the Chi-Square test would come back with warnings and small frequencies. Combining the numbers into two groups provides enough numbers per category allowing the frequencies to be large enough for the tests to be ran.

The Fisher Exact Test was run as well in case the Chi-Square test came back to be an invalid test. The Fisher Exact Test provided a probability as well which provides support for the Chi-Square probability found.

B. QUESTIONS

Nine questions were run individually in order to determine their probabilities and their relevance to the hypothesis: Outside sources influence eating disorders and behaviors of college cross country and track runner. Each question was run with a Chi-Square test and a Fisher Exact Test. Eight of the nine questions failed to support the hypothesis, while one question, question seven, did support the hypothesis. There was one question, question six, whose probability was very close to being able to support the hypothesis, but it did fail to support it in both the Chi-Square and Fisher Exact.

QUESTION #1	1	2	3	4	5	0
Have you ever felt pressured to lose weight for running?	47	14	23	19	6	1
MALE RESPONSES	33	4	12	10	3	0
FEMALE RESPONSES	14	10	11	9	3	1
LOW (1, 2, 3) RESPONSES	49 (M) + 36 (F) = 85					
HIGH (4, 5) RESPONSES	13 (M) + 12 (F) = 25					

The number of males and females whose answers belong in the ‘low’ area are larger than those whose answers are in the ‘high’ area. 49 males (79%) and 36 females (75%) answered in the ‘low’ category, providing an equivalent reaction, showing that males and females feel similar in their views about the pressure of losing weight for running.

The probability found in Chi-Square was 0.6167. This is greater than the level of significance of 0.05 which leads to failing to reject the null hypothesis because there is no statistical significance and because there is no difference between the males and females.. 85 of the 110 (77.27%) student-athlete respondents reported they do not feel pressure to lose weight for running. With these findings, this does not agree with the hypothesis.

QUESTION #2	1	2	3	4	5	0
Does your weight fluctuate between out-of season & in-season?	36	25	20	14	14	1
MALE RESPONSES	22	12	12	9	7	0
FEMALE RESPONSES	14	13	8	5	7	1
LOW (1, 2, 3) RESPONSES	46 (M) + 36 (F) = 82					
HIGH (4, 5) RESPONSES	16 (M) + 12 (F) = 28					

The number of males and females whose answers belong in the ‘low’ area are larger than those whose answers are in the ‘high’ area. 46 males (74%) and 36 females (75%) answered in the ‘low’ category, providing an equivalent reaction, showing that males and females feel similar in their views about their fluctuating weight during out-of-season and the in-season.

The probability found in Chi-Square was 0.9233. This is greater than the level of significance of 0.05 which leads to failing to reject the null hypothesis because there is no statistical significance and because there is no difference between the males and females. 82 of 110 (74.55%) respondents reported their weight does not fluctuate between the two seasons. With these findings, this does not agree with the hypothesis.

QUESTION #3	1	2	3	4	5	0
Do you feel pressure from your coach to lose weight?	80	14	7	5	3	1
MALE RESPONSES	49	7	2	3	1	0
FEMALE RESPONSES	31	7	5	2	2	1
LOW (1, 2, 3) RESPONSES	58 (M) + 44 (F) = 102					
HIGH (4, 5) RESPONSES	4 (M) + 4 (F) = 8					

The number of males and females whose answers belong in the ‘low’ area are larger than those whose answers are in the ‘high’ area. 58 males (94%) and 44 females (92%) answered in the ‘low’ category, providing an equivalent reaction, showing that males and females feel similar in their views about the pressure from their coach to lose weight.

The probability found in Chi-Square was 0.7063. This is greater than the level of significance of 0.05 which leads to failing to reject the null hypothesis because there is no statistical significance and because there is no difference between the males and females. Due to a warning of small expected frequency, Fisher Exact Test was also used providing a 2-sided probability of 0.7268. This is also greater than the level of significance of 0.05. 102 of 110 (92.73%) respondents reported they do not feel pressure from their coach to lose weight. With these findings, this does not agree with the hypothesis.

QUESTION #4	1	2	3	4	5	0
Do you feel pressure from your parents to lose weight?	90	12	3	3	1	1
MALE RESPONSES	52	9	0	0	1	0
FEMALE RESPONSES	38	3	3	3	0	1
LOW (1, 2, 3) RESPONSES	61 (M) + 45 (F) = 106					
HIGH (4, 5) RESPONSES	1 (M) + 3 (F) = 4					

The number of males and females whose answers belong in the ‘low’ area are larger than those whose answers are in the ‘high’ area. 61 males (98%) and 45 females (94%) answered in the ‘low’ category, providing an equivalent reaction, showing that males and females feel similar in their views about the pressure from their parents to lose weight.

The probability found in Chi-Square was 0.1976. This is greater than the level of significance of 0.05 which leads to failing to reject the null hypothesis because there is no statistical significance and because there is no difference between the males and females. Due to a warning of small expected frequency, Fisher Exact Test was also used providing

a 2-sided probability of 0.3161. This is also greater than the level of significance of 0.05.

106 of 110 (96.36%) respondents reported they do not feel pressure from their parents to lose weight. With these findings, this does not agree with the hypothesis.

QUESTION #5	1	2	3	4	5	0
Do you feel pressure from your teammates to lose weight?	81	17	8	3	0	1
MALE RESPONSES	47	6	3	1	0	0
FEMALE RESPONSES	34	11	1	1	0	1
LOW (1, 2, 3) RESPONSES	60 (M) + 47 (F) = 107					
HIGH (4, 5) RESPONSES	2 (M) + 1 (F) = 3					

The number of males and females whose answers belong in the ‘low’ area are larger than those whose answers are in the ‘high’ area. 60 males (97%) and 47 females (98%) answered in the ‘low’ category, providing an equivalent reaction, showing that males and females feel similar in their views about the pressure from their teammates to lose weight.

The probability found in Chi-Square was 0.7152. This is greater than the level of significance of 0.05 which leads to failing to reject the null hypothesis because there is no statistical significance and because there is no difference between the males and females. Due to a warning of small expected frequency, Fisher Exact Test was also used providing a 2-sided probability of 1.00. This is also greater than the level of significance of 0.05. 107 of 110 (97.27%) respondents reported they do not feel pressure from their teammates to lose weight. With these findings, this does not agree with the hypothesis.

QUESTION #6	1	2	3	4	5	0
Do you feel pressure from the media to lose weight?	76	13	10	7	3	1
MALE RESPONSES	53	3	3	3	0	0
FEMALE RESPONSES	23	10	7	4	3	1
LOW (1, 2, 3) RESPONSES	59 (M) + 41 (F) = 100					
HIGH (4, 5) RESPONSES	3 (M) + 7 (F) = 10					

The number of males and females whose answers belong in the ‘low’ area are larger than those whose answers are in the ‘high’ area. 59 males (95%) and 41 females (85%) answered in the ‘low’ category, providing a similar reaction, but with a 10% difference. This represents that the male respondents feel less pressure from the media to lose weight when compared to the female respondents, but both have a larger percentage of the sample in the ‘low’ category.

The probability found in Chi-Square was 0.0779. This is greater than the level of significance of 0.05 which leads to failing to reject the null hypothesis because there is no statistical significance and because there is no difference between the males and females. There is a 10% difference between the two, but it is not a significant difference or a large sample of respondents in the ‘high’ category. Due to a warning of small expected frequency, Fisher Exact Test was also used providing a 2-sided probability of 0.10. This is also greater than the level of significance of 0.05. The number of individuals who chose 3 on the scale of one to five was looked at. This was done in order to see if the number of respondents who answered 3 would be added to the respondents who

answered 4 and 5 and make a difference in the totals. There were 10 total individuals who chose 3 this would not provide a large enough change in the ‘low’ and ‘high’ input to make an impact. 100 of 110 (90.91%) respondents reported they do not feel pressure from the media to lose weight. With these findings, this does not agree with the hypothesis.

QUESTION #7	1	2	3	4	5	0
Do you feel there is an underlying expectation for runners to be a certain size or weight?	14	13	37	23	22	1
MALE RESPONSES	12	9	22	12	7	0
FEMALE RESPONSES	2	4	15	11	15	1
LOW (1, 2, 3) RESPONSES	43 (M) + 22 (F) = 75					
HIGH (4, 5) RESPONSES	19 (M) + 26 (F) = 45					

The number of males and females whose answers belong in the ‘low’ area are larger than those whose answers are in the ‘high’ area. 43 males (69%) and 22 females (46%) answered in the ‘low’ category and 19 males (31%) and 26 females (54%) answered in the ‘high’ category. There is a difference in the responses by the two groups. Males feel that there is not an underlying expectation for runners to be a certain size or weight, while females feel there is.

The probability found in Chi-Square was 0.0128. This is lower than the level of significance of 0.05 which leads to rejecting the null hypothesis because there is statistical significance and because there is a difference between the males and females. Due to a warning of small expected frequency, Fisher Exact Test was also ran to

collaborate this finding and the 2-sided probability was 0.0187 which agrees with the Chi-Square findings. 65 of 110 (59.09%) do not feel there is an underlying expectation.

With these findings, this does agree with the hypothesis.

QUESTION #8	1	2	3	4	5	0
How often do you weigh yourself?	9	26	27	27	20	1
MALE RESPONSES	5	15	12	15	15	0
FEMALE RESPONSES	4	11	15	12	5	1
LOW (1, 2, 3) RESPONSES	32 (M) + 31 (F) = 63					
HIGH (4, 5) RESPONSES	30 (M) + 17 (F) = 47					

The number of males and females whose answers belong in the ‘low’ area are larger than those whose answers are in the ‘high’ area. 32 males (52%) and 31 females (65%) answered in the ‘low’ category and 30 males (48%) and 17 females (35%) answered in the ‘high’ category. There is a difference in the responses of the two groups. The males have a close percentage between the two groups, showing they have similar results on how often they weigh themselves. Some males do not weigh themselves often, while others weigh themselves quite often. The females have a higher percentage in the ‘low’ group, showing the larger ratio does not weigh themselves often.

The probability found in Chi-Square was 0.1726. This is greater than the level of significance of 0.05 which leads to failing to reject the null hypothesis because there is no statistical significance and because there is no difference between the males and females. The male respondents do have a closer percentage between the ‘low’ and ‘high’ category,

but the ‘low’ category remains larger similar to the females. 63 of 110 (57.27%) respondents do not claim to weigh themselves often. With these findings, this does not agree with the hypothesis.

QUESTION #9	1	2	3	4	5	0
Do you change your eating habits between a typical practice day and a competition day?	10	16	19	28	35	1
MALE RESPONSES	6	9	11	18	17	0
FEMALE RESPONSES	4	7	8	10	18	1
LOW (1, 2, 3) RESPONSES	27 (M) + 20 (F) = 47					
HIGH (4, 5) RESPONSES	35 (M) + 28 (F) = 63					

The number of males and females whose answers belong in the ‘low’ area are larger than those whose answers are in the ‘high’ area. 27 males (44%) and 20 females (42%) answered in the ‘low’ category, while 35 males (56%) and 28 females (58%) answered in the ‘high’ category. There is a difference between the two groups and both males and females feel that they do change their eating habits between a typical practice day and a competition day.

The probability found in Chi-Square was 0.8432. This is greater than the level of significance of 0.05 which leads to failing to reject the null hypothesis because there is no statistical significance and because there is no difference between the males and females. Both groups have larger percentages in the ‘high’ category, providing a similarity. 47 of 110 (42.73%) respondents do not claim to change their eating habits between a practice and competition day. With these findings, this does not agree with the hypothesis.

C. SCOFF

The SCOFF questionnaire is a five question tool used to detect eating disorders. The scoring is simple; one point is given for every “yes” answered. A score of ≥ 2 indicates a likely case of anorexia nervosa or bulimia nervosa. 110 student-athletes completed the SCOFF questionnaire and a total of 18 individuals answered yes to two or more questions. This indicates that 16.36% of the student athletes surveyed has a possibility of developing or already having an eating disorder. The SCOFF does not diagnose eating disorders, so it is fallacious to state these individuals do have an eating disorder. The questions are listed below along with the numbers of individuals who answered No or Yes.

QUESTION	NO	YES
Do you make yourself Sick because you feel uncomfortably full?	98 (89.1%)	12 (10.9%)
Do you worry you have lost Control over how much you eat?	95 (86.4%)	15 (13.6%)
Have you recently lost more than 14 pounds in a 3 month period?	102 (92.7%)	8 (7.3%)
Do you believe yourself to be Fat when others say you are too thin?	100 (90.9%)	10 (9.1%)
Would you say that Food dominates your life?	90 (81.8%)	20 (18.2%)

- John F Morgan; Department of Public Health Sciences, St. George’s Hospital Medical School

The individuals who answered ‘yes’ to two or more questions on the questionnaire participated in every area of track and field, as well as cross country runners. There were individuals who ran distance such as cross country or the 10K in track. Other individuals ran the middle distances or sprints. Some also competed in the field effects such as high jump, long jump, or shot and discus. There were also

individuals who competed in the pentathlon, heptathlon, and duathlon. All in all, every aspect of cross country and track and field was covered by these eighteen individuals, so no one specific area can be stated as having more probability of the athlete developing an eating disorder.

The food these participants ate during in-season did not change from their regular eating habits. During the off-season, there was one individual who did not eat breakfast or dinner, while another individual decreased the amount of food they consumed.

Otherwise, the rest of the student-athletes had no change in their eating habits. During a competition day, there was no change in some of the participants. There were individuals who skipped a meal, such as lunch because of their competition time, or even skipped snacks or their dinner. The food consumption during a competition day is dependent on the athlete's competition time and how their stomach responds to certain foods they eat during competition. There was one individual who did not eat dinner, which would be assumed to be after the competition was over. Most of the other student-athletes ate dinner and snacks like a regular day.

COMPARE & CONTRAST LITERATURE REVIEW:

Question six of the nine questions asked the student-athletes "Do you feel pressure from the media to lose weight?" The results from the responses to this question represented both male and female student-athletes as not feeling pressure from the media to lose weight. There were 95% of the male respondents stating they do not feel pressure from the media, while 85% of the female respondents stated the same. The level of significance used for the study was 0.05. The probability found by Chi-Square was

0.0779 and the probability found by Fisher Exact was 0.10. These numbers are extremely close to 0.05 and would tend to support the hypothesis that outside influences do influence the eating behaviors of cross country and track runners. However, this is not the case and the larger percentages of males and females are answering in the 'low' category rather than the 'high' category, presenting that they do not feel pressure from the media.

In the article "Looking for an accurate mirror: A model for the relationship between media use and anorexia," Williams et al (2003) discovered that social and cultural forces have been identified as being factors in the development of eating disorders. Those findings suggested that women with anorexia nervosa used fashion magazine articles and images for specific functions related to their eating disorder. Many other studies suggested that women who already have sensitive views or are anxious about their bodies will be more influenced by the media as well (Williams 2003). The results from this study provide some support for the past findings because the probabilities were so close to declaring the hypothesis was correct and individuals do feel pressure from the media. The percentage of females who did answer in the 'high' category stating they do feel pressure from the media was 15% compared to the males 5%. This does concur with the findings in Williams' article because it discusses women more than men, and in this study as well, there is a larger percentage of females feeling pressure from the media.

The article "Eating Disorder Prevalence and Symptoms for Track and Field athletes and Nonathletes" by Hausenblas and McNally discovered more women than men were classified as having an eating disorder or symptomatic of an eating disorder. This is true

in the present study as well. The results of the SCOFF questionnaire discovered 11 women answered “yes” to 2 or more questions, while there were only 7 men. This is 23% of females and 11% of males having this chance. The SCOFF questionnaire does not diagnose eating disorders, but it does show individuals who have the possibility of developing or already having an eating disorder. Females are presenting with a greater risk of developing or already having an eating disorder with a 50% increase from the males in this study.

DISCUSSION:

Of the nine questions asked in the beginning part of the survey, only one question came back with a supporting result. This question was: Do you feel there is an underlying expectation for runners to be a certain size or weight? The results discovered the probability was statistically significant and supported the hypothesis.

Another question: Do you feel pressure from the media? was close to supporting the hypothesis as well, but fell a few numbers short. Even though the results do not support the hypothesis, it is important to look at the possibility this could have supported the hypothesis and that individuals are feeling pressure from the media. The media is a powerful source in today’s society and it is important to watch how some individuals perceive it.

The SCOFF questionnaire did provide some good feedback. 16.36% of respondents answered “yes” to two or more questions, indicate they have the possibility of developing an eating disorder or already having one. This is a very important fact to look at. 16% of student-athletes could have an eating disorder out of only 110 participants. This is a very

low number of participants with a very high number of possibilities. 48 females and 62 males completed the survey. This means that 11 of 48 females (22.9%) and 7 of 62 males (11.2%) answered enough questions “yes” to be classified in this category. These are large percentages of small groups. These are eye-widening numbers and should be increasing the awareness of eating disorders in collegiate athletics.

LIMITATIONS:

1. The survey was only presented to two colleges/universities and only 110 student-athletes completed the survey. The sample size should be increased to have more accurate results, as well the possibility of discovering more information proving the hypothesis to be correct.
2. There is no way to determine if individuals answered the surveys truthfully. The answers were believed to be the truth, providing the study’s results. Some individuals may have answered fictitiously thinking their answers would be discovered by the public, even though the method was explained to them and they would remain anonymous. If an individual did not feel they would remain anonymous, it is uncertain as to how many answers were skewed in order to provide answers they believe others would want to hear.

CONCLUSION:

The hypothesis that outside sources influence eating disorder and behaviors on cross country and track runners was only supported in one area. With a larger sample size, it is believed this result would be reversed and outside sources would be found to influence those individuals. The question asking if the respondents believe there is an underlying

expectation for runners to be a certain size or weight was found to support the hypothesis. The larger percentage of males (69%) answered in the 'low' category stating they do not believe there is an underlying expectation. On the other side, the larger percentage of females (54%) answered in the 'high' category and do believe there is an underlying expectation. This is a critical finding because it is important to understand how individuals view other athletes, as well as themselves.

The question concerning the media was close to supporting the hypothesis, but did not have enough numerical evidence. There were a larger percentage of females (15%) who do feel pressure from the media when compared to males (5%), but it was not the majority of the respondents providing no support for the hypothesis. With a larger sample size, it is expected this question would be found to support the hypothesis after a data analysis is performed.

The SCOFF questionnaire was a successful questionnaire that found over 16% of individuals does have the possibility of having or developing an eating disorder. 11 females (23%) and 7 males (11%) were discovered to be a part of the 16%, and unfortunately this is only out of a sample size of 110. With a larger sample population, these percentages may increase. The study was only performed on college cross country and track athletes, but there are not large differences between these athletes' thoughts and other athletes' thoughts and ideas. It would be beneficial for the SCOFF questionnaire to be presented in pre-participation physicals for all athletes in order to determine who should be watched a little more closely, especially when they have already raised questions for the medical staff.

In the profession of being a certified athletic trainer, it is important to understand the signs and symptoms of an eating disorder, as well as the risks involved in the disease. Having a tool to help determine if an individual needs help could help decrease the rising statistics of eating disorders in athletics. Knowing the influences, the type of eating behaviors an individual has, can help alert a certified athletic trainer and the supporting medical staff to help those individuals who need the appropriate help.

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Appendix A
Influences of Eating Disorders and Behaviors on
College Cross Country and Track Runners

You are being invited to take part in this research study. This research study is strictly voluntary. This cover letter explains why we are performing this research study and your role if you choose to participate. This letter also describes the possible risks connected with being in this study. After reviewing this information with the person responsible for your enrollment, you should know enough to be able to make an informed decision on whether you want to participate in the study. This study complies with all laws and regulations.

PURPOSE OF STUDY:

Influences of College athletes regarding disordered eating are complex. This study hopes to further define specific stressors that college athletes feel. With this additional information, actions may be possible to lower that stress.

DESCRIPTION OF RESEARCH:

Midwest colleges have been contacted to help complete a study regarding disordered eating behavior and factors that may encourage that behavior. Cross Country and Track runners will be given the opportunity to complete the survey. The survey will take approximately 5 to 10 minutes to complete. Multiple steps will be taken to ensure the confidentiality of the participants. This study is not intended to diagnose eating disorders. The information gained from the survey will then be analyzed to determine if a specific stressor is more likely to contribute to disordered eating behaviors.

RISKS, SIDE EFFECTS AND DISCOMFORTS TO PARTICIPANTS:

You will not experience any side effects or discomfort other than what is expected from filling out a short survey. There is a small risk that procedures may be disrupted or not followed leading to a breach of confidentiality.

POTENTIAL BENEFITS:

There are no direct benefits for you in this study. The information gained from this study may help with the understanding of disordered eating behaviors and what factors may be of influence. New information may lead to improved medical care.

I understand that the following statements about this study are true:

1. The investigators of this study do not have a financial interest in any aspect of this research
2. My participation is voluntary.

3. I may ask any questions I have about this study. I may contact the principal investigator for this study Kim Ricker at (937) 775-2776. I may also contact the faculty advisor for this study Tony L. Ortiz at (937) 775-3827. If I have general questions about giving consent or my rights as a research participant in this research study, I can call the Wright State University Institutional Review Board at (937) 775-4462.
4. I may withdraw at any time without any penalty or loss of benefits
5. I understand that I will not receive financial compensation from the investigators or Wright State University.

CONSENT

Having read and understood the above, and having had the chance to ask questions about this study and reflect and consult with others, I voluntarily give my consent to participate in this study. I have been given a copy of this consent.

PARTICIPANT NAME (PRINT)

SIGNATURE OF PARTICIPANT

SIGNATURE OF PRINCIPAL INVESTIGATOR

SIGNATURE OF FACULTY ADVISOR

Appendix B
INFORMED CONSENT FOR PARTICIPATION IN RESEARCH
Influences of Eating Disorders and Behaviors on
College Cross Country and Track Runners

College/University Name: _____

You are being asked to allow the student-athletes at your establishment to participate in a research study. This study looks at the influences of college athletes regarding disordered eating. For the study, the student-athlete will complete a survey regarding disordered eating behavior and factors that may encourage that behavior. The survey will take approximately between 5 and 10 minutes to complete. The student-athletes will not provide their names on these surveys, which will allow them to remain anonymous. The college/university will remain anonymous as well, and will not be named in the final research study.

With providing a signature on this consent form, you are allowing the student-athletes at your establishment to take part in this research study. The student-athlete still has the opportunity to refuse to participate in this study, in which they will refuse to complete the survey.

Having read and understood the above, and having had the chance to ask questions about this study and reflect and consult with others. I voluntarily give my consent to allow the student-athletes at my establishment to take part in the research study.

PRINT NAME

SIGNATURE : NAME

DATE

Appendix C

To The Student:

This survey is being conducted to better understand how runners feel about eating, eating disorders; and what they know about eating disorders. This research is being conducted to allow the information to be provided in a thesis paper.

To encourage you to be completely honest in your response, I assure you that your answers will be kept confidential. Your individual answers will not be shared with your parents, coaches, or others. Furthermore, your identity will be protected and not provided in the thesis project.

DO NOT PUT YOUR NAME OR OTHER IDENTIFYING INFORMATION ON THIS SURVEY

Survey/Questionnaire

Male _____ Female _____

What is your age? _____

How long have you been competitively running? _____

How many meets/races, on average, do you have per season? _____

What event(s) do you perform during the track season? _____

How much do you weigh in-season typically? _____

How much do you weigh out-of-season typically? _____

What is your food intake on a typical day when you are in-season?

Breakfast: _____

Lunch: _____

Dinner: _____

Snack: _____

What is your food intake on a typical day when you are out-of-season?

Breakfast: _____

Lunch: _____

Dinner: _____

Snack: _____

What is your food intake on a typical day of competition?

Breakfast: _____

Lunch: _____

Dinner: _____

Snack: _____

For The Following Questions Answer On The Scale From 1-5

1 = least/not much; 5 = most/a lot

- | | | | | | |
|--|---|---|---|---|---|
| Have you ever felt pressured to lose weight for running? | 1 | 2 | 3 | 4 | 5 |
| Does your weight fluctuate between out-of-season & in-season? | 1 | 2 | 3 | 4 | 5 |
| Do you feel pressure from your coach to lose weight? | 1 | 2 | 3 | 4 | 5 |
| Do you feel pressure from your parents to lose weight? | 1 | 2 | 3 | 4 | 5 |
| Do you feel pressure from your teammates to lose weight? | 1 | 2 | 3 | 4 | 5 |
| Do you feel pressure from the media to lose weight? | 1 | 2 | 3 | 4 | 5 |
| Do you feel there is an underlying expectation for runners to be a certain size or weight? | 1 | 2 | 3 | 4 | 5 |
| How often do you weigh yourself? | 1 | 2 | 3 | 4 | 5 |
| Do you change your eating habits between a typical practice day & a competition day? | 1 | 2 | 3 | 4 | 5 |

Please answer the following 5 questions with a Yes or No response

- | | | |
|---|-----|----|
| Do you make yourself Sick because you feel uncomfortably full? | Yes | No |
| Do you worry you have lost Control over how much you eat? | Yes | No |
| Have you recently lost more than 14 pounds in a 3 month period? | Yes | No |
| Do you believe yourself to be Fat when others say you are too thin? | Yes | No |
| Would you say that Food dominates your life? | Yes | No |

- John F Morgan; Department of Public Health Sciences, St. George's Hospital Medical School