

ORIGINAL
RESEARCH
PAPER

Girls on the Run: Improvements in self-esteem, body size satisfaction and eating attitudes/behaviors

R. DiGiacchino DeBate*, and S.H. Thompson**

*School of Community and Environmental Health, Old Dominion University, Norfolk, VA, USA, and

**Department of Health, Physical Education, and Recreation, Coastal Carolina University, Conway, SC, USA

ABSTRACT. A pilot assessment of a curriculum-based running program geared for girls 8-12 years old ($n=322$) was implemented to assess influences regarding psychological risk factors leading to disordered eating among girls who participate in sports. Utilizing a pretest/posttest study design, researchers administered questionnaires in pre-program session T(1), and post-program T(2). Statistical tests on self-esteem ($t=-10.628$, $p<0.05$), body size satisfaction ($t=4.359$, $p<0.05$), and eating attitudes/behaviors ($t=4.806$, $p<0.05$) revealed statistically significant improvements from baseline to post program. A sport-training program supplemented with a wellness curriculum may be an effective primary prevention program for disordered eating attitudes and behaviors.

(*Eating Weight Disord.* 10: 25-32, 2005). ©2005, Editrice Kurtis

INTRODUCTION

The physical and psychological benefits of sports participation among girls are well established. These include increased bone density, physical fitness, self-esteem, self-confidence, in addition to the decreased likelihood of the adoption of risk-taking behaviors, and the development of chronic disease in adulthood (1-5). Conversely, numerous studies have found that participation in some types of sports may increase the risk of developing disordered eating attitudes and behaviors (6-10). For example, exercise and sport may increase preoccupation with appearance, which may in turn contribute to the predisposition and progression of eating disorders (7, 11). Smolak et al. (12) explored this paradox by performing a meta-analysis of thirty-four studies addressing physical activity and disordered eating attitudes and behaviors. Results indicate that, depending on the circumstances, sports participation may be a risk factor for eating problems (i.e. elite athletes, and those participating in lean sports), but may also serve as a protective factor for those participating in non-elite, non-lean sports, as well as high school girls participating in non-elite sports (12).

Although disordered eating occurs in many subgroups of the population, athletes are six times more likely to develop disordered eating problems than the general population (6). Eating disorders are more

prevalent among athletes than non-athletes, more prevalent in female athletes than male athletes, and more prevalent in sports in which leanness or a specified weight is considered important (13). The President's Council on Physical Fitness and Sports estimates between 10-20% of female athletes have eating disorders (14). In the Women's Sports Foundation Report (15) Health Risks and the Teen Athlete, it was reported that although fewer athletes than non-athletes described themselves as overweight (27% vs. 40%), 48% of athletes reported trying to lose weight as compared to only 44% of non-athletes ($p<0.01$). In addition, 8% of athletes reported vomiting, laxative use, and taking diet pills, all indicative of a disordered emphasis on weight and body size.

As with participation in sports, numerous fixed and causal risk factors have been identified as increasing the likelihood for the development of disordered eating among children and adolescents (16). Fixed risk factors include gender, race and age. As with being more prevalent among female athletes, longitudinal studies assessing disordered eating among preadolescents and adolescents have uncovered age-related differences in risk factors (17). Additionally, research regarding ethnicity and disordered eating has found that African-American girls, as compared to white girls, report less dieting and body dissatisfaction (18-20). The identification of fixed risk factors are useful

Key words: Children and eating disorders, body image, self-esteem, eating attitudes, eating behavior.

Correspondence to:
Rita DiGiacchino DeBate,
Ph.D, MPH, CHES
Associate Professor
School of Community and
Environmental Health,
104 C Spong Hall,
Old Dominion University,
5115 Hampton Blvd,
Norfolk, VA, USA
E-mail: rdebate@odu.edu

Received: February 10, 2004

Accepted: June 1, 2004

in targeting populations in need of primary prevention programs (17).

Individual causal risk factors in the development of eating disorders include poor self-esteem, dieting, weight concerns, body dissatisfaction, overweight, or pubertal weight gain, being perfectionistic and eager to please others; having difficulty in communicating negative emotions such as anger, sadness, or fear; and difficulty in resolving conflict (17, 21, 22). Other family and socio-cultural risk factors include pre-morbid obsessive-compulsive disorder, having a family history of eating disorders, parental comments regarding appearance, eating-disordered mothers, misinformation about ideal weight, peer pressure regarding weight and eating, media influences, distorted images, and elite athletes (21, 22).

With the intention of creating a balance between increasing the positive effects of sports participation among girls while decreasing the possible negative consequences, the researchers believe that it is important to assess the fixed and causal risk factors so that effective programs that target age and race specific causal factors can be developed. As such, it is imperative that attention be placed on evaluation of current girls' athletic programs. These programs should be reviewed on their influences regarding the causal factors that may lead to the development of disordered eating such as self-esteem, body image, dieting practices, pressure to lose weight by coaches, and distorted images of elite athletes.

The purpose of this pilot study was to assess individual causal risk factors including dieting, body image, self-esteem that may lead to disordered eating among girls who participate in a community curriculum-based running program. In addition, the impacts on these causal factors among age and race were also assessed. This pilot assessment was to determine the impact of the program, in addition to gathering information for the planning of a more controlled future evaluation.

METHODS

Participants

In collaboration with the Girls on the Run International director, twenty-eight program sites representing five geographical locations across the U.S.A. were identified for participation representing a range of SES and metropolitan areas. Program sites provided a total of 377 program participants. The primary investigator's university institutional review board granted approval for this study. Parental consent was obtained for participants prior to participating in the study.

Design

Due to the formative nature of the program, the researchers employed a non-experimental pretest/posttest study design to examine the impact of the 12-week program on individual causal risk factors of self-esteem, body size dissatisfaction, and dieting. Differences among the individual causal factors were also assessed according to fixed variables of age and race.

The Girls on the Run site coach distributed questionnaires to participants at each meeting site. Questionnaires were administered before the first program session T(1), and at the end of the last session T(2). No reference group was available. All coaches were instructed to read the questionnaire out loud as the participants followed along and recorded their answers on the questionnaire.

Measures

Measure of self-esteem was taken using the Rosenberg Self-Esteem Scale (23). Coefficient alpha for the Rosenberg Self-Esteem Scale on this study population was 0.77, thus supporting previously reported reliability statistics (23, 24).

Body size satisfaction was measured utilizing the child/adolescent version of the silhouette rating scale (25, 26). Using this measure, the researchers asked participants to choose which figure they thought looked most like their body size and which figure looked most like what they wanted to look like. Previous studies with children aged 5-11 years have indicated accuracy of children identifying their own body size utilizing figural selections (27, 28).

A general measure of eating attitudes and behaviors was assessed utilizing an adapted version of the Children's Eating Attitudes Test (ChEAT) were performed to determine construct validity and reliability (29, 30). Construct validity was completed through principal axis factor analysis. Oblique and varimax rotations were performed to achieve simple structure. Three eigenvalues greater than 1.0 were extracted from the instrument, accounting for 40% of the variance. Each factor consisted of variables with practically significant loadings of 0.40 or greater. The extracted factors consisted of the following constructs: Dieting ($\alpha=0.65$), values ranged between 0-15, higher values indicating greater dieting behaviors. Questions included: I stay away from eating when I am hungry, I think about burning up calories when I exercise, I eat diet foods, I have been dieting, I am aware of the calorie content in the foods that I eat; Preoccupation with weight ($\alpha=0.66$), values ranged between 0-9, with higher values indicating greater preoccupation with weight. Questions included: I am

scared about being overweight, I think a lot about having fat on my body, I think a lot about wanting to be thinner; and pressure from others ($\alpha=0.62$), values ranged between 0-6, with higher values indicating greater pressure from others. Questions included: I think that others would like for me to eat more; I feel that others pressure me to eat.

The intervention program

Developed by Molly Barker, MSW, and Dori Luke, MSW, the Girls on the Run program (31) is based upon the framework presented by Fantini (32) who notes that adolescents' greatest issues fall into three core areas: lack of identity, lack of connectedness, and lack of voice in their lives. This 12-week (two one-hour sessions per week) experiential learning program for 8-12 year-old girls combines running (training for a 5k running event) with curriculum-based activities that encourage emotional, social, mental, and physical health in addition to character development. The purpose of the program is to educate and prepare girls for a lifetime of healthy living. The overall objectives of the curriculum include increasing self-esteem, body image, and healthy eating attitudes.

The 12-week program of taught by certified Girls on the Run coaches includes a three-part curriculum: Part 1: Understanding themselves and setting personal goals; Part 2: Learning skills to get along in a group; Part 3: Examining their responsibility to the community. Within the three-part curriculum are 24 lessons wrapped into clever and fun running workouts. Each lesson utilizes physical activity and experiential learning activities to enhance self-esteem, body image, positive eating attitudes/behaviors, teamwork, and a sense of community. Examples of lessons include: What is change and how do I do it; Getting physical: The importance of taking care of our physical selves; Being emotional is healthy; Finding the spirit in me; Values are valuable; Learning to

TABLE 1
Demographic characteristics of program participants (n=322).

Variable	f(%)
Age (in years)	
- 8-10	222 (68.9)
- 11-13	100 (31.1)
Race	
- White	261 (81.1)
- African-American	12 (3.7)
- Asian	9 (2.8)
- Latino	38 (11.8)
- Other	2 (0.6)

listen; Positivism: It really works; and Standing up for myself. Girls also choose and conduct a community service project and complete a 1-mile or 3.1-mile running event with their team members. Girls on the Run staff trained and certified Girls on the Run coaches. In addition, all program sites followed the established program curriculum.

Statistical analysis

Data were entered and analyzed using the SPSS V10 statistical program for Windows. Analysis included descriptive analysis in addition to paired-sample t tests, MANOVAs and five two-way mixed ANOVAs.

RESULTS

Of those who participated in the pre-test (n=377), 322 also participated in the post-test (85.4%); 55 participants who participated in the pre-test were not available for the post-test. Table 1 represents the demographic characteristics of program participants. The majority of the participants were Caucasian (81.1%) while the mean age of the participants was 10 years (SD=0.90).

Researchers used statistical tests performed

TABLE 2
Mean scores for self-esteem, eating attitudes/behaviors, and body size dissatisfaction pre and past program (n=322).

Variable	Pretest M (SD)	Posttest M (SD)	t	df	g
Self-esteem	21.37 (3.11)	23.52 (2.99)	-10.628**	320	0.70
Eating	10.53 (5.00)	9.36 (4.92)	4.806**	321	0.26
Attitudes/behaviors					
- Dieting	5.63 (3.05)	4.98 (2.92)	4.204**	321	0.22
- Preoccupation with weight	3.63 (2.55)	3.35 (2.43)	2.344*	321	0.11
- Pressure from others	1.26 (1.43)	1.04 (1.53)	2.446*	321	0.15
Body size dissatisfaction	0.74 (0.99)	0.53 (0.84)	4.359**	316	0.23

**p<0.001, *p<0.05.

TABLE 3
Mean scores for self-esteem, eating attitudes/behaviors, and body size dissatisfaction according to age pre and post program (n=322).

Variable	8-10 years (n=222)		11-13 years (n=100)	
	Pre M (SD)	Post M (SD)	Pre M (SD)	Post M (SD)
Self-esteem	19.95 (4.31)	21.31 (4.99)	20.45 (4.53)	21.29 (4.63)
Eating attitudes/behaviors				
- Dieting	5.67 (2.96)	5.10 (2.96)	5.55 (3.24)	4.69 (2.83)
- Preocc. with weight	3.65 (2.57)	3.25 (2.49)	3.59 (2.51)	3.56 (2.29)
- Pressure from others	1.20 (1.36)	1.01 (1.51)	1.40 (1.57)	1.10 (1.58)
Body size dissatisfaction	1.16 (0.97)	0.82 (0.97)	1.11 (0.95)	1.0 (0.99)

on self-esteem, body size dissatisfaction, and eating attitudes/behaviors to demonstrate statistically significant improvements from baseline to post program (Table 2). A doubly-multivariate analysis of variance with one within factor was performed for the pretest to posttest on the five measures: self-esteem, dieting, preoccupation with weight, pressure from others, and body size dissatisfaction. Effect sizes (g) based on the work of Hedges (33) were used to examine the magnitude of difference between the means. Hedges (33) suggests that effect size value of 0.2 is small, 0.5 is medium, and 0.8 is large. There was a statistically significant within subject effect, multivariate $F(5, 311)=13.32$, $p < 0.01$, $\eta^2 = 0.18$. Means, standard deviations, and follow-up univariate analyses are reported in Table 2. There were statistically significant differences between all pretest and posttest measures; the effect sizes ranged from 0.11 to 0.70. A doubly-multivariate analysis of variance with one between factor, age group, and one within factor, pretest and posttest, was performed on the five measures: self-esteem, dieting, preoccupation with weight, pressure from others, and body size dissatisfaction. The means and standard deviations for the pretest and posttest for all measures by age group are

reported in Table 3. There was a statistically significant within subject effect, multivariate $F(5, 311)=10.27$, $p < 0.01$, $\eta^2 = 0.14$. There was not a statistically significant between subject effect (multivariate $F(5, 311)=0.73$, $p > 0.05$, $\eta^2 = 0.01$) or interaction (multivariate $F(5, 311)=1.58$, $p > 0.05$, $\eta^2 = 0.02$).

Five two-way mixed ANOVAs were used to examine differences between age and pretest/posttest results. Age (8-10 years and 11-13 years) was the between subjects factor for all the analyses and time (pretest and posttest) was the within subjects factor for all analyses. The results of these analyses are reported in Table 5. There were no statistically significant differences between the ages or interaction between age and time. There were statistically significant differences between the pretest and posttest for self-esteem, dieting, pressure from others, and body size dissatisfaction (Table 5). The effect sizes for the statistically significant within subjects factors were small: self esteem $\eta^2=0.05$, dieting $\eta^2=0.05$, pressure $\eta^2=0.02$, body size dissatisfaction $\eta^2=0.04$.

A doubly-multivariate analysis of variance with one between factor, race, and one within factor, pretest and posttest, was performed on the five measures: self-esteem, dieting, preoc-

TABLE 4
Mean scores for self-esteem, eating attitudes/behaviors, and body size dissatisfaction according to race pre and post program (n=322).

Variable	White (n=261)		Non-white (n=61)	
	Pre M (SD)	Post M (SD)	Pre M (SD)	Post M (SD)
Self-esteem	20.28 (4.24)	21.37 (4.86)	19.36 (4.90)	21.02 (4.95)
Eating attitudes/behaviors				
- Dieting	5.73 (3.02)	5.03 (2.87)	5.21 (3.17)	4.75 (3.16)
- Preocc. with weight	3.67 (2.54)	3.40 (2.46)	3.48 (2.59)	3.13 (2.30)
- Pressure from others	1.21 (1.40)	1.05 (1.56)	1.51 (1.55)	1.02 (1.40)
Body size dissatisfaction	1.14 (0.96)	0.86 (0.98)	1.16 (0.95)	0.97 (1.0)

TABLE 5
Differences between age and pretest/posttest results (n=322).

	Self-esteem			Dieting		Preocc w/weight		Pressure		Body size	
	df	MS	F	MS	F	MS	F	MS	F	MS	F
Between group											
Age	1	8.15	0.24	9.69	0.70	2.06	0.21	2.78	0.91	0.01	0.01
Error	319	33.69		13.93		10.03		3.04		1.33	
Within group											
Time	1	166.91	17.79**	69.81	17.84**	6.40	2.68	8.25	6.12**	4.02	11.54**
Time*Age	1	9.38	1.00	3.04	0.78	4.74	1.99	0.42	0.31	1.14	3.28
Error	319	9.38		3.91		2.38		1.35		0.35	

**p<0.01

cupation with weight, pressure from others, and body size dissatisfaction. The means and standard deviations for the pretest and posttest for all measures by race are reported in Table 4. There was a statistically significant within subject effect, multivariate F (5, 310)=8.16, $p<0.01$, $\eta^2=0.12$. There was not a statistically significant between subject effect (multivariate F (5, 310)=0.72, $p>0.05$, $\eta^2=0.01$) or interaction (multivariate F (5, 310)=1.02, $p>0.05$, $\eta^2=0.02$). Five two-way mixed ANOVAs were used to examine differences between race and pretest/posttest results. Race (white and non-white) was the between subjects factor for all the analyses, and time (pretest and posttest) was the within subjects factor for all analyses. The results of these analyses are reported in Table 6. There were no statistically significant differences between race or interaction between race and time. There were statistically significant differences between the pretest and posttest for all the dependent variables. The effect sizes for the subjects factors were small: self esteem $\eta^2=0.06$, dieting $\eta^2=0.03$, preoccupation with weight $\eta^2=0.01$, pressure $\eta^2=0.02$, body size dissatisfaction $\eta^2=0.02$.

DISCUSSION

The primary aim of this pilot study was to assess the impact of a combination running program/wellness curriculum on individual causal risk factors self-esteem, body size dissatisfaction, and eating attitudes/behaviors. Based upon the findings of this evaluation, over the 12-week study period, sport training supplemented with the wellness curriculum resulted in relatively significant changes in all three of the noted areas for the participants.

The researchers found that female adolescents who participated in the curriculum based running program had positive impacts on self-esteem, which is consistent with previous research on adolescent sport participation (4, 5, 12). This is of critical importance because self-esteem has been recognized as an important factor in health behavior and is also a crucial component in adolescent development (34). Low self-esteem has been linked to poor body image in overweight females and also to eating disorders (34, 35). Programs that positively impact self-esteem in young females may improve self-concept, body image, and also prevent eating disorders.

TABLE 6
Differences between race and pretest/posttest results (n=322).

	Self-esteem			Dieting		Preocc w/weight		Pressure		Body size	
	df	MS	F	MS	F	MS	F	MS	F	MS	F
Between group											
Race	1.00	39.79	1.18	15.33	1.10	5.29	0.53	1.83	0.60	0.21	0.16
Error	319.00	33.59		13.91		10.02		3.04		1.33	
Within group											
Time	1.00	186.56	19.87**	33.28	8.49**	9.39	3.91*	10.53	7.85**	2.46	7.04**
Time*Race	1.00	7.84	0.84	1.45	0.37	0.13	0.05	2.71	2.02	0.57	1.63
Error	319.00	9.39		3.92		2.40		1.34		0.35	

**p<.01, *p<.05

Based on pretest results, one-half of the girls reported a desire to be thinner, exactly the same percentage that was found among Australian 8- to 12-year old females (35). In fact, on numerous occasions it has been reported that many young girls prefer a thinner body size as compared to their current size (25, 28, 37, 38). Completion of this intervention reduced the discrepancy between current and ideal body size, thus decreasing body size dissatisfaction. Researchers have reported that body dissatisfaction is predictive of eating disorder symptoms in adolescent girls; therefore, prevention programs for girls should address body image and size dissatisfaction as did the present curriculum (39, 40).

The significant improvements in eating attitudes/behaviors found in this study when comparing pretest/posttest scores are also noteworthy. After program completion, participants reported lower rates of dieting behaviors, less preoccupation with body weight, and less pressure from others regarding eating. These results support the work of Sudgot-Borgen et al. (41) who found physical activity more effective than nutritional counseling and cognitive behavioral therapy in reducing various disordered eating attitudes and behaviors.

Early adolescence is a difficult transition for girls, one that also marks an increase in weight control behaviors (42). A sport-training program supplemented with a wellness curriculum, such as Girls on the Run, may be an effective primary prevention program for eating disorders. The experiential learning activities provide the participants to focus on building self-esteem, enjoying physical activity, and learning to value themselves and individual differences, all of which support the value of physical activity when it is aimed at fun, fitness and social interaction (12).

When these individual causal factors were assessed by age and race of participants, no statistically significant differences were noted. Findings of this study indicate that this 12-week wellness based physical activity program produced relatively positive movements in self-esteem, body size satisfaction, and eating attitudes/behaviors among 8-13 year old white and non-white girls.

Implications for prevention

It is evident that a "fine line" may exist which separates the benefits of sport participation among girls from the possible risks of such participation. As society encourages our children to become more physically active as to reap the positive effects, prevention specialists must also provide programs that address the

development of the many identified risks. According to Grigg et al. disordered eating in adolescent females suggests the need for preventive programs, which encourage appropriate eating and dieting behaviors (43). As suggested by Shisslak et al. the prevention of eating disorders among adolescents should focus on general risk factors such as low self-esteem, self-mastery, and life-skills training including problem solving and communication (17). The Girls on the Run program which combines a wellness curriculum addressing physical, social, emotional, mental and spiritual health with physical activity provides a venue for becoming physically active while addressing the individual causal factors for the development of disordered eating. Educational interventions targeting younger at-risk adolescents may be more likely to reduce the problem, but as long as society continues to attach a stigma to obesity and to reward restrictive eating/dieting practices, the problem may remain (43).

A multitude of issues needs to be addressed in prevention programs. Prevention programs need to differ depending on the age of the recipients. Elementary school-aged girls have been found to have concerns correlated with peer pressure on weight and eating (44). Once in middle school, girls report concern related to pressure from peers, self-confidence, body size, trying to emulate females in the media, and being teased about weight (44). Because dieting concerns often become more intense for girls as the middle school years progress, it is critical that intervention programs be planned for the late elementary or early middle school years (45).

Limitations

Significant improvements were noted in self-esteem, body size satisfaction, and eating attitudes/behaviors among participants over the 12-week period, which indicates the value of this program. Thus, the researchers cannot make reference to the actual internal validity of the program due to threats not addressed by the chosen design. However, since Girls on the Run is still in its formative stages and the interval between pre- and posttest was of short duration utilizing valid assessment scales, this design was useful in conducting a formative pilot assessment of immediate program effects (46, 47). The results of this initial pilot assessment serve as a first step in the development of a more detailed program evaluation. While knowledge, attitude, and behavioral changes are important first steps in the prevention of eating disorders, an outcome evaluation at a

later point in time is needed to determine the true efficacy of this program (48).

However, due to the large number of participants in this study, and the significant results found with the pilot assessment coupled with the importance of disordered eating prevention among female athletes, this study provides some preliminary data for further research regarding curriculum based sport programs and a more rigorous evaluation of Girls on the Run.

REFERENCES

1. Calfas K.J., Taylor W.C.: Effects of physical activity on psychological variables in adolescents. *Pediatr. Exerc. Sci.*, 6, 406-423, 1994.
2. Ferron C., Narring F., Caudey M., Michaud P.A.: Sport activity in adolescence: Associations with health perceptions and experimental behaviors. *Health Educ. Res.*, 14, 225-233, 1999.
3. Sallis J., Owen N.: Physical activity, longevity, and physical health. Physical activity and behavioral medicine. Thousand Oaks, CA, Sage Publications, 1999, pp. 35-40.
4. Steiner H., McQuivey R.W., Pavelski R., Pitts T., Kraemer H.: Adolescents and sports: Risk or benefit? *Clin. Pediatr.*, 39, 161-166, 2000.
5. Steptoe A., Butler N.: Sports participation and emotional wellbeing in adolescents. *Lancet*, 347, 1789-1792, 1996.
6. Black D.R.: Eating disorders among athletes: current perspective. Reston, VA, American Alliance for Health, Recreation, and Dance. 1991, pp.1-10.
7. Davis C., Kennedy S.H., Ralevski E., Dionne M.: The role of physical activity in the development and maintenance of eating disorders. *Psychol. Med.*, 24, 957-967, 1994.
8. Davison K.K., Earnest M.B., Birch L.L.: Participation in aesthetic sports and girls' weight concerns at ages 5 and 7 years. *Int. J. Eat. Disord.*, 31, 312-317, 2002.
9. Hulley A.J., Hill A.J.: Eating disorders and health in elite women distance runners. *Int. J. Eat. Disord.*, 30, 312-317, 2001.
10. Sundgot-Borgen J.: Eating disorders in female athletes. *Sports Med.*, 17, 176-188, 1994.
11. Van De Loo D.A., Johnson M.D.: The young female athlete. *Clin. Sports Med.*, 14, 687-707, 1995.
12. Smolak L., Mumen S.K., Rubie A.E.: Female athletes and eating problems: A meta-analysis. *Int. J. Eat. Disord.*, 27, 371-380, 2000.
13. Sundgot-Borgen J.: Eating disorders among male and female elite athletes. *Br. J. Sports Med.*, 33, 434, 1999.
14. The President's Council on Physical Fitness and Sports. Physical activity and sport in the lives of girls: Physical and mental health dimensions from an interdisciplinary approach. Washington, D.C.: Author, 1997.
15. Miller K.E., Sabo D.F., Melnick M.J., Farrell M.P., Barnes G.M.: The women's sports foundation report: Health risks and the teen athlete. East Meadow, N.Y., Women's Sports Foundation, 2000.
16. Kazdin A.E., Kraemer H.C., Kessler R.C., Kupfer D.J., Offord D.R.: Contributions of risk factor research to developmental psychopathology. *Clin. Psychol. Rev.*, 17, 375-406, 1997.
17. Shisslak C.M., Crago M.: Risk and protective factors in the development of eating disorders. In: Thompson J.K., Smolak L. (Eds.), *Body image, eating disorders, and obesity in youth: Assessment, prevention, and treatment*. Washington, D.C., American Psychological Association, 2001, pp. 103-126.
18. Neff L., Sargent R., McKeown R., Jackson K., Valois R.: Black-white differences in body size perceptions and weight management practices among adolescent females. *J. Adolesc. Health*, 20, 459-465, 1997.
19. Schreiber G.B., Robins M., Streigel-Moore R., Obarzanek E., Morrison J.A., Wright D.J.: Weight modification efforts reported by black and white pre-adolescent girls: National heart, lung, and blood institute growth and health study. *Pediatrics*, 98, 63-70, 1996.
20. Story M., French S.A., Resnick M.D., Blum R.W.: Ethnic/Racial and socioeconomic differences in dieting behaviors and body image perceptions in adolescents. *Int. J. Eat. Disord.*, 18, 173-179, 1995.
21. Kreipe R.E., Birndorf S.A.: Eating disorders in adolescents and young adults. *Med. Clin. North Am.*, 84, 1027-1049, 2000.
22. White J.H. The prevention of eating disorders: A review of the research on risk factors with implications for practice. *J. Child Adolesc. Psychiatr. Nurs.* 13, 76-88, 2000.
23. Wylie R.C.: Rosenberg self-esteem scale (RSE). Measures of self-concept. Lincoln, University of Nebraska Press, 1989, pp. 24-35.
24. Alfonzo V.C.: Measures of quality of life, subjective well-being, and satisfaction with life. In: Allison D.B. (Ed.), *Handbook of assessment methods for eating behaviors and weight related problems: Measures, theory and research*. Thousand Oaks, Sage Publications, 1995, pp. 23-79.
25. Collins M.E.: Body figure perceptions and preferences among preadolescent children. *Int. J. Eat. Disord.*, 10, 199-208, 1991.
26. Thompson J.K.: Assessment of body image. In: Allison D.B. (Ed.), *Handbook of assessment methods for eating behaviors and weight problems: Measures, theory and research*. Thousand Oaks, Sage Publications, 1995, pp. 119-148.
27. Dowdney L., Woodward L., Pickles A., Skuse D.: The body image perception and attitude scale for children: Reliability in growth retarded and community comparison subjects. *Int. J. Meth. Psychiatr. Res.*, 5, 29-40, 1995.
28. Williamson S., Delin C.: Young children's figural selections: Accuracy of reporting and body size dissatisfaction. *Int. J. Eat. Disord.*, 29, 80-84, 2001.
29. Babbitt R.L., Edlen-Nezin L., Manikam R., Summers J. A., Murphy C.M.: Assessment of eating and weight-related problems in children and special populations. In: Allison D.B. (Ed.), *Handbook of assessment methods for eating behaviors and weight related problems: Measures, theory and research*. Thousand Oaks, Sage Publications, 1995, pp. 447-489.
30. Maloney M.J., McGuire J.B., Daniels S.R.: Reliability testing of a children's version of the Eating Attitudes Test. *J. Am. Acad. Child Adolesc. Psychiatry*, 27, 541-543, 1988.
31. Girls on the Run International. From: <http://www.girlsontherun.org>, 2003.

32. Fantini M.D.: *Regaining excellence in education*. Columbus, OH, Merrill, 1986.
33. Hedges L.V.: Distribution theory for Glass's estimator of effect size and related estimators. *J. Educ. Statistics*, 6, 107-128, 1981.
34. Pesa J.A., Syre T.R., Jones E.: Psychosocial differences associated with body weight among female adolescents: The importance of body image. *J. Adolesc. Health*, 26, 330-337, 2000.
35. Vohs K.D., Joiner T.E., Bardone A.M., Abramson L.Y., Heatherton T.F.: Perfectionism, perceived weight status, and self-esteem interact to predict bulimic symptoms: A model of bulimic symptom development. *J. Abnorm. Psychol.*, 108, 695-700, 1999.
36. Rolland K., Farnill D., Griffiths R.A.: Body figure perceptions and eating attitudes among Australian schoolchildren aged 8 to 12 years. *Int. J. Eat. Disord.*, 21, 273-278, 1997.
37. Gustafson-Larson A.M., Terry R.D.: Weight-related behaviors and concerns of fourth-grade children. *J. Am. Diet. Assoc.*, 92, 818-822, 1992.
38. Thompson S.H., Corwin S.J., Sargent R.G.: Ideal body size beliefs and weight concerns of fourth-grade children. *Int. J. Eat. Disord.*, 21, 279-284, 1997.
39. Killen J.D., Taylor C.B., Hayward C., Wilson D.M., Haydel K.F., Hammer L.D.: Pursuit of thinness and onset of eating disorder symptoms in a community sample of adolescent girls: A three-year prospective analysis. *Int. J. Eat. Disord.*, 16, 227-238, 1994.
40. Attie L., Brooks-Gunn J.: Development of eating problems in adolescent girls: A longitudinal study. *Dev. Psychol.*, 25, 70-79, 1989.
41. Sundgot-Borgen J., Rosenvinge J.H., Bahr R., Schneider L.S.: The effect of exercise, cognitive therapy, and nutritional counseling in treating bulimia nervosa. *Med. Sci. Sports Exerc.*, 34, 190-195, 2002.
42. Molak L., Levine M.P.: Adolescent transitions and the development of eating problems. In: Smolak L., Levine M.P., Striegel-Moore R. (Eds.), *The developmental psychopathology of eating disorders: Implications for research, prevention, and treatment*. Mahwah, NJ, Lawrence Erlbaum Associates, 1996, pp. 207-233.
43. Grigg M., Bowman J., Redman S.: Disordered eating and unhealthy weight reduction practices among adolescent females. *Prev. Med.*, 25, 748-756, 1996.
44. Taylor C.B., Sharpe T., Shisslak C., Bryson S., Estes L.S., Gray N., et al.: Factors related associated with weight concerns in adolescent girls. *Int. J. Eat. Disord.*, 24, 31-42, 1998.
45. Smolak L., Levine M.P., Graen S.: The impact of puberty and dating on eating problems among middle school girls. *J. Youth Adolesc.*, 22, 355-368, 1993.
46. Posavac E.J., Carey R.G.: *Program evaluation methods and case studies (154-174)*. Upper Saddle River, NJ, Prentice Hall, 2003.
47. Windsor R.A., Baranowski T., Clark N., Cutter G.: *Evaluation of health promotion and education programs*. Palo Alto, CA, Mayfield Publishing Company, 1984, pp. 127-170.
48. Smolak L.: Elementary school curricula for the primary prevention of eating problems. In: Piran N., Levine M., Steiner-Adair C. (Eds.), *Preventing eating disorders: A handbook of interventions and special challenges*. Philadelphia, Taylor & Francis, 1999, pp. 88-89.