

**A Sociological Look at the Female Athlete Triad:  
How Gender Socialization Influences the Occurrence of the  
Triad in College Athletes**

by

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**An Honors Thesis  
submitted in partial fulfillment of the requirements  
for the Honors Diploma  
to**

**The University Honors Program**

of

**The University of Alabama in Huntsville**

**4-23-2013**

**Abstract**

Sports participation has been shown to benefit female athletes' self-esteem and health, but these psychological and physiological advantages can be countered if a female athlete suffers from the female athlete triad. In order to determine effective treatment and preventive plans, it is important to determine causes of the triad. This study examines how gender socialization influences instances of disordered eating, menstrual irregularity, and low bone mineral density in female athletes. The results of the survey show a significant relationship between an athlete being told to diet and the occurrence of all three components of the triad. The results also showed a significant relationship between participants who watched more television and the occurrence of stress fractures.

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## **Abstract**

Sports participation has been shown to benefit female athletes' self-esteem and health, but these psychological and physiological advantages can be countered if a female athlete suffers from the female athlete triad. In order to determine effective treatment and preventive plans, it is important to determine causes of the triad. This study examines how gender socialization influences instances of disordered eating, menstrual irregularity, and low bone mineral density in female athletes. The results of the survey show a significant relationship between an athlete being told to diet and the occurrence of all three components of the triad. The results also showed a significant relationship between participants who watched more television and the occurrence of stress fractures.

## **Introduction**

Since the passage of Title IX, there has been an increase in women's participation in athletics. Athletic participation for females has been linked to higher self-esteem and a more positive body image (Throm-Nissenbaum and Carr 2011). While many women have enjoyed the benefits of sports participation, this is not true for all female athletes. In 1992, the American College of Sports Medicine coined the term "female athlete triad" to describe the association of disordered eating, amenorrhea, and osteoporosis found to be prevalent in female athletes. Since then, studies have shown that up to 66 % of female athletes display at least some form of menstrual irregularity associated with the female athlete triad (Kirchner and Cohen 2002).

Studying the causes of the triad is important because the hormonal disturbances associated with the triad not only decrease an athlete's performance, but also have implications for health risks throughout the lifetime. The 2011 International Federation of Sports Medicine's position statement reads that "increasing psychological and physiological demands on young female athletes, as well as the pressure from society for a lean and slim body can result in serious health risks" (Korsten-Reck 2011). The most apparent physical consequences of untreated symptoms of the triad include osteopenia and osteoporosis. Female athletes who display the female athlete triad are countering the benefits of exercise, and can start exhibiting stress fractures (a symptom of osteoporosis) as early as their twenties, regardless of continuing competition. The less apparent psychological damage caused by the triad can be just as debilitating, because some female athletes who suffer from disordered eating also suffer from anxiety and depression (Korsten-Reck 2011).

In the past, the perceived causes of the triad have been eating disorders such as anorexia nervosa and bulimia nervosa (Kirchner and Cohen 2002). In recent studies, many female athletes are considered to have the triad without actually being clinically diagnosed with an eating disorder. These athletes exhibit pathogenic weight control, but their body weight does not meet the DSM-IV requirements for bulimia or anorexia (Kirchner and Cohen 2002). Discovering other causes for the triad is important in order to pursue effective treatment and preventive plans.

The female athlete triad is a disorder unique to women; therefore, examining how socialization uniquely affects women can be a different approach to determining the causes of the triad. Women are generally socialized to be preoccupied with their bodies,

(Coelho, Soares, and Ribeiro 2010) and female athletes have the distinctive challenge of managing standards that are usually contradictory with societal ideals of athleticism (Steinfeldt, Carter, Zakrajsek, and Steinfeldt 2011). This study attempts to answer the question: How do different aspects of gender socialization, such as media or other outside influences, affect the occurrence of components of the female athlete triad?

## **Literature Review**

### Overview of the Triad

When the term female athlete triad was first identified by the American College of Sports Medicine in 1992, the term described the association between eating disorders, amenorrhea, and osteoporosis. Research found evidence of female athletes displaying less severe cases of the triad, but the strict diagnostic requirements led to under diagnosing athletes (Thein-Nssenbaum and Carr 2011). The revised 2007 Position Stand now refers to the female athlete triad as “the pathological end of a spectrum of interrelated subclinical conditions between health and disease” (Nattiv, Loucks, Manore, Sanborn, Sundgot-Borgen, and Warren 2007). The subclinical conditions of the triad have been revised to include energy availability, menstrual function, and bone mineral density (Thein-Nssenbaum and Carr 2011).

### Low Energy Availability

Energy availability is known as the central component of the female athlete triad (Kirchner and Cohen 2002). Energy availability is defined as dietary intake minus energy expenditure, and can range from optimal energy availability to low energy availability.

When energy expenditure is greater than caloric intake, physiological mechanisms are affected. In order to compensate for the low energy balance, the body reduces the energy input in cellular maintenance, thermoregulation, and reproduction (Nattiv, Loucks, Manore, Sanborn, Sundgot-Borgen, and Warren 2007).

Low energy availability can occur without an eating disorder. A negative energy balance can occur when an athlete unintentionally does not meet daily caloric intake needed to sustain exercise and other bodily functions. When athletes increase their exercise intensity, they might not know to increase their dietary intake as well (Thein-Nssenbaum and Carr 2011). Energy availability can be purposely lowered by increasing caloric expenditure through high intensity exercise or to intentionally decreasing their caloric intake, which can lead to disordered eating (Coelho, Soares, and Ribeiro 2010).

Disordered eating is characterized by abnormal eating behaviors including restrictive eating, fasting, skipping meals, binge-eating followed by purging, and the use of diet pills, laxatives, or enemas. Disordered eating behaviors are not the only criteria used to determine whether an athlete has an eating disorder because eating disorders are psychological illnesses that have strict criteria (Coelho, Soares, and Ribeiro 2010). These criteria include: body weight <85 % of expected, intense fear of weight gain, inaccurate perception of body size, and amenorrhea (in the case of anorexia nervosa) or binge-eating and purging 2 times a week for 3 months (in the case of bulimia nervosa) (Kirchner and Cohen 2002). Female athletes may possess many of the symptoms for an eating disorder but not meet the weight requirement for anorexia because of the increase in weight attributable to lean body mass that is a result of training. The term disordered eating can

encompass athletes who do not meet the criteria, but participate in pathogenic weight control measures that can lower their energy availability. Disordered eating has been found to occur in 27% of female college athletes (Coelho, Soares, and Ribeiro 2010) and has been reported at rates as high as 67% in collegiate gymnasts (Nattiv, Loucks, Manore, Sanborn, Sundgot-Borgen, and Warren 2007).

### Menstrual Function

Menstrual function ranges from eumenorrhea (normal menses) to amenorrhea. Amenorrhea is described as either primary or secondary. Primary amenorrhea is a delay in the onset of menses past the age of 15, while secondary amenorrhea is described as a cessation of menstruation after the onset of menarche (Thein-Nssenbaum and Carr 2011). Within the range of menstrual function, oligomenorrhea (or menstrual irregularity) describes menses that occur in intervals longer than 35 days (Nattiv, Loucks, Manore, Sanborn, Sundgot-Borgen, and Warren 2007). Menstrual irregularity occurred in 23.5% athletes in a sample and secondary amenorrhea has been reported to be as high as 65% in runners compared to 2-5% in the general population (Thein-Nssenbaum and Carr 2011).

Menstrual disorders tend to occur when energy availability is reduced by more than 33%, and result from the pituitary gland not secreting Luteinizing Hormone (LH) at the correct rate. LH reflects the activity of the gonadotrophin-releasing hormone (GnRH) from the hypothalamus, and regulates metabolic hormones that affect reproduction. Low energy availability disrupts metabolic processes regardless of clinical diagnoses of an eating disorder, and menstrual irregularities can occur when exercise expenditure is increased without increasing energy intake. Amenorrheic runners have been shown to be

consistently in an energy deficit state and most likely suffer from functional hypothalamic amenorrhea. In functional hypothalamic amenorrhea, ovulation can be restored once optimal energy availability is restored (Nattiv, Loucks, Manore, Sanborn, Sundgot-Borgen, and Warren 2007).

### Bone Mineral Density

Bone mineral density (BMD) ranges from optimal bone health to osteoporosis, a skeletal disorder that compromises bone strength and predisposes a person for fracture (Nattiv, Loucks, Manore, Sanborn, Sundgot-Borgen, and Warren 2007). A decrease in bone mass is labeled as osteopenia (Korsten-Reck 2011), and is a precursor to osteoporosis if bone mineral density continues to decline. Osteoporosis and osteopenia are more common in postmenopausal women than other populations, and diagnoses are based on *T-scores* that are not applicable to a younger population; therefore, low bone mineral density is defined as having density lower than expected for age-matched norms (Thein-Nssenbaum and Carr 2011). BMD is the basis for screening and diagnosing osteoporosis, but entire bone strength relies on other components such as internal structure of bone minerals and the quality of bone proteins. Previous studies have found the prevalence of osteopenia ranging from 22% to 50% and prevalence of osteoporosis ranging from 0% to 13% in female athletic populations ((Nattiv, Loucks, Manore, Sanborn, Sundgot-Borgen, and Warren 2007).

Osteoporosis in postmenopausal women is associated with an estrogen deficiency and can also occur as a result of hypogonadal states and nutritional deficiencies. Estrogen deficiencies in athletes with functional hypothalamic amenorrhea usually are

accompanied by chronic under-nutrition, and lower the rate of bone formation while increasing the rate at which bone is absorbed by the body (Nattiv, Loucks, Manore, Sanborn, Sundgot-Borgen, and Warren 2007).

### Risks

Factors that affect the hormonal imbalances associated with the female athlete triad include training intensity, nutrition, core temperature, and psyche (Korsten-Reck 2011). Female athletes who restrict their dietary intake are at the greatest risk for developing low energy availability, the first part of the triad (Nattiv, Loucks, Manore, Sanborn, Sundgot-Borgen, and Warren 2007). Male athletes also suffer from the psychological and physiological strains that competitive sport places on the body, yet they experience fewer effects similar to the triad. Thus, the role of gender itself is critical. I suggest that the differences in gender socialization influence the occurrence of the female athlete triad.

### Gender Socialization

As early as the age of three or four, most children recognize themselves as a gendered individual (Tobin, Menon, Menon, Hodges, Spatta and Perry 2010), and have been taught the societal ideals for their gender (Sanchez and Crocker 2005). Female gender socialization has traditionally been associated with feminine qualities such as nurturing, passivity, and relationship oriented (Sanchez and Crocker 2005). Ideals about gender are taught to children from an early age by the family, community, and peers, and touch almost every aspect of our social lives (Henslin 2007). Society can be harsh for those who do not conform, but continued investment in these gendered ideals can have



serious consequences on psychological and physiological health, especially in young women (Sanchez and Crocker 2005).

The negative psychological and physiological effects of investment in gender ideals become apparent when looking at dieting and eating disorders, one of the components of the triad. Of particular importance in gender socialization in women, is the focus on appearance. Thinness, a trait that many women strive for, can lead to unhealthy dieting and excessive exercise regimens that can be detrimental to a woman's health (Levitt 2008). For example, though only 1% of the population suffers from anorexia nervosa, over 90% of those are women. The number of women with symptoms of anorexia nervosa reaches 62% in female athlete population (Kirchner and Cohen 2002).

Eder (2007) explains the social constraints placed on young women while trying out for the aesthetic sport of cheerleading. Despite having to perform physically demanding routines, cheerleaders are still expected to show their femininity through smiles and a neat physical appearance. The article demonstrates that girls are taught at a young age that their worth is dependent on how others perceive them, and people perceive them more positively when they uphold feminine ideals (174). Participants in aesthetic sports such as cheerleading, gymnastics, and figure skating, along with lean endurance sports such as swimming and endurance running, are more likely to display components of the triad. Endurance, aesthetic, and weight-classed female athletes exhibited a clinical disorder 16% higher than the general population (Nattiv, Loucks, Manore, Sanborn, Sundgot-Borgen, and Warren 2007). When women have to negotiate

the masculine perceived arena of sports, women have a greater risk of developing disordered eating than the general population (Greenleaf, Petrie, Carter, and Reel 2009).

Masculine characteristics such as aggressiveness, competitiveness, and strength are all qualities labeled important for sport participation, but female athletes have the conundrum of figuring out where they fit in our gendered society. Female athletes also have to deal with muscularity or bulking up, which is seen as a negative quality in women. “Ideally, sportswomen have toned bodies, yet they must also avoid excessive, masculine-perceived, muscular bodies” (Krane, Choi, Baird, Aimar, Kauer 2004). This is especially evident in aesthetic sports and sports in which low body weight is seen as ideal for competition. Research has shown that this paradox in negotiating masculine and feminine ideals faced by female athletes can lead to lower body satisfaction and increase symptoms of disordered eating (Carter, Steinfeldt, Zakrajsek, and Steinfeldt 2011). The manner in which gender socialization affects the way female athletes view themselves could be key as to what might be a larger cause for the female athlete triad.

Little research has been done on how gender socialization may influence the rates at which female athletes suffer from the triad. This study will focus on how different aspects of gender socialization can be correlated with the components of the female athlete triad. Based on earlier studies, I hypothesize that, because women are socialized to use external factors such as body image to determine self worth, female athletes who invest in these gender ideals are more likely to develop characteristics of the female athlete triad.

## **Data & Methods**

I conducted a survey of female college athletes. This population was chosen because female collegiate athletes are more likely to be in limbo between the masculine traits required by their sport and the feminine traits expected by society. This population is also most likely to experience components of the female athlete triad because of high intensity training and age range. All NCAA-sanctioned female athletic teams at a Division II college were asked to participate in the survey. Coaches from the soccer, basketball, track & field, and cross country teams elected to have their teams participate, resulting in 37 valid surveys. Surveys and consent forms were distributed in a group setting during each team's practice. Surveys were anonymous and consent forms were collected separately from the survey to retain the athletes' anonymity.

The survey was designed to determine if female athletes displayed elements of the triad as well as assess aspects of gender socialization. I used the statistical software program SPSS to employ one-way ANOVA to test for significant differences in triad outcomes between groups based on gender socialization variables. I measured significance at the  $p < .05$  level except where noted.

### Dependent Variables

The survey measured multiple elements of the triad. First, menstrual function was determined. The presence of an irregular menses was determined by asking if athlete experienced an irregular menstrual cycle during their athletic career that was not related to pregnancy or birth control. An answer of yes was coded as 0, while an answer of no was coded as 1. The spectrum of eumenorrhea to amenorrhea was determined by asking

the athlete if they ever experienced a cessation of their menstrual cycle during their athletic career that was unrelated to birth control or pregnancy. Choices given were: a) Yes, for 1-2 months, b) Yes, for 3 or more months, c) No, but I have more than 35 days between each cycle, d) No, e) I have never menstruated. No athletes reported to have never menstruated. If participant answered D, it was coded as 0, and if participant answered A, B, or C answer was coded as 1 to indicate menstrual dysfunction.

Second, energy availability was established by asking how many meals participants ate per day. If a participant recorded eating 3 or more meals per day, answer was coded as 0. If a participant recorded eating less than 3 meals a day, the answer was coded as 1. Lastly, bone mineral density was determined by asking participants if they have had a bone or stress fracture during their career. Answers of no were coded as 0, and answers of yes were coded as 1. See Table 1 for descriptive statistics.

### Independent Variables

The survey measured gender socialization via media and other agents. Each participant was asked how many hours of television she watched per week. Answers of fewer than 10 were assigned variable 0. Answers of 10 and above were assigned variable 1. Participants were also asked: How well do you feel your body image and weight match what you see in the media on a scale from 1 to 7 with 7 meaning matching very well? A rating of 4 or above was assigned variable 0, and a rating of less than 4 was coded as 1. Diet was also assessed. Participants were asked if someone had suggested that they diet. A response of no was coded as 0 and a response of yes was coded as 1. For students who indicated that yes, someone had suggested that they diet, a follow-up question asked them

to indicate whom. Finally, a “Difference in Weight” variable was calculated by subtracting the participants’ reported ideal weight from their actual weight. If Difference in Weight was less than 10, variable was coded as 0. If Difference in Weight was 10 or more, then the variable was coded as a 1.

Data was also collected on a variety of other measures about participants. These include the sport(s) in which they participate, years of competition, age, height, and weight. Both BMI and body fat percentage were measured because BMI is not always a good health indicator for athletes due the increase of lean muscle mass. Body fat percentage was measured by the researcher using the Jackson-Polluck caliper method. Other questions inquired about diet, average time spent on the internet per day, hours of sleep each night, estimated daily caloric intake, number of hours spent doing rigorous exercise, and history of low bone density. No participant reported being diagnosed with low bone density. I was not able to use some of these variables in my analysis because of high rates of missing data (especially answers of “don’t know”) and/or invalid responses.

Based on the research regarding the female athlete triad and gender socialization, I propose the following hypotheses:

#### Hypotheses Leading to Disordered Eating:

1. Participants who showed a strong mismatch between their body and the bodies they see presented in the media are more likely to eat less than three meals a day.
2. Participants who were suggested to diet are more likely to eat less than three meals a day.

<b>Table 1: Descriptive Statistics of Sample (N=37)</b>						
<b>Variable</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Missing</b>	
<b>Years in Sports</b>	2	18	12.26	4.621	3	Number of years competing in sports
<b>Age</b>	18	23	20.16	1.323	0	Age in years
<b>Height</b>	62	72	66.689	2.859	0	Height self reported in inches
<b>Weight</b>	113	185	139.35	19.512	0	Weight self reported in pounds
<b>BMI</b>	16.7	28.7	22.022	2.7603	0	Body Mass Index
<b>Irregular Menses</b>	0	1	0.46	0.505	0	0=No 1=Has experienced irregular menses
<b>Cessation of Menses</b>	0	1	0.42	0.502	4	0= No 1= Missed menses for at least 1 month or >35 days between each menses
<b>Fractures</b>	0	1	0.43	0.502	0	0= No, 1=Yes
<b>Meals/day</b>	0	1	0.19	0.397	0	0= $\geq 3$ meals per day, 1= 2 meals or less per day
<b>TV/week</b>	0	1	0.25	0.439	1	0= <10 hours of TV per week, 1= $\geq 10$ hours of TV per week
<b>Diet Suggested</b>	0	1	0.21	0.415	4	0= No 1= Diet was suggested to athlete
<b>Media Image</b>	0	1	0.22	0.422	1	0= Rating of $\geq 4$ 1= Rating <3
<b>Difference in Weight</b>	0	1	0.19	0.397	0	0= Difference between ideal and actual weight < 10 lbs 1= $\geq 10$ lbs

#### Hypotheses for Menstrual Irregularities:

3. Participants who watched T.V. for more than 10 hours are more likely to experience irregularities in their periods.
4. Participants whose ideal weight is more than 10 pounds greater than actual weight are more likely to experience 1-3 months without menstruation.
5. Participants who showed a strong mismatch between their body and the bodies they see presented in the media are more likely to experience 1-3 months without menstruation.
6. Participants who were suggested to diet are more likely to experience irregularities in their periods.

#### Hypotheses for Low Bone Density:

7. Participants who watched T.V. for more than 10 hours are more likely to experience a bone fracture.
8. Participants whose ideal weight is more than 10 pounds greater than actual weight are more likely to experience a bone fracture.
9. Participants who showed a strong mismatch between their body and the bodies they see presented in the media are more likely to experience a bone fracture.
10. Participants who were suggested to diet are more likely to experience a bone fracture.

## Results & Discussion

My analysis produced mixed results. On the one hand, I find support for hypotheses #2, 6, 7 and 10 indicating that gender socialization is related to experiences of the athlete triad. I discuss these results below in more detail. On the other hand, I found no evidence to support the following hypotheses:

1. Participants who showed a strong mismatch between their body and the bodies they see presented in the media are more likely to eat less than three meals a day.
3. Participants who watched T.V. for more than 10 hours are more likely to experience irregularities in their periods.
4. Participants whose ideal weight is more than 10 pounds greater than actual weight are more likely to experience 1-3 months without menstruation.
5. Participants who showed a strong mismatch between their body and the bodies they see presented in the media are more likely to experience 1-3 months without menstruation.
8. Participants whose ideal weight is more than 10 pounds greater than actual weight are more likely to experience a bone fracture.
9. Participants who showed a strong mismatch between their body and the bodies they see presented in the media are more likely to experience a bone fracture

These hypotheses may not be significant for a couple of reasons. One factor to consider is that the population sample was too small for the difference between variables to reach



significance. Another factor is that these measures of gender socialization were unreliable. For instance, respondents reported spending a large amount of time on the internet, but indicated that much of that time was spent doing homework.

### Hypothesis 2

The analysis showed that participants who were told to diet are more likely to eat two meals or less a day (See Table 2). Although only marginally significant ( $p=0.059$ ), the analysis shows how external factors have an impact on a female athlete's caloric intake. It is important to note the term diet can take on various connotations. The word can encompass everything a person eats, "healthy eating," removing or adding certain foods, or intentionally changing eating habits to regulate weight.

Dieting is sometimes an entry point for disordered eating in female athletes. Because disorder eating is the first component of the triad, understanding how gender socialization affects an athlete's energy availability is important for preventative measures. Making coaches, sports officials, and trainers aware of the damage that can be caused by suggesting an athlete diet is a good starting point.

**Table 2: ANOVA for Meals/day by Diet Suggested**

	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Between Groups	0.541	1	0.541	4.993	0.059
Within Groups	4.368	31	0.141		
Total	4.909	32			

### Hypothesis 6

The analysis indicates that participants who are told to diet are also more likely to experience menstrual irregularities (See Table 4). Suggesting a diet does not directly cause irregularities in a female athlete's menstrual cycle, of course. However, menstrual irregularity is the second component of the triad, often resulting from the lack of energy availability that comes with disordered eating. Again, the prevalence of irregularities in menstrual cycle between those who have been told to diet and those who have not suggests the impact of body image through external gender socialization on the triad. Responses showed a number of different people are responsible for these suggestions to diet: coaches, athletic trainers, and parents. What they have in common, is that they are all in positions of great influence over athletes, and can have a great negative impact on their health.

**Table 3: ANOVA Menstrual Irregularities by Diet Suggested**

	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Between Groups	2.643	1	2.643	14.795	0.001
Within Groups	5.538	31	0.179		
Total	8.182	32			

### Hypothesis 7

My analysis indicates that female athletes who watched more than 10 hours of T.V. per week are more likely to suffer stress fractures (see Table 3 for ANOVA results).

Of course, watching television does not directly cause stress fractures. Here, I use television viewing as a proxy for the extent to which media influences gender socialization. As seen above, media tends to reinforce particular images of women as thin and toned, but not overly muscular. Thus, female athletes who watch more than 10 hours of television are exposed to female bodies that are not in agreement with the muscular build produced by athletic training. So, I hypothesized that female athletes who are socialized to see these thin, toned body types as more feminine do not train enough to protect their bones from injury (in order to avoid producing a more muscular build, which might be perceived as unfeminine). An alternate explanation that should be examined is that training and body maintenance are actually being replaced by watching television.

**Table 4: ANOVA for Stress Fractures by TV/week**

	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Between Groups	1.120	1	1.120	4.993	0.032
Within Groups	7.630	34	.224		
Total	8.750	35			

#### Hypothesis 10

Finally, my analysis shows that participants who were told to diet are more likely to experience a fracture (See Table 5). As explained in the above literature, fractures can be a side effect of low bone mineral density, and low bone density can occur in amenorrheic athletes. Having a participant being instructed to diet increases the chance of

suffering from a stress fracture makes sense if having someone tell an athlete to diet increases chances of disordered eating and irregular menses.

**Table 5: ANOVA for Stress Fractures by Diet Suggested**

	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Between Groups	1.440	1	1.440	6.622	0.015
Within Groups	6.742	31	0.217		
Total	8.182	32			

Thus, my analysis shows a correlation between having someone suggest that an athlete diet to their chances of experiencing disordered eating, menstrual irregularities, and bone fractures. In other words, participants who were told to diet were more likely to experience all three components of the triad. Whether someone has suggested that an athlete diet is a strong measure of gender socialization in that it captures the direct impact of external pressure to focus on appearance described in the literature as such a critical part of gender socialization. By telling an athlete to diet, a person is evaluating and reinforcing ideas of what a woman should look like.

## **Conclusions**

Although many of the results proved inconclusive with regard to the connection between gender socialization and prevalence of the female athlete triad, I found strong evidence of a correlation between a participant having someone suggest that she diet and all three elements of the triad. Furthermore, my results suggest that exposure to media (here, TV) may increase stress fractures among athletes.

Of particular importance in this study is the focus on appearance and the cultural belief that thinness is the standard women should strive to mimic. When the narrow idea of what it means to be feminine is reinforced by media or other people of influence, female athletes can engage in unhealthy behaviors that can lead to the female athlete triad. So, because gender socialization in women is highly based on these external factors, such as how others perceive them, it makes sense that a female athlete would put herself in an energy deficit if someone suggested she lose weight.

Based on results, I suggest implementing more preventive plans to decrease the rates of the female athlete triad. First athletes, coaches, trainers, and parents need to be educated about the triad and its implications for the health of the athlete. Many people in the sports arena are unaware of the triad, and many female athletes prefer to not have a menstrual cycle, so making sure athletes are aware of the consequences of triad is important. Lastly, training programs targeting the people who work with athletes such as trainers and coaches should include information about the ways gender socialization can affect the health of the athlete. These programs should also discuss the risk associated with dieting in female athletes, and that specific diet suggestions should be made by nutritionists or proper healthcare professionals.

The limited size of this study's sample and the fact that all athletes attended the same school are limitations. Future research, employing data from a wider range of participants should focus on exploring other measures of gender socialization. This study also did not use objective measurements of eating disorders, energy availability, and low bone density. Relying solely on self reported answers resulted in some unusable data, which limited the possible range of dependent variables.

Future studies should examine the general female population alongside female athletes to determine if there is significant difference between the two. Studies should also consider expanding the criteria of athlete to females who participate in recreational sports or who regularly attend gyms. These females could also be at risk of developing the triad, and may have less access to preventive and treatment plans.

## **Acknowledgements:**

First and foremost, I would like to thank my advisor Dr. Christina Steidl for all her much needed support, encouragement, and guidance throughout this entire process.

Next I would like to thank all the teams and coaches who took part in this study despite their hectic seasons.

Last, I would like to thank the Honor's Program for providing me with an enriching experience and the opportunity to complete this study.

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