A serious commitment to sport and exercise may predispose some female athletes to the development of eating disorders, particularly for those participating in sports where a low body weight is desired, like skating, gymnastics, and ballet. The energy restriction and low calcium intake often associated with eating disorders may increase risk of injury. Low body weight and its often accompanied amenorrhea are significant predictors of osteoporosis. The development of osteoporosis among eating disordered women has been confirmed by several researchers. Adequate calcium and vitamin D intake, along with balanced nutrition, are recommended as part of the preventive guidelines against osteoporosis. The program Osteoporosis Prevention for Female Athletes in High Risk Sports targeted potentially at-risk female athletes directly and through their coaches in an attempt to change eating behavior early enough to boost bone health.

OSTEOPOROSIS PREVENTION FOR FEMALE ATHLETES IN HIGH RISK SPORTS

The Female Athlete Triad is characterized by amenorrhea, osteoporosis, and eating disorders, and is most common in sports that are appearance-related (gymnastics, ballet, ice skating) or require repetitive movement (basketball, soccer, tennis, track/field, and cross-country running). The target population for this project was female athletes, between the ages of 12 and 22 years, who participated in sports that placed them at high risk for the Female Athlete Triad. This target age group was selected because preadolescence, the teen years, and early adulthood offer the opportunity to build bone density through nutrition and lifestyle changes.

Program goals were to increase awareness of The Female Athlete Triad and osteoporosis among preadolescent, adolescent, and college-age female athletes in high-risk sports; to increase educational efforts to modify their nutrition behaviors; and to increase awareness among coaches of female athletes of osteoporosis and its prevention.

INNOVATION/CREATIVITY

The professor in charge of the project, with assistance from a college senior majoring in health promotion, developed two lesson plans, as well as overhead masters, handouts, and a brochure on osteoporosis geared toward the target market. PowerPoint slide sets were developed on two topics: Preventing Osteoporosis in Female Athletes and Female Athletes, Nutrition, and Eating Disorders. The project staff also created an osteoporosis website for female athletes entitled Osteoporosis and the Female Athlete (www.coastal.edu/healthpromo/Osteoporosis.html).

The college senior was trained to use the lesson kits to conduct educational sessions for high school and college athletes participating in women’s soccer, track, cross country, cheerleading, tennis, and volleyball. Each participating athlete received a folder, key articles, and the project’s brochure Preventing Osteoporosis in Female Athletes.

Project staff conducted educational sessions with 12 coaches in “high risk” sports and provided them with the materials distributed to athletes, as well as the lesson kit with PowerPoint slides and background articles.

Additional materials were developed. A press release was
published in two area newspapers. The university newspaper printed the program’s Public Service Announcement. A bulletin board on The Female Athlete Triad was designed and placed in a university hall. Staff conducted two television interviews.

REPLICABILITY
The materials developed for this project easily could be used by “peer mentor” athletes, middle and high school health teachers, coaches, or other interested persons. All materials are available for replication through the project coordinator.

THEORY BASE/RATIONALE
Among this study group, 33.4 percent reported menstrual irregularities, 23 percent had calcium intakes below recommended levels, and 8.6 percent reported a previous or present eating disorder as measured by information obtained from their completion of paper-pencil surveys.

The program was framed around four Social Cognitive Theory constructs. Observational Learning was met through the use of a “peer” female athlete to conduct the educational sessions; the peer athlete also served as a role model whose image and, more importantly, message were respected by the participants. Behavioral Capability was addressed by providing the athletes with exposure to a knowledge base of proper nutrition and training to improve bone strength, and teaching them skills for changing their behavior based on this new knowledge. Self-Control of Performance was met through personal goal setting for future bone health and personal satisfaction from attaining those goals. Management of Emotional Arousal was met by designing sessions that had a positive tone and were not overly emotional, negative, or overbearing. A positive environment can boost self-efficacy, a participant’s belief that she can achieve success.

OUTCOMES/EVALUATION DATA
A total of 309 female athletes were reached through educational sessions. A pre- and post-test evaluated nutrition knowledge and changes in attitudes and beliefs regarding calcium consumption and osteoporosis prevention. Attitudes and beliefs improved significantly (p<.05) regarding naming risk factors for osteoporosis, needing calcium from foods and supplements, and naming and increasing foods high in calcium.

LESSONS LEARNED
“This project made us aware of the paucity of research and materials related to early risk of osteoporosis in female athletes. Education and intervention can help prevent this disease later in life.”

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QUESTIONS
1 What is the Female Athlete Triad?
   a. Gymnastics, ballet, ice skating
   b. Amenorrhea, osteoporosis, eating disorders
   c. Basketball, soccer, tennis
   d. Anorexia, bulimia, binging

2 How did Osteoporosis Prevention for Female Athletes in High Risk Sports utilize its student instructor?
   a. To grade exams
   b. To develop high calcium recipes
   c. To answer questions generated through a website
   d. To conduct educational sessions

3 Which was most prevalent among female athletes in the osteoporosis study group?
   a. Menstrual irregularities
   b. Eating disorders
   c. Low calcium intake
   d. Poor nutrition knowledge

4 Which best illustrates the construct of observational learning as applied in Osteoporosis Prevention for Female Athletes in High Risk Sports?
   a. “Peer” female athlete instructor
   b. PowerPoint slide presentations
   c. Website
   d. Brochure

REFERENCES