



# Eating Disorders

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## A qualitative analysis of factors related to eating disorder onset in female collegiate athletes and non-athletes

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### ABSTRACT

Female athletes are at risk for clinical eating disorders, yet their onset experiences have rarely been studied with qualitative methods. This study, which included interviews with 12 collegiate female athletes and 17 non-athletes, identified factors that contributed to eating disorder onset for both subgroups. Inductive content analysis revealed that low self-worth, peer issues, and comorbid psychological disorders were common in both groups. However, athletes reported sport-specific factors including performance pressure, team weigh-ins, and injuries, whereas family dysfunction, bullying, and puberty were more commonly reported triggers for non-athletes. Findings support prevention and treatment programs customized for unique vulnerabilities for each subgroup.

Clinical-level eating disorders (EDs) affect women at higher rates than men (Keel & Forney, 2013) and they are associated with serious medical consequences. Anorexia nervosa (AN), characterized by self-starvation and a disturbance in the experience of one's body weight, is the psychological disorder with the highest mortality rate (Streigel-Moore & Bulik, 2007). The binge-purge cycle of Bulimia nervosa (BN) contributes to gastrointestinal maladies, severe dehydration, and electrolyte disturbances (Mehler, 2011). These health consequences can sabotage athletic performance; yet athletes appear to be at higher ED risk than the general public (Torstveit, Rosenvinge, & Sundgot-Borgen, 2008). There is interest in prevention since ED treatment is challenging and effects are somewhat limited (Shaw, Stice, & Becker, 2009). Identification of risk factors is needed to best target prevention and intervention strategies for vulnerable populations.

The literature on risk factors for EDs in the general population is fairly substantial. Among the most salient risk factors are young age and female sex (Jacobi, Hayward, de Zwann, Kraemer, & Agras, 2004), societal pressure for women to achieve the thin ideal (Keel & Forney, 2013), and a constellation of

body dissatisfaction, negative mood states and dieting behaviors (Jacobi et al., 2004; Stice, Marti, & Durant, 2011). Past studies suggest that dieting is influenced by peer relationships, social norms, and modeling (Keel, Forney, Brown, & Heatherton, 2013). Individual personality traits including anxiety and depression, low self-esteem, and perfectionism, family-level factors including poor communication and negative comments about weight, and specific life experiences like puberty, sexual abuse, school transitions, death, or divorce are additional contributors to ED risk and onset in the general female population (Berge, Loth, Hanson, Croll-Lampert, & Neumark-Sztainer, 2012; Jacobi et al., 2011; Kally & Cumella, 2008; Koruth, Nevison, & Schwannauer, 2012).

Researchers have identified ED vulnerabilities among athletes; however, this literature is typically limited to survey research that investigates body dissatisfaction and disordered eating in athletes without clinical diagnoses. Nonetheless, a consistent finding, confirmed by a meta-analysis of 34 studies (Smolak, Murnen, & Ruble, 2000), is that ED risk is most elevated in “weight sensitive sports,” described by Ackland et al. (2012) to include *gravitational sports* like distance running, *weight-class sports* like wrestling, and *aesthetic sports*, like figure skating. Individual studies do indeed show elevated ED symptoms in gravitational sport athletes (Sundgot-Borgen & Torstveit, 2004), lightweight rowers (Gapin & Kearns, 2013), and athletes in aesthetic sports (Krentz & Warschburger, 2011). However, in Krentz & Warschburger’s (2011) study, disordered eating was predicted in both aesthetic and ballgame athletes by the desire to enhance sport performance by losing weight and by negative emotions about missing training sessions. Thus, while ED prevalence appears higher in some sports, ED triggers may be similar in weight-sensitive and non-weight sensitive sports.

The Weight Pressures in Sport for Females scale (WPS-F) (Reel, Soohoo, Petrie, Greenleaf, & Carter, 2010) provides an assessment of sport-specific weight pressures that are distinct from general cultural pressures affecting non-athletes. In addition to revealing uniforms, athletes have identified coaches and teammates as sources of pressure (Reel et al., 2010). These pressures are concerning given their association with body dissatisfaction, bulimic symptoms, and dieting (Reel, Petrie, Soohoo, & Anderson, 2013).

Prior qualitative studies on non-clinical samples indicate a presence of dual body pressure that can create a double-bind for some female athletes who feel pressure to obtain the ideal body type for their sport, while at the same time experience pressure to achieve society’s ideal “feminine” body (Krane, Choi, Baird, Aimar, & Kauer, 2004; Mosewich, Vangool, Kowalski, & McHugh, 2009). These two valued goals may be at odds with one another, contributing to body dissatisfaction given the difficulty of simultaneously achieving both ideals, particularly for athletes who need muscle mass to

perform at their best. The resultant body dissatisfaction is of concern as it may contribute to ED onset for athletes who have other individual vulnerabilities.

While the aforementioned studies provide insight into factors that predispose female athletes to poor body image, qualitative research on the onset of disordered eating in athletes is sparse. To our knowledge, there are only three published (non-case study) interview reports on ED onset in athletes. First, using structured interviews with 103 “at-risk” athletes, Sundgot-Borgen (1994) identified sport-specific risks that included injury, high training demands, and coaching changes. Next, in a qualitative study of 17 collegiate athletes with clinical EDs, the three most common triggers were negative mood states, low self-esteem, and hurtful relationships (Arthur-Cameselle & Quatromoni, 2011). Sport performance pressure also contributed to ED onset for almost half of that sample. Similarly, Stirling and Kerr (2012) interviewed 17 athletes and found that participants’ sub-clinical disordered eating was influenced by perfectionism, competitiveness, and pain tolerance, which are characteristics that are highly valued in sport (Thompson & Sherman, 1999). Notably, almost three-quarters of that sample reported that the perceived performance advantage of weight loss was a contributor to their eating pathology.

Taken together, prior studies indicate unique ED triggers and weight pressures in sport. However, it is difficult to identify patterns in the findings because the studies varied widely in diagnostic populations and methodology. Moreover, the closed-ended nature of past survey research may not have captured the entirety of onset experiences, and there has yet to be a qualitative ED study that included a non-athlete comparison group. Therefore, open-ended interviews with larger samples are needed. With limited resources for prevention programs, it is imperative to target the most salient risk factors. Specifically, initiatives in college athletics must address sport-specific risk factors to be time-efficient and to encourage coaches to prioritize participation. As such, we designed this study to identify factors that contributed to ED onset in a sample of elite competitive female athletes compared to same-aged non-athletes, all with clinical ED diagnoses.

## Method

### *Participants*

Participants in this study were 29 females (12 collegiate student-athletes and 17 college student non-athletes) recruited from colleges and universities in the eastern United States. Participants ranged from 18 to 24 years old (average, 20.1 years). The athlete sample was slightly older (*Mean* = 20.5 years) than the non-athlete sample (*Mean* = 19.8 years). Participants

identified as White ( $n = 28$ ) or Hispanic/White ( $n = 1$ ). Athletes competed in the following National Collegiate Athletic Association (NCAA) sports at the Division I ( $n = 10$ ) or Division III level ( $n = 2$ ): track and field and cross-country ( $n = 4$ ), track & field only ( $n = 4$ ), basketball ( $n = 1$ ), crew ( $n = 1$ ), soccer ( $n = 1$ ), and tennis ( $n = 1$ ).

Participants previously met *Diagnostic and Statistical Manual of Mental Disorders* (5<sup>th</sup> ed.; DSM-5; American Psychiatric Association, 2013) criteria for anorexia nervosa (AN;  $n = 17$ ); bulimia nervosa (BN;  $n = 3$ ); binge eating disorder (BED,  $n = 1$ ); or both AN and BN ( $n = 8$ ). Within the athlete sample, 66.7% experienced AN ( $n = 8$ ), 16.7% experienced BN ( $n = 2$ ), and 16.7% met criteria for both AN and BN ( $n = 2$ ). Non-athletes' diagnoses were 53% AN ( $n = 9$ ), 6% BN ( $n = 1$ ), 6% BED ( $n = 1$ ), and 35% with both AN and BN ( $n = 6$ ). At onset, athletes were on average 16 years old, while non-athletes were 14 years old. All participants reported at least one period of recovery, defined as not meeting DSM-5 ED criteria for at least 3 months. Athletes were, on average, 17.7 years old at the onset of their first recovery and their current recovery period was, on average, 10.4 months long. Non-athletes were 17.8 years old on average at the onset of their first recovery period and their current recovery was, on average, 14.4 months long.

## Procedure

Participants were recruited following their completion of an anonymous online survey study for which recruitment was accomplished via flyers posted on 16 college campuses on the east coast of the United States and emails to athletic departments. Institutional Review Board (IRB) approval was granted by all 16 universities. Participants were invited to be interviewed if they met the following criteria: (a) female, (b) age  $\geq 18$ , (c) DSM-5 clinical level ED for 6 or more months, and (d) experienced 3 months or more of recovery from the ED. Thirty-five respondents agreed to be interviewed. Three were excluded because they had never met DSM-5 ED criteria. Two athletes did not participate due to relapse ( $n = 1$ ) or inability to schedule ( $n = 1$ ). One athlete was interviewed, but her data were not analyzed because she competed only at the professional level, which was inconsistent with our focus on collegiate athletics. Thus, the final sample included 29 participants. All participants received a \$10 gift card.

After participants provided informed consent, the primary author (a licensed clinical psychologist) conducted all interviews. Interviews ranged in length from 35 to 45 minutes. We attempted to conduct interviews in person, yet geographic dispersion made it necessary to interview nearly half by phone ( $n = 14$ ). The same interview guide, probes, and rapport building techniques were used in both settings to standardize the procedure, yielding no measurable differences in interview length or quantity of responses.

Interviews were semi-structured, using an interview guide. All participants were first asked to describe their childhood educational, social, and sport experiences in order for the interviewer to build rapport. The primary research question was then posed: “What factors do you think contributed to the onset of your eating disorder?” The interviewer used neutral follow-up probes such as, “Can you say more about that?” to encourage elaboration. When participants finished responding, they were asked, “Is there anything else that you think contributed to the eating disorder starting at that time?” Participants were thanked, debriefed, and given a handout with counseling resources in the event that the interview caused distress; however, none indicated distress.

### **Data analysis**

We employed a critical realist epistemology (Miles & Huberman, 1994) in that we assumed the existence of an objective *real world* experienced by our participants, yet acknowledged that we can never gain a true understanding of this world free from social construction. Thus, we analyzed our data in attempt to accurately describe participants’ *beliefs* about what contributed to their EDs. We attempted to minimize coder influence by not identifying *a priori* codes or using a predetermined theory to frame the data.

Each interview was recorded and transcribed verbatim. The first two authors analyzed the transcripts independently using inductive, line-by-line open-coding to identify all areas that mentioned onset factors. We used low inference coding to stay as close as possible to the raw data and identified 58 factors reportedly related to ED onset. Next, we identified common themes in the factors using inductive content analysis (Patton, 2002) to establish thematic “codes,” which were given names that summarized participants’ meaning. Coding disagreements were discussed and consensus was reached before any theme was included in the final coding structure. To resolve disagreements, we chose the interpretation that required the least assumption about a participant’s meaning. We condensed the coding structure, resulting in four higher-order categories, 11 primary codes, and 19 sub-codes to organize the data (see Table 1). The senior author, a registered dietitian with clinical ED experience, reviewed the coding structure for accuracy. The sample size appeared adequate since there was evidence of data saturation.

Integrity of the analysis was enhanced in several ways. First, participants were unaware that the study compared athlete and non-athlete subgroups and the interviewer took care not to alert participants to such comparison. For example, the interviewer never asked, “how did being an athlete influence your eating disorder?” Similarly, the questions and probes were phrased the same for both groups. Finally, all participants were offered a copy of their transcript and were asked to report any inaccuracies. We also gave

**Table 1.** Frequency of participants who reported factors that contributed to eating disorder onset.

Categories	Primary codes	Secondary codes	
Psychological factors	Low self-worth: A = 100%, NA = 88%	Poor body image:	A = 83%, NA = 82%
		Feeling inadequate:	A = 67%, NA = 35%
	Comorbid disorders: A = 67%, NA = 76%	Depression:	A = 17%, NA = 65%
		Anxiety:	A = 58%, NA = 41%
		Learning disabilities:	A = 8%, NA = 12%
	Perfectionism/control: A = 42%, NA = 24%		
Physical/behavioral factors	Changes in weight: A = 41%, NA = 71%	Rapid weight changes:	A = 42%, NA = 35%
		Puberty body changes:	A = 8%, NA = 41%
	Rigid eating/dieting: A = 41%, NA = 41%		
	Injury/illness: A = 33%, NA = 0%		
Relationship factors	Peer issues: A = 75%, NA = 94%	Bullying/fitting in:	A = 8%, NA = 65%
		Peer negative comments:	A = 8%, NA = 41%
		Peer modeling of ED:	A = 58%, NA = 18%
		Romantic conflicts:	A = 25%, NA = 29%
	Family issues: A = 50%, NA = 77%	Family dysfunction:	A = 42%, NA = 59%
		Family ED/weight issues:	A = 25%, NA = 53%
		Family negative comments:	A = 0%, NA = 53%
	Other relationship issues: A = 33%, NA = 6%	Others controlling food:	A = 25%, NA = 0%
		Sexual assault:	A = 8%, NA = 6%
		Coming out:	A = 8%, NA = 0%
Environmental factors	Sport environment: A = 67%, NA = 18%	Performance pressure:	A = 67%, NA = 18%
		Team weigh-ins:	A = 17%, NA = 0%
	Cultural thin ideal: A = 17%, NA = 18%		

*Note.* The percentage of participants is reported separately for athletes (A) and non-athletes (NA).

participants the coding structure and solicited their feedback; there were no removals, additions, or revisions requested. Although there is debate over the use of member-checks, we took the perspective that they allow for verification of accuracy of coding and can even offer the experience of normalization for participants (Harper & Cole, 2012).

## Results

Participants shared rich details about their experiences, noting multiple factors that they believed influenced ED onset. Our analysis yielded 11 primary codes, organized into four categories, most with clarifying secondary codes. Reported in text and in Table 1 are percentages of athletes (A) and non-athletes (NA) who experienced each code/subcode.

### *Psychological factors*

The most common psychological factor associated with onset was Low Self Worth, noted by every athlete and 88% of non-athletes. More specifically,



participants reported poor body image (A = 83%; NA = 82%), which resulted in negative comparisons to peers; however, most who reported body image concerns were never actually overweight. For example, participant 3 (NA) reported, “I never looked good enough. I look back at pictures now, and I’m like, ‘I was so skinny.’ But then, I thought I was so fat.” Participant 6 (NA), clearly described her body image difficulties:

My mind or my spirit, my whatever is inside of my brain—I’ve never felt like that person is in the right place in my body. I feel like everyone’s body is a shell to their mind, but I’ve always felt like I was either mismatched or not in the right place—like, “what is this [body] and how do I get out of it?”

Another aspect of Low Self-Worth was a generalized feeling of inadequacy (A = 67%; NA 35%). Comparisons to peers, as one participant noted, “made me feel like I was kind of boring and an empty person” (participant 15, A). Another shared, “I remember feeling like everyone around me was smarter than me” (participant 10, NA). Several participants began food restriction to lose weight because, like participant 23 (A), it made them feel “superior and special” and allowed them to be “recognized for something.”

Comorbid Psychological Disorders preceding onset were reported by more than half of all participants (A = 67%; NA = 76%). Depression was far more commonly reported by non-athletes (A = 17%; NA = 65%), like participant #6 (NA) who noted, “I was sad, sad, sad. Beyond sad. And that’s when it [anorexia] all happened.” Anxiety (A = 58%; NA = 41%) and learning disabilities (A = 8%; NA = 12%) reportedly influenced onset given that disordered eating was initiated in an attempt to buffer stress and anxiety. Participant 2 (NA) stated, “I am diagnosed dyslexic, OCD, and ADD...I felt like I was different than everybody else—so also something that could have contributed.”

Some participants described Perfectionism and Desire for Control (A = 42%; NA = 24%) as contributors. More specifically, regulating food intake allowed some to feel “perfect,” which led to an overreliance on ED behavior. A non-athlete reflected that her ED was fueled by, “Always having to be perfect and super type A...and needing control over every single part of my life, especially my body” (participant 1, NA). An athlete said, “I was the one that got picked on when my mom got drunk. So I felt like I didn’t have any control and so I thought that controlling my eating was a way to do that” (participant 25, A).

### ***Physical and behavioral factors***

Participants also identified physical and behavioral changes that contributed to onset. Most common in this category were Changes in Weight or Body Shape (A = 41%; NA = 71%). Some experienced rapid unintentional or



intentional weight changes (A = 42%; NA = 35%) that then transitioned into an ED, most often because losing more weight “became like a game” (participant 27, A) that provided a sense of achievement. This factor was reflected by participant 12 (NA), who had been overweight as a child. She explained that within a span of 6 months, “I dropped a third of my body weight...it was a huge accomplishment...but I didn’t know how to stop what I was doing.” Non-athletes more commonly cited puberty-related body changes as ED triggers (A = 8%; NA = 41%). For example, participant 18 (NA) said, “I think it was because I was coming into awareness about my body as a sexual thing...so it was puberty and thinking about boys more.”

Close to half of participants reported Rigid Eating/Dieting (A = 41%; NA = 41%) that began due to a lack of knowledge or desire to eat “healthy,” but later contributed to ED onset. Participant 24 (A), who was diagnosed with celiac disease, reported that her “innocent denial of food ended up turning into deliberate denial of food.” Similarly, participant 10 (NA) noted, “I’d read about all the health benefits of a vegan diet, but I think I just went a little overboard with it.” Another non-athlete (participant 18) stated, “I was trying to avoid carbs...it was a weird, slow process the way my eating [disorder] habits developed from there, mostly guided by misinformation from the internet.”

A unique factor reported only by athletes was Illness/Injury (A = 33%; NA = 0%). When a serious injury or illness like mononucleosis prevented sport participation, athletes overcompensated via restrictive dieting or purging to avoid weight gain. Participant 13 (A) articulated this process, “What caused it to start? It was the injury...Suddenly going from being incredibly active and—I’ve always eaten a lot just because I was so active—and then suddenly to keep eating that much and stop [exercising].”

### ***Relationship factors***

Peer Issues (A = 75%; NA = 94%) were common in both athletes and non-athletes; however, notable differences emerged in the types of peer issues within the subgroups. Almost two-thirds (65%) of non-athletes described trouble fitting in or bullying, often associated with moving to a new school; however, only 8% of athletes reported such difficulties. Participant 21 (NA) stated, “I switched to a public middle school...it was really hard adjusting for me...I was bullied a lot...I didn’t really hang out with friends on the weekends or anything. I think that was definitely a huge contributing aspect to it.” Non-athletes were also much more likely to report negative comments about their body from peers (A = 8%; NA = 41%). For example, participant #14 (NA) noted, “[My classmates] would say that I was fat. I was so confused by the comments that the only way I could think to make them stop was just to be as skinny as I possibly could.”

Athlete participants were more likely to identify harmful influence from peers who modeled disordered eating and exercise (A = 58%; NA = 18%), which led to competitive dieting or imitation of unhealthy habits. Athletes specifically recalled teammates' and training partners' behaviors. For example, participant #25 (A) described the first time she purged as, "...a decision that was made based on conversations with the girls at the tennis academy because they had made some comments about [purging] being a solution, so I figured I'd try it." A few athletes mimicked non-athlete peers who restricted food intake, which could be particularly dangerous given an athlete's increased caloric needs. "I was around girls that could give two shifts about sports, so when they were eating like girls in high school eat, ...I just followed them and thought if I didn't eat like them, I would be bigger than them, which obviously was absurd!" (participant 26, A).

Around a quarter of participants reported romantic relationship conflicts (A = 25%; NA = 29%), like break-ups or unhealthy partner communication, as triggers. For example, when a boyfriend cheated on her, participant #16 (NA) thought, "I'm worthless. No one's going to love me...and I felt very alone and I was like, 'I deserve this [restriction].'"

Family Issues were a relatively common theme, though more frequent in non-athletes (A = 50%; NA = 77%). Family dysfunction, including parents' psychological instability or substance abuse, was a contributing factor for 42% of athletes and 59% of non-athletes. Participant #14 (NA) explained the circumstances surrounding her onset:

My family life was an absolute nightmare... [my father] both began drinking very heavily and also displaying signs of possibly a mental disorder, so we felt very unsafe...for about 5 years I thought he was going to kill me until he finally tried to kill me and mom, so it was understandably, very chaotic.

Several athletes also described parents with alcohol problems, including participant 24 (A) who said, "If I felt like [my father] lacked willpower in terms of his drinking, I would compensate for my own self and think I was stronger and could deny myself [food]."

Family members with EDs or obesity were also more common for non-athletes (A = 25%; NA = 53%). Participant 9 (NA) noted, "My mom was always really into her own weight. You can't help but take it out on other people when you're into your own weight...I think that's why I was very self-conscious." Participant 7 (NA) believed that her father's habits may have contributed to her anorexia because, "He eats really compulsively...he would eat ten pieces of bread at dinner...and then three bowls of ice cream and then he wouldn't eat all day...I was really disgusted by his eating." A unique occurrence for non-athletes, never indicated in our athletes, was the harmful influence of family members' critical comments about the participant's body or comments that reinforced the ED (A = 0%; NA = 53%). For example,

participant #11 (NA) shared, “If I asked for a second helping of [my favorite food], my mom was like, ‘Sure, if you want to be fat.’ And then put the hugest serving you’d ever seen in your life on the plate.”

Additional interpersonal factors were organized into Other Relationship Issues (A = 33%; NA = 6%). While these factors were less common, they capture the entirety of the participants’ experiences. Three athletes had other people in their life (parent or camp counselor) take control of their food intake (A = 25%; NA = 0%), which led to increased concern about food. Sexual assault contributed to onset for one athlete and one non-athlete (A = 8%, NA = 6%). Finally, one athlete’s ED onset was related to coming out regarding her sexual orientation (A = 8%, NA = 0%), because of “being afraid of what my parents would think...and just the stress of lying...” about having a girlfriend (participant 20, A).

### ***Environmental factors***

Participants reported that the Sport Environment was also related to ED onset (A = 67%; NA = 18%). In particular, performance pressure (A = 67%; NA = 18%) emerged as the best explanation of the triggering influence of sport. Several athletes believed that they developed an ED from an attempt to improve performance or achieve perceived ideal body norms in their sport. For example, participant 26 (A) stated, “It never was intended to be an eating problem...it came from such a genuine hard working place. It sounds weird, but it really was just to get better at soccer.” Similarly, a pole vaulter described the weight criterion for using her pole, “I would have to starve myself the day before to make sure I wasn’t overweight because you can’t use that pole over that weight” (participant 22, A). Perceived sport norms influenced participant 29 (A), who noted that her eating disorder was instigated by, “knowing in order to be really fast and a high profile runner, you had to be of a certain weight and I wasn’t that.” Three participants who were not athletes at the college level also reported that their onset was influenced by a desire to be thin for dance (participant 4, NA), gymnastics (participant 8, NA), or cheerleading (participant 10, NA) when they participated as adolescents. One noted, “I was 13 when the rest of the girls on my level were 8 or 9, just because I wasn’t the best gymnast in the world...they are obviously smaller because they are younger, but still it was pressure nonetheless” (participant 8, NA). Finally, public team weigh-ins were reported by a pole-vaulter and a rower (A = 17%; NA = 0%) as a trigger. The rower reported, “We were weighed every single day in front of everyone. Yeah, that really put me over the edge” (participant 28, A).

The last environmental theme was Sociocultural Pressure of the Thin Ideal (A = 17%; NA = 18%). Participants reported that ED onset was influenced by body pressures from thin images in the media, books about anorexia, and

general cultural messages conveying that “really teeny-tiny skinny girls are the most beautiful” (participant 7, NA) which led to “internalizing the thin mentality” (participant 23, A) for about one in six participants. Interestingly, athletes did not identify media coverage of elite athletes as a specific source of pressure affecting them to any greater extent than coverage of women in general.

## Discussion

This study is one of only two non-case study qualitative investigations that explores the onset experiences of female athletes with clinical-level EDs, and is the first study to include a non-athlete comparison group. Our participants’ responses revealed several common experiences across subgroups, particularly regarding psychiatric comorbidity and poor body image. Poor body image was mentioned by over 80% of both athletes and non-athletes, which aligns with established theories about the key role body dissatisfaction plays in ED onset (e.g., Stice et al., 2011), and supports the targeting of body image in athlete prevention programs (Bar, Cassin, & Dionne, 2016). However, while body dissatisfaction influenced onset for both athletes and non-athletes, triggers for the dissatisfaction appear to be unique for each group. In our sample, athletes’ poor body image and sense of inadequacy were most commonly connected to teammates’ modeling of ED behaviors and sport performance pressure, which confirms findings from past qualitative studies (Arthur-Cameselle & Quatromoni, 2011; Stirling & Kerr, 2012). The influence of teammate behavior cannot be understated, as this is perhaps the most important peer group for athletes. Eating pathology appears to be contagious, spreading through teams who eat, travel, and train together, yet compete against one another for coveted competition spots. Given what is known about the potential long-term effects of peer behavior on ED risk (Keel et al., 2013), our results provide a strong rationale for team-based prevention programming that addresses maladaptive team norms. Yet, many past prevention programs have included only individual athletes identified as “at risk,” rather than the entire team; in other studies, because of random assignment, a team has been divided into different treatment groups (Bar et al., 2016). While this practice is certainly helpful from a research standpoint, including all teammates in one session provides the opportunity to address misinformation and disordered behaviors.

Feelings of inadequacy constituted a prominent theme for our athletes, more so than non-athletes. The inadequacy could be connected to lack of accomplishment in sport, yet only some quotes support that interpretation. Instead, athletes compared themselves to other women and felt that they did not measure up in terms of looks or worth. This could be an example of the double-bind noted by past researchers (Krane et al., 2004; Mosewich et al.,

2009), where an athlete may feel competent in sport, but inadequate regarding attractiveness. Another distinguishing factor may be explained by athletes' competitiveness; when athletes felt inadequate, they reportedly became anxious and motivated toward self-improvement, rather than feeling helpless. This could explain our finding that athletes noted more anxiety while non-athletes reported more depression.

It is noteworthy that sport performance pressure was the second most commonly reported sub-code for athletes (67% of athletes). Interestingly, most of the performance pressure reflected the athletes' internal competitive drive, goals, and perceptions of ideal body norms, rather than external comments from coaches or teammates, which have been reported in earlier work (Arthur-Cameselle & Quatromoni, 2011). Addressing these internal pressures appears key, given that in a longitudinal study of female athletes, pressure to perform in sport predicted body dissatisfaction (Anderson, Petrie, & Neumann, 2012). This performance pressure explains why, when an athlete's ability to train and compete is compromised by injury or illness, they are particularly vulnerable to ED onset (Sundgot-Borgen, 1994). As our athlete participants reported, fears of weight gain (due to less physical activity when injured), led to over compensation via food restriction or purging. Overall, our findings suggest that interventions provided by professionals with clinical expertise and sensitivity to the sport environment are needed to assist athletes who are vulnerable because of their own internal pressures and beliefs. This call to action is timely in light of the NCAA's initiative on Mind, Body and Sport intended to increase access to mental health services for student-athletes (NCAA, 2014).

Our results share some similarities with survey research utilizing the Weight Pressures in Sport for Females (WPS-F) scale (Reel et al., 2010). Our participants identified teammate and appearance pressures in sport as contributors to EDs, but did not report uniform related pressure as was noted in past research using the WPS-F (Reel et al., 2010). Additionally, our study identified factors that are not included in the WPS-F. Therefore, while the WPS-F is a useful tool, it is limited in its ability to comprehensively assess ED risk factors in sport and was not designed specifically for that purpose.

In our study, team weigh-ins and other individuals controlling food intake were triggers reported only within the athlete subgroup. Past studies have noted that some coaches promote food restriction and more explicitly encourage weight control (Francisco, Alarcão, & Narciso, 2012), which may increase ED risk and possibly explains the positive findings from prevention programs that include coaches (Bar et al., 2016). Our participants did not discuss concern about muscle gain as a contributor to their poor body image or eating disorder symptoms, though prior qualitative studies have described such concern (Krane et al., 2004; Mosewich et al., 2009). Perhaps this discrepancy is due to the sport background of our athletes; we interviewed

several distance runners, who are unlikely to be as muscular as the participants in past studies who were often sprinters or ballgame athletes (Krane et al., 2004; Mosewich et al., 2009). It is also possible that our clinical ED samples' triggers differ from the non-clinical samples that have been recruited in previous athlete research.

Overall, non-athletes' low self-worth, poor body image, and depression stemmed from very different issues like bullying or trouble fitting in, including negative body comments from peers. These observations indicate that prevention programs for athletes versus non-athletes would need to target different precursors of poor body image to be most effective. For example, while non-athletes struggled with moving to a new school, athletes rarely mentioned such concerns. In fact, bullying or moving have never been reported as an ED trigger in prior qualitative studies on athletes (Arthur-Cameselle & Quatromoni, 2011; Stirling & Kerr, 2012; Sundgot-Borgen, 1994), perhaps because athletes immediately have a peer group at their new school by joining a team. By contrast, our non-athlete findings are similar to Berge et al.'s (2012), who reported that school transition was one of six core onset themes for their non-athletes. Transitions in school and puberty were vulnerable times for our non-athletes, which likely explains why their average age at ED onset was 2 years earlier than athletes in our sample. Again, these population-specific red flags provide a rationale for more customized prevention efforts.

Finally, non-athletes reported much more family dysfunction, which aligns with past non-athlete studies that identify family issues as one of the most common ED triggers (e.g., Kally & Cumella, 2008). In addition, our non-athletes were more than twice as likely to report having family members with EDs and they were also far more likely to be victims of body shaming. The lack of negative commentary from athletes' families may be unique or coincidental; perhaps the athletes were judged as more physically fit. Overall, our findings suggest that prevention and treatment programs for non-athletes should target family relationships via the inclusion of family therapy. Based on our results, family therapy may be less essential for addressing EDs in athletes, though this decision deserves individualized assessment and further study before a firm recommendation can be made about athletes' family therapy needs. For athletes, it is possibly more important to involve members of their "sport family" in prevention efforts.

### ***Strengths and limitations***

This qualitative study is strengthened by the inclusion of an internal comparison group of non-athletes. Our comparatively large sample size of 29 participants and evidence of data saturation provide reasonable assurance that we identified the most influential onset factors. Finally, the sample was



limited to participants with clinical-level EDs who had a period of recovery, ensuring a degree of similarity in their experiences.

However, our findings need to be interpreted in light of some limitations. First, some participants were interviewed in person and others by phone, yet the use of phone interviews allowed us to maximize our sample size. Of note is that participants' responses reflect only what they believe to have contributed to their ED, but cannot be considered evidence of a causal relationship. Also, the interview required self-reflection, which may be easier for some participants than others and is subject to memory bias. Nonetheless, interviewing college-aged participants was essential as it allowed a time window distant from onset for recovery to occur, which may have enhanced understanding of onset triggers. It also allowed the added pressures of the transition to college and participation in higher level sport to be experienced, as those circumstances could influence symptoms.

Participants' responses were not analyzed based on their ED diagnosis or sport type. Given that eight participants met criteria for two EDs, there was no valid way to stratify our analysis. Also, we made the *a priori* decision to recruit a mixed sample given that an extensive review on ED risk reported that most factors were, "general" and that "few differentiated between the three eating disorder syndromes" (Jacobi et al., 2004, p. 19). Similarly, although ED rates are higher in weight-sensitive sports, a recent study on prevention indicated that "for the overwhelming majority of assessed risk factors" the programs worked "equally well" for participants from "lean" (i.e., weight-sensitive) versus "non-lean sports" (Stewart, Plasencia, Han, Jackson, & Becker, 2014, p. 718).

Finally, it is important to note that our athlete and non-athlete labels specifically refer to collegiate sport participation. Three of our non-athletes' participation at the youth level in sport or dance influenced their ED onset. Although our athlete participants were far more involved in youth sport than these non-athletes, their experiences call into question the definitive use of "athlete" and "non-athlete" labels. Though, we are surely not the first to encounter this issue; survey researchers often use "non-athlete" college samples that undoubtedly contain individuals who competed in youth sport.

## Conclusion

This is the first qualitative study to examine eating disorder onset in a sample of elite athletes compared to non-athlete peers, allowing for more precise discernment of sport-specific triggers. Athletes' responses confirmed the presence of sport-specific onset factors including performance pressure, teammate modeling of ED behaviors, injury, and team weigh-ins. These findings justify prevention programs that are customized to meet athletes' unique needs (Bar et al., 2016) and indicate that treatment should focus on



building skills for coping with injury and sport performance pressure. Our results suggest that prevention strategies for non-athletes should include family therapy and address school transitions, body changes during puberty, and dysfunctional peer interactions.

Given sport-specific triggers, athletic departments should refer ED cases to athlete-specific treatment programs or individual providers who understand competitive sport. In addition, our findings serve as a call to action for enhanced screening for ED risk among athletes who are injured or who have teammates with known disordered eating. Athletic trainers and coaches need education and proactive strategies to help athletes avoid over-compensation when an injury limits their activity. Our findings also call for more prevention programming at the team level, where teammates are supported to address dual body image pressures and performance concerns together, particularly given that recent longitudinal research indicates that desire to be leaner to enhance sport performance predicts later disordered eating (Krentz & Warschburger, 2013). To be effective, prevention programs must directly address the widespread yet faulty belief that ‘lower body weight is better’ in sport, for this belief and the behaviors it fuels have serious consequences that threaten athletes’ well-being and performance.

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