

Middle School Primary Prevention Program for Eating Disorders: A Controlled Study with a Twelve-Month Follow-Up

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The aim of this pilot study was to evaluate the efficacy of a new school-based eating disorder prevention program designed to reduce dietary restraint and the level of preoccupation with regard to shape and weight. One hundred and six (61 females and 45 males) 11 to 12-year-old students were evaluated, 55 of whom participated in the program (experimental group). An additional 51 students formed the control group. The program met for six sessions, two hours per session. After six months, the experimental group received two booster sessions of two hours in two consecutive weeks. Outcome measures included the Eating Disorder Examination Questionnaire (EDE-Q), the children's version of the Eating Attitudes Test (EAT), the Rosenberg Self-Esteem Scale (RSES), and a Knowledge Questionnaire (KQ) devised by the authors of the program. The questionnaires were administered in both the experimental and control groups, one week before the intervention, one week afterwards, and at six-month and 12-month follow-ups. Unlike a previous school-based eating disorder prevention program, in the experimental group both an increase in knowledge and a decrease in some attitudes were maintained at 12-month follow-up (Eating Concerns EDE-Q scores). Although more intensive interventions seem necessary to modify shape and weight concern and self-esteem, these findings suggest that the intervention had been useful since it led to both an increase in knowledge and a decrease in some dysfunctional eating attitudes.

This study was supported by a grant from Provveditorato degli Studi di Lecce, Italy.

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Eating disorders continue to be one of the major public health concerns among young females in western countries. The onset typically takes place during adolescence or in early adult life. Among young women, the mean prevalence rate is 0.28% for anorexia nervosa and 1% for bulimia nervosa (Hoek, 1995). Unfortunately, only a small proportion of individuals with these disorders receive any clinical attention at all (Hoek, 1995) and even those seeking treatment tend to become concerned only after many years of illness once their disorder has already become chronic (Lucas, Beard, Fallon, & Kurland, 1991). Eating disorders have high morbidity and mortality (Zilber, Schfman, & Lerner, 1989) and in many cases they persist for years, disrupting a good part of the person's life.

Although the interest in primary and secondary prevention in eating disorders has dramatically increased in the recent years, to date, there are very few published controlled studies on the effectiveness of prevention programs (Killen et al., 1993; Moreno & Thelen, 1993; Moriarty, Shore, & Maxim, 1990; Paxton, 1993; Shisslak, Cragon, & Neal, 1990). In general, primary prevention programs in the schools have included the following objectives (Smolak, 1999): (1) To increase knowledge of the adverse effect of dieting and other weight control behavior, of the diversity and inheritance of weight and shape, and of pubertal changes and eating disorders; (2) To discourage calorie-restrictive dieting and promote healthy eating and exercise for fun and fitness; (3) To develop skills to resist social pressures to eat; and (4) To promote self-acceptance and development of a positive image. At the end of the program, all of the studies found a significant increase in knowledge, but none recorded any change in eating behavior or in attitudes towards body weight and shape.

A recent noncontrolled study (Carter, Stewart, Dunn, & Fairburn, 1997) has hinted at the possibility that primary prevention of eating disorders might do more harm than good. Immediately following the end of the program, the participants reflected an improvement in eating attitudes and behaviors, but this improvement was short-lived: overall scores of eating attitudes and behavior had returned to baseline at the six-month follow-up. In addition, the level of dietary restraint was significantly higher at follow-up than at the beginning of the study. It is difficult to interpret the results of this study since the absence of a control group did not permit the researchers to determine whether the increase was due to the effect of the program or to development or social factors. However, the possibility to induce, through a primary prevention program, attitude and behavior typical of eating disorders in some students must always be kept in mind. On the other hand, a recent Italian controlled study found that a short program (four two-hour sessions) was able to significantly reduce body dissatisfaction and the risk of bulimic attitudes in low-risk subjects, but not in high-risk subjects (Santonastaso et al., 1999).

Despite the general negative results of the previous study (Carter et al., 1997), school remains an important place to conduct primary prevention

studies for eating disorders. The task is to design a primary prevention program using the strengths of the previous program (Killen et al., 1992; Moreno & Thelen, 1993; Moriarty et al., 1990; Paxton, 1993; Shisslak et al., 1990) and creating new components to prevent or change dysfunctional attitudes and behaviors.

In 1996, our research team conducted a study to evaluate eating attitudes and prevalence of eating disorders in a sample of 795 students (588 females and 207 males) from six Lecce state secondary schools (Dalle Grave, De Luca, & Oliosi, 1998). The study found that 58.4% of the girls and 19.7% of the boys reported body dissatisfaction. Dieting was more prevalent in girls (18.7%) than in boys (4.8%). The point prevalence rates of eating disorders were: 0.2% in anorexia nervosa, 1.7% in bulimia nervosa, and 3.7% in eating disorders not otherwise specified. This study was a useful tool to draw the attention of the local political and school authorities with regard to the problem of eating disorders. In fact, the Lecce Director of Education allocated a research grant to Associazione Italiana Disturbi dell'Alimentazione e del Peso (AIDAP) for a primary prevention project. In 1998, we developed the theoretical and practical aspects of a primary prevention program and wrote a comprehensive manual "Prevenzione dei Disturbi dell'Alimentazione" (Dalle Grave & De Luca, 1999) that included background information for teachers and provided an outline of a detailed lesson plan. In 1998–1999, we carried out a controlled pilot study to explore the impact of our prevention program with regard to the eating and body attitudes in a sample of 11- to 12-year-old students. In this paper, we describe the theoretical framework of our prevention program and the data on eating attitudes and behaviors of 106 students (55 in the experimental group and 51 in the control group) before, after, and at six-month and 12-month follow-up.

METHODS

Participants

The study took place in one of the state middle schools in Lecce with the permission of the local Director of Education. One hundred and six (61 females and 45 males) 11- to 12-year-old students were evaluated, 55 of whom participated in the prevention program (32 females and 23 males). An additional 51 students formed the control group (29 females and 22 males). The first group consisted of two randomly selected classes while the remaining two classes from the first year classes formed the control group. Orientation with the teachers and staff members was held to discuss the theoretical and practical aspects of the program.

Study Design and Assessment

Six group sessions were administered to the experimental group during school hours, once a week for six weeks. Each session lasted two hours: the first 30

minutes were dedicated to the educational materials, the remaining time was devoted to practical activities, group discussions, and revision of homework. After six months, the experimental group received two booster sessions of two hours in two consecutive weeks. The booster sessions were divided into two parts: the first 45 minutes were devoted to reviewing the topic presented during the prevention program; the remaining time was an open discussion. The program was administered by two psychologists, both experts in eating disorders and with previous experiences in teaching and working with adolescents.

A battery of self-report questionnaires was administered one week before, one week afterwards, at six-month follow-up (one week before the booster sessions), and at 12-month follow-up.

There were two measurements of eating disorder features: The self-report version of the Eating Disorder Examination (EDE-Q; Fairburn & Beglin, 1994) and the children's adaptation of the Eating Attitude Test (EAT; Garner, Olmstead, Bohr, & Garfinkel, 1982; Maloney, McGuire, & Daniels, 1988). The EDE-Q provides a global measure (global EDE) and measures the key features of eating disorders (i.e., frequency of key eating behaviors, levels of dietary restraint, and concerns regarding eating, shape, and weight). In addition, participants completed the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) and a 35-item knowledge questionnaire (KQ), designed to measure how much the participant learned about the various topics covered in the program (a copy of this questionnaire is available on request). At baseline (one week before the first prevention session), participants completed a demographic and background information form to gather information regarding name, age, weight, height, socioeconomic status, and age of menarche.

The Program

The theoretical framework of the program is based on a cognitive behavioral conceptualization of eating disorders as multidimensional conditions stemming from a diverse set of predisposing, precipitating, and perpetuating factors (Garner & Bemis, 1982). It emphasizes the maintenance of the disorders by a characteristic set of overvalued ideas about the personal meaning of body weight and shape that interact with a broad range of stable individual and family characteristics such as perfectionism, affective regulation, asceticism, and fears of psychobiological maturity. Each of these traits or meaning systems are regulated, expressed, or maintained by the positive and negative reinforcement contingencies associated with dieting and then is maintained, in part, by the physiological sequelae of starvation (Garner & Dalle Grave, 1999).

Within this conceptualization we developed a program with the main objective of preventing the development of eating disorders by reducing the prevalence of dietary restraint and the level of concern of body weight and shape.

The specific aims were:

To increase the knowledge of the students on:

- sociocultural pressure to be thin and beautiful
- cognitive distortions, which can predispose to eating disorders (e.g., extreme concern for shape and body weight, low self-concept, perfectionism, and dichotomous thinking)
- physical and psychological effects of dieting
- eating disorders

To help the students to avoid developing an eating disorder by:

- reducing the importance they attribute to shape and body weight in self-evaluation by accepting the natural biological changes of puberty
- developing a philosophy of life based on self-acceptance (Ellis, 1962)
- maintaining a healthy eating and lifestyle

The general aim was to create a students' task force that would create a counter-culture in which the pupils would help each other avoid going on a diet and challenge media messages about thinness and beauty.

We tried to reach these aims by using the following procedures:

- An interactive rather than a didactic educational approach: A variety of educational techniques were used, including overheads and handouts. At the end of each session a summary poster, written by the student, was posted to the wall of the classroom. Whenever possible, ideas and suggestions were elicited from the students, and sharing information with each other was constantly encouraged. A story about a young girl was used throughout the prevention program to illustrate the points addressed in the course.
- A friendly approach to cognitive restructuring: Beliefs about the overriding importance of eating control, shape and weight (thinness), and self-evaluations are usually highly valued. Since the evidence about the validity or correctness of these beliefs is unavailable or irrelevant to the individual (Vitousek et al., 1998), the cognitive challenges based on reviewing evidence for and against a thought or belief is of little, if any, help in these cases. We therefore adopted a cognitive restructuring approach exploring the advantages and the disadvantages of holding such an attitude. The focus was on the functionality or utility of holding the belief. Group discussions on this topic were followed by homework assignments for the students on what they perceived to be the pros and cons of using eating control and thinness and to evaluate themselves.
- Homework: to encourage students to apply the prevention program throughout their lives
- Role playing: to teach students to deal with adverse comments about shape and weight

- Practical activities and group discussions: Every meeting included one or more practical activities on educational topics presented in the first part of the lesson and an open group discussion.

The program was designed to also include male students. We believe that, even if the vast majority of the subjects with eating disorders are females, it is important to educate males as to what is happening in society and what they could do to help a friend or another person affected by these disorders. Males, moreover, can play a significant role in reducing the social pressures on women to be thin and beautiful—pressures that promote body dissatisfaction, restrictive diets, and other factors implicated in the development of eating disorders in normal weight subjects.

Statistical Analysis

ANOVA for repeated measures was used to study the impact of the prevention program on the following measures: Body Mass Index (BMI), EAT, EDE-Q, RSES, and KQ. Groups (experimental and control groups) and sex were considered as factors among the participants. Baseline BMI was used as covariate in the model.

Correlational analysis was used to compare the variations of KQ from baseline with the variations of EAT, RSES, and EDEQ.

RESULTS

The Sample

Baseline data were collected on 106 subjects (61 females and 45 males). Their mean age was 11.6 (\pm 1.2) years and the average BMI was 18.3 (\pm 3.3). The prevalent social classes were in the lower (54.7%) and middle (45.3%) classes, while none of the subjects belonged to the upper social class. The participation rate at the four assessment points were as follows: at baseline 100% (n = 106), after the intervention 98.1% (n = 104), at six-month follow-up 97.2% (n = 103), at one year follow-up 98.1% (n = 104). None of the subjects refused to participate in the follow-up stages and all subjects were present for assessment. At baseline, there were no significant differences between the two groups (experimental and control groups) as far as most of the dependent variables were concerned. The only significant differences observed between the two groups were on the scores of KQ, EAT, and Eating Concern EDE-Q (see below).

Effects of Intervention

The analysis of KQ shows a main effect of time [$F(3,282) = 93.15$; $p < .01$], of group [$F(1,93) = 13.94$; $p < .01$] and an interaction time per group [$F(3,282)$

= 31.96; $p < .01$). Although the control group had a better knowledge than the experimental group at the baseline [$F(1, 90) = 5.09$; $p < .05$], the experimental group performed consistently better during the follow-up assessments. The significant effect of sex [$F(1,93) = 4.82$; $p < .05$], indicates that girls show a higher knowledge on eating disorders and related topics.

The variable EAT shows a main effect of time [$F(3,252) = 6.04$; $p < .01$], due to decreasing scores for both groups along all the assessments, and a significant effect of group [$F(1,83) = 6.14$; $p < .05$] as the scores of the experimental group were higher than the control group in all the assessments. Contrast analysis shows that the experimental group had significantly higher scores than the control group at the baseline [$F(1,89) = 5.02$; $p < .05$]. The experimental group scores decreased significantly after the prevention program [$F(1,84) = 13.21$; $p < .01$] but at the follow up they partially recovered, restoring the gap between the two groups (see Table 1).

Correlation analyses conducted between the variation from the baseline of the KQ scores and of the EAT scores are all negative but not significant. Interestingly, the correlation between the increase in the KQ scores after the prevention program and the decrease in the EAT scores at 6-month follow-up from the baseline, is almost significant [$r = -0.19$; $p = .055$]. Significant effect of time for the Global EDE-Q [$F(3,258) = 3.26$; $p < .05$] is determined by decreasing scores along time for both groups. Among the sub-scales, only Eating Concern EDE-Q shows a significant interaction time per group [$F(3,258) = 3.69$; $p < .05$], although entirely determined by lowering scores after the program for the experimental group [$F(1,86) = 7.44$; $p < .01$] which at baseline

TABLE 1. Mean scores on the outcome measures before and after the program, and at 6- and 12-month follow-up

		Before		After		6-month follow-up		12-month follow-up	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
KQ	C	17.21	3.63	17.82	4.27	20.16	4.46	20.04	4.05
	E	15.62	3.58	22.39	3.23	23.11	3.20	23.32	2.77
EAT total	C	6.82	6.26	5.53	5.95	4.64	4.65	4.18	4.68
	E	10.52	8.72	6.25	5.85	6.76	6.39	6.35	5.23
Global EDE-Q	C	0.46	.75	0.39	0.57	0.34	0.64	0.26	0.48
	E	0.75	0.87	0.54	0.73	0.62	0.83	0.53	0.83
Restraint EDE-Q	C	0.51	0.97	0.25	0.59	0.27	0.56	0.23	0.56
	E	0.64	1.11	0.38	1.00	0.45	1.06	0.41	0.96
Eating Concern EDE-Q	C	0.30	0.53	0.31	0.47	0.24	0.49	0.14	0.24
	E	0.64	1.11	0.38	1.00	0.45	1.06	0.41	0.96
Shape Concern EDE-Q	C	0.57	0.96	0.52	0.77	0.47	1.00	0.37	0.73
	E	0.91	1.12	0.62	0.88	0.85	1.20	0.69	1.13
Weight Concern EDE-Q	C	0.48	0.77	0.51	0.77	0.41	0.79	0.32	0.57
	E	0.81	0.95	0.76	0.79	0.84	1.00	0.75	1.02
RSE	C	32.08	6.25	34.19	4.60	33.60	4.76	35.00	4.67
	E	32.16	5.28	34.5	4.57	33.66	4.37	34.19	4.98

Note: KQ = Knowledge Questionnaire; EAT = Eating Attitudes Test; EDE-Q = Eating Disorder Examination Questionnaire; RSE = Rosenberg Self-Esteem; C = Control Group; E = Prevention Group
Significant differences are reported in text.

were significantly higher than the control group ones [$F(1,85) = 7,49$; $p < .01$]. RSE shows only a main effect of time [$F(3,246) = 6.62$; $p < 0,01$] without significant differences between the two groups.

DISCUSSION

The results of this pilot control study suggest that our school-based eating prevention program is not necessarily counter-productive and did not encourage dietary restraint or other unhealthy attitudes towards eating and weight regulation. Furthermore, the results suggest that this program may have been useful since it led to both an increase in knowledge and a decrease in some attitudes that were maintained at 12-month follow-up. The increase in knowledge was cited in many of the previously published works with regards to school-based primary prevention programs for eating disorders (Killen et al., 1993; Moreno & Thelen, 1993; Moriarty et al., 1990; Paxton, 1993; Rosen, 1989; Shisslak et al., 1990), however, none of these studies demonstrated changes in eating behavior after their intervention. The significant reduction observed in the experimental group on the Eating Concern EDE-Q is an interesting finding that can provide a healthy optimism in the field of eating disorders prevention.

The significant reduction observed on the EAT and global EDE-Q scores in both the experimental and control group merits a brief comment. The general aim of the prevention program was to create a counter-culture in which the pupils helped each other to discourage dieting and to challenge media messages about thinness and beauty. Although at the time of writing we have no data to support our hypothesis, we think the students in the experimental condition have influenced positively the attitudes of the control group students. The almost significant negative correlation we found between the increase in knowledge after the prevention program and the EAT scores at 6-month follow-up merit some speculations. It seems that the increase of knowledge in this young sample of students was unable to trigger an immediate effect on attitudes, but rather a delayed positive effect. This result, if confirmed, suggests that improving the knowledge in 11–12 year-old students can potentially modify some attitudes later in the life of these participants.

Our study did not find significant changes on the levels of restraint, shape and weight concern, and self-esteem. Therefore, a more intensive intervention seems necessary to modify these attitudes. However, after examining the statistical data, we found that at this young age (11–12 years) very few students were engaging in weight control behavior or evidenced significant eating disturbances. Therefore, it was very difficult to statistically achieve significant decreases in the behavior and attitudes. A better way to evaluate the efficacy of a primary prevention program in this young sample would be to follow them through their high school years to determine the

long-term effects of program participation (Phelps, Dempsey, Sapia, & Nelson, 1999).

This was a pilot study, which has certain limitations. First of all, the number of participants was small. It is impossible to generalize from these results. A replication with a larger sample is required and is currently taking place. Second, the study is based on self-report assessment questionnaires; these instruments are not the ideal way to assess eating disorders features since they tend to overestimate psychopathology (Fairburn & Beglin, 1994). However, it is difficult to avoid their use in studies of this type. Third, the experimental group, despite the randomization, had more pathological eating attitudes compared to the control group. It is difficult to determine why these differences occurred. We speculate that dieting and other weight control strategies can lead to behaviors with a high rate of imitation among adolescents. Lastly, the study was conducted in the same school and it is highly possible that the experimental group could have influenced the control group. However, this influence, if it did occur, has had a positive effect (significant reduction of EAT and Global EDE-Q scores in the control group).

The study had three particular methodological strengths. First, the response rate was high: complete data were available on 97% of the subjects. This is important since studies with low response rate are maybe subject to bias. In fact, it has been observed that eating disorders are overestimated among nonrespondents to eating disorders surveys (Beglin & Fairburn, 1992). Second, the program has included some elements, for example, friendly way of cognitive restructuring and homework, which can explain the unexpected changes found in EAT and Eating Concern EDE-Q scores. Third, the program included two booster sessions after six months. Unfortunately, the results of this study do not allow us to infer causality between the 12-month follow-up outcome and the execution of the booster sessions. Nevertheless, our impression is that regular booster sessions could be a inexpensive way to maintain through time the improvement in knowledge and attitudinal changes that can be obtained by a short primary prevention program.

In conclusion, our results show that a school-based program can improve knowledge and some attitudes in young adolescent students. However, the limitations of the study do not permit us reach a definitive conclusion with regards to the efficacy of our program. Further research with a larger sample, a longer period of follow-up, and different outcome measure are required.

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