

Effective Nutrition Support Programs for College Athletes

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This paper presents an overview of the Husky Sport Nutrition Program at the University of Washington. This program is a component of the Department of Intercollegiate Athletics Total Student–Athlete Program, an NCAA-sponsored CHAMPS/Life Skills Program that provides life skills assistance to student–athletes. Successful integration of a sport nutrition program requires an understanding of the athletic culture, physiological milestones, and life stressors faced by college athletes. The sport nutritionist functions as an educator, counselor, and administrator. Team presentations and individual nutrition counseling provide athletes with accurate information on healthy eating behaviors for optimal performance. For women's sports, a multidisciplinary team including the sport nutritionist, team physician, clinical psychologist, and athletic trainer work to prevent and treat eating disorders. Case studies are presented illustrating the breadth of nutrition-related issues faced by a sport nutritionist working with college athletes.

Key Words: intercollegiate athletics, life skills, physiological milestones, sport nutrition, nutrition counseling, eating disorders

Nutrition plays an important role in achieving optimal performance as adolescent athletes transition from involvement in high school sports to competition at the intercollegiate level. College athletes have increased nutritional demands related to more intense workouts and continued physiological milestones (24, 25, 27). The Husky Sport Nutrition Program at the University of Washington teaches college athletes the importance of nutrition in academic and athletic performance. This article considers the following issues in the development of an intercollegiate sport nutrition program: understanding the intercollegiate athletic culture, physiological milestones and life stressors faced by college athletes, nutritional concerns of college athletes, and the prevention and treatment of eating disorders in female athletes. Case studies are presented to illustrate the breadth of nutrition-related issues faced by sport nutritionists working with college athletes.

Understanding the Intercollegiate Athletic Culture

To successfully integrate a sport nutrition program within an intercollegiate setting, it is important to have an overview of the National Collegiate Athletic Association (NCAA) and intercollegiate athletics.

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NCAA Divisions I, II, and III

Expectations placed on student-athletes vary in NCAA Division I, II, and III institutions. In NCAA Division I athletic programs, demands on student-athletes include maintaining full or partial scholarships, increased visibility due to regional and national media exposure, and pressures from coaches to excel in sports while maintaining academic eligibility as required by the NCAA. While student-athletes from revenue sports of football, basketball, and baseball are usually under a great deal of public scrutiny, great demands are also placed on student-athletes from nonrevenue sports (e.g., crew, gymnastics, ice hockey, soccer, softball, swimming, tennis, track, cross-country, and volleyball) to reach championship status (1).

NCAA Division II institutions have fewer student-athletes on scholarship as compared to Division I. Division III student-athletes are not offered scholarships. While there is limited national exposure in Division II and III athletic programs, student-athletes may still experience local and statewide scrutiny along with pressures from teammates and coaches to excel on and off the field (1).

Intercollegiate Athletics

The sport nutritionist has a unique opportunity to work with a diverse group of professionals including athletic administrators, coaches, athletic trainers, team physicians, sport psychologists, and academic and financial aid counselors. A sport nutritionist provides the expertise in nutrition, an area of study in which coaches, athletic trainers, and team physicians typically do not have formal training (9).

Developing relationships with key athletic department personnel is important to successfully institutionalize a sport nutrition program. Coaches are under a great deal of pressure to win, and the sport nutritionist can provide valuable information to coaches and student-athletes that can positively influence athletic performance. However, practice time limitations imposed by the NCAA, academic demands, and busy in-season travel itineraries are potential barriers to team presentations or individual counseling sessions. On the other hand, if only one head coach or senior administrator experiences the benefits of a sport nutrition program, his or her support can greatly benefit an athletic department.

Clark (9) presented a comprehensive overview of the diverse role of the sport nutritionist at Penn State University. The sport nutritionist at the University of Washington, an NCAA Division I school, has similar responsibilities as a counselor, educator, and administrator.

Nutrition Counseling. There are 650 student-athletes at the University of Washington. Individual nutrition counseling sessions are available to all student-athletes and cheer squad members. Many athletes initiate contact with the sport nutritionist for personal nutrition strategies to enhance performance. Athletes also are referred to the sport nutritionist by their coaches, athletic trainers, or team physicians. Appointments last 30 to 60 min and cover reason for referral, nutrition history, food records for computerized analysis, and/or body composition assessment. The appointment is documented in the student-athlete's training room medical record.

Nutrition Education. In addition to individual nutrition counseling sessions, nutrition talks also are presented to men's and women's teams. These presentations typically last 30 min and cover such topics as energy demands of exercise, the role of carbohydrate in body fueling, protein needs of athletes, fluid requirements and

hydration, planning meals on the run, eating on the road, strategies for healthy weight gain or weight loss, use of supplements, and nutrition before, during, and after exercise. Other nutrition education activities include writing articles for the student-athlete newsletter and developing handouts for team presentations and individual nutrition counseling sessions.

Administration. As an administrator, the sport nutritionist is responsible for delivering sport nutrition services within the athletic department. This involves managing a budget, acting as a resource during recruitment of student-athletes, and working with athletic department and campus administrators, coaches, team physicians, athletic trainers, and student-athletes to determine needed nutrition-related services and policies.

For example, the student-athlete advisory committee identified a need for vending machines within the athletic department. The sport nutritionist worked with this committee, athletic department administrators, and the vending machine contractor to identify the location for the vending machines and the types of foods to be stocked. The effort resulted in sports drinks, fruit juices, low-fat milk, yogurt, cereal, fruit, pretzels, and other low-fat, high-carbohydrate snack foods being available to student-athletes.

Other administrative functions include input in the development of athletic department policies related to supplement use, assessment of body composition, and referral and treatment of eating disorders. The sport nutritionist also meets with potential student-athletes during their recruitment trips to campus and collaborates with the Department of Housing and Food Service to provide nutritional analysis of foods served in dorm and campus cafeterias.

NCAA Life Skills Program

In 1994, the NCAA Foundation and the NCAA Division I-A Athletic Directors Association developed the CHAMPS (Challenging Athletes' Mind for Personal Success)/Life Skills Program to provide a systematic approach for addressing the individual needs of each student-athlete. The CHAMPS/Life Skills Program focuses on the student-athlete as a young adult with changing needs and skills. The program's curriculum is structured into five key commitments: academic excellence, athletic excellence, personal development, community service, and career development (8, 18, 19). Nutrition is identified under the commitment to personal development.

Currently 210 NCAA Division I, II, and III institutions have implemented a CHAMPS/Life Skills Program. Because of the emphasis placed on nutrition as part of the commitment to personal development, this provides great opportunities for registered dietitians with advanced training in sport nutrition and exercise physiology to establish sport nutrition programs at the collegiate level. To date, only a handful of sport nutritionists work full-time in athletic departments (14, 27).

The College Student-Athlete

Developing insight into the complex internal and external stressors faced by college student-athletes is critical in order to provide comprehensive sport nutrition services. College student-athletes face a myriad of challenges as they experience the unique demands of being a student and an athlete. Foremost, college years are a time

of transition—establishing new relationships, developing an identity separate from family, solidifying values and moral and ethical standards, determining career interests, balancing academic workload with social activities, and living with newly found independence (21). In addition to these transitional issues, physiological milestones and life stressors influence how student-athletes adjust to competition at the intercollegiate level.

Physiological Milestones

Puberty is the dynamic biological process that results in numerous changes in physical appearance, body composition, and sexual maturation. As young adults enter college, many assume that they have completed their physical maturation. In reality, growth and development can continue to occur into a college student's late teens or early 20s (23). Late physiological milestones can be associated with heredity; however, they also can be influenced by sport demands. For example, delayed menarche is more common in certain groups of female athletes—gymnasts, cross-country runners, and dancers—than in nonathletes. This can be related to training prior to menarche, high-volume and intense training regimens, decreased caloric intake, and low body weight (26, 30). Further discussion on athletic amenorrhea is presented in section on the treatment of eating disorders in female athletes.

Other examples of physiological development in college students are increases body fat in female athletes and continued growth in male athletes. In my experience, the notorious “freshman 15” in some female athletes can be related to fat distribution associated with maturation and/or increased muscle mass that occurs with training. On the other hand, male athletes may not reach their adult height until their early 20s (23).

Case Study: Sam. Sam was a 22-year-old senior who was in his last competitive year as a coxswain on the varsity crew team. He had been involved in crew since high school, and most of his social activities in college centered around being a member of the crew team. Sam's was referred to the sport nutritionist when the athletic trainer became concerned about Sam's preoccupation with his body size. He was trying to lose weight by restricting his food intake to approximately 1,000 kcal/day and drinking increased amounts of water. His weight was 132 lb at 5'9" with 3% body fat.

Sam described himself as being thin all his life. The first 2 years of high school he weighed 75 lb. In his senior year he weighed 100 lb. At the same time he was continuing to grow in height. Sam recalled that during his freshman year of college he was 5'6" and weighed 118 lb. Since that time, he had grown at least 1/2 in. and gained 2–3 lb each year except for his senior year when he gained approximately 10 lb in 3 months. Sam was concerned that his weight gain would affect his position as a coxswain in the men's varsity boat.

Sam also was seen by the team physician. The team physician determined that Sam had not completed his growth potential and that the weight gain was related to a growth spurt. At this time, it was clear that Sam was growing out of his small stature that had allowed him to be a successful coxswain over the past 7 years. The team physician, sport nutritionist, athletic trainer, and clinical psychologist worked with Sam to understand the changes that were taking place in his body. The coaching staff was very supportive and Sam continued as a coxswain during his senior year.

Life Stressors

Unlike nonathletes, collegiate athletes are faced with dual roles as students and public performers (15). This impacts their daily lives, adding stressors relating to academic and athletic performance, challenges to succeed, social activities, and physical health.

Academic and Athletic Performance. Student-athletes are under great pressure to perform academically and athletically. Their daily routine involves the academic rigors of attending classes and mandatory study sessions, keeping tutorial appointments, doing class assignments, and preparing for exams. At the same time, they are going to practice and optional workouts, participating in strength and conditioning programs, viewing tapes, and attending to prepractice and postpractice rehabilitation (15, 20).

Student-athletes also are required to maintain a grade point average that meets NCAA requirements for athletic eligibility. While many student-athletes are able to handle these demands, some struggle due to a lack of academic preparedness from high school (1, 11, 15, 20). Others do poorly since they view their athletic scholarship only as a stepping stone to professional sport and do not devote the necessary time and effort to their studies.

Challenges to Succeed. Being under public scrutiny is a reality for student-athletes. This heightens the pressure to excel and maintain top performance. For some student-athletes, this intensifies fears of failing, triggers self-doubt and self-criticism, and raises concerns about letting people down—coaches, athletic administrators, teammates, family, friends, their hometown community, and even the media. Others view college athletics as their last chance to achieve their dream of a professional career in sport, thus exacerbating the need to succeed (20).

Social Activities. College is a time for young adults to develop social skills and leisure interests (20). However, student-athletes find there is not enough time in the day to meet academic and athletic demands and to enjoy friendships, hobbies, and other leisure interests. This can have a great impact on the psychosocial development of student-athletes, who may feel isolated from friends and family and uninvolved in campus life.

Student-athletes' social activities also can be impacted by NCAA rules that limit athletes' ability to work during the academic year. While some student-athletes obtain spending money from parents for going out to a movie or dinner, or buying compact discs or clothes, other student-athletes are from families of limited means who cannot provide financial support. These student-athletes not only miss out on social activities but also cannot afford personal necessities. Parham (20) reported that athletes who struggle financially often feel "frustrated, trapped, and even exploited."

Physical Health. Fear of illness and injury is a major concern for student-athletes. Even missing several days of practice can contribute to feelings of isolation and anxiety. Many athletes view illness or injury as letting the team down and perceive pressure by their coaches or teammates, sometimes rightly so, to return to practice (3, 20). At the extreme is the termination of an athletic career due to injury. This can be an overwhelming experience for the athlete, resulting in increased tension, grief, anger, and depression.

The combination of overtraining and poor nutrition also can impact an athlete's physical health. Many college athletes have been involved in their sport since

childhood and have been training and competing for years without any significant time off. This overtraining, which is often viewed as normal by elite athletes, can account for a sense of staleness. Staleness also can be attributed to poor eating habits and inadequate energy intake. While it is assumed that college athletes are knowledgeable about nutrition, many of them lack accurate nutritional information and food preparation skills.

Nutritional Concerns of College Athletes

College athletes recognize the importance of training and rehabilitation on athletic performance. However, many of these athletes do not clearly understand the role of nutrition in athletic and academic performance. Most coaches do not have the educational training, nor is it their job to provide nutrition counseling. While athletic trainers have had some nutrition courses, they are usually too busy with the other demands of their jobs (25).

At the University of Washington, the Husky Sport Nutrition Program has been developed to provide nutrition education and counseling services to student-athletes. The program is staffed by a part-time registered dietitian with graduate training in sport nutrition and exercise physiology. The following discussion highlights nutrition-related concerns faced by college athletes.

Eating for Optimal Performance

Nutrition is important for college athletes to meet daily academic and training demands and to optimize performance during competition. For the busy college athlete who is trying to juggle the demands of academics and athletics, it is easy to skip meals, eat on the run, and limit hydration. Despite their busy schedules, student-athletes do find the time to work with the sport nutritionist, especially when they perceive a decrease in performance.

While many student-athletes are aware that carbohydrate is an important source of energy in the athletic diet, they are not always able to translate this into types and amounts of food. It is not unusual for students to associate carbohydrate with breads, pastas, cereal, rice, and fruit, but they are often unaware that vegetables, milk, and yogurt are good sources of carbohydrate. For some student-athletes, a high-carbohydrate, low-fat diet translates into eating carbohydrate only from breads and pasta, thus limiting important nutrients found in fruits, vegetables, and dairy products.

On the other hand, some athletes—typically male athletes from such sports as football and basketball—are used to eating large volumes of foods. They often are unaware of the role of carbohydrates in fueling muscles. In the quest for calories to gain weight, these athletes tend to choose foods that are higher in fat and lower in carbohydrates, many times relying on fast foods due to cost and convenience.

Obtaining food records with detailed information on class schedule, meal times, team workouts, and study sessions helps the sport nutritionist ascertain the athlete's food choices and nutritional intake. It also helps determine how the athlete fuels his or her activities throughout the day.

Case Study: Sarah. Sarah, a freshman crew athlete, was concerned with fatigue. Her food and activity record (Table 1) revealed that she ate breakfast, had a quick snack after morning classes, and then didn't eat again until dinner. Sarah was

5'9" and weighed 160 lb with 19% body fat. She had regular menstrual cycles. Her energy needs were estimated between 3,100 and 3,400 kcal, depending on level of physical activity.

Analysis of a 4-day food and activity record determined that Sarah's caloric intake was 2,135 kcal. On several days her diet also was low in protein (50–67 g) and fat (28–38 g). In reviewing this information, Sarah recognized that she needed to increase the protein and fat in her diet and eat more food during the day especially prior to her workout. Sarah was able to understand that her fatigue also was related to overexercising and dehydration.

After gaining insight into how her body used food to fuel her exercise, Sarah increased her food intake by eating lunch during her 11:30 a.m. class and added more protein and fat to her diet along with drinking more fluids. She also decreased the frequency of optional workouts. Her fatigue resolved within a few weeks, which positively reinforced the dietary changes she made.

Food and activity records also provide the opportunity to explore cultural food preferences, financial constraints, and meal planning skills. Athletes from outside the U.S., especially during their freshman year, are unfamiliar with the variety of food choices available. They miss their traditional foods and unintentionally restrict food intake. This is also true for students from different regions of the

Table 1 Typical Daily Activity and Food Record for Female Crew Athlete

| Time | Activity |
|----------|-------------------------------------------------------------------------------------------------------------------------------|
| 7:30 am | Wake-up |
| 7:40 am | Breakfast: 1 apple, 2 servings instant apple/cinnamon oatmeal, 12 oz strawberry lemonade, 1 bagel, 2 Tums, 1 multivitamin |
| 9:30 am | Environmental science class |
| 10:30 am | American history class |
| 11:30 am | Geography class |
| 12:30 am | Walked from class to crewhouse |
| 1:00 pm | Snack: small chocolate muffin and 2 cups orange juice |
| 1:30 pm | Got ready for crew practice |
| 2:00 pm | Practiced with team to 4:00 pm |
| 4:00 pm | Optional workout to 5:30 pm |
| 5:45 pm | Dinner: 1 cup cooked pasta with tomato sauce, 1 small poppyseed muffin, 1 large banana, 1 dinner roll, 1 cup NF frozen yogurt |
| 6:30 pm | Studied to 8:30 pm |
| 8:45 pm | Optional workout to 10:00 pm |
| 10:00 pm | Studied to 11 pm |
| 11:00 pm | Snack: 1 serving instant apple/cinnamon oatmeal |
| 11:15 pm | Went to bed |

Note. Nutrient analysis of daily activity and food record: 2,170 kcal; 80% carbohydrate (446 grams), 9% protein (50 grams), 11% fat (28 grams). Athlete's daily intake also included a multivitamin supplement and two Tums as a source of calcium.

United States. Reliance on fast foods can indicate financial hardship or limited cooking skills. It is not unusual for some scholarship student-athletes who are from families with limited finances to run out of money for food prior to the next scholarship check.

Protein Needs of Athletes

Much attention has been paid to the protein in athletes' diets since *The Zone* hit bookstores in 1995 (10). College athletes are asking whether they need to eat more protein and less carbohydrate for optimal performance.

Although research indicates that protein requirements increase with physical activity, athletes with protein intakes similar to the average American diet will meet the increased need of 1.2 to 2.0 g/kg of protein per day (22). In the college athlete, protein intake is influenced by vegetarian/vegan diets, belief that a high-protein diet is needed to build muscle, and popular press such as *The Zone* (4, 10, 22). The sport nutritionist is an important resource in providing individualized protein recommendations based on training and energy needs as illustrated in the following case study.

Case Study: Laura. Laura, a member of the women's golf team, was referred to the sport nutritionist by the golf coach. The coach was concerned about Laura's food choices when eating on the road, noting that "all she eats is salad."

Laura was trying to eliminate animal products from her diet. Her reasons for becoming a vegan were related to moral beliefs about cruelty to animals and political and economic views associated with the costs of meat production and its effects on the environment. Laura's typical food intake included a bagel for breakfast, steamed vegetables for lunch, and salad and bread for dinner. She was not eating beans since did not know how to prepare them. Laura had recently added a protein shake and increased her amounts of food since her parents also were concerned about her dietary intake. She would occasionally have yogurt although really wanted to completely eliminate animal products from her diet.

Laura was 5'5" and weighed 129 lb with 18% body fat. Her weight had been stable over the past 2 years. Her menstrual cycle was normal.

The sport nutritionist worked with Laura to increase her total caloric intake and meet her protein requirements. Laura was unaware of how foregoing animal protein would influence her caloric intake. She was shown how to determine her total caloric intake and the influence of meeting her energy needs on performance. This was particularly important since the general perception is that golf does not demand high energy. While recreational golfers can ride on carts during an 18-hole game, collegiate golfers are required to walk and carry their own clubs, and they typically play 36 holes in one day. For Laura, this meant increasing her caloric intake and having food on hand since she could be on the golf course for over 8 hr/day.

In addition to focusing on total caloric intake, Laura also needed to increase her protein intake from nonmeat sources. After learning more about the protein content of foods and the concept of complementary proteins, Laura was able to incorporate tofu, beans, and soy milk to increase her protein intake.

For the sport nutritionist, this athlete presented a challenge. It took many months of working with Laura to determine that her vegan diet and disordered eating were related to a lack of nutrition information and limited cooking skills. Over time, Laura started including dairy products in her diet since it was difficult to find good

protein sources to eat when traveling. However, Laura's interest in animal rights and environmental causes continued. She became actively involved as a volunteer for an animal shelter and an environmental project that was studying the impact of golf courses on the ecology.

Weight Control

Many coaches and athletes believe that weight loss and lower body fat composition are linked to optimal performance. An unrealistic perception of what is an ideal body weight for competitive athletes, especially in sports in which leanness is considered important, can contribute to pathogenic weight loss practices including crash diets, diet pills, diuretics, laxatives, excessive exercise, fasting, fluid restriction, sweating, spitting, and vomiting (13, 16, 29). The sport nutritionist is key in providing realistic weight loss goals for athletes. The following case study illustrates how collaboration between the coach and sport nutritionist can help a college athlete lose weight. Further discussion on weight control practices and eating disorders is presented below.

Case Study: Tanya. Tanya, an African-American track-and-field athlete, was referred for nutritional counseling in the fall of her freshman year. She redshirted her freshman year since her coach was interested in having her increase strength and power. He also wanted her to lose weight but did not want to compromise athletic performance. He stressed the importance of an approach that would help Tanya increase muscle mass and decrease body fat over time.

At Tanya's initial visit, she weighed 263 lb at 5'10" (body composition was not determined due to the limitations of using Lange calipers). Tanya was living in a dormitory and eating at campus cafeterias. She was eating on the run, consuming mainly fast foods that were high in calories and fat. The initial strategy in working with Tanya was to increase her knowledge about how an athlete's nutritional intake can influence performance. Discussions focused on the role of carbohydrates in fueling muscles and how to make selections when eating at campus dining facilities. By June of her freshman year, her weight decreased to 259 lb. Over the summer she moved into an apartment and was able to increase her intake of lean meats, fruits, and vegetables while continuing to train. In late August her weight decreased to 244 lb, a rate of loss of approximately 1.25 lb/week. Tanya continued to lose weight over the next 2 years. By the end of her second competitive year, Tanya's weight was down to 220 lb. Over this time period, she excelled in her sport, achieving All-American status and competing in the 1996 Summer Olympic Games.

Nutrition Supplements and Ergogenic Aids

The pressure to win contributes to athletes' search for a competitive edge. Many collegiate athletes use nutrition supplements and ergogenic aids with the expectation of improved performance. Unfortunately, aggressive marketing promotions targeting athletes make it difficult for them to determine the efficacy of claims by supplement manufacturers.

Supplements and ergogenic aids promoted to college athletes include the following:

- Products that provide calories (carbohydrate, protein, and fat) such as liquid supplements and energy bars
- Products that provide vitamins and minerals including multivitamins, liquid minerals, and supplements containing plants and herb extracts
- Products that contribute to performance during exercise and enhance recovery after exercise like sport drinks, electrolytes, and carbohydrate supplements
- Products that are believed to stimulate and maintain muscle growth, for instance, high-protein diets and purified amino acids (4)
- Products that contain micronutrients and/or cellular components that are promoted as ergogenic aids to enhance performance, such as antioxidants, caffeine, carnitine, chromium picolinate, creatine, and pyruvate (2, 4, 6, 7)

Nutrition supplements can provide needed nutrients for college athletes. In my experience, some athletes find it difficult to meet their energy requirements from food. Liquid supplements and sports bars containing carbohydrates, proteins, and fats can provide an easy way to increase caloric intake. For athletes who avoid meat and dairy products, liquid supplements are a source of protein. Sport drinks, gels, and recovery carbohydrate drinks can contribute needed fluids and carbohydrate before, during, and after exercise. For many female athletes, iron and calcium supplements are recommended when dietary intake is low in these nutrients.

The sport nutritionist must be aware of nutritional supplements and ergogenic aids that are being promoted to athletes. While some coaches will budget for use of supplements, most college athletes must purchase supplements on their own. Many products can easily cost over \$50 a month if used as recommended by the manufacturer. The sport nutritionist can help the athlete make sound decisions concerning the use of supplements. In most cases, the athlete should be advised that money is better spent on foods necessary for a well-balanced diet than nutritional supplements.

Case Study: Mike. Mike, a 19-year-old African-American, wanted to gain muscle mass. His strength coach suggested that he talk with the sport nutritionist. Mike was 5'9", weighed 207 lb, and had 10% body fat. At the initial visit, Mike said that a fellow football player who was using a popular protein supplement told Mike that he needed to eat 500 g protein daily. Mike was concerned since he did not know if could eat that much protein and he could not afford the protein supplement.

The sport nutritionist's analysis of Mike's food records indicated that his current protein intake was greater than 150 g/day. It was explained to Mike that protein needs vary by weight and that his current diet was meeting his protein needs. The information presented to Mike was reinforced by the strength coach.

Prevention and Treatment of Eating Disorders in Female Athletes

Eating disorders are prevalent among nonathletes on college campuses (31). However, college athletes face additional stressors that place them at risk for eating disorders (5, 12, 17):

- Desire to optimize performance
- Involvement in sports that emphasize body appearance or leanness for optimal performance

- Heightened body awareness, which may make them prone to body image concerns
- Personality characteristics of athletes—driven, competitive, perfectionist, and disciplined
- High stakes associated with winning
- Influence of parents and coaches

At the University of Washington, a multidisciplinary team plays an integral role in addressing these risk factors to prevent and treat eating disorders. The team includes a sport nutritionist, team physician, clinical psychologist, and athletic trainer. Risk reduction strategies include the education of coaches and administrative staff on issues related to eating disorders in athletes. As discussed previously, this involves input into policies regarding the assessment of body composition. The sport nutritionist also has been involved in workshops for athletes, coaches, and administrative staff on the female athlete triad and preventing eating disorders in athletes by deemphasizing body weight and increasing sensitivity to weight issues.

In addition, the sport nutritionist works with the multidisciplinary team in treating athletes with eating problems. Initial evaluation involves a detailed weight/height history, exercise history, 3-day dietary analysis, and body composition measurements, using arm circumference and triceps skinfold for lean muscle mass, and three-site skinfold (triceps, suprailiac, and thigh) for estimate of percent body fat. Caloric intake versus caloric needs is estimated. On follow-up visits, the sport nutritionist works with the athlete on the effects of starvation on muscle mass and menstrual function and appropriate body fueling in relation to sport. Modest goals in caloric and nutrient intake are identified. Intervention also includes discussions on choosing healthy foods from dorm cafeteria, shopping and cooking tips, and eating on the road.

While eating disorders such as anorexia nervosa and bulimia nervosa occur in athletes, disordered eating also can be associated with limited or incorrect views on proper sport nutrition (28). For example, in the case studies of Sarah, the crew athlete, and Laura, the golfer, their disordered eating behaviors were associated with a lack of nutrition information. For these athletes, nutrition counseling provided early intervention in patterns of disordered eating, thus preventing full-blown eating disorders.

Conclusion

This article supports the need for sport nutritionists within intercollegiate athletics. While most surveys show that athletes and coaches think nutrition is important, results indicate a lack of nutrition knowledge (25). Nutrition is important for optimal performance and should be an essential part of all athletes' training.

With the development of the NCAA CHAMPS/Life Skills Program, there are new opportunities to integrate sport nutrition programs within intercollegiate athletic departments. Registered dietitians specializing in sport nutrition need to be recognized by athletic administrators, coaches, athletic trainers, and team physicians as a valuable resource in helping college athletes increase nutritional knowledge and improve eating habits for optimal performance.

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