Body Image and Dieting Behaviors Among Elite Figure Skaters

Paula J. Ziegler,1 Chor San Khoo,2 Bonnie Sherr,3 Judith A. Nelson,4 Wendy M. Larson,5 and Adam Drewnowski6*

1Nutrition and Health, Campbell Soup Co., Camden, New Jersey
2Nutrition and Health, Campbell’s Center for Nutrition and Wellness, Campbell Soup Co., Camden, New Jersey
3Nutrition Science, Campbell Soup Co., Camden, New Jersey
4U.S. Olympic Training Center, Sports Medicine Division, Colorado Springs, Colorado
5Human Nutrition Program, School of Public Health, University of Michigan, Ann Arbor, Michigan
6Human Nutrition Program, School of Public Health and Department of Psychiatry, University of Michigan, Ann Arbor, Michigan

Accepted 5 May 1997

Abstract: Objective: This study explored links among body image, dieting behavior, and nutritional status among 40 nationally ranked junior figure skaters. Method: Questionnaires were provided to 40 junior skaters (range 12.9–22.9 years) during a skaters’ camp. Food intakes were recorded over 4 consecutive days and blood samples were drawn. Nutritional status was assessed using food intake records and selected biomarker data. Results: Data suggested that these athletes dieted despite relative satisfaction with body image. Although biochemical measures of nutritional status were all within normal range, inadequate energy intakes and delayed menarche (in women) were widespread in this athlete sample. Discussion: Data dispute common theories of dieting being linked to dissatisfaction with body image. The article also cautions against overreliance on biochemical assessment as a marker of nutritional inadequacy. © 1998 by John Wiley & Sons, Inc. Int J Eat Disord 24: 421–427, 1998.

Key words: athletes; body image; dieting; energy intakes; nutritional status; menstrual status

INTRODUCTION

Figure skating combines artistry and physical strength. The seemingly effortless grace of skating performances can mask the enormous endurance and strength that are required
of these athletes. The ideal female skater often resembles the female gymnast in being slender and petite (Tofler, Stryer, Micheli, & Herman, 1996; Nash, 1987); in contrast males aspire to be muscular but trim. The desirable body image may be conditioned by the unique demands of figure skating, which include extensions, lifts, and jumps. The skater’s satisfaction with his or her body shape or body weight can also be influenced by external factors, including the opinions of coaches, parents, and peers. The sport of figure skating is gaining in popularity and is a particular favorite with television audiences (Sandomir, 1997).

Numerous studies have pointed to a high prevalence of eating disorders among competitive athletes, particularly female gymnasts (Rosen & Hough, 1988). Most have explored dieting behaviors among female runners, swimmers, and dancers (Evers, 1987; Rosen, McKeag, Hough, & Curley, 1986) as well as male wrestlers (Thiel, Gottfried, & Hesse, 1993). Very few studies have addressed figure skaters, either male or female (Rucinski, 1989). Severe energy restriction in competitive sports can have adverse effects on health, particularly among junior athletes. Even mild to moderate restriction may damage the adolescent athlete, hindering growth or delaying menarche. The chief characteristics of the female athlete triad—amenorrhea, disordered eating, and osteoporosis—have been described elsewhere (Nattiv, Agostini, Drinkwater, & Yeager, 1994). This study addressed body image issues, dieting attitudes and behaviors, and dietary intakes in young male and female competitive figure skaters.

**METHOD**

**Subjects and Procedures**

Participants were 40 junior skaters, selected on the basis of placement in the 1995 national figure skating championships. Nineteen young males (mean age 17.8 years; range 14.6–21.6 years) and 20 young females (mean age 15.9 years; range 12.9–22.9 years) attending a skaters’ camp in Colorado completed a number of questionnaires on body image, weight history, weight-related attitudes and behaviors, physical activity and sports, and food preferences (Drewnowski, Kurth, & Krahn, 1994). The Weight History questionnaire probed for current and past body weight, weight fluctuations, and dieting behaviors as well as menstrual history (in women). The Diet and Sport Questionnaire assessed time spent in various sports activities, as well as various weight control strategies, including fasting, purging, laxative use, and the type and frequency of exercise. Assessments of body image included a series of nine silhouette drawings representing body shapes ranging from emaciated to obese (Fallon & Rozin, 1985). The Food Preference Checklist recorded preferences for 172 individual foods along a 9-point scale (1 = dislike extremely; 9 = like extremely). Participants were instructed on the completion of food diaries and recorded dietary intakes over a 4-day period. The MenuScan Food Dictionary™ and the associated nutritional data base were used in data coding and analyses. Questionnaire responses and dietary intake data were analyzed using SPSS for Windows (version 6.1). Blood samples were drawn following an overnight fast for laboratory analyses of biochemical markers of nutritional status.

**RESULTS**

Subject characteristics are summarized in Table 1. Mean body mass index values (BMI = kg/m²) were 22.4 for men and 18.4 for women, within the normal range. Given the
young age of the respondents, pediatric growth charts (National Center for Health Statistics, 1973) were also used to assess weight and stature as a function of sex and age. Fifty percent of the males and 85% of the females were below the 50th percentile BMI for weight by age.

**Desired Body Weight**

Most young women and many young men tend to perceive themselves as overweight (Drewnowski, Kurth, et al., 1994). As in past studies, subjects judged their weights along a 5-point scale, ranging from very underweight to very overweight. The majority of the sample (77.8% of males, 80% of females) reported being underweight or being about right. In contrast, less than 50% of college-age women in a previous study had rated themselves as underweight or about right, while fully 46% reported being overweight (Drewnowski, Kurth, et al., 1994).

Most young women and some young men wish to be thinner than they are. With the desire for weight change expressed as the difference (in pounds) between reported current and reported desired weight, 79% of the women and 32% of the men wished to weigh less than their current weight (Drewnowski, Kurth, et al., 1994). In the present sample of figure skaters, 72% of the women and 39% of the men desired to be thinner than they were. The mean desired weight loss was 3.6 lb for females and 1.8 lb for males. Data previously obtained with a college-age population estimated desired weight loss at 7.4 lb for women and a desired weight gain of 1.9 lb for men. The desire for weight gain among adolescent males has been interpreted as a desire for a more muscular build (Drewnowski & Yee, 1987). Despite perceiving themselves as underweight, this group desired further weight loss.

**Body Shape**

Using the nine line drawings in the Diet and Sports Questionnaire, the subjects indicated the body shape that best represented their current appearance as well as the shape they would like to look like. Previous studies using a similar instrument (Fallon & Rosin, 1985) suggested that women generally indicated a preference for a thinner silhouette, whereas males were more likely to report a satisfaction with their current body shape. Consistent with those results, female skaters desired to be thinner than they currently were. Mean values on the 9-point scale for desired versus current were 2.05 vs 2.55.

<table>
<thead>
<tr>
<th>Table 1. Subject characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male ( (n = 19) )</td>
</tr>
<tr>
<td>( M )</td>
</tr>
<tr>
<td>Age (years)</td>
</tr>
<tr>
<td>Height (cm)</td>
</tr>
<tr>
<td>Weight (kg)</td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
</tr>
<tr>
<td>Reported weight (lb)</td>
</tr>
<tr>
<td>Desired weight (lb)</td>
</tr>
<tr>
<td>Desired weight loss (lb)</td>
</tr>
</tbody>
</table>

Note: Data are means ± SE of means; (ranges).
respectively. These ratings were substantially lower than had been reported previously for college women using a comparable set of line drawings (Fallon & Rozin, 1985). No significant difference between the current and desired figures was found among the men in our study (mean scores 4.22 vs. 4.33), again consistent with previous results.

Fallon and Rozin (1985) had reported that 70% of college females and 33% of college males expressed a desire for a thinner silhouette. In contrast, only 40% of our female skaters and 11% of male skaters expressed a desire for a thinner figure, consistent with the finding that most already viewed themselves as underweight or about right.

In past studies, the desire for thinness has been linked to dissatisfaction with current body size, shape, or general physical appearance (Striegel-Moore, Silberstein, & Rodin, 1986). In contrast, the present group of skaters reported satisfaction with their physical attractiveness (50% of males and 65% of females) and body shape (66.7% of males and 60% of females). The women were more satisfied with their physical attractiveness than were the men; 65% of females were often or almost always satisfied versus 50% of males. The level of satisfaction with body shape was equal in the men and the women. These ratings of body satisfaction exceed those previously reported among female college gymnasts (O’Connor, Lewis, Kirchner, & Cook, 1996).

In this group at least, the desire for thinness does not appear to be associated with perception of self as overweight and negative body image. This is contrary to the standard belief that negative body image and dieting are causally linked.

**Weight Control Behaviors**

Although female skaters were generally satisfied with their body shape and saw themselves as either normal or underweight, they continued to restrict calories for the purpose of weight control. Most of the females (65%) and some of the males (26%) reported previous dieting for the purpose of weight loss. Point prevalence of dieting to lose weight was estimated at 55% for women and 18% for men, despite the fact that over one half of dieting females were already at or below the 25th percentile weight for height category. In contrast, the prevalence of dieting to lose weight in a study of college students was estimated at 23% for women and only 3% for men (Drewnowski, Kurth, et al., 1994).

The skaters further rated the frequency of use of various methods to control body weight, including the use of fasting, laxatives or diuretics, purging, and intensive exercise (more than 1 hr/day). No subject reported using fasting, laxatives or diuretics, or purging other than rarely or never. Despite their rigorous training schedule, 59% of females and 66.7% of males reported that they rarely or never used intensive exercise as a method of losing weight. Again, these rates are below those reported in the literature. A previous study (Rosen et al., 1986) found that 32% of female collegiate athletes practiced at least one pathogenic weight-control behavior (self-induced vomiting, laxatives, diet pills, or diuretics). Gymnastics, a sport with physical and mental demands very similar to those of skating, had the highest prevalence of pathological weight loss methods (74%) among the various sports studied (Rosen et al., 1986).

**Dietary Intakes**

Energy and macronutrient composition of the diet, as based on the 4-day food diaries, is shown in Table 2. Mean daily energy intakes were 1,422 kcal/day for women and 2,477 kcal/day for men. Diet composition was 62.6% carbohydrate, 15.9% protein, and 23.4% fat for women and 57.8% carbohydrate, 15.3% protein, and 27.9% fat for men. Males con-
sumed only 75.0% of estimated energy needs, as established by Nevin-Folino (1993), and females only 59.1%.

Dieters typically restrict the amount of fat they consume (Rock, Demitrack, & Drewnowski, 1996). Percent of energy from fat was 23.4% for women (range 8–35%) and 27.9% for men (range 19–36%). While diets containing less than 30% fat are recommended for the prevention of cancer and coronary heart disease in adults, they are not necessarily optimal for young women, especially those with high energy needs. Diets deriving a mean of 23% energy from fat were associated with menstrual irregularities in college-age women (Rock, Gorenflo, Drewnowski, & Demitrack, 1996).

Plasma biomarkers of nutritional status were all within normal range, as shown in Table 2. However, one potential consequence of low energy and fat intakes among women may be abnormalities in reproductive endocrinology (Krahn et al., 1992). Thirteen of the 20 women (65%) in the present sample experienced delayed onset of menarche (>13 years at age of menarche). The mean age of menarche was 13.2 years, as compared to the average of the onset of menses in American girls of between 12.6 and 12.9 years (Teitz, 1982). Of the 16 females who had reported reaching menarche, 7 (or 44%) reported irregular or absent cycles.

### Food Choices

Consistent with previous data, female skaters expressed preferences for low-calorie items such as tossed green salad, fruits, and vegetables. Mean preference score was 7.0 for females versus 6.1 for males. In contrast, male skaters were more likely to express preferences for high-fat items, including meat dishes. Mean preference score for high-fat, high-salt foods was 6.2 (males) versus 5.5 (females); mean score for meats was 7.1 (males).
and 5.9 (females). These differences were significant at $p = .05$. No significant differences between the sexes were obtained for other food categories.

**DISCUSSION**

Elite figure skaters, both male and female, reported a general satisfaction with their attractiveness and body shape. Although the BMIs for both men and women were within normal ranges, the population as a whole was underweight when pediatric growth charts were used as a standard. A majority of this athlete sample considered themselves to be of appropriate weight or even underweight. Even so, a majority of the females and a large percentage of the males reported a desire to lose weight, and the prevalence of dieting for weight loss was higher than reported in a general population of young adults (Drewnowski, Yee, Kurth, & Krahn, 1994).

In many past studies, normative dissatisfaction with body weight and body shape has been viewed as a necessary precursor to dieting behaviors. This theoretical construct is not confirmed by the present results. Elite skaters dieted to lose weight despite the fact that they were generally satisfied with their body weight and body shape. Other studies, particularly those with anorectic patients (Garner, Garfinkel, & Bonato, 1987; Patton, 1992), have suggested that the perception of self as overweight is one motivating factor for the commencement of dieting. Again, dieting in the present group was associated with the perception of self as underweight or about right. We conclude that dieting behaviors in this group were not linked either to perception of self as overweight or to a normative dissatisfaction with body image, but were simply mandated by the unique demands of this particular sport.

Analyses of dietary intake data identified some potential problems regarding inadequate energy intakes and excessively low fat content of the diet. Despite inadequate energy intakes, biochemical markers in this group of athletes were within normal ranges. However, data analyses pointed to potential menstrual abnormalities among female skaters, manifested either as delayed menarche or irregular menstrual cycles. Overreliance on biochemical assessment has the potential to blind researchers to other indicators of nutritional inadequacy, such as the delay or absence of menses and other manifestations of stunted or delayed growth and development. It is possible that the external demands, such as the expectations of coaches, judges, and parents, have influenced the skaters to believe that dieting is necessary and normal. Parents, coaches, trainers, and health care providers who are in contact with competitive young female athletes should be aware of the subtle manifestations of and potential harm in undernourishment. Though standard indices of nutritional status, typically intended for use with adults, may appear normal, the nutritional status of the adolescent athlete needs to be scrutinized with greater care.

**REFERENCES**


