Prevention of eating disorders in athletes: an intervention for coaches

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PREVENTION OF EATING DISORDERS IN ATHLETES: AN INTERVENTION FOR COACHES

A Dissertation
Submitted to the Graduate Faculty of
Louisiana State University
Agricultural and Mechanical College
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by
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Abstract

Research has found that athletes, particularly those involved in "aesthetically-oriented" sports, are at increased risk for engaging in unhealthy weight reduction practices and developing clinical eating disorders. Prevention studies of eating disorders have had some success, but there are very few published studies that address prevention in athletes. This study was designed as an eating disorders prevention program that targeted coaches as change agents. Cheerleading coaches at national or regional conferences attended an intervention workshop or a control workshop. Coaches who attended the intervention workshop received information regarding nutrition, eating disorders, and ways to manage athletes with eating disorders. They had the opportunity to participate in seven intervention strategies (e.g., reading materials, Internet support, parent handouts) after attending the workshop. Seven months following the workshop, the coaches and cheerleaders completed an assessment battery designed to test the effectiveness of the intervention. The results indicated that the intervention was successful in increasing knowledge about eating disorders among coaches and producing behavior changes in coaches. However, the changes observed in the coaches did not lead to improvements in body image among cheerleaders or reduce the cheerleaders’ perceptions of weight pressures associated with their sport. These findings imply that interventions can be implemented by important adult figures (e.g., coaches, teachers) but the overall effectiveness of these interventions must be enhanced in order to have a significant impact on the athletes themselves.
Introduction

Athletes, particularly those involved in "aesthetically-oriented" sports, are at increased risk for engaging in unhealthy weight reduction practices and developing clinical eating disorders (e.g., Blouin & Goldfield, 1995; Goldfield, Harper, & Blouin, 1998; Hulley & Hill, 2001; Klock & DeSouza, 1995; Sundgot-Borgen, 1993; Szymanski & Chrisler, 1990; Zucker, Womble, Williamson, & Perrin, 1999). Recently, prevention studies of eating disorders have reported success in decreasing behaviors and attitudes associated with eating disorders (Franko, 1998; Huon, Roncolato, Ritchie, & Braganza, 1997; Kater, Rohwer, & Levine, 2000; Moreno & Thelen, 1993; O’Dea, & Abraham, 2000; Phelps, Sapia, Nathanson, & Nelson, 2000; Stice, Mazotti, Weibel, & AGRAS, 2000; Varnado-Sullivan, Zucker, Williamson, Reas, & Thaw, 2001; Winzelberg et al., 1997). However, there has only been one published study that has empirically evaluated an eating disorder prevention program for athletes (Abood & Black, 2000). The current study was a prevention study for eating disorders in athletes. In general, the resources required to implement prevention programs on a large scale are immense. There is a need to develop effective interventions that can be implemented fairly easily with effects that reach beyond the relatively small research sample. One of the unique characteristics of the current study was that it examined a methodology designed to intervene at a level that has the potential to have exponential effects.

The coach is an influential figure in an athlete’s life, and negative practices or attitudes concerning body size/shape can have a powerful impact on the athlete’s own behavior or attitudes (Biesecker & Martz, 1999; Griffin & Harris, 1996; Harris & Foltz, 1999; Thompson, 1987; Thompson & Sherman, 1993; Williamson et al., 1995). In addition, prevention studies have emphasized the role of coaches in the early identification of eating disturbances (Abood &
Black, 2000; Powers & Johnson, 1996; Sesan, 1989). In light of these findings, this study was designed to test the efficacy of a prevention program for eating disorders in athletes. The prevention program targets coaches as change agents. Coaches were a primary intervention target themselves as well as a means by which to intervene with the athletes, parents, and other school professionals. The primary goals of this program targeting behavior of the coaches included: 1) increasing awareness of the behavioral and psychological aspects of eating disorders to facilitate early identification and referral, 2) decreasing negative practices (e.g., weight requirements, negative comments concerning weight), and 3) decreasing misconceptions concerning nutrition, body weight, and body fat composition in athletes. Secondary goals of the program targeting the athletes themselves included: 1) increased nutritional knowledge, 2) decreased levels of body concerns, and 3) decreased perception of weight pressures from coaches.

Prevalence

Recent epidemiological studies have pointed to a rising prevalence of eating disorders in adolescent girls (Hoek et al., 1995). Currently, the prevalence of bulimia nervosa and anorexia nervosa among adolescent and young females is estimated to be 1-3% and 0.5% - 1% respectively (Hoek, 1995; Shisslak, Crago, & Estes, 1995). This disorder affects primarily females, with a prevalence rate approximately 10 times higher in females than in males (American Psychiatric Association, 1994). Epidemiological studies of eating disorders point to an increase in the frequency of the disorder in individuals born after 1960 with younger ages of onset during this time period (Dorian & Garfinkel, 1999).

The current DSM-IV classification of eating disorders applies a fairly stringent set of criteria for the diagnosis of full-syndrome anorexia or bulimia nervosa which may lead to an
underestimate of the prevalence of eating disturbances. For example, studies have found that patients with “partial-syndrome eating disorder,” or EDNOS, outnumber patients with full-syndrome bulimia nervosa by two to one (King, 1989). Additionally, Killen et al. (1986) reported that 13% of adolescent girls engage in dieting, pathological eating behaviors, and purgative behaviors. Garner, Rosen, and Barry (1998) emphasize the seriousness of pathogenic weight control behaviors regardless of formal diagnosis. Thus, although the rate of “full-syndrome” eating disorders remains relatively small, the higher incidence of reported “sub-clinical” eating disorders suggests a need to focus treatment and prevention efforts on individuals engaging in any unhealthy weight control behaviors regardless of diagnostic status.

Eating Disorders and Athletes

Body concerns, pubertal timing, dieting, social pressure for thinness, and self-esteem are some of the variables that have been found to be associated with the development of eating disorder symptoms (Button, Sonuga-Barke, Davies, & Thompson, 1996; Killen et al., 1996; Patton, Johnson-Sabine, Mann, Wood, & Wakeling, 1990). Rosen and Neumark-Sztainer (1998) classify risk factors into the following three categories: 1) personal factors (including developmental, cognitive/affective, and psychological factors), 2) socioenvironmental factors (including sociocultural norms, familial factors, peer norms and behaviors, and food availability), and 3) behavioral factors (including eating behaviors, dieting, physical activity, coping behaviors, and specific skills).

One behavioral risk factor that has been associated with increased levels of eating disorders is participation in sports. Populations exposed to high levels of social pressure for thinness have been hypothesized to be at increased risk for eating disorders. These groups include athletes whose sport supports a thin body size (e.g., gymnasts), models, and dancers.
For athletes, there are additional pressures concerning body composition, shape, size, and weight specific to sport involvement in addition to the general societal pressures for thinness. These additional pressures have led researchers to hypothesize that participation in sports may be a risk factor for the development of eating disorders.

However, research has been somewhat equivocal about whether or not athletic involvement is a true risk factor for the development of eating disorders and disturbed body image (Fulkerson, Keel, Leon, & Dorr, 1999; Reel & Gill, 1996; Rhea, 1999; Warren, Stanton, & Blessing, 1990). When athletes in general are studied without regard to the type of sport involvement, some studies have shown no difference between athletes and non-athletes on measures of eating disorders (Fulkerson, Keel, Leon, & Dorr, 1999; Rhea, 1999; Warren, Stanton, & Blessing, 1990; Wilkins, Boland, & Albinson, 1991). On the other hand, studies that have compared different sub-groups of athletes have found a higher prevalence of eating disorders in: 1) sports which emphasize leanness for performance success (e.g., runners) (Clock & DeSouza, 1995; Hulley & Hill, 2001; Lundholm & Littrell, 1986; Szymanski & Chrisler, 1990; Reel & Gill, 1996), 2) judged sports versus refereed sports (e.g., gymnastics vs. basketball) (Zucker, Womble, Williamson, & Perrin, 1999), and 3) sports in which weight classifications apply (e.g., bodybuilders) (Blouin & Goldfield, 1995; Goldfield, Harper, & Blouin, 1998).

A recent meta-analysis of the published literature on the prevalence of eating disorders among athletes demonstrates a small, but significant effect size for both male and female athletes, indicating higher levels of anorexic and bulimic symptoms in athletes compared to nonathletes (Hausenblas, & Carron, 1999). Overall, when sports are classified into groups according to their emphasis on leanness, athletes whose sport has a high degree of emphasis on
body size/shape (e.g., gymnastics, figure skating, cheerleading) have a higher prevalence of eating disorders and body image disturbances than do athletes whose sport does not have such an emphasis (e.g., basketball, softball, hockey).

It is important to note that causality cannot be assumed in the relationship between participation in certain sports and the development of eating disorders. It is unclear whether participation in certain sports serves as a “trigger” for eating disorders due to increased pressures for thinness or if persons with pre-existing eating disorders are drawn to certain types of sports. In a study employing structural equation modeling, Williamson et al. (1995) tested a psychosocial model of risk factors in the development of eating disorder symptoms among athletes. They found that social pressure for thinness (from coaches and peers), performance anxiety, and negative self-appraisals concerning athletic accomplishments were associated with increased levels of concern about body shape and size. Overconcern with body shape/size was a mediating factor between these three risk factors and eating disorder symptoms. This study offers preliminary evidence for a psychosocial model of eating disorder development among athletes. Research is needed in order to test the relationship between athletic involvement, personal characteristics (e.g., perfectionism) and eating disorder symptoms.

Beyond epidemiological studies of eating disturbances in athletes, the literature is quite sparse. There is a need for longitudinal studies to determine the course of eating disorder symptoms across the athlete’s career. In light of the findings from Williamson et al.’s (1995) study, the role of the coach is an important topic to address in future research concerning athletes and eating disorders. To date, no published study has examined the effectiveness of interventions aimed primarily at the coaching/training staff to promote prevention and early identification of eating disorders among athletes.
Cheerleading

Cheerleading is an athletic activity involving several specific pressures for thinness. Cheerleaders wear revealing uniforms that could result in increased body concerns. Additionally, cheerleaders experience pressure to maintain a low body weight for stunting purposes. Finally, many squads have weight requirements that must be met in order to be eligible to try-out for the squad and/or strict weight requirements for continued participation. These pressures make cheerleading an ideal target for eating disorder prevention research.

Eating disorder symptoms in cheerleaders have been specifically examined in three studies (Lundholm & Littrell, 1986; Reel & Gill, 1996; Taub & Blinde, 1994). Reel and Gill (1996) examined both high school and college cheerleaders with respect to body image, weight pressures, and psychosocial predictors of eating disorder symptoms. They found that 84% of the cheerleaders sampled reported significant pressures to lose weight or maintain a below-average weight. In addition, 46% of the cheerleaders agreed with the statement “Body weight and appearance are important to my coach.” College cheerleaders reported a higher frequency of try-out weight limits and periodic weigh-ins throughout the season. However, the high school cheerleaders reported greater body dissatisfaction and a higher frequency of eating disorder behaviors (e.g., purging).

Lundholm and Littrell (1986) measured desire for thinness and pathological weight control behaviors in 751 high school cheerleaders. Those participants that scored in the upper third on a measure of desire for thinness also reported increased levels of body dissatisfaction, concern with dieting, caloric restriction, and weight, binge eating, and purging when compared to participants scoring in the lower third. Of the 751 cheerleaders that participated, 250 (33%) were classified as having high levels of drive for thinness.
Taub and Blinde (1994) compared female athletes, performance squad members, and non-participating adolescents on measures of disordered eating. Their sample included 38 cheerleaders (classified as “performance squad members”). They found that 28.9% of the cheerleaders sampled had EAT-26 scores of 20 or greater which has been used as a cutoff for identifying disturbed eating patterns (Garner, Olmstead, & Garfinkel, 1982). Of all the athletic teams and performance squads tested, the highest percentage of participants with EAT scores at or above 20 were cheerleaders (28.9%) followed by softball players (28.2%), pom-pom squad members (24.4%) and track and field/cross-country (19.5%).

The findings of these three studies indicate that cheerleaders experience high drive for thinness, body dissatisfaction, and social pressures for thinness when compared to other athletes and non-athletes. However, no published studies have targeted cheerleaders in prevention efforts making this population ideal for the current investigation.

The Coach-Athlete Relationship

Griffin and Harris (1996) surveyed a large group of junior high and high school coaches concerning their attitudes, knowledge, personal experiences, and recommendations to athletes regarding weight loss. They found that both male and female coaches reported that 20% of the female athletes at their school needed to lose weight. Additionally, 64% of the coaches surveyed reported that an athlete’s weight in their sport was either extremely important or definitely important. Although 71-84% of the coaches agreed that being knowledgeable about weight control, eating disorders, and nutrition is definitely important, they did not demonstrate high levels of understanding when given a quiz concerning these topics. In deciding whether or not an athlete needs to gain or lose weight, 29% of the coaches cited appearance and 24% cited performance as indicators while only 12% cited weight for height, 10% cited percentage of body
fat, and 3% cited a medical recommendation. A total of 23% of the coaches replied “yes” or “probably yes” when asked whether or not any athletes on their team had an eating disorder. However, the coaches did not recommend psychologists to their athletes for help with weight loss efforts or eating disorders.

This study demonstrates a general lack of knowledge about nutrition, body weight, and eating disorders among coaches. Coaches would benefit from information regarding the relationship between body weight and performance as well as guidelines on how and when to make recommendations for weight loss (Harris & Foltz, 1999). Coaches reported a high rate of possible eating disorders among their athletes, but demonstrated poor ability to detect such problems. This study demonstrates the need to educate coaches about the signs and symptoms of eating disorders among athletes. Furthermore, these results point to a need to provide information about appropriate referral sources.

Biesecker and Martz (1999) recently conducted an analog study examining the effects of coaching behaviors on athletes’ vulnerability for eating disorders. They developed two vignettes (positive and negative) describing a conversation between a coach and an athlete who has recently gained weight. In the positive vignette, the coach is concerned with the athlete’s overall well-being. In the negative vignette, the coach is concerned about the effect of the weight gain on the athlete’s performance. Biesecker and Martz found that college students who read the negative vignette expressed higher levels of weight preoccupation, intent to diet, and body image disturbances than did those who read the positive vignette. This study demonstrates the potentially negative effect of coaching style on the development of eating disturbances in athletes. While this study is limited by its sample characteristics (i.e., non-athletes) and analog-status, it points to a clear need for further study.
Prevention of Eating Disorders

In recent years, the development and evaluation of prevention programs for eating disorders has been a top priority for researchers. According to the Committee on Prevention of Mental Disorders, the term prevention applies to interventions that occur prior to the onset of a clinically diagnosable disorder (Munoz, Mrazek, & Haggerty, 1996). Prevention studies have been further categorized into the following categories: primary, secondary, and tertiary. Primary prevention has been defined as interventions aimed at reducing the incidence of new cases of a particular disorder. Secondary prevention refers to interventions designed to reduce the morbidity and chronicity of mental disorders through early identification and intervention with individuals at risk or in the early stages of the development of the disorder. Finally, the focus of tertiary prevention programs is the reduction of disorders through the rehabilitation of persons suffering from the disorder (Caplan & Grunebaum, 1967; Noordenbos, 1994; Piran, 1997; Vandereycken & Meermann, 1984).

Along similar lines, the National Institute of Mental Health--Institute of Medicine Prevention report recently proposed that researchers categorize prevention studies into the following categories: universal, selective, and indicated (cited in Munoz, Mrazek, & Haggerty, 1996). Universal prevention interventions target the general population, or those that have not been identified as being at increased risk for the development of a mental disorder. Selective prevention interventions target those at above average risk for the development of a mental disorder. Indicated prevention interventions target high-risk individuals with detectable symptoms or predisposing biological markers for the development of a mental disorder.

This study contained elements of both primary and secondary prevention. There were elements of primary prevention within this study because of the general goal to decrease the
incidence of eating disorders among non-symptomatic individuals. More specifically, the primary prevention elements of this study consisted of efforts to decrease pressures for thinness from coaches, increase nutritional knowledge, and decrease levels of body concerns among cheerleaders that do not exhibit eating disorder symptoms. This study also contained elements of secondary prevention due to the goals of early identification and intervention with individuals at risk or in the early stages of the development of an eating disorder. Specific secondary prevention elements within this study included efforts targeting coaches in the facilitation of early identification and referral of cheerleaders exhibiting symptoms of eating disorders.

The current study can also be classified according to the categories of universal, selective, or indicated prevention. In general, this study targeted a population that has been shown to be at increased risk for the development of pathological eating behaviors. This characteristic further delineates the proposed study as a selective prevention study.

There have been relatively few empirical evaluations of programs designed to prevent eating disorders. Many studies provide descriptions of prevention programs, but have not evaluated the effectiveness of these programs (e.g., Buddeberg-Fischer & Reed, 2001; Friedman, 1998; Rosenvinge & Gresko, 1997) Among earlier studies that report data concerning the effectiveness of prevention programs, the results have not been particularly promising (Carter, Stewart, Dunn, & Fairburn, 1997; Killen et al., 1993; Mann et al., 1997; Martz, Graves, & Sturgis, 1997; Smolak, Levine, & Schermer, 1998; Stewart, Carter, Drinkwater, Hainsworth, & Fairburn, 2001). In general, these interventions have had modest effects in increasing knowledge concerning nutrition, body weight, and unhealthy weight reduction techniques but little impact on attitudes and behaviors. In fact, some prevention studies have demonstrated
iatrogenic effects (Carter et al., 1997; Mann et al., 1997) in which eating disorder symptoms and attitudes worsened over time among individuals participating in the prevention study.

The majority of these programs have been school-based interventions targeting elementary, junior high, or high school females. In general, girls are assigned to an intervention or control group and attend several information-based sessions designed to increase knowledge about the negative consequences of dieting and eating disorders, nutrition, and sociocultural ideals. It has been hypothesized that such approaches may actually produce the behaviors they intend to prevent by inadvertently “teaching” individuals how to engage in unhealthy weight reduction practices (Carter et al., 1997; O’Dea & Abraham, 2000).

Recently, several studies have demonstrated more promising results concerning prevention programs (Baranowski & Hetherington, 2001; Dalle Grave, De Luca, & Campello, 2001; Kater, Rohwer, & Levine, 2000; O’Dea & Abraham, 2000; Phelps et al., 2000; Smolak & Levine, 2001; Stice et al., 2000; Varnado-Sullivan, Zucker, Williamson, Reas, & Thaw, 2001; Zabinski, 2001). Varnado-Sullivan et al. (2001) implemented a school-based prevention program for sixth and seventh grade males and females at two private schools. The program resulted in a reduction in fear of fatness and avoidance of feared foods at post-test and at 10.5 week follow-up. The authors attempted to include parents and teachers in prevention efforts as well as target at-risk individuals with a family-based intervention. However, the school administrators, teachers, and parents were reluctant to participate, making these interventions impossible to implement. This study was also limited by a lack of long-term follow-up data.

Two innovative prevention programs demonstrating positive results were reported by Stice et al. (2000) and Zabinski et al. (2001). Stice et al. (2000) targeted female undergraduates with high levels of body concerns through a program designed to create cognitive dissonance
concerning thin-ideal internalization. Participants were asked to help develop a program for high school girls to avoid adopting the thin-ideal. Results demonstrated a decrease in thin-ideal internalization, body dissatisfaction, dieting, negative affect, and bulimic symptomatology, and most effects were maintained at one-month follow-up. This study was limited by a lack of long-term follow-up data, but early results were promising. Zabinski et al. (2001) reported improvements in scores on the Body Shape Questionnaire as well as global scores and select subscale scores of the Eating Disorder Examination-Questionnaire (EDE-Q; Shape subscale and Weight subscale) using an internet-based intervention. Once again, no long-term follow-up data was reported, making it impossible to judge the effectiveness of this intervention over time.

Three recent studies have reported positive follow-up data over periods of at least 12 months (Dalle Grave, De Luca, & Campello, 2001; O’Dea & Abraham, 2000; Smolak & Levine, 2001). O’Dea and Abraham (2000) implemented a school-based 10-lesson intervention focusing on coping skills, self-esteem, relationship skills, and communication skills in male and female students aged 11-14. They found significant improvements in the intervention group compared to the control group on measures of body satisfaction, perceived physical appearance, and rated importance of social acceptance, physical appearance, and athletic ability. In addition, intervention participants allowed age-appropriate weight gains compared to the control participants. These results were maintained at one-year follow-up. Dalle Grave, De Luca, and Campello (2001) reported increases in knowledge and decreases on the Eating Concerns subscale of the EDE-Q 12 months following a six-session school-based intervention. In addition, Smolak and Levine (2001) demonstrated increased knowledge and body esteem, and fewer self-reported unhealthy weight management techniques 2 years following an intervention targeting elementary school boys and girls. These studies are among the first long-term
controlled outcome studies demonstrating positive effects of eating disorder prevention programs.

Several suggestions have been put forth regarding the development and implementation of future prevention programs (Taylor & Altman, 1997; Franko, 2001; Franko & Orosan-Weine, 1998; Graber & Brooks-Gunn, 1996; Griffiths & Farnill, 1996; Noordenbos, 1994; Piran, 1995; Piran, 1997; Piran, 2001; Rosen & Neumark-Sztainer, 1998; Rosenvinge & Gresko, 1997; Rosenvinge & Borresen, 1999; Smolak & Levine, 1994). Studies that have targeted a universal population with limited success have suggested that prevention efforts may be more successful in targeting groups or individuals shown to be at increased risk for the development of eating disorder symptoms (Killen et al., 1993; Rosen & Neumark-Sztainer, 1998; Stice et al., 2000). In fact, two current studies targeting females at risk for the development of eating disorders have demonstrated positive findings (Huon et al., 1997; Stice et al., 2000). Furthermore, Franko (2001) suggested that prevention efforts may be best targeted at extracurricular activities that are focused on girls rather than using schools as targets for prevention programs. The current study incorporated these suggestions by targeting an “at risk” population of females participating in a predominately female extracurricular activity.

A second suggestion for future research has been the need to include adults in prevention efforts. The importance of including parents, teachers, coaches, and other school personnel in prevention programs has been repeatedly emphasized (Battle & Brownell, 1996; Graber & Brooks-Gunn, 1996; Griffiths & Farnill, 1996; Piran, 1995; Piran, 1997; Piran, 2001; Rosenvinge & Borresen, 1999; Smolak & Levine, 1994). Adults can play an important role in identifying children with eating disorders as well as modeling appropriate attitudes and behaviors concerning body image. Piran (2001) points out that prevention programs may be
more successful when they target the complex cultural context in which negative body image
and eating disorders development, pointing to a need to include both specific influential adult
figures (e.g., parents, teachers) and more global community resources (e.g., school
administration). However, despite the impact of adults in the lives of children and adolescents,
no published studies have targeted these groups in prevention programs.

Third, there is a need for evaluation of program benefits over time. Several studies have
failed to present long-term follow-up data, making it impossible to determine the effectiveness of
the program over time (e.g., Kater, Rohwer, & Levine, 2000; Moreno & Thelen, 1993). The
need for long-term follow-up is best illustrated by the Carter et al. (1997) study in which
treatment gains not only disappeared at 6-month follow-up, but there was actually an increase in
dietary restraint compared to baseline. This study demonstrated the need for long-term
evaluation of programs.

The best age at which to intervene has also been a topic of much discussion. Many
researchers have argued that prevention studies should be targeted to elementary school children
(Shisslak, Crago, Estes, & Gray, 1996; Smolak, Levine, & Schermer, 1998). However, current
findings do not provide conclusive evidence for intervening in one age group over another.
Successful studies have been implemented at the college level while unsuccessful studies have
been implemented in elementary schools and vice versa (Stice et al., 2000; Killen et al., 1993).
Thus, it is premature to focus exclusively on one age group. Instead, all age groups should
continue to be a focus of prevention efforts, offering developmentally appropriate programming
for each age level (Rosen & Neumark-Sztainer, 1998).

Franko and Orosan-Weine (1998) provide an excellent summary of methodological
problems with prevention research (small samples, lack of follow-up, age of target audience, size
of targeted group) as well as conceptual problems (focus on cognitive rather than behavioral variables) within the prevention literature. They suggest that future programs focus on recruiting adequate sample sizes and provide longitudinal evaluation. Additionally, the need to focus on behavioral improvements in addition to knowledge and attitudinal changes should be an important element of future prevention programs.

Prevention in Athletes

Powers and Johnson (1996) provide a description of recent prevention studies targeting athletes. Efforts in the primary prevention of eating disorders among athletes have been undertaken by several organizations within the athletic community. The International Olympics Committee has developed a task force to study eating disorders among female athletes. The National Collegiate Athletic Association (NCAA) has made substantial efforts to decrease eating disorders among college female athletes by developing written and audiovisual materials for athletes, coaches, and trainers concerning eating disorders. Additionally, USA Gymnastics has developed comprehensive prevention programs to prevent eating disorders among gymnasts. These efforts demonstrate that the athletic community recognizes that eating disorders are a serious concern and are willing to devote substantial resources to alleviate such problems.

Two studies addressing eating disorders prevention in athletes have been published. Sesan (1989) described a three-level intervention program at the University of Delaware. The intervention includes both primary and secondary prevention efforts. However, no data has been reported concerning the effectiveness of this program. Abood and Black (2000) implemented an 8-week health education intervention program focusing on self-esteem, stress management, nutrition, and goal setting. Their sample consisted of 70 Division I female college athletes from the following sports: diving, cross-country, track, swimming, softball, basketball, and volleyball.
Participants in the experimental group experienced a decrease in drive for thinness and body dissatisfaction when compared to participants in the control group.

Contribution of the Current Study

The current study offers a significant contribution to the existing literature in several ways. First, this study employed a longitudinal design with a 7-9 month follow-up period. Most previous prevention studies have conducted immediate follow-up assessments but have not measured the effectiveness of the intervention over time. Franko and Orosan-Weine (1998) emphasize the need for prevention studies that test the efficacy of programs over time. This study followed the coaches and cheerleaders over a period of 7-9 months to determine the long-term effects of the intervention.

A second advantage of the current study is that it targeted an “at-risk” population. Previous prevention studies that have had limited success have often intervened with a general population of elementary, junior high, high school, or college students. Interventions that target groups that are known to be “at-risk” have been recommended for future prevention studies (Franko & Orosan-Weine, 1998; Killen et al., 1993). Cheerleaders have been demonstrated to be at increased risk for the development of eating disorder symptoms. Thus, the current study was designed to contribute to the existing literature by empirically investigating an intervention that targets an “at risk” population.

Third, this study offers a unique methodology which encompasses primary and secondary prevention in one program. Previous studies which have attempted to combine primary and secondary prevention efforts have had little success or have even demonstrated iatrogenic effects (Mann et al., 1997). Authors have argued that the ideal strategies for primary prevention (e.g., education about the harmful effects of pathological weight control behaviors) versus secondary
prevention (e.g., normalizing pathogenic weight control behaviors) are incompatible and may result in iatrogenic effects when combined. These findings have led investigators to argue against combining these two types of prevention. However, the studies that have previously combined primary and secondary prevention have used a combination of these strategies within the intended intervention population. This study implemented primary and secondary prevention strategies with coaches who were then taught to intervene with the athletes and their parents. This approach was designed to ameliorate the difficulties encountered by previous researchers who have used a combination of primary and secondary prevention strategies.

Finally, this is the first study to target adults in prevention of eating disorders among adolescents. Coaches were the primary intervention target, but parents were included in the intervention strategies as well. The need to include important adult figures (e.g., parents, coaches, teachers) has been repeatedly emphasized in the literature (Battle & Brownell, 1996; Graber & Brooks-Gunn, 1996; Griffiths & Farnill, 1996; Piran, 1995; Piran, 1997; Piran, 2001; Rosenvinge & Borresen, 1999; Smolak & Levine, 1994) although no published studies have done so. The current study offers the first evaluation of a prevention study for eating disorders designed to target adults as well as adolescents.

Hypotheses

The following predictions were made concerning the effectiveness of the intervention on both the coaches’ behaviors/attitudes and the cheerleaders’ behaviors/attitudes:

1) Intervention coaches will demonstrate increased knowledge concerning the symptoms of eating disorders compared to control coaches.
2) Intervention coaches will demonstrate increased nutritional knowledge and decreased misconceptions concerning nutrition, body weight, and body fat composition in athletes compared to control coaches.

3) Intervention coaches will engage in more positive behaviors (i.e., lead discussions about body image, provide handouts to parents and cheerleaders) and fewer negative behaviors (i.e., negative comments about body weight, shape, or size; mandatory weigh-ins, unhealthy recommendations for weight loss) than will control coaches.

4) Cheerleaders in the intervention group will demonstrate increased nutritional knowledge and decreased misconceptions concerning nutrition, body weight, and body fat composition in athletes compared to cheerleaders in the control group.

5) Cheerleaders in the intervention group will have decreased levels of body concerns compared to cheerleaders in the control group. However, it is predicted that there will be no difference in the number of cheerleaders with significant eating disorder symptoms between the intervention and control groups as the relatively brief intervention is not expected to “treat” existing eating pathology.

6) Cheerleaders in the intervention group will have decreased perception of weight pressures from the coach compared to cheerleaders in the control group.

7) Cheerleaders in the intervention group will report that coaches engaged in more positive behaviors (i.e., lead discussions about body image, provide handouts to parents and cheerleaders) and fewer negative behaviors (i.e., negative comments about body weight, shape, or size; mandatory weigh-ins, unhealthy recommendations for weight loss) than cheerleaders in the control group.
8) Overconcern with body size in coaches and weight pressures from coaches will be related to preoccupation with body weight and shape and perception of pressures for thinness among athletes.
Experimental Phase I

Method

Participants

The participants were coaches recruited at national and regional conferences for cheerleading coaches. A total of 40 female coaches participated in the initial stages of the study. Of the 40 coaches, 23 were recruited from a national conference held in Reno, Nevada, and the remaining 17 were recruited from workshops in Hammond, Louisiana and Birmingham, Alabama. At the beginning of the workshops, the coaches were randomly divided into two equal groups by providing numbers to coaches as they entered the workshop. The only exception to the randomization process occurred when more than one coach from the same program attended the workshop. In cases such as this, both coaches were assigned to the same group in order to control for contamination effects. One group (n = 20) comprised the experimental group and received the intervention workshop. The second group (n = 20) comprised the control group and received the control workshop.

The mean age of the participants was 37 years old (SD = 8.5 years), and the majority of the participants were married (78%). Mean weight of the participants was 151 pounds (SD = 34 lbs), and mean height was 64 inches (SD = 2.4 inches) providing a mean Body Mass Index (BMI) of 26.3 (SD = 5.8). This sample of women was 95% Caucasian, 2.5% African American, and 2.5% Hispanic. 62% of the sample indicated that they were not currently on a diet while 38% indicated that they were currently dieting. 42% of the coaches reported that they were cheerleaders in high school and 20% were cheerleaders in college. Thus, a high percentage of the coaches had personal cheerleading experiences themselves.
Program Description

**Intervention Workshop.** The intervention workshop consisted of approximately 30 minutes of project rationale/assessment and a 1 hour presentation. See Table 1 for a summary of the program components. The presentation included the following components:

1) **Description of eating disorders and referral information.** Several authors have emphasized the need to inform coaches about the symptoms of eating disorders in order to facilitate early identification and referrals (Biesecker & Martz, 1999; Griffin & Harris, 1996; Harris & Foltz, 1999; Thompson & Sherman, 1993). This segment of the presentation consisted primarily of educational information regarding the symptoms of anorexia nervosa and bulimia nervosa as well as behavioral and psychological warning signs associated with pathological eating behaviors. Coaches were provided with information regarding appropriate referral sources and ways to manage an athlete with a suspected eating disorder. Research concerning athletes/cheerleaders as a group “at-risk” for the development of eating disorders was briefly discussed.

2) **Nutritional information specifically targeted to athletes.** Research has demonstrated that coaches have limited knowledge concerning nutrition and weight management and may hold erroneous beliefs about the relationship between body weight and performance (Griffin & Harris, 1996; Harris & Foltz, 1999). This segment of the presentation addressed myths regarding body weight and performance. Physical consequences of malnutrition and low body weight were addressed, specifically with regards to athletic performance. The effects of amenorrhea on physical health and athletic performance was also presented.
3) Specific coach behaviors. Specific coach behaviors such as mandatory weigh-ins, negative comments regarding weight, etc. were addressed. This segment of the presentation was based on the handout by Karin Kratina, M.A., R.D. entitled “Ten Things Coaches Can Do To Help Prevent Eating Disorders In Their Athletes” (Kratina, 1996; See Appendix A).

4) Provision of future intervention tools. Coaches were provided with a total of seven different options for further intervention. They were informed that these activities were optional (they were not required to complete these activities in order to receive compensation for participating), but they were encouraged to take advantage of all of the options. Coaches were informed that they would receive detailed instructions via email and mail on how to implement the activities. They were given instructions to read the information packet at the time of the workshop, but they did not receive any further instructions at that time. The following intervention tools were provided:

A) Reading Materials. Each coach was provided with a packet of relevant reading materials compiled from various sources including the National Collegiate Athletic Association (NCAA), research articles, and books. The handouts included a copy of the workshop materials and various materials concerning nutrition, the symptoms of eating disorders, the relationship between athletic involvement and eating disorders, how to manage athletes with eating disorders, and education and prevention of eating disorders in athletes.

B) Referral Form. Previous studies have demonstrated a lack of knowledge among coaches concerning appropriate referral sources for athletes with suspected eating disorders (Griffin & Harris, 1996). In an effort to increase
awareness of referral options, the coaches were provided with a form designed to help them gather information from their community regarding qualified professionals. Coaches were also provided with telephone numbers and mailing addresses of national organizations (e.g., American Anorexia/Bulimia Association, Inc.) which provide nationwide referral sources with lists of therapists, physicians, treatment programs, and hospitals specializing in the treatment of eating disorders. In addition, coaches were asked to identify dieticians, social workers, psychologists, and psychiatrists within their community that would be acceptable referral sources. See Appendix B for a copy of the referral form coaches received.

C) Web site. A study website was developed with links to other websites containing additional information about eating disorders. Links were included to national eating disorder organizations, relevant NCAA publications, and relevant sports nutrition sites. The study website primarily served as a source of further information for interested coaches.

D) Parent Handouts. Parents play a particularly important role in the prevention of eating disorders and in the identification of existing eating problems (Smolak & Levine, 1994). In an attempt to involve the parents in this program, coaches were given copies of a handout designed to provide information for parents about preventing eating disorders in athletes. This handout was designed by Pauline Powers, M.D. and contains information about dieting, weight loss, excessive exercise, etc. (see Appendix C).
E) **Video.** A 24-minute video tape was provided to coaches that presented information concerning puberty and genetic determinants of appearance, the thin ideal, cultural and historical factors in ideals of beauty, dieting, and eating disorders. The video was provided for coaches to show to their squad members. The video was developed and evaluated by Heinze, Wertheim, and Kashima (2000) for an eating disorders prevention program. After viewing the video, adolescents demonstrated decreased drive for thinness and decreased intentions to diet. See Appendix D for a copy of the video script.

F) **Discussion Format.** Coaches were provided with a detailed discussion format designed to follow the video. Previous studies have shown that interactive discussion as opposed to lecture-style formats have been more successful in prevention studies (Franko & Orosan-Weine, 1998). Therefore, coaches were asked to lead an interactive discussion concerning social pressures for thinness, specific pressures related to cheerleading, the relationship between body weight and performance, and the impact of negative comments from peers about body shape/size. See Appendix E for a copy of the discussion outline coaches received.

G) **Cheerleader Handouts.** Coaches were provided with a handout designed for the cheerleaders concerning nutrition and the food guide pyramid. The cheerleader handouts included a copy of the food guide pyramid, servings size guidelines, sample menus, guidelines for maintaining a healthy body weight/body fat percentage, and information about body weight and athletic performance. See Appendix F for a copy of the Cheerleader handouts.
<table>
<thead>
<tr>
<th>Topic</th>
<th>Content</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b) research on athletes and eating disorders</td>
<td>Hausenblaus &amp; Carron (1999)</td>
</tr>
<tr>
<td></td>
<td>c) making appropriate referrals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) physical/medical consequences of malnutrition</td>
<td>Pomeroy &amp; Mitchell (1992)</td>
</tr>
<tr>
<td></td>
<td>c) nutrition beliefs and myths</td>
<td>Williams (1985)</td>
</tr>
<tr>
<td>Coaching Behaviors</td>
<td>a) negative practices such as mandatory weigh-ins, negative comments about body size/shape</td>
<td>Thompson &amp; Sherman (1993)</td>
</tr>
<tr>
<td></td>
<td>b) managing an athlete with an eating disorder</td>
<td>Thompson (1987)</td>
</tr>
<tr>
<td>Future Intervention Tools</td>
<td>a) reading materials</td>
<td>Thompson &amp; Sherman (1993)</td>
</tr>
<tr>
<td></td>
<td>b) referral form</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) parent handout</td>
<td>Powers (1999)</td>
</tr>
<tr>
<td></td>
<td>d) video</td>
<td>Heinze, Wertheim, &amp; Kashima (2000)</td>
</tr>
<tr>
<td></td>
<td>e) website</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e) discussion format</td>
<td></td>
</tr>
<tr>
<td></td>
<td>f) cheerleader handouts on nutrition</td>
<td>Steen &amp; Berning (1992)</td>
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</table>
Control Workshop. Participants in the control workshop received the same project rationale as participants in the intervention workshop. They completed the baseline assessment and participated in a 1-hour presentation. This workshop focused on psychological issues that can increase performance. Specific topics that were addressed included: relaxation training, problem-solving, and goal setting. General health tips related to increasing athletic performance were addressed including proper sleep hygiene, avoidance of drugs and alcohol, and the importance of eating a well-balanced diet. Coaches were informed of the 7-month follow-up assessment and were eligible to receive compensation for their participation.

Assessment Measures

A brief set of assessment measures was chosen based on the following criteria: 1) conformity with the intervention goals (e.g., the goal of increased nutritional knowledge required an assessment of nutritional knowledge) 2) psychometric properties 3) acceptance within the literature 4) length of time necessary to complete, and 5) contribution of the data to the overall aims of the study. The following measures were chosen for the coaches’ baseline measures: Sports Nutrition Questionnaire, Background Information-Coach, CHEER-Coach, Body Shape Questionnaire-Short, Behavioral Checklist-Coach, and Eating Disorders Knowledge Quiz. Immediately following the workshops, coaches completed a post-test using the Sports Nutrition Questionnaire and the Eating Disorders Knowledge Quiz. The specific rationale according to the above criteria for inclusion of each assessment measures is provided below.

Background Information-Coach (Appendix G). A brief questionnaire was administered to coaches for the purposes of gathering demographic information and follow-up information. Specific information necessary for follow-up included 1) mailing address, 2) work phone number, 3) number of squad members and type of squad, and 4) email address. Follow-up
information was sent via email and regular mail. Additional demographic topics of interest that were assessed included gender, marital status, ethnic background, height/weight, age, history of cheerleading, and dieting status.

**Sports Nutrition Questionnaire (Appendix H).** The Sports Nutrition Questionnaire was administered as a measure of nutritional knowledge. This measure consists of 23 items, and examples of the items include “If someone needs to lose some weight, 3 to 5 pounds a week is a good rate of weight loss, “Lower body weight will improve athletic performance,” and “For athletes, less than 10% of calories should come from fat.” Each item is answered on a 5-point Likert scale ranging from “strongly disagree” to “strongly agree.” Of the 23 items, 8 are reversed scored. Higher scores are indicative of low levels of knowledge and unhealthy attitudes concerning athletes and nutrition. Coefficient alpha of the scale was .70, indicating an acceptable level of internal consistency of the items.

**Body Shape Questionnaire - Short (BSQ-Short; Evans & Dolan, 1993; Appendix I).** The full-scale BSQ is a 34-item self-report questionnaire used to assess concerns about body shape and size. All items are scored on a 6-point Likert scale ranging from “never” to “always.” The scale has been shown to have excellent reliability and validity (Cooper et al., 1987). Evans and Dolan (1993) developed a 16-item shortened version of the BSQ which demonstrated equally strong psychometric qualities. For the current study, the BSQ-short was used to assess level of overconcern with body size. Overconcern with body size as measured by the BSQ has been found to be the primary mediator of other risk factors for the development of eating disorders among athletes (Williamson et al., 1995). Furthermore, it was hypothesized that overconcern with body size in coaches may be related to preoccupation with body weight and shape and
perceptions of pressures for thinness among the athletes. The 16-item version of the BSQ was chosen to decrease time of completion.

Eating Disorders Knowledge Quiz (Appendix J). One of the primary goals of the intervention included increasing coaches’ knowledge about the signs and symptoms of eating disorders. In order to assess the efficacy of the program in this domain, coaches completed a short quiz concerning eating disorders. The quiz was designed specifically for use in this study because there are no published measures that have been previously used and validated. The quiz contains 10 items answered in a multiple-choice format. An example of a quiz item is “A person with anorexia nervosa” a) is significantly underweight, b) is fearful of gaining weight, c) experiences body image disturbances, d) all of the above.

Behavioral Checklist-Coach (Appendix K). The coaches completed a checklist designed to measure behavioral changes. This checklist was designed specifically for this study. Items were included that assess the number of activities in which the coach participated (e.g., read the book). The measure includes 10 items and two additional questions concerning referral of cheerleaders with suspected eating disorders. Examples of items include “I have read a book or book chapter on how to help athletes with eating disorders” and “I have referred cheerleaders on my squad for help with eating disorder symptoms.” Each item is answered “yes” or “no.” This questionnaire was included as a measure of the coaches’ level of involvement with the program in order to test the hypothesis that the intervention’s effects on the coaches and the cheerleaders would be greatest among squads in which the coach participated in a greater number of intervention strategies.
CHEER (Reel & Gill, 1996; Appendix L)-Coach. CHEER-Coach is a 12-item self report questionnaire designed to assess coaches’ perceptions of the importance of weight and the amount of weight pressures associated with cheerleading. CHEER-Coach addresses such issues as weight-limits, weigh-ins, and weight pressures on cheerleaders from stunt partners, peers, family members. In addition, CHEER-Coach assesses the amount of pressure coaches put on cheerleaders to attain a thin body size. Each item is answered on a 5-point Likert scale from “strongly agree” to “strongly disagree.” The original items were completed by the cheerleaders, while slightly revised items were completed by the coaches. CHEER contains four items that specifically address coaching behaviors (i.e., “My coach encourages female squad members to maintain a below average weight.” “Body weight and appearance are important to my coach.” “Weigh-ins are held periodically throughout the cheerleading season.” “My squad has a weight requirement to try out.”). An example of a revised coaches’ item is “I encourage female squad members to maintain a below average weight.” These items were used to assess the efficacy of the intervention workshop compared to the control workshop in changing specific coach behaviors. In addition, the coaches responses were compared to the cheerleaders’ responses as a measure or inter-rater reliability of behavior change. Scores on the full questionnaire were used to assess the effect of the intervention workshop at a more global level. For example, answers to the coaches’ item “Some of my cheerleaders would improve their performance if they lost at least 5 pounds” would predictably differ among the intervention and control group.

Procedure

Cheerleading coaches voluntarily attended a 1 ½ hour workshop at national or regional coaches’ conferences. The workshop was entitled “Using Psychology To Improve Your Squad’s Performance.” In order to control for selection biases, coaches in the intervention and control
group chose to attend the workshop based on the same title. Once the coaches arrived at the workshop, they were split into two groups and moved to different rooms. They were not informed of their group status. Coaches in both groups were requested to participate in a research project “designed to test the efficacy of an intervention designed for coaches and cheerleaders to promote health behaviors.” They were informed that they could earn up to $100 for their squad in exchange for their participation, and they were given details regarding participation requirements in order to receive full payment (completion of coach baseline measures, completion of coach follow-up measures, and completion of the cheerleader follow-up measures from at least 6 of the squad members) or half payment (completion of follow-up measures by at least 3 squad members in addition to completing all other requirements). Completion of the post-workshop activities (e.g., reading the book, showing the video) by the intervention group was not required in order to receive payment, and this fact was emphasized to coaches in the intervention group. Coaches who agreed to participate next completed the baseline measures. Following administration of the baseline measures, the 1-hour presentation was presented followed by a second administration of the Sports Nutrition Questionnaire and Eating Disorders Knowledge Quiz.

Coaches receiving the control workshop did not receive information or materials for further intervention. The control workshop focused on behaviors that could increase performance such as relaxation training, proper sleep hygiene, problem-solving skills, avoidance of drugs and alcohol, and eating a well-balanced diet.

At the conclusion of the workshop, coaches in the intervention group were provided with the packet of reading materials, the video, parent handouts, referral forms, cheerleader handouts, and website referral list. Reading the handouts was the only assignment at the conclusion of the
workshop. Coaches in the intervention group were informed that they would receive instructions on a bi-monthly schedule for the remaining activities. At two-month intervals, coaches in the intervention group were contacted regarding completion of the remaining assignments. The first assignment was completion of the referral form. Coaches were provided with suggestions regarding different types of referral sources (e.g., school counselor, psychologists, psychiatrists, social workers). The second assignment was the distribution of the parent handouts and visiting the study website. At the sixth-month point, the coaches were contacted with instructions for showing the video and leading a discussion among the cheerleaders. This occurred in early September which ensured that the cheerleaders were in school and actively practicing/performing. Because the conferences were in March, one concern was that the coaches would have a different squad in March than they would in the following summer/fall (most squads have try-outs in the spring). In order to ensure that the cheerleaders who were participating in the follow-up assessment were the same cheerleaders that viewed the video and participated in the discussion, this activity was completed last.

Results

Analysis of Coach Demographic Variables

Analysis of demographic variables as a function of group assignment utilized separate univariate analyses of variance (ANOVAs) and Chi-Square analyses (see Tables 2 and 3 for a summary). There were no significant differences between coach groups for any demographic variables. Means, standard deviations, and percentages according to coach group for demographic variables are shown in Table 2.
Table 2. Coach Data: Demographic Variables by Group

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>37.95</td>
<td>9.51</td>
</tr>
<tr>
<td>Control</td>
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<td>7.31</td>
</tr>
<tr>
<td>BMI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>25.59</td>
<td>5.12</td>
</tr>
<tr>
<td>Control</td>
<td>27.17</td>
<td>6.59</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caucasian</td>
<td>100%</td>
<td>90%</td>
</tr>
<tr>
<td>African-American</td>
<td>0%</td>
<td>5%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0%</td>
<td>5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Currently on a diet</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>40%</td>
<td>35%</td>
</tr>
<tr>
<td>No</td>
<td>60%</td>
<td>65%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cheered in High School</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>45%</td>
<td>40%</td>
</tr>
<tr>
<td>No</td>
<td>55%</td>
<td>60%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cheered in College</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>25%</td>
<td>15%</td>
</tr>
<tr>
<td>No</td>
<td>75%</td>
<td>85%</td>
</tr>
</tbody>
</table>

* there were no significant differences between groups for any demographic variables (p > .05)
Table 3. Coach Data: Type of Squad According to Group Assignment

<table>
<thead>
<tr>
<th>Type of Squad</th>
<th>Number of Squads According to Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental</td>
</tr>
<tr>
<td>Youth Squad</td>
<td>4</td>
</tr>
<tr>
<td>Junior High</td>
<td>11</td>
</tr>
<tr>
<td>Combination Youth &amp; JH</td>
<td>1</td>
</tr>
<tr>
<td>High School</td>
<td>2</td>
</tr>
<tr>
<td>College</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: There were no significant group differences according to squad type (p > .05)

Coach Baseline Scores on the Assessment Measures

The mean score across coach groups on the Sports Nutrition Questionnaire was 54.05 (SD = 7.38) out of a possible score of 115. Higher scores are indicative of low levels of knowledge and unhealthy attitudes concerning athletes and nutrition. Approximately 25% of the coaches indicated that they believed lower body weight would lead to improved athletic performance. For the statement, “For athletes, less than 10% of calories should come from fat,” 54% of the sample rated this statement with moderate to high levels of agreement (healthy fat intake is actually 30%). The overwhelming majority of coaches (95%) indicated the belief that the use of diuretics or laxatives is not a safe way to lose weight before athletic performances.

The mean score across coach groups at baseline on the Eating Disorders Knowledge Quiz was 5.92 (SD = 1.35) out of a possible score of 10. Higher scores indicate increased levels of knowledge about the symptoms of eating disorders. Approximately 50% of the coaches did not
know that people with bulimia nervosa are usually normal weight or overweight, and 40% of the coaches did not know how to distinguish bulimia nervosa from anorexia nervosa. Finally, over two-thirds of the coaches did not know that the primary characteristic of bulimia is binge eating.

The mean score across coach groups at baseline on CHEER-Coach was 41.05 (SD = 5.76) out of a possible score of 60. Higher scores on this measure indicate that the coach puts fewer weight pressures on the cheerleaders and the coach perceives that the cheerleaders experience few weight pressures associated with cheerleading overall. Thus, the coaches indicated that they believe the cheerleaders experience moderate levels of weight pressures associated with cheerleading. Only 1 coach reported having a weight requirement for cheerleaders to try out, and 95% of the coaches did not believe that there should be weight requirements. A total of 5 coaches (12.5%) indicated that they have periodic weigh-ins throughout the cheerleading season. 28% of the coaches agreed that some cheerleaders would improve their performance if they lost at least 5 lbs, and 13% believed the lightest cheerleaders are at a distinct advantage. Over half the coaches agreed that stunt partners noticed if their partner put on weight, and 64% indicated that they believed that the uniforms made the cheerleaders conscious of their weight and appearance. Finally, 62% of the coaches indicated that weight and appearance were important to them, 36% believed that it was important to the cheerleaders’ families, and 77% believed that it was important to the cheerleaders’ friends.

The mean score across coach groups at baseline on the Behavioral Checklist-Coach was 3.05 (SD = 1.66) out of a possible score of 10. Higher scores indicate that the coaches have engaged in more behaviors designed to prevent eating disorders among their squad members. The mean score indicates that the coaches have engaged in few such behaviors. However, over one-fourth of the coaches reported that they had previously read information about how to help
athletes with eating disorders and had provided nutrition information to squad members. An additional 20% of coaches reported that they had led a discussion about body image and eating disorders within their squads. Three coaches indicated that they have referred cheerleaders for help with possible eating disorders. A total of 15% of the coaches noted that they had made occasional comments to squad members about body weight, shape, or size.

The mean score across coach groups at baseline on the BSQ-Short was 95.00 (SD = 25.26) out of a possible score of 192. Higher scores indicate higher levels of concern about body size and shape. The previously established mean for normal females on the BSQ-Short is 85.1 (SD = 36.4). Coaches’ mean scores indicated that the coaches have average levels of body concerns.

Analysis of Baseline and Post-Test Differences According to Coach Group on the Assessment Measures

Multivariate Analysis of Variance (MANOVA) was used to evaluate coach group differences on the assessment measures at baseline (see Table 4 for a summary). As expected, there were no significant differences between coach groups at baseline on total scores for the Sports Nutrition Questionnaire, Eating Disorders Knowledge Quiz, CHEER-Coach, BSQ-Short, or Behavioral Checklist-Coach.

Two separate 2 (group) x 2 (time) repeated measures ANOVA’s were performed to evaluate coach group differences on the Sports Nutrition Questionnaire and the Eating Disorders Knowledge Quiz at post-test (immediately following the workshop). There was a significant main effect for time \[ F (1, 38) = 64.43, p < .0001 \] and a significant interaction between group and time \[ F (1, 38) = 108.70, p < .0001 \] for scores on the Sports Nutrition Questionnaire. As predicted, coaches’ scores did not differ at baseline but scores were significantly lower in the
experimental group (indicating higher levels of knowledge) than scores in the control group at post-test. Figure 1 illustrates these findings.

These results were replicated for the Eating Disorders Knowledge Quiz. There was a significant main effect for time \[ F (1, 38) = 19.46, p < .0001 \] and a significant interaction between group and time \[ F (1, 38) = 36.78, p < .0001 \] for scores on the Eating Disorders Knowledge Quiz. As shown in Figure 2, coaches’ scores did not differ at baseline but scores were significantly higher in the experimental group (indicating higher levels of knowledge) than scores in the control group at post-test.

Table 4. Coach Data: Baseline and Post-Test Coach Differences According to Group

<table>
<thead>
<tr>
<th>Measure</th>
<th>Group</th>
<th>Baseline Mean (SD)</th>
<th>Post-Test Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNQ</td>
<td>Experimental</td>
<td>54.40 (6.39)</td>
<td>38.25 (7.93)*</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>53.70 (8.40)</td>
<td>55.80 (8.91)</td>
</tr>
<tr>
<td>ED Knowledge</td>
<td>Experimental</td>
<td>5.85 (1.46)</td>
<td>7.75 (1.55)*</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>6.00 (1.26)</td>
<td>5.70 (1.26)</td>
</tr>
<tr>
<td>BC-Coach</td>
<td>Experimental</td>
<td>2.90 (1.45)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>3.20 (1.88)</td>
<td></td>
</tr>
<tr>
<td>CHEER-Coach</td>
<td>Experimental</td>
<td>42.35 (5.38)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>39.75 (5.97)</td>
<td></td>
</tr>
<tr>
<td>BSQ-Short</td>
<td>Experimental</td>
<td>95.70 (28.12)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>94.30 (22.76)</td>
<td></td>
</tr>
</tbody>
</table>

Note: SNQ = Sports Nutrition Questionnaire, ED Knowledge = Eating Disorder Knowledge Quiz, BC-Coach = Behavioral Checklist-Coach
*denotes that groups differed significantly \( p < .0001 \)
**no data is presented for post-test BC-Coach, CHEER-Coach, and BSQ-Short because these measures were not administered at post-test
Figure 1. Mean Baseline and Post-Test Scores on the Sports Nutrition Questionnaire

Figure 2. Mean Baseline and Post-Test Scores on the Eating Disorders Knowledge Quiz
Experimental Phase 2

Method

Participants

Participants in the follow-up study included coaches from the original sample (control group and experimental group) and the cheerleaders on their squads. At the initial workshop, coaches provided information regarding the number of squad members, type of squad (e.g., junior high, high school), and future contact information. After the 8 month follow-up period, each squad received a coach questionnaire packet and individual cheerleader questionnaire packets. Follow-up assessments were completed 8-11 months following the initial intervention. A total of 19 coaches and 140 cheerleaders completed the follow-up study. The experimental group consisted of 6 coaches and 20 cheerleaders while the control group consisted of 13 coaches and 120 cheerleaders. In exchange for their participation in the full study, coaches received $100 for their squad. The requirements for receiving full payment included: 1) completion of coach baseline measures, 2) completion of coach follow-up measures, and 3) completion of the cheerleader follow-up measures from at least 6 squad members. Squads received $50 (half of the payment) if requirements 1 and 2 were met and at least 3 squad members complete the follow-up measures. Of the 19 coaches that completed the follow-up assessment, 14 received full payment ($100), 1 received half payment ($30), and 3 did not return enough cheerleader data to receive payment. A total of 21 coaches from phase I did not complete the follow-up assessment (7 from the control group and 14 from the experimental group). For the experimental group, 2 coaches retired from coaching following the initial workshop, 4 did not end up coaching during the 2001-2002 season, and the remaining 8 could not be contacted at follow-up. The 7 coaches from the control group that did not complete the
follow-up assessment did not respond to email or mail. Additionally, squads from the experimental group returned fewer cheerleader packets because 3 of these squads were youth squads and the coaches/parents felt that the questionnaires were too advanced for this age group.

Comparing Baseline Differences Between Coaches that Completed Follow-up and Coaches that Did Not Complete Follow-Up. ANOVAs and Chi Square analyses were conducted to determine if there were differences at baseline between coaches that completed follow-up (Completers) and those that didn’t (Non-Completers) (see Table 5 for a summary of group means). Demographically, potential differences between groups were examined for age, BMI, race, marital status, dieting status, previously cheerleading experience, and squad type. There were no significant differences between groups according to age \( F (1, 38) = 3.63, p > .05 \), BMI \( F (1, 38) = 1.45, p > .05 \), or baseline scores on the Sports Nutrition Questionnaire \( F (1, 38) = 3.82, p > .05 \), CHEER-Coach \( F (1, 38) = 0.97, p > .05 \), BSQ-Short \( F (1, 38) = 0.83, p > .05 \), Eating Disorders Knowledge Quiz \( F (1, 38) = 0.13, p > .05 \), or Behavioral Checklist-Coach \( F (1, 38) = 0.04, p > .05 \). Table 6 shows the means and standard deviations according to groups for each of these variables. Likewise, there were no significant differences between groups for race \( X^2 (2) = 2.33, p > .05 \), marital status \( X^2 (2) = 5.87, p > .05 \), type of squad \( X^2 (2) = 3.15, p > .05 \), previous high school cheerleading experience \( X^2 (2) = 1.52, p > .05 \), previous college cheerleading experience \( X^2 (2) = 0.03, p > .05 \), or current dieting status \( X^2 (2) = 0.54, p > .05 \).

Analysis of Cheerleader Demographic Variables. The 20 experimental group cheerleaders and 120 control group cheerleaders completed a demographic survey. Analysis of demographic variables by group assignment utilized separate univariate analyses of variance (ANOVA) and Chi-Square analyses (see Table 6 for a summary). There were significant differences between groups for age \( F (1, 138) = 5.72, p < .05 \) and type of squad \( X^2 (4) = \)}
Mean age for the experimental group cheerleaders was 13.15 (SD = .99) while the mean age for the control group was 14.67 (SD = 2.80). All of the experimental group cheerleaders were on a junior high squad while only half of the control group cheerleaders were on a junior high squad.

Table 5. Coach Data: Completers Vs. Non-Completers at Baseline

<table>
<thead>
<tr>
<th>Baseline Measure</th>
<th>Completers</th>
<th>Non-Completers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Age</td>
<td>34.05</td>
<td>7.95</td>
</tr>
<tr>
<td>BMI</td>
<td>25.20</td>
<td>5.62</td>
</tr>
<tr>
<td>SNQ</td>
<td>51.74</td>
<td>7.30</td>
</tr>
<tr>
<td>CHEER-Coach</td>
<td>40.11</td>
<td>6.86</td>
</tr>
<tr>
<td>BSQ-Short</td>
<td>91.16</td>
<td>19.06</td>
</tr>
<tr>
<td>ED Knowledge Quiz</td>
<td>5.84</td>
<td>1.21</td>
</tr>
<tr>
<td>Behavioral Checklist-Coach</td>
<td>3.11</td>
<td>1.97</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race</th>
<th>Completers</th>
<th>Non-Completers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caucasian</td>
<td>90%</td>
<td>100%</td>
</tr>
<tr>
<td>African-American</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>5%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital Statues</th>
<th>Completers</th>
<th>Non-Completers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>74%</td>
<td>81%</td>
</tr>
<tr>
<td>Single</td>
<td>26%</td>
<td>5%</td>
</tr>
<tr>
<td>Divorced</td>
<td>0%</td>
<td>14%</td>
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</table>

<table>
<thead>
<tr>
<th>Currently on a Diet</th>
<th>Completers</th>
<th>Non-Completers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>32%</td>
<td>43%</td>
</tr>
<tr>
<td>No</td>
<td>68%</td>
<td>57%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cheered in High School</th>
<th>Completers</th>
<th>Non-Completers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>53%</td>
<td>34%</td>
</tr>
<tr>
<td>No</td>
<td>47%</td>
<td>66%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cheered in College</th>
<th>Completers</th>
<th>Non-Completers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>21%</td>
<td>19%</td>
</tr>
<tr>
<td>No</td>
<td>79%</td>
<td>81%</td>
</tr>
</tbody>
</table>

* there were no significant differences between groups on any baseline scores or demographic variables (p > .05)
Table 6. Cheerleader Data: Cheerleader Demographic Variables by Group

<table>
<thead>
<tr>
<th></th>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>*<em>Age</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>13.15</td>
<td>.99</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>14.67</td>
<td>2.80</td>
<td></td>
</tr>
<tr>
<td>Matched Control</td>
<td>13.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>62.45</td>
<td>1.99</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>62.66</td>
<td>2.75</td>
<td></td>
</tr>
<tr>
<td>Matched Control</td>
<td>62.76</td>
<td>2.02</td>
<td></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>108.7</td>
<td>15.13</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>110.17</td>
<td>20.44</td>
<td></td>
</tr>
<tr>
<td>Matched Control</td>
<td>103.65</td>
<td>14.64</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th>Control Group</th>
<th>Matched Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Squad</strong>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junior High</td>
<td>100%</td>
<td>49%</td>
<td>100%</td>
</tr>
<tr>
<td>High School</td>
<td>0%</td>
<td>36%</td>
<td>0%</td>
</tr>
<tr>
<td>College</td>
<td>0%</td>
<td>15%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>100%</td>
<td>84%</td>
<td>94%</td>
</tr>
<tr>
<td>African-American</td>
<td>0%</td>
<td>6%</td>
<td>0%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0%</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Asian</td>
<td>0%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>0%</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Currently on a diet</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15%</td>
<td>15%</td>
<td>6%</td>
</tr>
<tr>
<td>No</td>
<td>85%</td>
<td>85%</td>
<td>94%</td>
</tr>
</tbody>
</table>

Note: Height is reported in inches, weight is reported in pounds
* denotes a significant difference between the experimental group and control group ($p < .05$)
(n = 59 junior high, n = 43 high school, n = 18 college). There were no significant differences according to group for ethnic background, dieting status, height, or weight. Means, standard deviations, and percentages for demographic variables according to group assignment are shown in Table 6.

Correlations Between Age, Type of Squad, and the Dependent Measures for Cheerleaders. Because the experimental group cheerleaders were significantly younger than the control group cheerleaders, variables of age and type of squad were correlated with the dependent measures to determine if these demographic variables have a significant influence on the dependent variables (see Table 7 for a summary). Significant correlations were found between age and scores on the Sports Nutrition Questionnaire (r = -.31, p < .002) and CHEER-Cheer (r = -.25, p < .002). Additionally, type of squad was significantly correlated with scores on the Sports Nutrition Questionnaire (r = -.37, p < .002).

<table>
<thead>
<tr>
<th>1. Age</th>
<th>2. Type of Squad</th>
<th>3. SNQ</th>
<th>4. CHEER-Cheer</th>
<th>5. BSQ-Short</th>
<th>6. BC-Cheer</th>
<th>7. EAT-26</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2. Type of Squad</td>
<td>.88*</td>
<td>2</td>
<td>.88*</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>3. SNQ</td>
<td>-.31*</td>
<td>3</td>
<td>-.31*</td>
<td>-.37*</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>4. CHEER-Cheer</td>
<td>-.25*</td>
<td>4</td>
<td>-.25*</td>
<td>-.22</td>
<td>-.03</td>
<td>4</td>
</tr>
<tr>
<td>5. BSQ-Short</td>
<td>.05</td>
<td>5</td>
<td>.05</td>
<td>-.04</td>
<td>-.42*</td>
<td>5</td>
</tr>
<tr>
<td>6. BC-Cheer</td>
<td>.18</td>
<td>6</td>
<td>.18</td>
<td>-.14</td>
<td>-.07</td>
<td>.01</td>
</tr>
<tr>
<td>7. EAT-26</td>
<td>.01</td>
<td>7</td>
<td>.01</td>
<td>-.06</td>
<td>.10</td>
<td>.29*</td>
</tr>
</tbody>
</table>

Note: SNQ = Sports Nutrition Questionnaire, BSQ = Body Shape Questionnaire, BC-Cheer = Behavioral Checklist-Cheer, EAT = Eating Attitudes Test
* p < .002.
**Matched Cheerleader Control Group.** Because the correlations between age, type of squad, and the dependent variables were high, a control group matched according to age and type of squad was selected. A total of 17 control group cheerleaders who were 13 years of age and cheered on a junior high squad were designated to be the matched control group. The demographic variables for the new matched control group are shown in Table 6. There were no significant differences on any demographic variables between the experimental group cheerleaders and the matched control group cheerleaders.

**Follow-Up Assessment Measures**

1) Coaches. At follow-up, coaches received questionnaire packets including all of the baseline assessment measures with the exception of the demographic questionnaire. Therefore, coaches completed the Sports Nutrition Questionnaire, Eating Disorders Knowledge Quiz, BSQ-Short, Behavioral Checklist-Coach, and CHEER-Coach.

2) Cheerleaders. For the cheerleaders’ assessment at follow-up, the following measures were chosen: Background Information-Cheer, CHEER-Cheer, Body Shape Questionnaire-Short, Eating Attitudes Test-26, Behavioral Checklist-Cheer, and Sports Nutrition Questionnaire. A brief description and rationale for these measures follows.

**Background Information - Cheer (Appendix M).** Cheerleaders completed a brief questionnaire designed to gather demographic information. Specific questions concern age, gender, ethnic background, cheerleading history, dieting status, current height/weight, and weight history.

**Behavioral Checklist-Cheer (Appendix N).** Cheerleaders also completed a behavioral checklist designed to assess the cheerleaders’ perception of coach behaviors. For each activity the coaches could have engaged in that involved the cheerleaders, the cheerleaders were asked to
verify whether or not the coach provided that activity. The questions were comparable to the items on the Behavioral Checklist-Coach version. The only items present on the Behavioral Checklist-Coach that were not also answered by the cheerleaders pertained only to the coaches’ activities (i.e., reading the book, viewing the website, completing the referral form). In addition to answering “yes” or “no” to questions about the coaches’ behavior, the cheerleaders also completed rating scales on the quality of the discussion presentation. These items were included as a measure of differences in the coaches’ abilities to lead an interesting discussion.

Eating Attitudes Test - 26 (EAT-26; Garner et al., 1982; Appendix O). The EAT-26 is a 26-item self-report questionnaire used to identify behaviors and attitudes associated with anorexia and bulimia nervosa. Each item is answered on a 6-point Likert scale with descriptors ranging from “always” to “never.” The EAT-26 is a widely used screening tool for the presence of eating disorder symptoms (Garner, Rosen, & Barry, 1998), and has demonstrated strong reliability and validity. A cutoff score of 20 has been established as an indication of disturbed eating patterns. The EAT-26 was administered to the cheerleaders in the proposed study as a measure of disturbed eating. According to the hypotheses, the intervention would be less successful with respect to cheerleaders who have moderate to severe eating disturbances. Thus, it was important to be able to identify those cheerleaders that display such symptoms. Additionally, data from the EAT-26 was used to identify cheerleaders who would benefit from referral services. One of the primary goals of the intervention was to increase the coaches’ awareness of eating disorder symptomatology and facilitate referrals. The coaches’ self-report concerning referral of cheerleaders for additional services (e.g., nutritional, medical, psychological) was compared to the actual self-reported symptoms of the cheerleaders according to the EAT-26.
Several studies examining eating disorders in athletes have administered the EAT-26 as a measure of eating disturbances (Taub & Blinde, 1994; Warren, Staton, & Blessing, 1990; Wilkins, Boland, & Albinson, 1991). Wilmore (1996) has argued that the EAT-26 is not valid in samples of athletes because this population may tend to under-report symptoms. Thus, Wilmore argues that the EAT-26 may fail to identify athletes who have eating disorders. On the other hand, several investigators have successfully used the EAT-26 to screen for eating disorders in athletes. Garner, Rosen, & Barry (1998) concluded that the primary factor in obtaining valid results with the EAT-26 is ensuring the confidentiality of the athletes. Thus, in the present study, the cheerleaders were informed that their answers would be strictly confidential (parents, coaches, etc. would not have access to this information) and they received individual envelopes in which to seal their completed measures.

**CHEER (Reel & Gill, 1996; Appendix P)-Cheer.** The original CHEER questionnaire was administered to the cheerleaders as a measure of weight pressures associated with cheerleading (for a full description of the measure, see the previous section on coach assessment measures). Reel and Gill (1996) report an internal consistency of the 12 CHEER items to be alpha = .71. No other psychometric properties of this questionnaire have been reported. For the purposes of this study, scores on the CHEER-Cheer were correlated with scores on the BSQ-short and EAT-26 (for cheerleaders only) to help establish concurrent validity (See Table 8 for a summary of the correlations between assessment measures). The Pearson Product Moment correlation between CHEER-Cheer and the BSQ-Short was $r = -0.42$ ($p < .01$) and the correlation between CHEER-Cheer and the EAT-26 was $r = -0.29$ ($p < .01$). These correlations demonstrate adequate concurrent validity. As a measure of discriminant validity, CHEER scores were correlated with scores on the Sports Nutrition Questionnaire. The correlations between
these two measures was $r = -0.03$. The lack of a relationship between these two measures demonstrates adequate discriminant validity of CHEER-Cheer.

Table 8. Cheerleader Data: Correlations Between Cheerleader Assessment Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sports Nutrition Questionnaire</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. CHEER-Cheer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Behavioral Checklist-Cheer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. BSQ-Short</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. EAT-26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: BSQ = Body Shape Questionnaire, EAT = Eating Attitudes Test
* $p < .01$.

Procedure

In October (7 months following the workshop), coaches received the follow-up assessment packets. Each packet included one coach’s packet, and individual cheerleaders’ packets in separate envelopes. The cheerleader packets consisted of consent forms for the parents, assent forms for the cheerleaders, assessment measures, and instructions to seal all of the information in the envelope and return to the coach. The coach was instructed to return all of the packets at one time. Thus, the cheerleaders completed a post-intervention assessment only, while the coaches completed baseline and post-intervention assessments. The lack of a pre-intervention assessment of the cheerleaders was a limitation of the proposed design. However, it was impossible to conduct a baseline assessment of the cheerleaders in March and follow-up in October because try-outs for the new squads were held in the late spring. In order to help ensure that the control and intervention squads did not differ significantly at pre-intervention, coaches
were randomly assigned to groups. Furthermore, baseline data from the coaches (type of squad, region of the country, etc.) was used to assess any pre-existing group differences.

Manipulation Check: Experimental Group Compliance with the Interventions. For the 6 coaches in the experimental group who completed the follow-up assessment, self-reported behavior change from baseline to follow-up on the 10 target behaviors was examined. The target behaviors included: 1) reading information about helping athletes with eating disorders, 2) showing a video to squad members about body image, 3) refraining from comments to squad members about body weight, shape, or size, 4) leading a squad discussion about body image, 5) refraining from conducting mandatory weigh-ins, 6) visiting a website about eating disorders and athletes, 7) distributing handouts to parents of squad members concerning eating disorders, 8) developing a referral list of professionals qualified to treat eating disorders, 9) providing handouts about nutrition to squad members, and 10) referring squad members with suspected eating disorders for professional help. Compliance with the interventions targeting these 10 behaviors across time was high. See Table 9 for a summary of the number of coaches who engaged in these behaviors at baseline and at follow-up. The most significant changes (from 0% compliance at baseline to 100% compliance at follow-up) were for 1) reading information, 2) showing a video, and 3) leading a discussion. No change was observed for the number of coaches who reported referring a cheerleader for help with a possible eating disorder from baseline to follow-up. None of the 6 coaches reported referring a squad member at either baseline or follow-up.

One method intended to verify the validity of the coaches’ self-reported behavior change included correlating coaches’ report of behavior change with cheerleader’s report of coach behavior. However, only 3 of the 6 coaches in the experimental group that completed the
follow-up assessment returned cheerleader data. The remaining 3 coaches declined to return cheerleader data because their squads were classified as “youth” squads and the coaches deemed the squad members too young to complete the questionnaires. Therefore, due to the small sample size, correlations between coach and cheerleader measures was not possible. Upon visual examination of the data provided by the 3 coaches and their corresponding cheerleaders, the following observations were made:

1) **Parent Handouts**: Of the 3 coaches, 2 reported that they had provided handouts about eating disorders to the parents of the squad members. The corresponding squad members verified the coaches self-report—that is, the squad members of the coaches that reported providing parent handouts also reported that their parents had been given handouts. The squad members corresponding to the coach that did not report providing parent handouts confirmed this self-report.

2) **Cheerleader Handouts**: These results were identical to those above. Two of the three coaches reported providing handouts to the cheerleaders, and the corresponding cheerleaders verified this self-report.

3) **Comments**: Each of the 3 coaches reported that they did not make any comments to squad members about body weigh, size, or shape. Correspondingly, all of the cheerleaders reported that the coaches did not make such comments.

4) **Mandatory Weigh-Ins**: All of the coaches denied having mandatory weigh-ins and each of the cheerleaders reported that they did not have mandatory weigh-ins.

5) **Discussion**: Each of the 3 coaches reported that they led a discussion about body image among their squad members. Cheerleaders from 2 of the 3 squads agreed that their coach had led such a discussion.
6) **Referrals:** All of the coaches denied having referred a cheerleader for professional help with a suspected eating disorder. Correspondingly, none of the cheerleaders reported that they had been referred for treatment of an eating disorder.

7) **Video:** All of the coaches reported that they had shown a video to their squad members about body image. However, cheerleaders from only two squads reported that their coach had shown a video to them.

Overall, the coaches’ self-report of behavior change was verified by the cheerleaders. The only discrepancy between the coaches’ report and the cheerleaders’ report came from the discussion and video.

### Table 9. Coach Data: Self-reported Behavior Change for Coaches in the Experimental Group

<table>
<thead>
<tr>
<th>Target Behavior</th>
<th>Baseline</th>
<th>Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes (%)</td>
<td>No (%)</td>
</tr>
<tr>
<td>Reading material</td>
<td>0 (0%)</td>
<td>6 (100%)</td>
</tr>
<tr>
<td>Showing video</td>
<td>0 (0%)</td>
<td>6 (100%)</td>
</tr>
<tr>
<td>Refrained from comments</td>
<td>5 (83%)</td>
<td>1 (17%)</td>
</tr>
<tr>
<td>Led discussion</td>
<td>0 (0%)</td>
<td>6 (100%)</td>
</tr>
<tr>
<td>Did not conducted weigh-ins</td>
<td>6 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Visited websites</td>
<td>0 (0%)</td>
<td>6 (100%)</td>
</tr>
<tr>
<td>Distributed parent handouts</td>
<td>0 (0%)</td>
<td>6 (100%)</td>
</tr>
<tr>
<td>Developed referral list</td>
<td>0 (0%)</td>
<td>6 (100%)</td>
</tr>
<tr>
<td>Distributed squad handouts</td>
<td>1 (17%)</td>
<td>5 (83%)</td>
</tr>
<tr>
<td>Referred squad member</td>
<td>0 (0%)</td>
<td>6 (100%)</td>
</tr>
</tbody>
</table>
Results

Coach Data

H1 and H2: Baseline, Post-Test, and Follow-Up Differences on the Sports Nutrition Questionnaire and the Eating Disorders Knowledge Quiz According to Coach Group. To test H1 and H2, a repeated measures MANOVA was conducted to evaluate coach group differences on scores for the Sports Nutrition Questionnaire and Eating Disorders Knowledge Quiz. To evaluate the effect of group assignment (i.e., experimental vs. control) and time (i.e., baseline, post-test, follow-up), a 2 x 3 repeated measures MANOVA was used. The MANOVA was performed with one between-subjects variable (group) and one within-subjects variable (time). Significant main effects were obtained for group \( [F(2, 16) = 5.61, p < .01] \) and time \( [F(4, 14) = 12.70, p < .0001] \). Additionally, there was a significant interaction between group and time \( [F(4, 14) = 25.54, p < .0001] \). Table 10 shows the means and standard deviations on the Sports Nutrition Questionnaire and Eating Disorders Knowledge Quiz at baseline, post-test, and follow-up for the coaches that completed follow-up. Figures 3 and 4 demonstrate the changes over time according to coach group for these two measures.

Univariate ANOVA’s for each main effect were conducted as follow-up tests to the MANOVA. Mauchly’s test of sphericity was significant \( [X^2(2) = 7.28, p < .05] \), indicating a violation of the assumption of sphericity. Therefore, the Greenhouse Geiser degrees of freedom correction procedure was applied. The ANOVA for coach group was significant for the Sports Nutrition Questionnaire \( [F(1, 17) = 7.14, p < .01] \) and the Eating Disorders Knowledge Quiz \( [F(1, 17) = 11.20, p < .01] \). The ANOVA for time was also significant for the Sports Nutrition Questionnaire \( [F(1.46, 24.90) = 10.96, p < .01] \) and the Eating Disorders Knowledge Quiz \( [F(1.70, 28.86) = 9.33, p < .01] \).
Figure 3. Mean Baseline, Post-Test, and Follow-up Scores on the Sports Nutrition Questionnaire for Coaches the Completed Follow-up

Figure 4. Mean Baseline, Post-Test, and Follow-up Scores on the Eating Disorders Knowledge Quiz for Coaches that Completed Follow-up
Table 10. Coach Data: Means and Standard Deviations for the Sports Nutrition Questionnaire and Eating Disorders Knowledge Quiz Over Time

<table>
<thead>
<tr>
<th></th>
<th>Mean Experimental Group (SD)</th>
<th>Mean Control Group (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SNQ</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Baseline</td>
<td>50.83 (7.76)b</td>
<td>52.15 (7.37)</td>
</tr>
<tr>
<td>b. Post-Test</td>
<td>36.17 (4.75)*ac</td>
<td>54.85 (7.61)</td>
</tr>
<tr>
<td>c. Follow-up</td>
<td>50.17 (7.22)b</td>
<td>54.00 (6.47)</td>
</tr>
<tr>
<td><strong>EDK-Quiz</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Baseline</td>
<td>6.00 (.89)b</td>
<td>5.77 (1.36)</td>
</tr>
<tr>
<td>b. Post-Test</td>
<td>8.67 (.52)*ac</td>
<td>5.69 (1.25)</td>
</tr>
<tr>
<td>c. Follow-up</td>
<td>7.00 (.89)*b</td>
<td>5.46 (1.39)</td>
</tr>
</tbody>
</table>

Note: SNQ = Sports Nutrition Questionnaire, EDK-Quiz = Eating Disorders Knowledge Quiz
* denotes a significant difference between the experimental group mean and the control group mean
a denotes a significant difference from the baseline mean score
b denotes a significant difference from the post-test mean score
c denotes a significant difference from the follow-up mean score

Dependent t-tests were conducted as post-hoc tests to evaluate the specific effect of time according to group on the Sports Nutrition Questionnaire and the Eating Disorders Knowledge Quiz for coaches. For the experimental group’s scores on the Sports Nutrition Questionnaire at baseline, post-test, and follow-up, 3 dependent samples t-tests were conducted. Holm’s sequential Bonferroni correction procedure was used to control for familywise error rate across these tests (alpha < .017 was used to interpret significant results). Mean scores for the coach experimental group on the Sports Nutrition Questionnaire were significantly different from
baseline to post-test, $t(5) = 6.62, p < .0167$ and from post-test to follow-up $t(5) = -3.88, p < .0167$. Mean scores from baseline to follow-up were not significantly different $t(5) = 0.19, p = .86$. Therefore, the experimental group scored significantly lower on the Sports Nutrition Questionnaire at post-test than at baseline, but these changes were not maintained at follow-up.

For the control group’s scores on the Sports Nutrition Questionnaire at baseline, post-test, and follow-up, 3 dependent samples t-tests were conducted. There were no significant differences on mean scores for the coach control group on the Sports Nutrition Questionnaire between baseline and post-test $t(12) = -2.72, p = .02$, baseline and follow-up $t(12) = -1.23, p = .24$, or post-test and follow-up $t(12) = 0.43, p = .68$. Therefore, the coach control group’s scores on the Sports Nutrition Questionnaire did not change from baseline, post-test, or follow-up.

The procedure for testing the effect of time according to coach group on the Eating Disorders Knowledge Quiz was identical to that used for the Sports Nutrition Questionnaire. Mean scores for the experimental group on the Eating Disorders Knowledge Quiz were significantly different from baseline to post-test, $t(5) = -6.33, p < .0167$ and from post-test to follow-up $t(5) = 5.00, p < .0167$. Mean scores from baseline to follow-up were not significantly different $t(5) = -1.94, p = .11$. Therefore, the coach experimental group scored significantly higher on the Eating Disorders Knowledge Quiz at post-test than at baseline, but these changes were not maintained at follow-up. For the coach control group’s scores on the Eating Disorders Knowledge Quiz at baseline, post-test, and follow-up, 3 dependent samples t-tests were conducted. There were no significant differences on mean scores for the control group on the Eating Disorders Knowledge Quiz between baseline and post-test $t(12) = 0.78, p = .78$, baseline and follow-up $t(12) = 0.84, p = .42$, or post-test and follow-up $t(12) = 0.51, p = .62$. Therefore,
the coach control group’s scores on the Eating Disorders Knowledge Quiz did not change from baseline, post-test, or follow-up.

To compare scores on the Sports Nutrition Questionnaire and the Eating Disorders Knowledge Quiz for the experimental group and the control group at baseline, post-test, and follow-up, independent samples t-tests were performed. The experimental group scored significantly lower on the Sports Nutrition Questionnaire at post-test than did the control group, t(17) = -5.49, p < .0167. There were no significant differences between the experimental and control group on mean Sports Nutrition Questionnaire scores at baseline, t(17) = -0.36, p = .73, or follow-up, t(17) = -1.16, p = .26. For the Eating Disorders Knowledge Quiz, the experimental group scored significantly higher than the control group at post-test t(17) = 5.54, p < .0167, and at follow-up t(17) = 2.90, p < .0167. There were no significant differences between the experimental group and control group for coaches on mean Eating Disorders Knowledge Quiz scores at baseline, t(17) = 0.38, p = .71.

H3: Baseline and Follow-Up Differences on CHEER-Coach and the Behavioral Checklist-Coach According to Group for Coaches. To test H3, a repeated measures MANOVA was conducted to evaluate coach group differences on mean scores for CHEER-Coach and Behavioral Checklist-Coach. These measures were completed at baseline and follow-up. To evaluate the effect of group assignment (i.e., experimental vs. control) and time (i.e., baseline, follow-up), a 2 x 2 repeated measures MANOVA was used. The MANOVA was performed with one between-subjects variable (group) and one within-subjects variable (time). A significant main effect was obtained for time [F(2, 16) = 22.32, p < .0001]. Additionally, there was a significant interaction between group and time [F(2, 16) = 14.73, p < .0001]. Table 11 shows the means and standard deviations on CHEER-Coach and Behavioral Checklist-Coach at
baseline and follow-up for the coaches that completed follow-up. Figures 5 and 6 demonstrate the changes over time according to group for these two measures.

Univariate ANOVA’s for the significant main effect of time and the significant interaction between coach group and time were conducted as a follow-up test to the MANOVA. The ANOVA for time was significant for the Behavioral Checklist-Coach \( F(1, 17) = 36.42, p < .001 \), but was not significant for CHEER-Coach \( F(1, 17) = 2.91, p = .11 \). The ANOVA for the group by time interaction was also significant for the Behavioral Checklist-Coach \( F(1, 17) = 30.09, p < .001 \) but not for CHEER-Coach \( F(1, 17) = 0.09, p = .77 \). Therefore, mean scores on the Behavioral Checklist-Coach were significantly higher at follow-up than they were at baseline for the experimental group, but scores on this measure were equivalent at baseline and follow-up for the control group. Scores on CHEER-Coach did not change over time and were not affected by group status.

Figure 5. Mean Baseline and Follow-up Scores on CHEER-Coach for Coaches Who Completed Follow-up
Table 11. Coach Data: Means and Standard Deviations for CHEER-Coach and the Behavioral Checklist-Coach Over Time

<table>
<thead>
<tr>
<th></th>
<th>Mean Experimental Group (SD)</th>
<th>Mean Control Group (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEER-Coach</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Baseline</td>
<td>41.33 (6.41)</td>
<td>39.54 (7.24)</td>
</tr>
<tr>
<td>b. Follow-up</td>
<td>43.33 (2.80)</td>
<td>42.38 (6.47)</td>
</tr>
<tr>
<td>Behavioral Checklist-Coach</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Baseline</td>
<td>2.00 (.63)</td>
<td>3.61 (2.18)</td>
</tr>
<tr>
<td>b. Follow-up</td>
<td>6.83 (.2.93)* a</td>
<td>3.85 (1.95)</td>
</tr>
</tbody>
</table>

* denotes a significant difference between the experimental group mean and the control group mean

a denotes a significant difference from the baseline mean score

b denotes a significant difference from the follow-up mean score
Cheerleader Data

H4, H5, & H6: Differences Between the Experimental Group and Matched Control Group on the Sports Nutrition Questionnaire, CHEER-Coach, and BSQ-Short. MANOVA was used to test the hypothesis that the cheerleaders in the experimental group would have increased nutritional knowledge (H4), decreased concern about body size/shape (H5), and decreased perceptions of weight pressures from their coach (H6). The MANOVA was conducted with one between-subjects factors (group) with two levels (experimental group vs. matched control group) using total scores on the Sports Nutrition Questionnaire, CHEER-Cheer, and BSQ-Short as dependent variables. The main effect for group was not significant \[ F (3, 33) = 0.55, p = .65 \]. Therefore, there were no significant differences on these measures according to group status. Table 12 shows the means and standard deviations on the Sports Nutrition Questionnaire, CHEER-Cheer, and BSQ-Short for the experimental and matched control cheerleaders.

Table 12. Cheerleader Data: Means and Standard Deviations for Sports Nutrition Questionnaire, CHEER-Cheer, and the BSQ-Short for the Experimental and Matched Control Groups

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group (SD)</th>
<th>Matched Control Group (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNQ</td>
<td>63.30 (4.87)</td>
<td>65.18 (4.61)</td>
</tr>
<tr>
<td>CHEER-Cheer</td>
<td>45.95 (6.82)</td>
<td>47.12 (7.75)</td>
</tr>
<tr>
<td>BSQ-Short</td>
<td>77.00 (38.74)</td>
<td>69.88 (32.41)</td>
</tr>
</tbody>
</table>

Note: SNQ = Sports Nutrition Questionnaire
*There were no significant differences between groups
H5: Clinical vs. Non-Clinical EAT-26 Scores for Cheerleaders. According to H5, cheerleaders in the intervention group were expected to have decreased level of body concerns but equal levels of clinical eating disorder symptoms as cheerleaders in the control group. The above analyses showed that intervention cheerleaders and control cheerleaders did not differ according to level of body concerns. To examine differences in clinical eating disorder symptoms, intervention and control group cheerleaders’ scores on the EAT-26 were compared. A total of 10 cheerleaders scored above the clinical cut-off score of 20 on the EAT-26. As predicted, there were no differences according to group assignment (experimental vs. matched control) for the number of cheerleaders above the clinical cut-off \( \chi^2 (1) = .87, p = 1.00 \). Only one cheerleader in the experimental group scored above 20 on the EAT-26. The corresponding coach did not recognize the cheerleader as having a potential eating disorder or refer her for professional help. Of the remaining 9 cheerleaders whose EAT-26 scores were in the clinical range, only one reported that she had been referred by her cheerleading coach for help with a possible eating disorder. The corresponding coach also reported that she had referred a cheerleader for professional help. Of the 10 cheerleaders with elevated EAT-26 scores, 6 were on junior high squads, 2 were on high school squads, and 2 were on college squads.

H7: Differences Between the Experimental Group and Matched Control Group on the Behavioral Checklist-Cheer for Cheerleaders. To test H7, an independent t-test was used to evaluate differences between mean scores for cheerleaders in the experimental group and cheerleaders in the matched control group using total scores on the Behavioral Checklist-Cheer. Cheerleaders in the experimental group scored significantly higher on the Behavioral Checklist-Cheer than did cheerleaders in the matched control group \( t (38) = 5.21, p < .01 \). The mean total
score for the experimental group was 4.35 (SD = 1.04) and the mean total score for the matched control group was 2.94 (SD = .43).

For analysis of individual items on the Behavioral Checklist-Cheer, Chi Square analyses were conducted to evaluate difference between groups. Experimental group cheerleaders reported that significantly more coaches had shown a video \(X^2 (1) = 21.44, p < .01\) and led a discussion \(X^2 (1) = 15.10, p < .01\) about body image. Table 13 shows cheerleaders’ report of coach behavior according to group.

Table 13. Cheerleader Data: Cheerleader Report of Coach Behavior in the Experimental Group and Matched Control Group

<table>
<thead>
<tr>
<th>Target Behavior</th>
<th>Experimental</th>
<th></th>
<th>Matched Control</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes (%)</td>
<td>No (%)</td>
<td>Yes (%)</td>
<td>No (%)</td>
</tr>
<tr>
<td>Showing video**</td>
<td>15 (75%)</td>
<td>5 (25%)</td>
<td>0 (0%)</td>
<td>17 (100%)</td>
</tr>
<tr>
<td>Refrained from comments about weight, shape, etc. to squad members</td>
<td>19 (95%)</td>
<td>1 (5%)</td>
<td>17 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Led discussion**</td>
<td>12 (60%)</td>
<td>8 (40%)</td>
<td>0 (0%)</td>
<td>17 (100%)</td>
</tr>
<tr>
<td>Did not conducted weigh-ins</td>
<td>20 (100%)</td>
<td>0 (0%)</td>
<td>17 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Distributed parent handouts</td>
<td>11 (55%)</td>
<td>9 (45%)</td>
<td>13 (76%)</td>
<td>4 (24%)</td>
</tr>
<tr>
<td>Distributed squad handouts</td>
<td>9 (55%)</td>
<td>11 (45%)</td>
<td>3 (18%)</td>
<td>14 (82%)</td>
</tr>
<tr>
<td>Referred squad member</td>
<td>0 (0%)</td>
<td>20 (100%)</td>
<td>0 (0%)</td>
<td>17 (100%)</td>
</tr>
</tbody>
</table>

** denotes a significant difference between the experimental group and matched control group (p ≤ .001)
H8: Relationship Between Coach and Cheerleader Scores. It was predicted (H8) that coach scores on the BSQ-Short, CHEER-Coach, and Behavioral-Checklist Coach would be related to cheerleader’s scores on these measures. Correlations between these variables were computed in order to examine the relationship between coaches’ scores and cheerleaders’ scores. For each cheerleader, the corresponding coach’s score for each measure was correlated with the cheerleader’s individual score. For example, if “Coach A” returned data from 10 cheerleaders, “Coach A’s” BSQ-Short score was used to compute correlations between coach and cheerleader BSQ-Short scores for each of the 10 cheerleaders on the coach’s squad. Total scores for coaches on the BSQ-Short, CHEER-Coach, and Behavioral-Checklist-Coach were correlated with total scores for cheerleaders on the BSQ-Short, CHEER-Cheer, and Behavioral Checklist-Cheer. In addition, a subscale of CHEER (for coaches: Coach Pressures-Coach; for cheerleaders: Coach Pressures-Cheer) was computed for coaches and cheerleaders that included items directly relevant to coach behaviors. For coaches, Coach Pressures-Coach included five CHEER-Coach items: 1) Cheerleading squads should have weight limits. 2) Weigh-ins are held periodically throughout the cheerleading season. 3) Some of my cheerleaders would improve their performance if they lost at least 5 pounds. 4) I encourage females squad members to maintain a below average weight. 5) Body weight and appearance are important to me. For cheerleaders, Coach Pressures-Cheer included four CHEER-Cheer items: 1) My squad has a weight requirement to try-out. 2) Weigh-ins are held periodically throughout the cheerleading season. 3) My coach encourages female squad members to maintain a below average weight. 4) Body weight and appearance are important to my coach. These subscales were computed because total CHEER scores reflect cheerleaders’ perceptions of weight pressures from a variety of sources.
(i.e., friends, family, stunt partners, revealing uniforms), and it is unlikely that these pressures will be influenced significantly by only the coach.

Because multiple correlations were calculated, a Bonferroni correction procedure was utilized for the interpretation of significant correlations (alpha/20 = .0025). Table 14 shows the correlation coefficients for each pair of variables. Significant correlations were found between Behavioral Checklist-Coach and Behavioral Checklist-Cheer scores ($r = .47, p < .0025$), Coach Pressures-Coach and Coach Pressures-Cheer scores ($r = .32, p < .0025$), and CHEER-Coach and Coach-Pressures-Cheer ($r = .29, p < .0025$). There was a significant positive relationship between the number of target behaviors coaches endorsed and those reported by the cheerleaders. Additionally, the more weight pressures coaches reported placing on cheerleaders, the more pressures cheerleaders perceived from the coach. Finally, the total weight pressures coaches reported that cheerleaders experience was positively related to the cheerleaders’ perception of weight pressures specifically from the coach.

**Table 14. Correlations Between Coach and Cheerleader Scores**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CHEER-Coach</td>
<td>.91*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. CP-Coach</td>
<td></td>
<td>.91*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. BC-Coach</td>
<td>-.64*</td>
<td>-.70*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. BSQ-Coach</td>
<td>-.65*</td>
<td>-.61*</td>
<td>.28*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. CHEER-Cheer</td>
<td>.18</td>
<td>.17</td>
<td>-.14</td>
<td>-.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. CP-Cheer</td>
<td>.29*</td>
<td>.32*</td>
<td>-.25</td>
<td>-.04</td>
<td>.83*</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7. BSQ-Cheer</td>
<td>-.002</td>
<td>.06</td>
<td>-.12</td>
<td>-.04</td>
<td>-.42*</td>
<td>-.25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. BC-Cheer</td>
<td>-.22</td>
<td>-.23</td>
<td>.47*</td>
<td>-.20</td>
<td>-.07</td>
<td>-.06</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. EAT-26</td>
<td>.03</td>
<td>.05</td>
<td>-.06</td>
<td>-.02</td>
<td>-.24</td>
<td>-.27*</td>
<td>.59*</td>
<td>.06</td>
<td></td>
</tr>
</tbody>
</table>

Note: CP = Coach Pressures, BC = Behavioral Checklist-Coach, BSQ = Body Shape Questionnaire, EAT = Eating Attitudes Test

* p < .0025.
Discussion

The purpose of the present study was to examine the effectiveness of an intervention targeting coaches on knowledge, attitudes, and behaviors associated with eating disorders and body image disturbances among coaches and athletes. As noted in the introduction, no prior studies have investigated the effectiveness of intervening with important adult figures (e.g., coaches, parents, teachers) in providing primary and secondary prevention of eating disorders. The present study is also one of only a few experimental investigations of the effectiveness of prevention strategies with athletes, a group shown to be at increased risk for the development of eating disorders and body image disturbances.

Review of Hypotheses and Findings

H1: Predicted Increases in Knowledge about Eating Disorders for Coaches

The hypothesis that coaches in the experimental group would demonstrate increased knowledge levels about eating disorders was supported. Coaches in the experimental group demonstrated significant increases in knowledge level compared to their baseline knowledge level and compared to control coaches. The increase in knowledge was maintained over the 8-month follow-up period.

This finding is encouraging in that it demonstrates that providing a brief workshop, reading materials, and opportunities for obtaining further information can lead to lasting improvements in knowledge about eating disorders. Such knowledge is important for coaches, particularly with respect to their ability to recognize potential eating disturbances among athletes. For example, at baseline approximately 50% of the coaches did not know that a person with bulimia nervosa is most likely to be within a normal weight range or overweight. Instead, coaches generally believed that weight loss or being underweight is a necessary component of an
eating disorder. Given this misconception, coaches would have difficulty recognizing a potential eating disorder in a squad member who is not underweight.

**H2: Predicted Increases in Nutritional Knowledge for Coaches**

The hypothesis that coaches in the experimental group would demonstrate increased levels of nutritional knowledge following the intervention was partially supported. Immediately following the intervention, the experimental coaches demonstrated increased nutritional knowledge and decreased misconceptions concerning nutrition, body weight, and body fat composition compared to baseline and the control coaches at post-test. However, at 8-month follow-up, gains in nutritional knowledge were not maintained.

This finding suggests that a relatively brief intervention including verbal and written information about nutrition is not an effective means by which to promote long-term increases in knowledge. Interestingly, similar interventions were successful in increasing knowledge about eating disorders, but unsuccessful in increasing nutritional knowledge. One explanation for this difference may lie in the coaches’ motivation to learn about eating disorders versus general nutrition knowledge. Coaches may have felt that gaining knowledge about eating disorders was important or directly relevant to their role as a coach. Conversely, coaches may believe that increasing their nutritional knowledge would not significantly improve their coaching abilities.

**H3 & H7: Predicted Behavior Change in Coaches**

The hypothesis that coaches would engage in more positive behaviors and fewer negative behaviors than the control coaches was supported. At post-test and follow-up, experimental group coaches reported engaging in increased efforts to prevent eating disorders on their squads than did control group coaches. Additionally, the cheerleaders supported the coaches’ self-reported behavior change. Specifically, both coaches and cheerleaders reported that more
coaches in the experimental group engaged in a discussion about body image, showed a video about body image, and provided squad handouts about nutrition. Additionally, more coaches in the experimental group reported reading material about preventing eating disorders and providing handouts to parents.

Overall, very few coaches reported conducting mandatory weigh-ins or supporting the practice of mandatory weigh-ins for squad members. A total of 3 coaches reported that they conducted mandatory weigh-ins at baseline. Only one of these coaches was in the experimental group and that coach failed to complete the follow-up assessment. There were only 4 coaches from college squads in the original sample, and previous studies have shown that mandatory weigh-ins and try-out weight limits are more common in college squads (Reel & Gill, 1996).

The behavior change reported by the coaches is encouraging in that few prior prevention studies have demonstrated success in changing behavior. Most prevention studies have demonstrated effectiveness in changing knowledge or attitudes, but producing behavior change has been more difficult (Franko, & Orosan-Weine, 1998). The changes reported by coaches and cheerleaders included behaviors directed at parents, cheerleaders, and the coaches themselves, indicating that the coaches were able to implement prevention strategies among their squads. Training important adult figures to execute prevention strategies is a more efficient and cost-effective way of implementing programming to a larger number of people. The current results suggest that a relatively brief intervention can lead to changes in behavior among important adult figures.

Despite the high level of compliance with the behavioral interventions, there were a few interventions that resulted in low levels of compliance. Namely, coaches reported lower levels of compliance concerning usage of the referral list and the website interventions. Again, it is
likely that motivation played a significant role in compliance with these interventions. Because none of the experimental coaches reported suspecting that a squad member might have an eating disorder, the coaches may not have felt that developing a referral list was a useful activity. Additionally, coaches were provided with reading materials about eating disorders in athletes, and visiting websites for additional information may have been viewed as redundant.

**H4: Predicted Increases in Nutritional Knowledge for Cheerleaders**

The hypothesis that cheerleaders in the experimental group would exhibit increased levels of knowledge about nutrition and decreased misconceptions concerning nutrition, body weight, and body fat composition in athletes compared to cheerleaders in the control group was not supported. Knowledge levels in both groups were equivalent despite the fact that cheerleaders in the experimental group reported receiving handouts about nutrition and athletes from their coaches. This finding demonstrates that either A) the cheerleaders did not read the information, or B) the cheerleaders read the information but did not retain the information over time. Given A, an important consideration for future work would be to generate materials that are more interesting and interactive in order to increase compliance. For example, web-based instruction may be a more effective means of relaying information, particularly for adolescents. If explanation B is true, then repeated exposure to the information might be an effective solution. Having coaches present the information verbally or in a discussion-format in addition to the provision of written materials might lead to long-term knowledge increases.

**H5: Predicted Reductions in Body Concerns Among Cheerleaders**

The hypothesis that cheerleaders in the experimental group would have decreased levels of body concerns compared to cheerleaders in the control group was not supported. There were no differences in the level of body concerns experienced by cheerleaders in either group.
This finding suggests that the behavior changes in coaches did not affect cheerleaders’ level of body concerns. This finding contrasts with the findings by Heinze, Wertheim, and Kashima (2000) who demonstrated that after viewing the video, adolescents demonstrated decreased drive for thinness and decreased intentions to diet. However, this study did not report long-term changes in these variables. Therefore, the video may be effective in changing intentions and attitudes on a short-term basis only.

H6: Predicted Decrease in Perceptions of Weight Pressures in Cheerleaders

The hypothesis that cheerleaders in the intervention group would experience fewer weight pressures from coaches compared to cheerleaders in the control group was not supported. Scores on CHEER, a measure of weight pressures specifically associated with cheerleading, did not differ across groups for either coaches or cheerleaders. One likely explanation for this finding is that coaches reported placing few weight pressures on cheerleaders at baseline regardless of group assignment. For CHEER items that directly addressed weight pressures from coaches, both coaches and cheerleaders reported low levels of pressures. For example, only 4% of the cheerleaders and none of the coaches agreed with the statement “I/my coach encourage(s) female squad members to maintain a below average weight.” Therefore, it would have been very difficult for the intervention to effect perceived weight pressures among cheerleaders given the generally low levels of pressures cheerleaders perceived from coaches.

H8: Predicted Relationship Between Coach Pressures and Body Concerns and Cheerleader Symptoms

The hypothesis that overconcern with body size in coaches and weight pressures from coaches would be related to preoccupation with body weight and shape and perception of pressures for thinness among cheerleaders was partially supported. There was no relationship between coaches’ and cheerleaders’ level of body concerns, but there was a moderate
relationship between cheerleaders’ perceptions of weight pressures from the coach and cheerleader level of body concerns. Additionally, there was a slightly stronger relationship between cheerleaders’ perceptions of weight pressures from the coach and EAT-26 scores. Furthermore, there was a stronger relationship between perceived weight pressures from the coach and EAT-26 scores than between total perceived pressures and EAT-26 scores.

This finding indicates that coach behaviors and pressures do play a role in cheerleaders’ level of body concerns and eating disorder symptoms. Given the generally low levels of perceived weight pressures from the coach, this finding highlights the fact that any weight pressures from the coach can have a strong impact on cheerleaders.

Limitations of the Current Study

One obvious limitation of the current study is the low rate of follow-up among coaches in the experimental group. Over twice as many coaches in the control group completed the follow-up assessment compared to coaches in the experimental group. One explanation for the low rate of follow-up among the experimental coaches was that more coaches in the experimental group reported that they did not end up coaching during this season for various reasons (retirement, resignation, etc.). It is likely that this disproportionate attrition in the experimental group was partly a chance phenomenon. However, it is also possible that coaches in the experimental group were less likely to complete the follow-up assessment because these coaches felt pressure to be actively involved in the study. There may be some bias in the follow-up sample of coaches such that the coaches that completed follow-up completed more of the study activities than did those who dropped-out. The control group did not have any obligations during the 8-month follow-up period which may have made it easier to return the follow-up questionnaires without worrying about the consequences of being noncompliant. The only test for bias confirmed that
there were no significant differences at baseline on demographic variables or dependent
variables between coaches who completed follow-up and those that did not complete follow-up.
Coaches in the experimental group were repeatedly informed that participation in the study
activities was optional, but these coaches may have felt implicit pressures.

With the low sample size, the generalizability of the findings is also limited. The sample
consisted of primarily junior high and high school coaches. On average, the experimental group
of cheerleaders consisted of 13-year old females on junior high squads. Therefore, it is
unadvisable to generalize these results to an older sample of cheerleaders.

Relationship Between the Current Findings and Previous Findings

There have not been any previously published findings for prevention studies targeting
adult figures, despite a consensus that such research is needed (Battle & Brownell, 1996; Graber
& Brooks-Gunn, 1996; Griffiths & Farnill, 1996; Piran, 1995; Piran, 1997; Piran, 2001;
Rosenvinge & Borresen, 1999; Smolak & Levine, 1994). Given the lack of previous data, the
current findings offer some encouragement in that the relatively brief intervention led to long-
term increases in knowledge about eating disorders and some changes in behavior related to
prevention efforts. The ineffectiveness of the intervention in producing long-term changes in
knowledge levels, attitudes, or behaviors among the cheerleaders replicates much of the early
prevention work in this area (Carter, Stewart, Dunn, & Fairburn, 1997; Killen et al., 1993; Mann
et al., 1997; Martz, Graves, & Sturgis, 1997; Smolak, Levine, & Schermer, 1998; Stewart,
Carter, Drinkwater, Hainsworth, & Fairburn, 2001).

Varnado-Sullivan et al. (2001) reported that it is difficult to get parents, school
administrators, and teachers to become involved in prevention efforts. The authors attempted to
provide family-based interventions for students considered to be “at risk” for the development of
eating disorders. However, the parents of these children chose not to participate. In addition, Varnado-Sullivan et al. (2001) reported that teachers and school administrators did not follow-through in attending workshops or allowing follow-up data collection. The low rate of follow-up among intervention coaches in the current study further demonstrates the difficulties involved with eliciting participation among important adult figures.

Smolak, Levine, & Shisslak (2001) questioned teachers about their willingness to participate in prevention efforts. The majority of the teachers they sampled reported that they were “very likely to use” pamphlets (containing information about risk factors and advice on how to help students with suspected eating disorders) and/or a school resource person who was knowledgeable about the detection and treatment of eating disorders. The teachers reported that they were “very unlikely” to use full scale curricula (6-10 lessons) due to time-constraints. In fact, one-third of the teachers reported that they were “not at all likely” to add even a single lesson. These findings may help explain the difficulties involved with eliciting participation among parents, teachers, and in the present study, coaches. It may be important to implement intervention programs targeting adults with the adults that are the most interested and motivated to participate. In elementary, junior high, or high school settings, a school counselor or nurse may be more willing to become involved in prevention efforts. At the college level, athletic trainers or sports psychologists may be more appropriate intervention targets given the pressures and responsibilities already experienced by the coach.

Directions for Future Work

These findings clearly point to the need for further study. The low level of perceived pressures from coaches suggests that interventions aimed at junior high and high school cheerleading coaches may need to focus less on changing negative coach behaviors and more on
helping promote healthy body image among cheerleaders and reducing pressures from other sources. The cheerleaders endorsed high levels of weight pressures associated with cheerleading from stunt partners, family members, friends, and revealing uniforms. Future intervention efforts should target these pressures as well as coach pressures.

To increase coach motivation to learn about nutrition, more time and energy should be spent in providing a strong rationale for the need to increase nutritional knowledge and decrease misconceptions about body weight. The current intervention focused more heavily on information transmission and less on motivational enhancement which may have contributed to these findings. As suggested by Franko (2001), motivation assessment and enhancement may be key elements of prevention interventions aimed at adult figures. Additionally, future studies should address the issue of whether increases in knowledge can affect behavior. For example, one way to examine whether or not increasing knowledge about eating disorders actually leads to increased ability to detect eating disorders might be to give coaches case summaries and measure their ability to accurately distinguish cheerleaders with and without possible eating disorders.

Given the finding that changing coach behaviors does not seem to be a powerful enough intervention to improve cheerleader concerns about body size/shape, future studies may need to focus more on secondary prevention efforts among coaches. The current results support the notion that long-term reductions in body concerns among athletes are difficult to accomplish through coach behaviors. Body image and eating disorders are influenced by a variety of factors including social, biological, and psychological variables, and making lasting changes by intervening in only a few of these areas may not be possible. Thus, studies that focus prevention efforts on adult figures such as coaches may be more effective at promoting secondary rather than primary prevention strategies.
Overall, the coaches in this sample reported a low prevalence of negative behaviors and weight pressures. There is some evidence to suggest that college squads are more competitive and have higher pressures for thinness from coaches (Reel & Gill, 1996). Therefore, a replication of this study with a college coaching sample might lead to more information about negative behaviors (e.g., the practice of weigh-ins) and the possibility of reducing these behaviors through interventions.

Summary

The current study contributes to the existing literature by providing an empirical analysis of a prevention study targeting important adult figures as agents of change. Overall, the hypotheses that the intervention would lead to increases in knowledge and behavior changes among coaches was supported. However, these behavior changes and knowledge improvements did not lead to subsequent changes in cheerleader symptoms.
References


Appendix A

10 Things Coaches Can Do To Help Prevent Eating Disorders In Their Athletes

--Karin Kratina, M.A., R.D.

1. Instruct coaches and trainers to recognize the signs and symptoms of eating disorders and understand their role in helping to prevent them. Those with eating problems often hide their symptoms to avoid calling attention to them. They are often unaware the behavior is abnormal.

2. Provide athletes with accurate information regarding weight, weight loss, body composition, nutrition, and sports performance in order to reduce misinformation and to challenge practices that are unhealthy and even counterproductive. Be aware of local professionals who will help educate the athletes.

3. Emphasize the health risks of low weight, especially for female athletes with menstrual irregularities or amenorrhea. The athlete should be referred for medical assessment in these cases.

4. Refer to a sports psychologist or other therapist skilled at treating disorders if an athlete is chronically dieting and/or exhibits mildly abnormal eating. Early detection increases the likelihood of successful treatment — left untreated, the problem may progress to an eating disorder.

5. De-emphasize weight by not weighing athletes and by minimizing (eliminating) comments about weight. Instead, focus on other areas in which athletes have more control in order to improve performance, i.e., focus on strength and physical conditioning, as well as the mental and emotional components of performance. (There is no risk in improving mental and emotional capacities!)

6. Do not assume that reducing body fat or weight will enhance performance. While weight loss or a reduction in body fat can lead to improved performance, studies show this does not apply to all athletes. Additionally, many individuals respond to weight loss attempts with eating disorder symptoms. Improved performance should not be at the expense of the athlete’s health.

7. Understand why weight is such a sensitive and personal issue for many women. Since weight is emotionally charged for many, eliminate derogatory comments or behaviors, no matter how slight, about weight. If there is concern about an athlete’s weight, the athlete should be referred for an assessment to a Registered Dietician and Sports Psychologist skilled in treating eating disorders.

8. Do not automatically curtail athletic participation if an athlete is found to have eating problems, unless warranted by a medical condition. Consider the athlete’s health, physical and emotional safety and self-image when making decisions regarding an athlete’s level of participation in his/her sport.
9. Sport personnel should explore their own values and attitudes regarding weight, dieting, and body image, and how these values and attitudes may inadvertently affect their athletes. They should understand their role in promoting a positive self-image and self-esteem in their athletes.

10. Take warning signs seriously. Take eating disorder behaviors seriously. There is a 10-15% mortality and 25% suicide rate for those with eating disorders.
Appendix B

Referral Information Form

This form is intended to help you generate a list of referral options in the event that a squad member needs an assessment or treatment for a possible eating disorder. Ideally, this form will be completed *prior* to the development of a problem so that you will be able to respond promptly and effectively.

Specific Referral Sources:

**School Counselor**

Speak with your school counselor about community resources. He/she may know about local hospital-based eating disorders programs or individual professionals within the community that specialize in treating eating disorders.

Suggestions from the counselor:

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<th>Name of Program/Individual:</th>
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**Clinical Psychologists**

Clinical psychologists are Ph.D. level clinicians who specialize in the assessment and treatment of a wide range of psychological problems. Some psychologists specialize in the treatment of eating disorders, and would be excellent referral sources. You might want to call a local psychologist and ask them to provide the names of some local professionals who treat eating disorders. If you are unfamiliar with any local psychologists, you could simply look in the phone book.

Local Psychologists Specializing in Eating Disorders:

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<th>Name of Program/Individual:</th>
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**Psychiatrists**

Psychiatrists are medical doctors who specialize in the treatment of mental illness. Most often, psychiatrists provide medical treatment (e.g., prescribe medications if necessary) but do not conduct long-term therapy. Try to identify 1-2 psychiatrists in your area that are familiar with the treatment of eating disorder.

Local Psychiatrists Specializing in Eating Disorders:

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<th>Name of Program/Individual:</th>
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<td>Phone Number:</td>
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**Social Workers/Counselors**

Social workers and Counselors are Master’s level clinicians trained in conducting individual and family therapy. Again, it would be beneficial to identify 1-2 social workers and/or counselors in your community that are trained in the treatment of eating disorders.

Local Social Workers/Counselors Specializing in Eating Disorders:

<table>
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<th>Name of Program/Individual:</th>
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The following contains a list of national organizations devoted to research, treatment, and prevention of eating disorders. Some of these organizations offer nationwide referral sources. This means that you can call their organization and they will provide you with information about local programs/professionals who specialize in treating individuals with eating disorders.

**National Organizations:**

American Anorexia/Bulimia Association, Inc. (AABA)
133 Cedar Lane
Teaneck, NJ 07666
(201)836-1800
*provides a nationwide referral service, offers informational packets, and publishes a newsletter

Anorexia Nervosa and Associated Disorders (ANAD)
Box 7
Highland Park, IL 60035
(708) 831-3438
*provides an international referral list of therapists and programs, newsletter and information packets

Anorexia Nervosa and Related Eating Disorders, Inc. (ANRED)
P.O. Box 5102
Eugene, OR 97405
(503)344-1144
*provides a nationwide referral service, newsletter, and information packet

National Anorexic Aid Society (NAAS)
1925 E. Dublin-Granville Road
Columbus, OH 43229
(614)436-1112 or (614)846-2833
*provides referral services in the US, Canada, and Great Britain, newsletter and information
Appendix C

Athletes and Eating Disorders: A Parent’s Guide

1. *Weight Loss.* Many teens beginning a sport lose some weight. However, if the amount seems to be large, it is helpful to see if the athlete is still on his or her growth curve. During development, there are individual differences in growth. Your youngster’s pediatrician keeps track of this development and usually has plotted an individual growth curve. Thus, the pediatrician can determine if the athlete has fallen below his or her usual growth curve.

2. *Re-setting of weight goals.* Since the majority of adolescent girls (and perhaps boys) diet at some point, it can be difficult to determine if a small weight loss is an early sign of an emerging eating disorder. In addition, many teenagers lose weight when they first begin an active sport and become a part of a team. If your teenager decides to lose a modest amount of weight, does so, and is satisfied, there is probably no problem. On the other hand, if the initial weight loss is achieved and the person resets his or her goal to a lower weight, it may indicate a problem.

3. *Amenorrhea.* If your daughter loses her menstrual periods, take it seriously. Although the stress of physical exercise can cause amenorrhea, loss of menses can also be an early sign of an eating disorder. Irrespective of the cause, amenorrhea during adolescence is dangerous since it is associated with the early development of osteoporosis (thinning of the bones and bone fractures).

4. *Excessive Exercise.* Although this can be difficult to judge, if your teenager exercises more than is expected by his or her particular sport or particular level in that sport, discussion with your teenager or with the coach may be warranted. For example, if the athlete is part of a basketball team and the coach expects the participants to run a mile two days of the week and your teen runs two miles every day, this could be a problem. On the other hand, an elite athlete in training for a marathon may be exercising many hours per day.

5. *Inappropriate dieting behavior.* If your teenager is in a group of athletes who are following extreme or unusual dieting practices, this requires your attention. If more than one athlete in his or her group has an eating disorder, there may be undue emphasis on dieting by the coach or the group in general. Use of Fat Burning Aids, laxatives, or diuretics is also hazardous to a teenager’s overall health.

6. *Negative comments by coach or trainer.* If you learn that the coach has made negative comments about the weight, shape, or performance of any of the athletes in the sport, it is wise to schedule a meeting with the coach and ask him or her to refrain from such comments. Also, many coaches of elite athletes have received training in eating disorders. For example, USA Gymnastics sponsors educational programs for coaches to teach them about eating disorders and how to prevent them in their athletes. It is helpful to determine if the coach has participated in these educational endeavors. If you suspect that the coach is making comments to the athletes that are derogatory, it can be helpful to attend a few practices or competitions to assess the attitudes of the coaches.
7. **Use of exercise to purge.** If the teenager exercises regularly after consuming food, he or she may be using exercise to burn up calories. This may be a form of purgative behavior.

8. **Intense use of exercise or pursuit of a sport after a significant disappointment.** For example, if your teenager was usually quite sociable, but then her boyfriend broke up with her, and she no longer sees her friends, but devotes many hours daily to exercise, this may be a problem.

9. **Avoidance of tasks of adolescence.** If the athlete becomes preoccupied with exercise such that they are no longer socializing, achieving in school, or engaged in the process of emancipation from parents, then exercise may have become an inappropriate solution to a problem in one of these areas of development.

10. **Athletic performance and weight loss.** The belief that weight loss *per se* will improve athletic performance is incorrect. Genetic endowment, muscle mass, and motivation are the three factors that most influence performance. If the athlete or coach believes that ever increasing weight loss will continue to improve performance, this may place the adolescent at risk for an eating disorder.

11. **Participation in high risk sports.** Certain sports, such as gymnastics, cheerleading, swimming, diving, dance, or body building and wrestling in males, are judged on both athletic performance and appearance and may place the adolescent athlete at a particular risk. Prior to participation in these sports, it is wise to know the attitude of the coach and the training they have in the prevention of eating disorders.

12. **Unrealistic sport achievement expectation.** Although it is helpful to encourage an athlete who has the potential to become an elite athlete, it is counterproductive and perhaps dangerous to encourage an athlete who is not able to become an elite athlete to try to do so. A realistic appraisal of the athlete’s potential by the parent, coach, and athlete will decrease the likelihood of a severe disappointment later.
Appendix D

Video Script

Hi my name is Kellie and I’d like to talk to you today about body image and dieting. Body image means the way you feel about your body and about how it looks. I’ve seen lots of girls your age having a hard time understanding their bodies and the way they look. Lots of girls discover dieting and think that this will be the answer. They think it will help solve their problems and give them more confidence and control. I am here to tell you that it’s not as easy as this. Through this video, I hope to help you understand more about what’s behind body image and dieting.

Puberty and genetic determinants of appearance.

Let’s start at the beginning. Between the ages of 9 and 16, girls’ bodies go through all sorts of changes. It’s puberty and it can be a very confusing time for lots of girls. Everyone has to go through puberty at some stage, even if they don’t want to or are scared. Your body can change quite a lot and girls can get really embarrassed and want to hide their bodies.

One thing you may not know is that your body shape is decided before you are born. Around puberty, this will start to become obvious. All adolescents have a growth spurt - but if you are a boy, you will become muscular and if you are a girl, you will become rounded and soft. Girls develop breasts and gain weight around the tummy, hips and bottom. This is not a bad thing and it does not happen because you ate too much jam on your toast or a few tim tams too many. It is a normal part of becoming a healthy woman.

Partly, the way you look has to do with your genes. If your parents and grandparents had dark hair and brown eyes, you would not expect to have blonde hair and blue eyes. If all the women in your family are 5 feet tall, you would not expect to grow to be 6 feet! In the same way our eye colour and our height is decided before we are born, so is our body shape and our weight. Some girls are naturally bigger and others are naturally smaller.

I know that a lot of girls feel alarmed by the changes that are happening to their bodies and put lots of effort into trying to keep their bodies the same during puberty. But it is important to remember the fact that girls must gain weight in order to become a woman. Often, girls try to control how they look by dieting. They are scared that the changes occurring to their bodies are not normal and that they will look strange.

At this time, it is common to ask yourself questions like “am I normal?”

The thin ideal

Show the picture of the anorexic model.

In my opinion, this model does not have a normal, womanly figure. She is one of a small group of women who is willing to give up her womanhood for her modelling career. You see a lot of these women in magazines and on the TV.

Screen normal v. thin girls side by side

After a while, you get used to seeing thin models, and sometimes when you compare yourself to them, you feel like you’re the one who does not fit in. You might think, if this is the way a woman is supposed to look, then I’ve got a lot of work to do! This is simply not true.

Excerpts of boys talking about all the different sorts of girls they think are beautiful.

While some models are not naturally thin, many have to battle constantly to stay at very low weights. Research shows that models can be up to 25% under weight for their height. One American model said “I tried every fad diet. I used to starve myself for 4 days in a row. “One night I was eating only a head of lettuce for dinner. My housemate, who was also a model, walked in and said “You’re eating a whole head of lettuce? How could you? I cried and said “But it’s all I’ve had all day. It’s not even 200 kilojoules. I think I was a normal person before I started those diets.”
The fashion industry
So why are all the models so skinny? I believe that it has a lot to do with advertising and the fashion and beauty businesses. The fashion business earns a lot of money (and that’s billions of dollars) by making lots of girls, like you, feel bad about themselves. They want you to see the models and try to be like them because this will make you spend money on clothes, fitness equipment and diet food.

Flash up pictures of models selling different products
Whether it’s buying clothes, make-up, beauty cremes, thigh cremes, ab-toners, special bras, diet drinks. What are these pictures telling you? If you use this facial moisturiser, you will look like the woman here. What about this picture? You too can be like as this girl and have long blonde hair flying in the wind if you wear these clothes. Show a picture with a woman kissing a man - suggests you that if you buy this perfume, you will be popular with men. Boys experience similar pressure - show the muscly man. How many guys do you really know who look like this?

Show original and computer-altered model side-by-side
Another very common visual trick is altering magazine photos of models. This is done by a graphic artist after the shot has been taken. It’s very easy to do - you simply use a scanner to scan the photo onto a computer screen. Then you use the mouse to flatten any normal bumps on thighs and to make them look thinner. These are the sorts of fake images that you see in everyday magazines. In actual fact, only one in forty-thousand women are naturally skinny.

Some of the pictures you see in magazines and on TV look really good. They can be hard to resist. They promise you will have flawless skin, long shiny hair, be popular, wealthy, and have a successful career. When you really start to think about it, you might think this is pretty dumb. These are empty promises and they are just designed to make you spend your hard-earned pocket money.

Historical changes in the ideal of beauty and ideas from different cultures.
In fact, it is very interesting to observe how this trend has changed over time. If we go back in history, we can see that the models who are fashionable now (show one) are not the same as those who were fashionable in the olden days. The famous painter Rubens considered these women (show them) to be ideal and, judging from the success of his paintings, it appears that many other people agreed with him, back then and even today. Rubens captured women’s beauty in their natural state, not those who have dieted all their lives. Through his eyes, he shows us how glamorous, graceful and elegant women of any size can be. He makes their voluptuous figures a feature.

In the 19th century in France, tight corsets were all the fashion (show picture). Women went to extreme lengths to get their waists to look this thin - they would lace up their waists so tight that fainting was common. Many young girls would sleep in their corsets, so that their ribs grew deformed (show picture). Medical research showed that the tight corsets were causing women to have internal damage and that, in some cases, it ruined the possibility of them having children – all in the name of fashion.

People’s notions of what is ideal can vary according to which country they live in and which culture they belong to. For example, it is considered a sign of beauty to have a stretched neck in Burma (show picture). Women begin stretching their necks when they are children and as adults, their necks can reach up to 30 cm long. This stretching separate the vertebrae of the backbone, so if these women were to remove the rings, their necks would not be able to support their heads and they would die.

This sort of thing is what we mean when we say ‘being a slave to fashion’.

So the current fad of being very thin (show picture of anorexic model) can be seen as another weird historical trend. In 100 years, we may all look back at magazine photos and sigh and wonder why women ever tried to look that thin, just as we think it’s pretty weird that people wore tight corsets that stopped them from having children and just as Burmese women stretch their necks with rings. Not only that, but in 100 years, people may read about the diets women have gone on to get this thin and may think that women in the ‘90’s were all a bit funny in the head!
Diets

Let’s talk about diets. From my experience, I know the truth is that strict diets do not work. They may help you to lose weight in the short term, but as many people will tell you, they are useless in the long-term.

A strict diet is very different to healthy eating and a sensible diet. A sensible diet means eating a broad range of foods form the 5 food groups. It does not mean counting calories. It is important to eat three meals a day and to have some light snacks in between. For example, this is why you have a break in school mid-morning - so that you can eat and drink something that gives your body and your brain the energy to keep going until lunch!

A recent survey by London doctors showed that 95% of dieters were not able to stick to their diets and ended up gaining the weight that they had initially lost. Why does this happen? Because dieting makes you lose water at first, not real weight. When you jump on the scales, it seems like the weight has fallen off. But when you start eating normally again, you regain the water - and the weight.

Scientists have discovered that when you do not eat enough, your body does not use the food you eat as quickly. Your body slows down to prepare for starvation. That’s why people who diet do not have a lot of get-up-and-go. Their body is telling them to take it easy. That is also why people who take dieting to the extreme can faint. They simply are not giving their bodies the energy needed to do even the most basic things like stand up and walk.

Ever heard of people who skip breakfast on a diet? Or who don’t eat lunch? Believe it or not, research has shown that people who do not eat regular meals tend to be heavier. Why? Because their body slows down without regular meals. Also, dieters who skip breakfast and lunch tend to get very, very hungry later in the day. By mid afternoon, they feel starving and they eat more than they normally would.

So dieting for weight loss is not a good idea. What it is important to understand is that if you go on fad diets, or you do what is called yo-yo dieting, when you swing between dieting and eating lots, you will end up putting on the weight again, usually plus a couple of extra kilos. Losing weight and putting it back on again is far worse than sticking to a constant, heavy weight. This means that regular meals are important.

There are lots of other reasons why weight loss diets are not a good idea. Dieting puts a lot of stress on the body. It is bad for your immune system, as you are not getting the vitamins you need to stay healthy.

Not only that, but being hungry can make you obsessed with food and it becomes difficult to concentrate on other things. In fact, one study compared girls who dieted from those who did not diet. What did they find? That the girls who dieted got worse marks on tests of quick thinking and memory. Not only that, but it took them longer to react to anything - the dieting girls were altogether a lot slower at their work.

Eating Disorders

When people go on very extreme diets for a long period of time and get really hung-up about their weight and their appearance, they may have an eating disorder. Eating disorders happen when food and body size become more important than a person’s life. One example of an eating disorder is anorexia. People with anorexia starve themselves of just eat small amounts of food even if they’re really hungry. People with anorexia refuse to eat even though they are very thin. They have an extreme fear of gaining weight. But really they have stopped eating in order to cover up other emotions, such as anger or sadness about things that may have upset them, like problems at home.

In my experience, it’s pretty common for someone with anorexia to say things like this: I began dieting because I wanted to be looked upon as attractive, strong and in control. I refused to eat and lost weight, but I didn’t achieve the control and happiness I was looking for. Instead I felt ashamed, depressed, dirty and alone. I became trapped in a horrible world that I could not escape from.” In my experience, that’s just what it’s like. Often people with anorexia see themselves as being overweight, even though they may be very thin. (Show picture of anorexic girl seeing her reflection in the mirror as obese).

The other eating disorder is called bulimia. People with bulimia binge, or eat enough for several meals at once. They are not hungry and they do not enjoy the food they are eating. Instead they feel terribly out of control and are eating to cover up other emotions, such as insecurity, worthlessness, or anger or sadness about things that may have upset
them. When they have finished bingeing, they feel really guilty and depressed and they do anything they can to try and get rid of the food they have just eaten. Like anorexia, this is also a very dangerous way to treat your body and carries with it similar serious health problems.

**How can you prevent eating disorders and what can girls do instead of diet?**

First, eating disorders are treatable, and the sooner the treatment begins, the better the chances for a full recovery.

Second, I believe it is important to look behind the reasons why someone stops eating or eats too much. Often girls stop eating or overeat because they are using this as a way of covering up how they really feel or of coping with feelings of being angry, hurt, upset or confused. I know this from experience. Unfortunately, the solution is not as simple as this - you cannot use food or lack of it as a substitute for real feelings. Developing eating problems is like rubbing salt into a wound - it just adds to problems instead of solving them.

It is important to deal with feelings. One way you can do this is by communication, that is by telling someone that you feel confused, upset or angry instead of blocking out your feelings with food or with dieting.

There are lots and lots of things you can do instead of diet. Kaz Cooke, the comedienne, cartoonist and author of ‘Real Gorgeous’ (show book) has some really good suggestions about ways to boost your body image. You might like to try some of these suggestions:

Accept puberty! It is important to understand that being an adolescent, it is OK to feel confused about your appearance and uncertain about the way you should look. Your body is going through or has gone through changes and you might feel pretty alarmed. But trying to change your physical appearance does not help. When you’re feeling bad about yourself, I know that it’s easy to see all the pictures of beautiful, confident, successful women in magazines and on the tele and think that if you looked like them, your life would be better. But this is simply not true. No diet, no make-up, no skin creme and no pair of Levis can give you true happiness.

Improve your confidence and self esteem! For a long time the way women feel about themselves has been tied to the way they look. Girls are taught from a young age to look pretty and neat. In the past, men were judged by what they did while women were judged by how they looked and dressed. This was a pretty stupid state of affairs, but things are beginning to change and you can do lots to help. We all know that looking like Elle McPherson does not help us get good marks in Maths, swim, run, jump, get along with our parents and brothers and sisters, cook, sew, talk, write English essays or be a worthwhile person.

*Show the excerpt of boys being asked what they would do if their girlfriend turned into Elle McPherson - would feel very insecure, short, pimply, nervous, would not be able to relax and enjoy themselves.*

You have every right to be proud of your body. We have learned how the perfect body like you see in the magazines is a myth. I know it can be hard, but I wonder what would happen if you decided that the perfect body is simply the one you currently have?

Often when you go through puberty, family members and relatives and friends make thoughtless comments about how your body is changing. Some girls have told me that these comments caused them to try dieting. The people who comment on changes to your figure have usually forgotten what puberty was like for them. Or else, if they’re brothers or boys your age, they are often doing it to detract attention form themselves and from the fact that they are also feeling very self-conscious. Remember, you don’t have to put up with thoughtless comments about your appearance. Kaz Cooke suggests that you have the courage to stick up for yourself! You might want to tell them that it’s none of their business. Or you could try telling them you like the way you look. You can educate them by saying “it is normal to put on weight as a teenager and from what I hear, it’s also normal to get hassled about it.” If someone says you are fat, try something like “A bit fat for you, or a bit fat for me?” Remember, you are you-sized!

Be critical of what you see and hear! Lots of girls become a victim to the fashion magazines and follow every word they say like sheep. This is sometimes tempting, the magazines like to make you think they know it all. But you know, even though the magazines may be telling you to diet or tone or cleanse your body before going to the beach, you do not have to do any of this. Actually, you don’t have to go on a diet to get into your swim suit. You could try
buying one that fits (whether its a size 8 or a size 18 doesn’t matter) enjoy showing off your womanly curves. I know this can be hard when all the models are stick thin, but next time you’re at the beach, try looking at all the women around you. You will realise that they come in all shapes and sizes.

Maybe you’ve got the deb or school ball coming up. Think about whether you really need to diet and buy the dress you saw Kate Moss wearing, or could you pick one that shows off the features you like about yourself (and don’t try telling me there aren’t any, it just means you’re not looking properly!)

Be smart and think about the messages that magazines, movies and the TV are giving you. Every time you see a magazine article telling you to be thinner, exercise more, or to wear skimpy clothes, don’t fall into the trap of feeling bad about yourself. Instead ask yourself: why is this magazine running this story? To sell clothes? To sell cosmetics? Because they know we are all interested in our body image and they know that their story will make me buy the magazine? Ask yourself “why I should listen to this?” Ask yourself “Who is the expert on my body, some unknown magazine editor, some silly clothes designer who thinks women only come in size 8, or me?”

Your physical appearance is not the most important thing about you! Try making a list of all the good things about you, but they can’t be things to do with your appearance. If you can’t think of any yourself, list things that other people might have said about you. Here is what some other students your age came up with (list on screen.)

Communicate! Express yourself and your feelings. If you are worried because you think about food all the time, or you are always telling yourself you are too fat or because you think you may be taking dieting to the extreme, talk to someone about it, or write a diary, draw a picture of how you feel, put it in a letter to your best friend.

Remember, eating too much or eating too little is not a good way to deal with hurt, sadness or anger. Instead, try writing your feelings down. From my experience, it really seems to help to talk to someone you can trust. This might be a friend, a relative or the school counsellor. Find some time alone with this person and give them warning that you want a serious chat. Say “Do you have some time to talk to me now, I’ve got something personal that I’d really like to discuss with you.” You’ll be amazed at how helpful a trusted friend, relative or counsellor can be in listening to the things that bother you.

Lots of girls and women use food to reward themselves. Many of us are brought up using food to make us feel good. Food can be comforting for a little while, but it does not solve big problems. If you’re looking for a quick fix to help you feel good, there are lots of other things you can do other than eat junk chocolate or McDonalds. Here’s what some other students have said…. If you are trying to control your weight, unfortunately, there are no magic or instant ways to control your body weight or change your appearance. What can you do is follow a sensible diet and exercise. Maybe you’ve heard this a hundred times before, but that’s because it is the only true way to get healthy and stay healthy. Any diet program that is new, exciting, or that offers very quick weight loss is just a silly gimmick that gives you false hope and sometimes does your health more harm than good. Often the diets published in popular magazines are not healthy and you should be very careful of following them. They have not been developed by qualified dietitians.

I believe there is too much pressure on females to look great. It is true that what is inside is much more important. Beauty is a lot more than the way you look or what you wear. It doesn’t really matter how you look on the outside - if you do things that make you feel happy on the inside, you will glow with beauty.

Trying to be like other people or trying to live up to what other people say we should be like stops us from being unique and different to one another. It stops us being who we want to be and feeling comfortable with ourselves.

Have a good look around you! You’ll find that the beautiful girls are the ones who hold their heads up high, not because they’re thin, but because they love and respect themselves. And finally, please consider what it really means next time you say you are going on a diet.
References (Credits)
Cooke, K. *Real Gorgeous*. Doubleday publications, Sydney, Australia.
The Body and Self Esteem. Full Voice, Issue One. The Body Shop
Assorted issues of Who magazines
Fashion magazines
Newspaper articles
Appendix E

Video Follow-Up Discussion Questions

Below you will find some questions intended to give you some help in leading a discussion following the video. Please do not be concerned with following the outline exactly—simply use it as a general guideline.

What did you think about the video? Can you relate to any of these issues?

Do you think there are any pressures in cheerleading to be thin or lose weight? If so, what kinds of pressures have you experienced?

Do you think losing weight will make you a better cheerleader? Why or why not?

What can we do on our squad to make it a better environment?

What would you say to a younger girl who was struggling with these issues?

How do you feel when you look at magazines or watch tv shows in which there are very thin models?

Have you experienced negative comments from others about your body shape/size? How did it make you feel? Have you made negative comments about others? What about behind their back?

Have you ever gone on a diet? Why or why not?

Do you compare your body to other girls? Do you find yourself talking negatively to yourself about your appearance? (e.g., “I am so fat.”) Would you ever say these things to a close friend? (e.g., tell her “You are so fat.”)? Why or why not?

What qualities do you find most important in another person? In yourself? Where do you rank “appearance” in these qualities?

Do you have a friend who has struggled with an eating disorder? What can you do to help?
Appendix F

Cheerleading and Nutrition

Cheerleaders are athletes, and athletes must maintain proper nutrition in order to practice and perform adequately. You’ve probably read about lots of different “fad” diets and nutritional supplements designed to increase athletic performance or lose weight. However, studies on nutrition and sports performance have repeatedly proved that the best way to maximize athletic performance is by following the recommendations of the Food Guide Pyramid. The following handouts provide information specifically for the unique needs of cheerleaders. You undoubtedly spend hours and hours practicing to improve your jumps, stunts, dancing, and squad synchronization. Ironically, if you practice poor nutrition, your performance may be negatively affected regardless of the hours of drills and practice. Therefore, nutritional “fitness” is an extremely important component of your training program. In the following pages you’ll find a copy of the food guide pyramid, servings size guidelines, sample menus, guidelines for maintaining a healthy body weight/body fat percentage, and information about body weight and athletic performance.
The Food Guide Pyramid

Look at the recommended number of servings from each of the food groups below. How do your nutritional habits compare to these recommendations? You may find that you do not eat enough servings from some food groups while you may eat too many servings of other groups.
What is a serving?

Did you know that a sandwich actually contains 2 servings of bread, or that 1 serving of meat is approximately 3 oz (the size of a deck of cards)? Many restaurants today provide very large servings of food--one helping may actually be 2-4 servings of a particular food group. The following guides can help you determine just how many servings of each food group you are eating. You may be surprised at just how many/few servings from the different food groups you are getting each day. It is important that you eat the minimum number of servings from each of the five major food groups in order to have the necessary vitamins, minerals, carbohydrates, and protein in your diet. Remember, the food you eat is just as important to your athletic performance as the number of hours you practice!

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Examples of 1 serving</th>
</tr>
</thead>
</table>
| Milk, Yogurt, and Cheese        | A. 1 cup of milk or yogurt  
B. 1 ½ ounces of natural cheese  
C. 2 ounces of processed cheese |
| Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts | A. 2-3 ounces of cooked lean meat, poultry or fish  
B. ½ cup of cooked dry beans, 1 egg, or 2 tablespoons of peanut butter equal 1 ounce of lean meat |
| Vegetable                      | A. 1 cup of raw leafy vegetables  
B. ½ cup of other vegetables, cooked or chopped raw  
C. 3/4 cup of vegetable juice |
| Fruit                          | A. 1 medium apple, banana, orange, etc.  
B. ½ cup of chopped, cooked, or canned fruit  
C. 3/4 cup of fruit juice |
| Bread, Cereal, Rice, and Pasta  | A. 1 slice of bread  
B. 1 ounce of ready-to-eat cereal  
C. ½ cup of cooked cereal, rice, or pasta |
Nutrients: Water, Carbohydrates, Protein, Fat, & Vitamins and Minerals

WATER

Water is, without a doubt, the most important nutrient for an athlete. Your body is made of about 70% water. When you exercise, you can lose a lot of water by sweating. You must replenish this lost water in order to perform at your best. In fact, losing as little as 2% in body weight from fluid loss can lead to a significant decrease in concentration, coordination, strength, and stamina.

You should drink at least 8 glasses of water per day. During exercise you should drink more. One common myth is that “drinking water prior to exercising will cause stomach cramps.” However, it has been proven that consuming water, even in large amounts, prior to exercise, does not negatively affect performance.

CARBOHYDRATES

Carbohydrates are the most readily available source of food energy. Your body needs plenty of carbohydrates in order to produce glycogen, the major source of energy for working muscles. Some people think that carbohydrates are “bad” because of their relatively high caloric levels. However, if you fast, diet or adopt a high-protein diet, you may reduce muscle glycogen to inadequate levels causing fatigue and weakness.

Some common foods containing carbohydrates include: potatoes, bread, pasta, and cereal. A good rule of thumb is to eat 5-6 grams of carbohydrate per kilogram of body weight. Again, you can usually find out the amount of carbohydrate in foods by looking at the labels. You can use the following formula to determine your daily carbohydrate needs.

\[
\text{(Your body weight in pounds)} \quad \text{\begin{array}{c}
\frac{\text{Your body weight in pounds}}{220} \end{array}} \quad \times \quad 5.5
\]
PROTEIN
Athletes often believe that a high-protein diet supplies extra energy, enhances athletic performance, and increases muscle mass. However, there isn’t any evidence to support these claims.

Proteins are built from amino acids that are put together in long chains. Of these amino acids, some are considered essential and cannot be made by the body. This means we must get them from the foods we eat. Meats and dairy products contain high-quality proteins (meaning they contain all of the essential proteins). In addition, beans, peas, and nuts are good sources of protein.

You have probably heard of high-protein diets and low-protein diets. In general, it is recommended that athletes consume between 0.8 - 1.0 grams of protein per kilogram of body weight. You can use the following formula to get an estimate of your daily protein needs.

\[
\text{(Your body weight in pounds)} \times \frac{0.9}{2.2}
\]

FAT
Dietary fat has received lots of attention in recent years. Thousands of new products that are “low in fat,” “reduced fat,” or “fat-free” have entered the market place. In general, you may have the impression that “fat is bad.” However, fat is a necessary part of a balanced diet and is a source of energy, protects vital organs, prevents heat loss, and prevents growth deficiencies. It is recommended that dietary fat intake comprise 20-30% of caloric intake. Eating a diet too high or too low in fat can cause significant health problems.

VITAMINS AND MINERALS
Studies show that 54-84% of athletes use vitamin supplements. However, most supplements far exceed the recommended daily allowance, and the “extra” vitamins are often excreted from the body. Following a balanced diet supplies more than enough nutrients for good health. So you might want to consult with a physician or dietician before you “flush” away any more money on vitamins.

Vitamins and minerals are essential nutrients needed to sustain life. The two types of vitamins are fat soluble ( A, D, E, and K) and water soluble ( C and the B complex vitamins). Nutrition experts believe that people in the United States receive an adequate supply of vitamin and minerals if they eat a balanced diet. Thus, most people do not need or benefit from mineral or vitamin supplements.
Calories, Body Weight, and Body Composition

What is a calorie?

A calorie is a measure of energy available to the body. It is a form of measurement like minutes are a measure of time, inches are a measure of length and so on. We use calories to measure the energy our body uses. The foods we eat can be measured in terms of calories. If you look on the back of most food packages, the label will tell you then number of calories in one serving.

How Many Calories Do You Need?

There is no absolute answer for this question that applies to everyone. Caloric needs depend on age, gender, activity level, height, and weight just to name a few. In general, males need more calories than females, athletes need more calories than nonathletes, and taller/heavier people need more calories than shorter/lighter people. On page 9 you will find two sample diets that have been prepared for a male and female athlete. One is for a 170-pound male cross-country runner and the other is for a 100-pound female gymnast. Chances are, your caloric needs will fall somewhere between these two (e.g., between 1800 and 3800 calories).

If you want more specific information about your individual caloric needs, you can look at the website www.TheLifeStyleCompany.com and go to “Self-Assessments You Can Do.” From there go to “Find Your Daily Calorie Needs” where you will answer a few questions and a calculator will estimate your daily caloric needs.

How much should I weigh?

Advertisements and magazines convey the message that you can mold your body any way you like through exercise, pills, creams and so on. However, your body weight is largely determined by genetics and depends on your body frame and sex. For athletes in particular, it is important to understand that body weight alone (the number on the scale) is not as informative as body composition. Body composition refers to the percent of body weight due to fat tissue versus muscle tissue. You should never decide to lose or gain weight because of your body weight alone. The same amount of muscle tissue weighs more than fat tissue, so you could appear to be overweight based on your body weight simply because you are very muscular.

As I am sure you know, different sports have different ideal body composition. Women have higher body fat percentages than males. Some athletes or coaches think that the lower your body weight or body fat percentage, the better you will perform. This is just not true. When body weight drops below a certain ideal level, athletic performance suffers and injuries/illnesses increase. Although there is not any data on ideal body composition for cheerleaders, data on elite gymnasts (internationally competitive) shows a range of body fat between 8-16%. For you, this number is likely to be much higher. You should also consider your role on the squad. Some cheerleaders are shorter and have smaller frames (usually the “flyers”) while other are taller with larger frames (usually the “bases”). As you have learned, in order to have a successful squad you need both.
Do you need to lose/gain weight?

This is a decision that should be made together with your physician, parents, and possibly your coach. Remember, you should not decide to lose weight based only on your body weight—body composition is also important. If you are concerned that you may need to lose or gain weight, speak to someone you trust (parent, coach, etc.) and always seek medical advice.

What are healthy/unhealthy ways to lose weight?

If your physician recommends that you lose weight, there are several ways to accomplish this—some ways are healthy and others are very unhealthy. Below are some examples of unhealthy ways to lose weight.

1. Skipping meals.

Research shows that skipping meals often leads to overeating during the next meal. This may cause you to eat more by the end of the day than you would have if you had not skipped a meal. Also, skipping meals can cause your metabolic rate to decrease. This means that your body may slow down its use of energy, ultimately making it much harder to lose weight.

2. Overtraining.

As an athlete, you are probably getting lots of exercise. It will not be beneficial or healthy for you to begin over-exercising. If you find yourself exercising simply to burn calories/lose weight, you are probably not enjoying yourself. If you think this might be a problem, you should talk to your parents, your coach, or another trusted adult.

3. Using pills.

You should never take any medications (even over-the-counter medications) to try to lose weight unless you are being supervised by a medical doctor. If you are currently using any sort of pills to lose weight you should talk to your parents or your coach immediately.

4. Losing a lot of weight in a short period of time.

If you are trying to lose weight, the most you should ever lose is 1-2 pounds per week. If you lose more than 1-2 pounds in a week, you are probably losing fluid or muscle-mass, neither of which is desirable.
A Sign That You Are “Nutritionally Unfit”

Amenorrhea

Normally, a female begins to have menstrual periods sometime between ages 10 and 16. Primary amenorrhea refers to the lack of any menstrual period by the age of 16. Secondary amenorrhea occurs in a female whose regular cycles stop. Menstrual irregularities occur when cycles fluctuate with excessive length or brevity. While there are multiple causes of amenorrhea, the following are causes that are related to nutrition:

1. **Nutrition**
   
   Undernourishment (eating too few calories) can cause amenorrhea. Studies have shown that females in certain sports (such as gymnastics) consume too few calories which results in an absence of menstrual periods.

2. **Weight**
   
   Your body needs a certain percentage of body fat in order to have normal menstrual functioning. In our thinness-driven society, we often receive the message that “fat is bad.” While an excess of body fat can certainly be unhealthy, so can a shortage of body fat. When a woman loses too much weight or has a low percentage of body fat, her menstrual periods will cease.

3. **Sport**
   
   Exercise and physical conditioning are extremely beneficial. However, exercising excessively is not and may lead to amenorrhea.

At this point you may be thinking that ceasing your menstrual periods would not be such a bad thing. However, research points to several potential health problems associated with amenorrhea such as:

1. **Fertility**
   
   Obviously, if you are not having menstrual periods it is unlikely that you will be able to conceive a child. For most of you, this is not a problem right now. However, amenorrhea may affect your ability to have children later in life--researchers have yet to determine the effect of amenorrhea on future fertility.

2. **Stress fractures**
   
   Estrogen is a hormone that protects the strength and hardness of your bones. Amenorrhea can lead to a lack of estrogen. This means that you may be more vulnerable to injuries such as stress fractures, shin splints, or knee injuries.

3. **Osteoporosis**
   
   Amenorrhea has been related to osteoporosis, a disease that results in stooped posture and fractures of the hip, vertebrae, and wrists. Osteoporosis is related to a lack of estrogen production usually found in older women (age 50 and above). However, if your menstrual period ceases, you may put yourself at early risk for osteoporosis.
Appendix G

Background Information: Coach

Name: __________________________________________

School: __________________________________________

Address where you can receive follow-up materials (school or home):
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Work Phone Number: (___) ____________________________

Email address: ______________________________________

Number of squad members: ____________________________

Type of squad (circle one):  Junior High  High School  College

The following contains questions about your own personal characteristics. Remember, this information is strictly confidential and will only be used for demographic purposes.

Your age: __________________________

Your gender (circle one):  Male  Female

Your ethnic background (circle one):  Caucasian  African-American  Hispanic  Asian  Other (please specify): __________________________

Marital Status (circle one):  Married  Separated  Single  Widowed  Divorced

Did you cheer in junior high/high school? (circle one)  Yes  No

Did you cheer in college? (circle one)  Yes  No

Are you currently on a diet to lose weight? (circle one)  Yes  No

Height: __________________________

Weight: __________________________

100
Appendix H

Sports Nutrition Questionnaire

*Please circle the number that corresponds with your opinion according to the scale below.*

1 = strongly disagree  
2 = disagree  
3 = neutral  
4 = agree  
5 = strongly agree

1. If an athlete feels weak after a few days of hard training, I believe they should eat more protein for strength.

2. If someone needs to lose some weight, 3 to 5 pounds a week is a good rate of weight loss.

3. Girls in my sport should weigh less than nonathlete girls.

4. A sandwich contains 2 servings from the bread, cereal, rice, and pasta group.

5. Lower body weight will improve athletic performance.

6. For athletes, less than 10% of calories should come from fat.

7. According to the Food Guide Pyramid, you should eat an equal number of servings from the vegetable group and the milk, yogurt, and cheese group.

8. Use of diuretics or laxatives is a safe way to lose weight before an athletic performance.

9. Skipping meals is not an effective way to lose weight because it may lead to overeating.

10. About 6 ounces of lean meat is considered one serving from the meat, poultry, fish, dry beans, eggs, and nuts group.
11. To determine an athlete’s optimal body weight, it is necessary to have an estimate of body composition.

12. Water is the most important nutrient for the athlete.

13. For individuals trying to build muscles, it is important to maintain an adequate total calorie level.

14. Female athletes should have a body fat percentage between 4% and 8% in order to maximize performance.

15. Consuming dietary fat can lead to poorer athletic performance.

16. Skipping meals increases your metabolic rate.

17. In order to perform at their best, athletes should train as hard as possible.

18. Amenorrhea (the loss of menstrual periods), is a possible consequence of losing too much weight.

19. The bread, cereal, rice, and pasta group forms the base of the Food Guide Pyramid and reflects the largest number of recommended servings.

20. As little as a 2% decrease in body weight from fluid loss can lead to a significant decrease in strength and stamina.

21. Drinking water prior to exercise will cause stomach cramps.

22. It is impossible to have too many vitamins.

23. All athletes should take a vitamin supplement.
Appendix I

Body Shape Questionnaire-Short

We would like to know how you have been feeling about your appearance over the PAST FOUR WEEKS. Please read each question and circle the appropriate number to the right. Please answer all the questions.

OVER THE PAST FOUR WEEKS:

1. Has feeling bored made you brood about your shape? ..................1 2 3 4 5 6
2. Have you thought that your thighs, hips, or bottom are too large for the rest of you? .................1 2 3 4 5 6
3. Have you worried about your flesh not being firm enough? ..............1 2 3 4 5 6
4. Have you felt so bad about your shape that you have cried? .............1 2 3 4 5 6
5. Have you avoided running because your flesh might wobble? .......1 2 3 4 5 6
6. Has being with thin women made you feel self-conscious about your shape? ..................................1 2 3 4 5 6
7. Have you worried about your thighs spreading out when sitting down? ........................................1 2 3 4 5 6
8. Has eating even a small amount of food made you feel fat? ............1 2 3 4 5 6
9. Have you avoided wearing clothes which make you particularly aware of the shape of your body? .......1 2 3 4 5 6
10. Has eating sweets, cakes, or other high calorie food made you feel fat? ..1 2 3 4 5 6
11. Have you felt ashamed of your body? ..................................................1 2 3 4 5 6

12. Has worry about your shape made you diet? .................................1 2 3 4 5 6

13. Have you felt happiest about your shape when your stomach has been empty (e.g., in the morning)? ........................................1 2 3 4 5 6

14. Have you felt that it is not fair that other women are thinner than you? ........................................1 2 3 4 5 6

15. Have you worried about your flesh being dimply? ...........................1 2 3 4 5 6

16. Has worry about your shape made you feel you ought to exercise? ........................................1 2 3 4 5 6
Appendix J

Eating Disorders Knowledge Quiz

Please circle the correct response.

1. A person with anorexia nervosa
   A. is significantly underweight   C. experiences body image disturbances
   B. is fearful of gaining weight   D. all of the above

2. Which of the following is not a symptom of an eating disorder?
   A. exercising excessively   C. binge eating
   B. being a vegetarian   D. self-induced vomiting

3. Females with anorexia nervosa do not have
   A. problems with constipation   C. fears about gaining weight
   B. low body weight   D. normal menstrual functioning

4. Eating disorders affect
   A. females only   C. males and females equally
   B. males more than females   D. females more than males

5. Which of the following is NOT a commonly abused substance among people with eating disorders?
   A. diuretics   C. antihistamines
   B. laxatives   D. diet pills

6. In order to be diagnosed with anorexia nervosa, a person must be at least
   A. 15% underweight   C. 5% underweight
   B. 10% underweight   D. 12% underweight

7. Each of the following symptoms may be present in a person with anorexia nervosa or a person with
   bulimia nervosa EXCEPT
   A. binge eating   C. significantly underweight
   B. purging   D. body image disturbances

8. People with bulimia nervosa are usually
   A. severely underweight   C. slightly underweight
   B. normal weight or overweight   D. none of the above

9. The term purging includes
   A. self-induced vomiting   C. misuse of enemas
   B. laxative abuse   D. all of the above

10. What is the primary symptom of bulimia nervosa?
    A. self-induced vomiting   C. body image disturbances
    B. binge eating   D. excessive weight loss
Appendix K

Behavioral Checklist-Coach

Please circle the appropriate response after each question referring to your behavior OVER THE LAST 6 MONTHS.

1. I have read information on how to help athletes with eating disorders.  
   YES   NO

2. I have shown a video to my squad about body image eating disorders.  
   YES   NO

3. I have occasionally made comments about body weight, shape, or size to a member of my squad.  
   YES   NO

4. I have led a discussion about body image and eating disorders within my squad.  
   YES   NO

5. I have conducted mandatory weigh-ins for my squad.  
   YES   NO

6. I visited a website containing information about eating disorders and athletes.  
   YES   NO

7. I have distributed handouts to the parents of my squad members concerning eating disorders.  
   YES   NO

8. I have developed a list of qualified professionals to which I can refer my squad members if I am concerned about their eating habits.  
   YES   NO

9. I have provided information concerning nutrition to my squad members.  
   YES   NO

10. I have referred a squad member for help with a possible eating disorder.  
    YES   NO
How many squad members have you referred for help with a possible eating disorder?

__________________________

Please provide the names or initials of current squad members you have referred (remember, these names will be completely confidential and this data will only be used for verification purposes)

__________________________
__________________________
__________________________

Finally, please provide the names or initials of current squad members you suspect may have an eating disorder but you have not yet referred for help.

__________________________
__________________________
__________________________
__________________________
Appendix L

CHEER-Coach

Please answer the following questions by circling *strongly agree* (SA), *agree* (A), *neutral* (N), *disagree* (D), or *strongly disagree* (SD).

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>SA</td>
<td>A</td>
<td>N</td>
<td>D</td>
<td>SD</td>
<td>My squad has a weight requirement to try out.</td>
</tr>
<tr>
<td>2.</td>
<td>SA</td>
<td>A</td>
<td>N</td>
<td>D</td>
<td>SD</td>
<td>Cheerleading squads should have weight limits.</td>
</tr>
<tr>
<td>3.</td>
<td>SA</td>
<td>A</td>
<td>N</td>
<td>D</td>
<td>SD</td>
<td>Weigh-ins are held periodically throughout the cheerleading season.</td>
</tr>
<tr>
<td>4.</td>
<td>SA</td>
<td>A</td>
<td>N</td>
<td>D</td>
<td>SD</td>
<td>Some of my cheerleaders would improve their performance if they lost at least 5 pounds.</td>
</tr>
<tr>
<td>5.</td>
<td>SA</td>
<td>A</td>
<td>N</td>
<td>D</td>
<td>SD</td>
<td>Stunt partners notice if their partner puts on weight.</td>
</tr>
<tr>
<td>6.</td>
<td>SA</td>
<td>A</td>
<td>N</td>
<td>D</td>
<td>SD</td>
<td>I encourage female squad members to maintain below average weight.</td>
</tr>
<tr>
<td>7.</td>
<td>SA</td>
<td>A</td>
<td>N</td>
<td>D</td>
<td>SD</td>
<td>My squad participates in a weight-training program during the season.</td>
</tr>
<tr>
<td>8.</td>
<td>SA</td>
<td>A</td>
<td>N</td>
<td>D</td>
<td>SD</td>
<td>The lightest female squad members are at a distinct performance advantage.</td>
</tr>
<tr>
<td>9.</td>
<td>SA</td>
<td>A</td>
<td>N</td>
<td>D</td>
<td>SD</td>
<td>The cheerleading team uniform makes the cheerleaders conscious of their weight and appearance.</td>
</tr>
<tr>
<td>10.</td>
<td>SA</td>
<td>A</td>
<td>N</td>
<td>D</td>
<td>SD</td>
<td>Body weight and appearance are important to me.</td>
</tr>
<tr>
<td>11.</td>
<td>SA</td>
<td>A</td>
<td>N</td>
<td>D</td>
<td>SD</td>
<td>Body weight and appearance are important to the cheerleaders’ family.</td>
</tr>
<tr>
<td>12.</td>
<td>SA</td>
<td>A</td>
<td>N</td>
<td>D</td>
<td>SD</td>
<td>Body weight and appearance are important to the cheerleaders’ friends outside of cheerleading.</td>
</tr>
</tbody>
</table>
Appendix M

Background Information: Cheerleaders

School: _______________________________

Email address: _______________________________

Type of squad (circle one):  Junior High  High School  College

The following contains questions about your own personal characteristics. Remember, this information is strictly confidential and will only be used for demographic purposes.

Your age: ____________________________

Your gender (circle one):  Male  Female

Your ethnic background (circle one):  Caucasian  African-American  Hispanic  Asian  Other (please specify): ____________________________

Did you cheer in junior high? (circle one)  Yes  No

If in college, did you cheer in high school? (circle one)  Yes  No

Are you currently on a diet to lose weight? (circle one)  Yes  No

Height: ____________________________

Weight: ____________________________

What is the least you have ever weighed? ____________________________

What is the most you have ever weighed? ____________________________
Appendix N

Behavioral Checklist-Cheer

Please circle the appropriate response after each question referring to your coach’s behavior OVER THE LAST 6 MONTHS.

1. My coach has occasionally made comments about body weight, shape, or size to me or another member of my squad. YES NO

2. My coach showed a video to our squad about body image and eating disorders. YES NO

3. My coach has led a discussion about body image and eating disorders within my squad. YES NO

If you answered YES to number 3, please answer the following questions by circling the appropriate number:

3a. I found the discussion to be informative.
   1  2  3  4  5
   Strongly Disagree Neutral Agree Strongly
   Disagree Agree

3b. I found the discussion to be helpful.
   1  2  3  4  5
   Strongly Disagree Neutral Agree Strongly
   Disagree Agree

3c. My coach did a good job of leading the discussion.
   1  2  3  4  5
   Strongly Disagree Neutral Agree Strongly
   Disagree Agree

3d. I found the discussion interesting.
   1  2  3  4  5
   Strongly Disagree Neutral Agree Strongly
   Disagree Agree

4. My coach has conducted mandatory weigh-ins for my squad. YES NO

5. My coach distributed handouts to my parents. YES NO
6. My coach provided information concerning nutrition to my squad.  YES  NO

7. My coach referred me for help with a possible eating disorder (remember, your responses are completely confidential).  YES  NO
### Eating Attitudes Test-26

Please check a response for each of the following statements.

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

CHEER-Cheer

Please answer the following questions by circling strongly agree (SA), agree (A), neutral (N), disagree (D), or strongly disagree (SD).

1. SA A N D SD My squad has a weight requirement to try out.
2. SA A N D SD Cheerleading squads should have weight limits.
3. SA A N D SD Weigh-ins are held periodically throughout the cheerleading season.
4. SA A N D D SD My cheerleading performance would improve if I lost at least 5 pounds.
5. SA A N D SD My stunt partner notices if I put on weight.
6. SA A N D SD My coach encourages female squad members to maintain a below average weight.
7. SA A N D SD My squad participates in a weight-training program during the season.
8. SA A N D SD The lightest female squad members are at a distinct performance advantage.
9. SA A N D SD My cheerleading team uniform makes me conscious of my weight and appearance.
10. SA A N D SD Body weight and appearance are important to my coach.
11. SA A N D SD Body weight and appearance are important to my family.
12. SA A N D SD Body weight and appearance are important to my friends outside of cheerleading.
Vita

Brooke L. Whisenhunt, is a native of Arkansas and obtained her Bachelor of Arts degree in 1997 from the University of Arkansas in Fayetteville, Arkansas. She received her Master of Arts degree in psychology with an emphasis in clinical psychology from Louisiana State University in May of 2000. She will receive her Doctor of Philosophy degree in August of 2002. She is currently completing her predoctoral clinical internship at the University of British Columbia Hospital in Vancouver, British Columbia.