

## EATING DISORDERS IN FORMER NCAA DIVISION 1 COLLEGIATE GYMNASTS AND THEIR BEHAVIORS AFTER GRADUATING

JESSIE DEZIEL, MARK DEBELISO\*

Department of Kinesiology and Outdoor Recreation, Southern Utah University, Utah, USA.

\*Email: markdebeliso@suu.edu

**How to cite this article:** DeZiel, J., & DeBeliso, M. (June 2020). Eating disorders in former NCAA division 1 collegiate gymnasts and their behaviors after graduating. Journal of Physical Education Research, Volume 7, Issue II, 35-44.

**Received:** January 12, 2020

**Accepted:** June 04, 2020

### ABSTRACT

*This study investigated the prevalence of eating disorders among former NCAA division I collegiate gymnasts. Former female NCAA collegiate gymnasts (n=90) from the USA completed three different questionnaires relevant to eating disorders. The EAT-26 and SCOFF questionnaires were used to determine prevalence of disordered eating. The BSQ questionnaire was used to measure concerns about body weight and shape that are closely related to conditions of anorexia nervosa and bulimia nervosa. The SCOFF questionnaire had the highest number (N=36 or 40%) of former gymnast that scored as potentially eating disorder. Similarly, the EAT-26 the questionnaire identified approximately 1/3rd of the gymnasts as potentially eating disordered (N=31 or 34.4%). The BSQ questionnaire identified the least number of gymnasts as potentially with an eating disorder (N=12 or 13.3%). Eleven gymnasts scored as having potential eating disorder on all three instruments. Within the parameters of this study, eating disorders appear to exist in life after sport. This study indicates that eating disorders may continue or manifest after a gymnast's career is over. The results of this study may alert parents, coaches, teammates, athletic trainers, and prior female collegiate gymnasts to be vigilant with regards to the potential of eating disorders among these retired athletes. These results are salient in that helping an athlete to mitigate eating disorders is as important in retirement as during the competitive years.*

**Keywords:** Eating disorder, NCAA, athletes, aesthetic, gymnastics, gymnasts, body shape.

### 1. INTRODUCTION

Sports are a great way to teach athletes how to work together, build their self-confidence, as well as promote overall physical activity (Papaioannou & Hackford, 2014). Although there are many positive aspects of sports there are also negative pressures put on athletes. Collegiate student athletes are some of the most admired students on their campuses (Etzel, Watson, Visek, & Maniar, 2006). Games are televised and social media is popular among younger generations, student-athletes receive plenty of public attention (Etzel et al., 2006). Public attention places the pressure of winning on athletic teams because fans won't attend games if teams are losing. The athletes have other pressures such as their academics, athletics, and personal life (Hill, 2005).

Athletes have a large number of stressors to manage, and some sports require more demands from athletes. All athletes are required to be in competition shape and expected to compete at the highest level. There are a handful of sports that pressure athletes regarding body shape and weight. Gymnastics is categorized as one of those sports because gymnasts are considered aesthetic performers (Borgen & Corbin, 2016). The pressure to be thin and the

long hours of physical training are persistent demanding stressors among collegiate gymnasts (Davis & Strachan, 2001). These pressures could possibly lead any gymnast to an eating disorder or disordered eating. Eating disorders are more prevalent in sports with frequent weight checks or in sports where thin, smaller athletes are preferred such as gymnastics, ice skating, cheerleading, diving, running, dancing, cycling, and wrestling (Palmera, 2012). The female athlete triad is considered the relationship between “disordered eating, menstrual dysfunction, and musculoskeletal injuries”. The negative health consequences as related to the female collegiate athlete triad have been discussed in detail elsewhere (Beals & Manroe, 2002).

A stressor a gymnast could experience is pressure from coaches. For example, a recent news article describes an athlete who was a gymnast as well as a diver for her high school. The news article describes her coach jokingly tell her she was getting big (Hellmich, 2006). She asked her coach what to work on over the summer and her coach responded with, “don’t get fat.” (Hellmich, 2006). If an athlete is told to not get fat from their coach, they may start to engage in disordered eating.

A gymnast’s performance is a stressor and they are in control of how they perform, but their scores are based off a judge’s opinion. Judges are human beings that may often have bias toward certain gymnasts or teams which can cause discrepancies in the gymnast’s score. If a gymnast is thinner, the judges might reward them a higher score. This notion was suggested in a recent news article discussing how gymnasts who have a lean body may receive higher scores because their gymnastics looks better (Hellmich, 2006). Although a judge is not supposed to be biased based on body appearance, but rather judge gymnastics’ performance, it doesn’t always appear to be the case.

Physical appearance is also a stressor that gymnasts likely encounter. Gymnasts may develop eating disorders because of what they are required to wear as well as swimmers and divers (Hill, 2005). A former Olympic athlete states “it’s no wonder some female athletes have body image problems. As they’re developing and becoming women, they’re out there in nothing but a skimpy little Speedo or leotard” (Hellmich, 2006). The former Olympian further stated that the pressure to have a particular body image is magnified as the athlete matriculates to the college competitive venue where scholarships maybe on the line. It is important that coaches are aware of and supportive of their athletes in sports where much of their body is being exposed to the general public who are watching the competition in person, on television, or the internet.

The results of a study that focused on disordered eating among 215 collegiate gymnasts revealed that over 60% of the gymnasts met the criteria for one of the intermediate disordered eating categories which resulted in only 22% being classified as normal or non-disordered (Petrie, 1993). Gymnasts who received more comments about their weight or body type had significantly more disordered eating patterns (Kerr, Berman, & De Souza, 2005). Researchers examined eating behaviors of gymnasts and discovered disordered eating among female collegiate gymnasts is a normative behavior (Petrie, 1993). Disordered eating is when an athlete doesn’t see food as fuel that helps build their body, but rather sees food as calories and fat (Hellmich, 2006). Athletes whom display disordered eating are not comfortable with their bodies (Hellmich, 2006). A study by Anderson & Petrie (2011) examined the eating behaviors of athletes and determined the prevalence of eating disorders in lean-sport female athletes, which include gymnasts and swimmers, had significantly higher prevalence than that of endurance athletes, technical athletes, and ball game sport athletes.

Prior research suggests a mechanism to manage and treat an eating disorder is through a team of people which includes sports medicine physicians, athletic trainers, nutritionists, counselors, psychiatrists, coaches, family, and teammates (Currie & Morse, 2005). The importance of this team is to support the athlete working through an eating disorder. The best way to deal with an eating disorder is to address it early and confront the issue with the athlete

(Currie & Morse, 2005). The confrontation helps the athlete not feel alone and ensures the athlete they are in a safe place (Currie & Morse, 2005).

A high percentage of gymnasts will experience either an eating disorder or disordered eating throughout their career (Anderson & Petrie, 2011). Post competitive years for a gymnast could affect the gymnast's eating habits. Being removed from the gymnastics culture removes the social pressures to be thin which could reduce symptoms of eating disorders (O'Connor, Lewis, Kirchner, & Cook, 1996). Gymnast's workout for long hours and usually train 20-30 hours a week which could create anxiety about weight gain post competitive years (O'Connor, Lewis, Kirchner, & Cook, 1996). Prior research by Otis et al. (1997) study suggested that there was not a high prevalence of gymnasts with eating disorders. However, Otis et al.'s (1997) was published in 1997. Given the prevalence of disordered eating among competitive collegiate gymnasts, it would be of interest to examine the prevalence of disordered eating among this population once their competitive careers have ended. The results of such a study could prove directly beneficial to these now retired athletes in terms of seeking professional help to mitigate the eating disordered behavior. Indirectly, many of these now retired gymnasts are mothers (or will be mothers) and it is not a stretch to think that their children will explore gymnastics. Helping these now retired athletes (and now mothers) understand the persistence of eating disorders during and following a competitive gymnastics career may help them better guide their children as they face the same similar pressures that manifest in the form of an eating disorder or disordered eating.

The purpose of this research effort was to assess eating disorders among retired collegiate gymnasts through the administration of the Eating Attitudes Test (EAT-26) (Garner, Olmstead, Bohr, & Garfinkel, 1982), the SCOFF questionnaire (Morgan, Reid, & Lacey, 1999), and the Body Shape Questionnaire (BSQ) (Cooper, Taylor, Cooper, & Fairburn, 1986).

## **2. METHODS AND MATERIALS**

### **2.1 Participants**

The participants in this study were former division I NCAA female collegiate gymnasts. The gymnasts were recruited from across the United States from a host different Universities. The study and consent form were approved by the Southern Utah University Institutional Review Board (IRB) prior to recruiting the participants. The participants had completed their competitive career with in the last 15 years.

### **2.2 Instruments**

Three questionnaires were employed during the current study in order to assess eating disordered behaviors among retired collegiate gymnasts. The specific instruments used in the current study were the eating attitudes test survey (EAT-26) (Garner, Olmstead, Bohr, & Garfinkel, 1982), the SCOFF questionnaire (Morgan, Reid, & Lacey, 1999), and the Body Shape Questionnaire (BSQ) (Cooper, Taylor, Cooper, & Fairburn, 1986). Demographic information was also collected.

The EAT-26 questionnaire determines likelihood that an athlete would be vulnerable to an eating disorder (Garner, Olmstead, Bohr, & Garfinkel, 1982). The questionnaire is composed of 26 questions and takes about five minutes to complete. The EAT-26 is intended to be either self-administered or administered by health professional, school counselors, coaches, camp counselors, and others (Garner, Olmstead, Bohr, & Garfinkel, 1982). The EAT-26 is not an instrument for diagnosing an eating disorder or take the place of a professional diagnosis or consultation (Garner, Olmstead, Bohr, & Garfinkel, 1982). The

EAT- 26 acts as the first step in the screening process (Garner, Olmstead, Bohr, & Garfinkel, 1982). The second step would be setting up a consultation and evaluation with a qualified professional (Garner, Olmstead, Bohr, & Garfinkel, 1982). The concept behind the EAT-26 questionnaire is to screen the athlete in the earlier stages leading up to an eating disorder, which often times leads to getting counseling sooner. Treating an eating disorder sooner rather than later is important with regards to reducing the risk of serious physical and psychological complications (Garner, Olmstead, Bohr, & Garfinkel, 1982).

The scoring on the EAT-26 is scored on a Likert scale from 0-3. Once the questions are all answered the total number is added up. If the score adds up and is 20 or higher it doesn't indicate they have an eating disorder, but it does suggest the person has concerns regarding body weight, body shape, and eating (Garner, Olmstead, Bohr, & Garfinkel, 1982). When an individual scores  $\geq 20$  it is recommended that the participant seek professional help. The EAT-26 is considered a valid and reliable instrument for screening for symptoms of eating disorders (Garner, Olmstead, Bohr, & Garfinkel, 1982).

The SCOFF questionnaire is an instrument that helps identify those likely to suffer from anorexia nervosa or bulimia nervosa (Morgan, Reid, & Lacey, 1999). The SCOFF questionnaire is intended to be used by non-professionals but is not meant to substitute for a professional diagnosis (Morgan, Reid, & Lacey, 1999). The SCOFF is composed of 5 different questions in a yes or no response format. The acronym SCOFF stands for sick, control, one, fat, and food. If  $\geq 2$  of the questions are answered with a yes response, it indicates a possible case of anorexia nervosa or bulimia nervosa or a different eating disorder (Morgan, Reid, & Lacey, 1999). If the participant answers yes  $\geq 2$  of the questions, they should seek professional help from a therapist, dietitian, or physician (Morgan, Reid, & Lacey, 1999). The SCOFF has demonstrated high sensitivity and specificity and as such is considered a valid screening instrument for eating disorders (Morgan, Reid, & Lacey, 1999).

This BSQ questionnaire is also a self-report measure of body shape preoccupations that are typical for both bulimia nervosa and anorexia nervosa (Cooper, Taylor, Cooper, & Fairburn, 1986). The BSQ questionnaire is composed of 34 questions (Cooper, Taylor, Cooper, & Fairburn, 1986). This questionnaire is on a Likert scale 1-6. Once all of the questions are answered on the questionnaire the total is added up. If the total score is below 80 there are no concerns with body shape. If the score is 80-110 there is a mild concern with shape. A score of 111-140 is a moderate concern with shape, and over 140 is a marked concern with shape (Cooper, Taylor, Cooper, & Fairburn, 1986). The concurrent and discriminant validity of the BSQ are considered as good (Cooper, Taylor, Cooper, & Fairburn, 1986).

### **2.3 Procedures**

This study was conducted during the spring semester 2020 and was carried out through the use of an online platform via Google Forms. Following approval from the SUU IRB committee (IRB APPROVAL #25-012020a) contact with former gymnasts was made through a Facebook Alumni group. The former gymnasts who "liked" the Facebook post expressing interest in participating in the study provided their emails. Those who provided their email were then sent a link to Google Forms to participate in the survey.

The landing page where informed consent to participate in the study was carried out. The informed consent stated to the potential participants that participation was voluntary and at any time during the questionnaire if they felt uncomfortable, they were allowed to withdraw. The participants were also informed that their responses were anonymous and encouraged to be honest while answering the questions. Those who provided informed consent advanced to the first step in the data collection portion of the study. Those who did not provide informed consent self-terminated from engaging the study.

The first step in the data collection process requested the participants: age, previous eating disorder diagnosis history, and if their eating habits have changed since retirement from gymnastics. The participants then sequentially completed the EAT-26, SCOFF, and the BSQ questionnaires. The link to the study Google Form's page was available for two weeks and the participants had to complete their study involvement within that time frame.

## 2.4 Analysis

Demographic information regarding the age of the participants, history of prior eating disorders, and change in eating status were examined. Descriptive statistical analysis was carried out with mean and standard deviations being calculated for EAT-26, SCOFF, and the BSQ questionnaires. The number and percent of the retired gymnasts that were considered as potentially having an eating disorder per each of the questionnaires were also tabulated. A frequency distribution of the EAT-26 scores was also generated.

## 3. RESULTS

**Table 1: Demographic information**

Characteristic	<i>f</i>	%
<b>Age</b>		
22	3	3.3
23	17	18.8
24	17	18.8
25	14	15.5
26	7	7.7
27	5	5.5
28	10	11.1
29	3	3.33
30	5	5.5
31	3	3.3
32	2	2.2
33	0	0
34	2	2.2
35	2	2.2
36	0	0
37	1	1.1
<b>Diagnosed Eating Disorder</b>		
Yes	12	13.3
No	78	86.6
<b>Eating Habits Changed</b>		
Yes	76	84.4
No	14	15.5

*Note: Diagnosed eating disorder during competitive career. Retired gymnast's perception of their eating habits following retirement as compared to their competitive years.*

Ninety former NCAA Division I female gymnasts completed the study. Demographic information regarding the distribution of the age of the gymnasts, prior diagnosis of an eating disorder, and change in eating behaviors is presented in Table 1.



**Table 2: Descriptive Statistics for the EAT-26, SCOFF, and BSQ Questionnaires**

Subscale	Mean	SD
EAT-26	15.6	11.3
SCOFF	1.3	1.3
BSQ	108.8	35.0

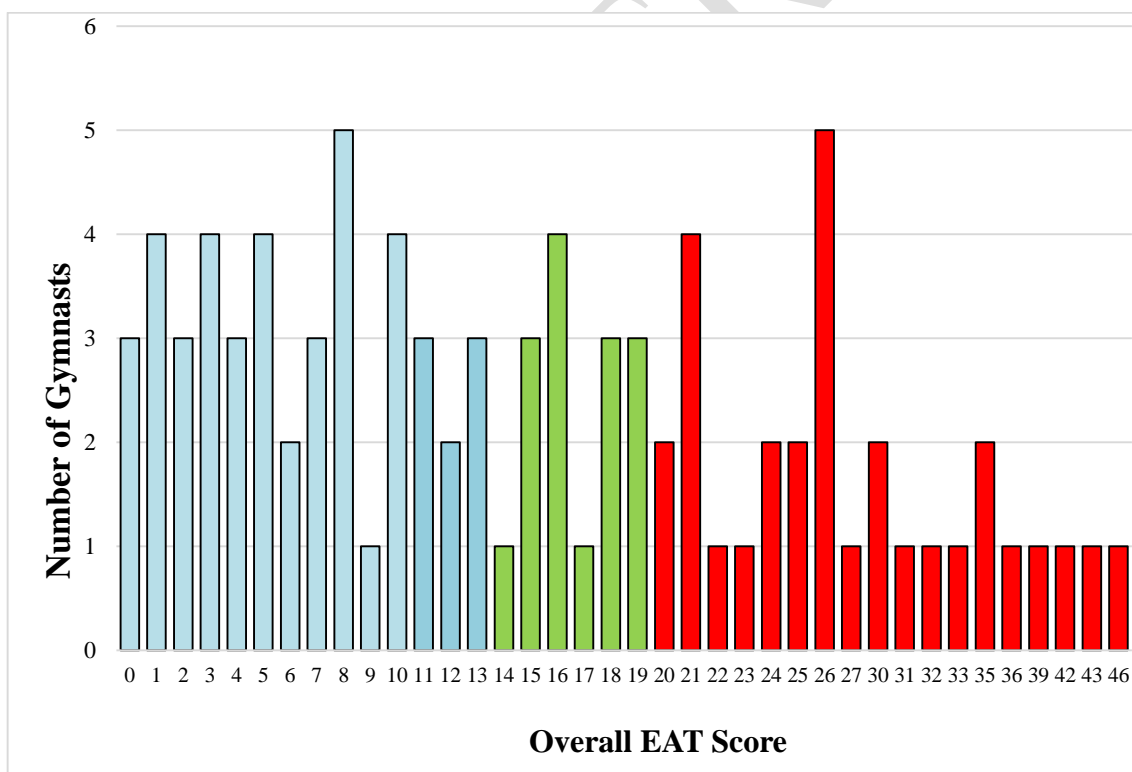
Note: Mean scores were determined by summing the scores for each subscale and dividing by the number of items in each subscale for each athlete. The maximum score for the EAT-26 questionnaire is 78. The maximum score for the SCOFF questionnaire is 5. The maximum score for the BSQ questionnaire is 204.

**Table 3: Percentage of Former Division I NCAA Gymnasts with a Potential Eating Disorder**

Questionnaire	f	%
EAT-26	31	34.4
SCOFF	36	40.0
BSQ	17	18.9

Note. The number of former NCAA gymnasts that could have a potential eating disorder followed by the percentage of the whole population. Cut-off for potential eating disorder: EAT-26 score  $\geq 20$ , SCOFF yes responses  $\geq 2$ , BSQ score  $\geq 140$

Table 2 provides the mean and SD for the EAT-26, SCOFF, and BSQ surveys. Table 3 identifies the number (and percent) of retired gymnasts that are considered as possibly having an eating disorder as identified by the EAT-26, SCOFF, and BSQ surveys.



**Figure 1: Individual EAT-26 scores for former female division I collegiate gymnasts (n=90).**

Figure 1 provides a frequency distribution of the EAT-26 scores of the retired gymnasts. The red bars represent a score above 20 indicating a potential eating disorder. The green bars represent a score from 14-19 indicating a potential disordered eating behavior. The blue bars represent low scores which are not of concern.

#### 4. DISCUSSION

The purpose of this research effort was to assess eating disorders among retired female collegiate gymnasts through the administration of the EAT-26 (Garner, Olmstead, Bohr, & Garfinkel, 1982), the SCOFF (Morgan, Reid, & Lacey, 1999), and the BSQ (Cooper, Taylor, Cooper, & Fairburn, 1986). To do so, retired NCAA Division I gymnasts from across the US were recruited to participate in the study that collected data via an online platform (Google Forms). Pertinent demographics of the participants included: age range of the participants was 22-37 years, 12% reported a diagnosed eating disorder during their competitive years, and 76% indicated that they had changed their eating behaviors since retirement.

The mean EAT-26 score for participants was  $15.6 \pm 11.3$ . The results show that 31 out of 90 (34.4%) former female division I gymnasts scored a 20 or higher, indicating the athlete is at risk for a potential eating disorder and should be recommended to seek professional help. Additionally, there were 15 out of 90 (16.6%) that scored from 14-19 indicating they could have some eating disordered habits. The remainder of the gymnasts 44 out of 90 (48.8%) scored between 0-13 indicating the former athlete is not at risk of an eating disorder. Figure 1 shows the breakdown of EAT-26 score for all the former female NCAA division I gymnasts (N = 90).

The results of the current study regarding the EAT-26 scores of retired gymnast's does compare favorably with the results of a study by Beals and Monroe (2002). Beals and Monroe (2002) stated that collegiate aesthetic sport's athletes scored significantly higher on the EAT-26 than athletes who participated in endurance or team/anaerobic sports (2002). The EAT-26 score results of the aforementioned study were (mean $\pm$ SD): aesthetic sport athletes (13.5 $\square$ 10.9), endurance sports athletes (10.0 $\square$ 9.3), and team sport athletes (9.9  $\square$  9.0) (3). Noteworthy is the similarity of the mean EAT-26 scores of collegiate aesthetic sport athletes reported by Beals and Monroe (2002) and that noted on the current study of retired gymnasts (whom were aesthetic sport athletes).

The mean BSQ for participants was  $108.8 \pm 35.0$ . The current study had a total of 17 (18.9%) former NCAA gymnasts that scored above the specified number which qualified them as having a potential eating disorder. The remainder of the gymnasts 73 (81.1%) did not score high enough to be at potential risk for an eating disorder. Scores over 140 are marked as concerned with their body shape (Kristjansdottir, Siguroardottir, Jonsdottir, Porsteinsdottir, & Saavedra, 2019). Researchers that examined the BSQ scores among elite athletes concluded that aesthetic sports had higher BSQ scores than fitness and weight-class sports (Kristjansdottir et al., 2019). The results of the study that focused on the BSQ demonstrated that 39.4% of aesthetic sports had severe or moderate body image concerns (Kristjansdottir et al., 2019).

The mean SCOFF score for participants was  $1.3 \pm 1.3$ . There were 36 (40.0%) of the retired gymnasts that scored high enough to have a potential eating disorder. A study by Zeulner et al. (2016) examined eating disorders in male and female elite and amateur endurance athletes with the use of the SCOFF. The results from the study (Zeulner et al., 2016) concluded 18.9% of the athletes were at risk of developing an eating disorder independent of gender (Zeulner et al., 2016). The results also indicated there was no difference between elite or amateur athletes when examining the prevalence of potential eating disorders (Zeulner et al., 2016). The potential difference in eating disorders between the retired gymnasts in the current study and that of the aforementioned elite female endurance runners maybe related to the issue of aesthetics. Gymnastics is considered an aesthetic sport where as endurance running is not. Prior research (Beals & Manroe, 2002) indicates that collegiate aesthetic athletes exhibit a greater prevalence of disordered eating then endurance athletes. It is possible that the focus on aesthetics of these now retired

gymnasts persists following their competitive career and contributes to the prevalence of potential eating disorders observed in the current study.

Each of the three questionnaires identified participants as having an eating disorder. The BSQ questionnaire had 17 gymnasts scoring high enough to be qualified for a potential eating disorder. The EAT-26 questionnaire had 31 gymnasts that scored high enough to be identified as having a potential eating disorder. The SCOFF questionnaire had 36 gymnasts who could be termed having a potential eating disorder. The range of retired female gymnasts with a potential eating disorder in the current study across the three questionnaires used (EAT-26, BSQ, and SCOFF) was 19-40%.

Previous researcher has examined the eating behaviors of female collegiate athletes and suggested that 15-32% demonstrated at risk behaviors that are consistent with an eating disorder (Beals & Manroe, 2002) and is relatively consistent with the results of the current study. A study by Petrie (1993) reported that 60% of collegiate gymnasts met the criteria for at least one intermediate disordered eating category and suggested disordered eating among female collegiate gymnasts is a normative behavior. A study by Anderson and Petrie (2011) stated a high percentage of gymnasts will experience either an eating disorder or disordered eating throughout their career. The results of the aforementioned studies (Anderson & Petrie, 2011; Petrie, 1993) suggests a much greater prevalence of eating disorders among active female collegiate gymnasts than those reported in the current study among retired collegiate gymnasts. Given that the current study was not longitudinal in nature, it is not known if the prevalence of eating disorders persists and/or manifests after a gymnast's career is over.

O'Connor et al. (1996) indicated that being removed from the gymnastics culture may reduce the social pressures to be thin which could reduce symptoms of eating disorders. O'Connor et al. (1996) also reported gymnasts had little obsession with thinness before puberty, high obsession with thinness while in college, and slightly lower obsession with thinness after college. After completion from sport, body shape becomes less of a worry to the former collegiate gymnasts (O'Connor et al., 1996). O'Reilly and Chan (2012) examined former female NCAA gymnasts and discovered more gymnasts were satisfied with the shape of their bodies and less weight-preoccupied than when being competitive athletes. O'Reilly and Chan (2012) and Kerr et al. (2005) both reported fewer eating disorders were present 15 years after retirement from gymnastics. O'Reilly and Chan (2012) suggested a decline in eating disorders after sport is likely due to a reduction in pressure being perceived by the athlete. The results of the aforementioned studies (Kerr et al., 2005; O'Connor et al., 1996; O'Reilly & Chan, 2012) could help explain the findings of the current study.

Some of the potential shortcomings of this study include self-reported questionnaires. The self-reported questionnaires take into account the honesty of the participants. Keeping in mind that the participants were previously members of a population with issues regarding eating disorders and body shape awareness, both sensitive matters. With the questionnaire being anonymous, it may have helped the participants be honest. Another shortcoming may be related to the environment in which the participants self-administered the questionnaires. Completing the survey in a quiet environment in one session would have been ideal. It is possible that the results of a questionnaire could be less valid if the participants were not completely focused on the questionnaire during its administration.

Future research regarding eating behaviors of gymnasts should include longitudinal research. Specifically, it would be interesting to follow the eating behaviors of a large cohort of collegiate female gymnasts throughout their career and into their post-competitive years. The information gleaned may provide a more precise understanding of how a gymnast's eating behaviors change across adulthood. Such information could help coaches, parents, clinicians, and gymnasts (active and retired) mitigate eating disorders and avoid the associated negative health consequences.



## 5. CONCLUSION

This study indicates that the prevalence of eating disorders may continue and/or manifest after a female collegiate gymnast's career is over. The results of this study may alert family, coaches, teammates, athletic trainers, and prior female collegiate gymnasts to be vigilant with regards to the potential of eating disorders among these retired athletes. These results are salient in that helping an athlete to mitigate eating disorders is likely as important in retirement as during the competitive years.

## 6. APPLICATIONS IN SPORT

The negative health consequences as related to the female collegiate athlete triad have been discussed in detail elsewhere (Beals, & Manroe, 2002). When a female collegiate athlete retires they are not immune from the negative health consequences of an eating disorder. With that said, after gymnastics is over, the gymnast will enter a new era of their life and some may become a mother and/or even a coach (Bloom, Durand-Bush, Schinke, & Salmela, 1998). It is critical that former gymnasts recognize what an eating disorder is and focus on breaking the bad habit. Eating disorders could affect a former gymnast, now pregnant, during the gestation period which is crucial to the healthy development of the fetus. Once the child is born, it is important for the retired gymnast, now mother, to assure their new child is getting the right nutrition so the child can grow and be healthy. The aforementioned notion now extends to the scenario where the former gymnast is now a coach. Imagine the potential negative impact of a former gymnast with an eating disorder, now a coach, on current youth or collegiate gymnasts in regards to their development of an eating disorder (some whom may also be their children). It's easy to imagine how a coach with an eating disorder would adversely impact the notion of healthy eating with their athletes. The unintended consequence could be another gymnast who develops an eating disorder, retires at some point, becomes a mother and/or coach, and the eating disorder cycle repeats itself.

This information is useful for coaches and parents because it acts as a tool to help their athletes. Educating those directly involved with the athletes everyday may help prevent these athletes from developing an eating disorder. Educating athletes on how to fuel their body to be successful as an athlete will encourage athletes to make better choices when it comes to food.

## 7. ACKNOWLEDGEMENT

Many thanks to the caring professors at SUU who helped shape this paper. A special thanks to Professor DeBeliso for the advice and suggestions in the early stages of developing this research topic. Thank you to all the anonymous former NCAA gymnasts who participated in this study.

## 8. REFERENCES

- Anderson, C., & Petrie, T. A. (2011). Prevalence of disordered eating and pathogenic weight control behaviors among NCAA division I female collegiate gymnasts and swimmers. *Research Quarterly for Science and Sport*, 83(1), 120-124.
- Beals, K. A., & Manroe, M. M. (2002). Disorders of the female athlete triad among collegiate athletes. *International Journal of Sport Nutrition and Exercise Metabolism*, 12, 281-293.
- Bloom, G. A., Durand-Bush, N., Schinke, R. J., & Salmela, J. H. (1998). The importance of mentoring in the development of coaches and athletes. *International journal of sport psychology*, 29, 267-281.
- Borgen, J. S., & Corbin, C. B. (2016). Eating disorders among female athletes. *The Physician and Sports Medicine*, 15(2), 88-95.

- Cooper, P. J., Taylor, M. J., Cooper, Z., & Fairburn, C.G. (1986) The development and validation of the body shape questionnaire. *International Journal of Eating Disorders*, 6, 485-494.
- Morgan, J. F., Reid, F., & Lacey, J. H. (1999). The SCOFF questionnaire: assessment of a new screening tool for eating disorders. *BMJ*, 319(7223), 1467-1468.
- Currie, A., & Morse, D. E. (2005). Eating disorders in athletes: Managing the risks. *Journal of Clinical Sports Medicine*, 24, 871-881.
- Davis, C., & Strachan, S. (2001). Elite female athletes with eating disorders: A study of high-performance female athletes. *International Journal of Sport Psychology*, 23, 179-192.
- Drinkwater, B., Loucks, A., Sherman, R. T., Sundgot-Borgen, J., & Thompson, R. A. (2005). *IOC Medical Commission Working Group: Position Stand on the Female Athlete Triad*. Lausanne, Switzerland: IOC, 20051-46.
- Etzel, E. F., Watson, J. C., Visek, A. J., & Maniar, S. D. (2006). Understanding and promoting college student-athlete health: Essential issues for student affairs professionals. *NASPA Journal*, 43, 518-546.
- Garcia, F.D., Grigioni, S., Chelali, S., Meyrignac, G., Thibaut, F., & Dechelotte, P. (2010). Validation of the French version of SCOFF questionnaire for screening of eating disorders among adults. *The World Journal of Biological Psychiatry*, 11, 888-893.
- Garner, D.M., Olmstead, M.P., Bohr, Y., & Garfinkel, P.E. (1982). The eating attitude test: Psychometric features and clinical correlates. *Psychological Medicine*, 12, 871-8.
- Hellmich, N. (2006). Athletes' hunger to win fuels eating disorders. *USA Today*.
- Hill, C. N. (2005). The relationships of social physique anxiety, body image and body composition on the risk of developing eating disorders in youth gymnasts (Doctoral dissertation, University of Saskatchewan).
- Humphrey, J. H., Yow, D. A. & Bowden, W. W. (2000). Stress in college athletics: Causes, consequences, coping. Binghamton, NY: The Haworth Half-Court Press.
- Kerr, G., Berman, E., & De Souza, M. (2005). Disordered eating in women's gymnastics: Perspectives of athletes, coaches, parents, and judges. *Journal of Applied Sport Psychology*, 18(1), 28-43.
- Kristjansdottir, H., Siguroardottir, P., Jonsdottir, S., Porsteinsdottir, G., & Saavedra, J. (2019). Body image concern and eating disorder symptoms among elite Icelandic athletes. *International Journal of Environmental Research and Public Health*, 16(15): 2728. doi: 10.3390/ijerph16152728.
- Lentillion-Kaestner, V., Berchtold, A., Rousseau, A., & Ferrand, C. (2014). Validity and reliability of the French versions of the body shape questionnaires. *Journal of Personality Assessment*, 96(4), 471-477.
- O'Connor, P. J., Lewis, R. D., Kirchner, E. M., & Cook, D. B. (1996). Eating disorder symptoms in former female college gymnasts: Relations with body composition. *American Journal of Clinical Nutrition*, 64, 840-843.
- O'Reilly, J., & Chan, C. K. (2012). *Women and Sports in the United States: A Documentary Reader*. Ann Arbor, MI.
- Otis, C. L., Drinkwater, B., Johnson, M., Loucks, A., & Wilmore, J. (1997). American College of Sports Medicine: Position Stand; The female athlete triad. *Medicine and Science in Sports and Exercise*, 29, 5-16.
- Palmera, C. (2012). Sports associated with eating disordered athletes.
- Papaioannou, A., & Hackford, D. (2014). *Routledge Companion to Sport and Exercise Psychology*. (1<sup>st</sup> ed.). London.
- Petrie, T. A. (1993). Disordered eating in female collegiate gymnasts: Prevalence and personality/attitudinal correlates. *Journal of Sport and Exercise Psychology*, 15(4), 424-436.
- Petrie, T. A. (2008). Difference between male and female college lean sport athletes, nonlean sport athletes, and nonathletes on behavioral and psychological indices of eating disorders. *Journal of Applied Sport Psychology*, 8(2), 218-230.
- Turk, J., Prentice, W., Chappell, S., & Shields, E. (1999). Collegiate coaches' knowledge of eating disorders. *Journal of Athletic Training*, 34(1), 19-24.
- Zeulner, B., Ziemainz, H., Beyer, C., Hammon, M., & Janka, R. (2016). Disordered eating and exercise dependence in endurance athletes. *Advances in Physical Education*, 6(2), 76-87.