Weight Loss Competitions at the Work Site: Impact on Weight, Morale and Cost-Effectiveness

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Abstract: Three weight loss competitions were held in business/industrial settings. One competition was between three banks; the other two were within industries, either between employee teams selected at random or between divisions of the industry. Attrition in the competitions was less than 1 per cent and weight loss averaged 5.5 kg. Both employees and management reported positive changes in morale and employee/management relations, and both considered the competition important to the success of the program. The cost-effectiveness ratio ($2.93 per 1 per cent reduction in percentage overweight) is the best yet reported. (*Am J Public Health* 1984; 74:1283–1285.)

Health promotion at the work site has potential for improving public health,[1-2] but in the weight control area, programs have not transferred well from clinical to work settings; the typical worksite program reports nearly double the attrition and half the weight loss found for similar programs in the clinic.[3-7] One way to improve these results may be to introduce health promotion competitions to enhance motivation and social support. This paper describes the use of weight loss competitions in three work settings.

Methods

Three separate competitions were held in Lycoming County, an area of 119,000 population in north central Pennsylvania. Employees in all participating industries were invited to participate. Subjects less than 10 per cent overweight were excluded from the main analyses.

Competition 1 (Three Banks)—A challenge for competition was issued by the presidents of three banks* with a total of 570 employees. In the three banks, 176 employees (31 per cent of the work force) participated in the 12-week program; 112 persons were more than 10 per cent overweight.

Competition 2 (Litton)—Fifty-three of 225 employees of a manufacturing firm (Litton Industries) participated in the 13-week program. The participants were assigned randomly to one of three teams within the industry.

Competition 3 (Koppers)—Forty-eight of the 1,200 employees of Koppers Industries, a manufacturing firm, participated in a 15-week program. They were assigned to three teams based on work in one of seven divisions in the company (employees in a division were on the same team).

Each participant was given a weight loss goal (weight/ideal weight), with a 20-pound (9.1 kg) maximum. To discourage crash dieting, any loss greater than a person's goal was not counted. We observed no cases where subjects used dangerous means to lose weight quickly. The winner of each competition was the team that achieved the greatest percentage of its goal (the sum of individual's weight goals). Each participant paid $5 and the pool of money in each competition was awarded to the winning team.

Participants were weighed weekly by a member of the research team who was not connected with industry. At each weigh-in, the participants received an installment of a behavioral treatment manual[8] which emphasized self-monitoring, stimulus control, slowing eating, reinforcement, social support, attitude change, nutrition, and exercise. A large board (4 × 5 ft) was placed in a prominent location in each workplace to show the weekly progress of each team. The boards provided weekly feedback and acted as incentives. Employees and management completed a post-program questionnaire to rate several aspects of the program. They rated changes on five-point scales in morale, energy level, employee-management relations, absenteeism, and work performance.

Results were analyzed using analyses of variance and covariance with initial weight as the covariate. Chi square analyses were used to evaluate questionnaire responses and correlations were used to test for associations between weight change and questionnaire responses. The covariance analyses yielded the same pattern of results as the analyses of variance, so the numbers presented hereafter are the unadjusted means. There were no differences in initial weight or initial percentage overweight between the teams within any competition (Table 1).

Results

Weight Loss and Attrition

Only one person of the 213 in the three competitions dropped out, an attrition rate of 0.5 per cent. The mean weight loss for the three competitions was 5.5 kg and the mean change in percentage overweight was 9.1 per cent. The changes by sex and site are presented in Table 1. Both men and women showed significant losses, but men were more successful than women in each competition; in the first competition, men had greater weight loss (8.5 kg vs 5 kg, $p < .0001$) and percentage of goal achieved (11.8 per cent vs 8.9 per cent, $p < .0001$). A six-month follow-up was done on 94 of the 122 participants in the bank competition. The mean weight loss at that time was 4.7 kg (6.3 kg for men and 3.2 kg for women). The average person maintained 80 per cent of the weight lost during the program.

Persons who were less than 10 per cent overweight were excluded from the analyses presented above. Nevertheless, this group ($n = 75$) comprised 26 per cent of the total participants. Their mean loss was 3 kg (mean goal for this group was 2.8 kg). Seventy-four per cent reached their goal weights.

Ratings by Employees and Management

All employees rated improvement or no change in all

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TABLE 1—Mean Initial Values and Changes in Men and Women in the Three Weight Loss Competitions

Groups	N	Age (yrs)	Initial Weight (kg)	Initial % Overweight	Weight Change (kg)	Change in % Overweight
Bank Competition						
Male	29	36.7	92.2	28.4	−8.5	−11.8
Female	83	35.3	75.6	33.7	−5.0	−8.9
Total	112	35.7	79.9	32.3	−6.0	−9.7
Litton Competition						
Male	18	43.7	91.9	34.2	−6.3	−9.3
Female	35	47.2	70.9	32.3	−4.9	−8.9
Total	53	46.0	78.0	32.9	−5.4	−9.0
Koppers Competition						
Male	31	39.4	88.3	41.9	−4.8	−8.0
Female	17	35.9	73.9	38.7	−4.0	−7.5
Total	48	38.2	83.2	40.8	−4.5	−7.8
Overall Totals	213	38.8	80.2	34.4	−5.5	−9.1

work-related factors; the largest change was in morale (Figure 1). All five components of the program (weekly weigh-in, team support, lobby scoreboard, prize, and competition) were rated as beneficial by at least 50 per cent of the employees; the highest ratings were for the weekly weigh-in ($\bar{X}$ = 96 per cent), team support ($\bar{X}$ = 86 per cent), and the competition ($\bar{X}$ = 87 per cent). Sixty-two per cent of the employees rated this program as more successful than their previous attempts to lose weight.

All eight of the top managers in the bank competition reported that the program was a positive event in their work place and that they would recommend a similar program to managers in other settings. The percentages of managers reporting improvement among their employees were 100 per cent for health attitudes, 75 per cent for morale, 63 per cent for employee health, 59 per cent for employee-management relations, and 25 per cent for both work performance and absenteeism. None reported negative changes. Managers rated team support, competition, and the weekly weigh-in as the most important parts of the program. At the six-month follow-up, all managers said they would support holding another competition.

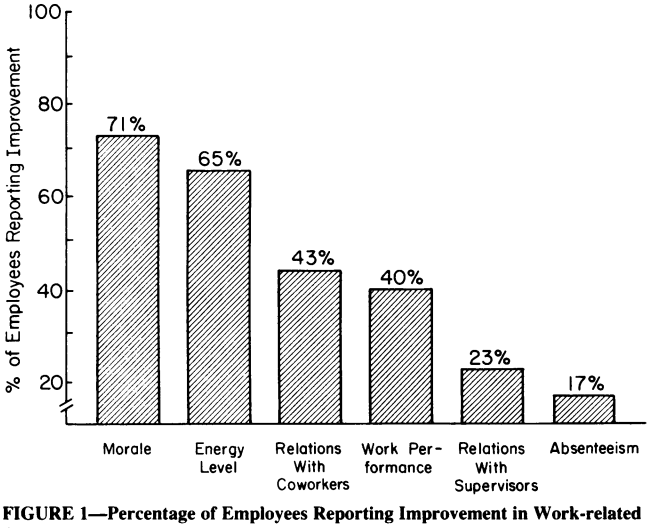

FIGURE 1—Percentage of Employees Reporting Improvement in Work-related Areas.

All employees who did not report improvement in an area listed "no change" as a response.

Eighty-five per cent of the employees and 100 per cent of the managers felt that the involvement of top management was important to the program's success. The ratings of management involvement were lowest in the competition with the smallest weight losses (Koppers). Within the bank competition, the bank with the lowest ratings of management involvement also had the smallest losses.

Cost-Effectiveness

The costs for each competition were calculated[9-11] to include personnel time for management and employees and for program staff to organize and supervise the program, along with small costs for materials. The cost per kilogram lost was $4.87, but since organizational expenses decreased for the second and third competitions, their costs per kilogram lost were $2.56 and $1.88. The costs for this program are compared to those from other clinical and work site programs in Figure 2. The cost-effectiveness ratio was greatest for the competition approach.

Discussion

The results of these health promotion competitions are encouraging. The drop-out rate was less than 1 per cent and

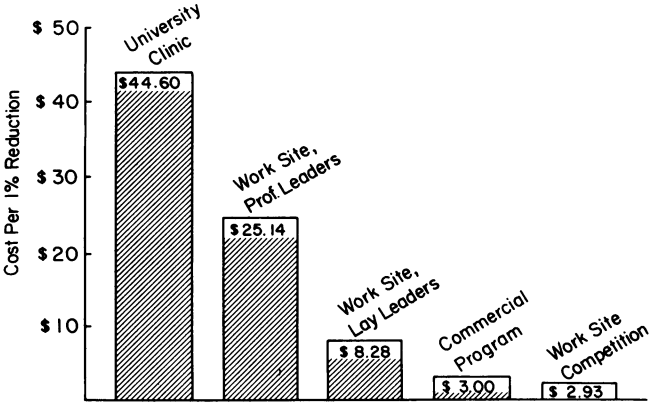

FIGURE 2—The cost per 1% reduction in percentage overweight for different weight loss programs.

Estimates were obtained for a university clinic (Stanford Eating Disorders Program) and for a commercial group from Yates,[11] and for the work site programs with professional and lay leaders from Brownell, *et al.*[4]

the mean weight loss was 5.5 kg. This stands in contrast to the consistently modest effects of other programs.[3-7] The approach worked well in both business and industrial settings, in work sites ranging in size from 150 to 1,200 employees, and in competitions held between and within businesses. Ratings of the program were favorable from both management and employees. All the managers said they would recommend the program in other business settings and would support another program in their own work sites.

The competitions had a favorable cost-effectiveness ratio compared to other programs reported in the literature. The cost of $2.93 per 1 per cent reduction in percentage overweight is better than those for other work site programs, a university clinic, and a commercial program (Figure 2). Furthermore, the ratio was even lower in the second and third competitions, after the initial planning and start-up.

These results raise interesting questions about the relative importance of education and motivation. Most health promotion programs focus on education and the provision of classes or facilities. This may be neither necessary nor sufficient. The competitions produced positive results with a less intensive program than used in other programs, presumably because of the increased motivation and social support. This view is supported by ratings of employees and management. These issues need to be studied in more detail, and more research is needed to define the effectiveness and limitations of this approach to other areas of health promotion.

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Foundation Seeks Applications for Dental Scholars Program

The Robert Wood Johnson Foundation is accepting applications for the 1985–86 class of Dental Services Research Scholars, a fellowship program for dental faculty seeking the skills required to undertake research in the financing, organization, and delivery of dental health services in the United States.

As many as five, two-year fellowships will be offered in this final round of the three-year program. The fellowships—offered at Harvard University and the University of California, Los Angeles—will emphasize the development of research skills in such areas as health services organization and management, economics and finance, epidemiology, and policy analysis.

Scholars will also receive appointments as visiting faculty members and annual stipends up to a maximum of $40,000 in addition to fringe benefits. The stipends and benefits will be financed by the Foundation through grants to the Scholars' home institutions.

The program is administered by Raymond P. White, Jr., DDS, PhD, a senior program consultant of the Foundation and professor of oral and maxillofacial surgery at the University of North Carolina, Chapel Hill.

The deadline for applications for the 1985–86 fellowships is November 1, 1984. Selected candidates will be interviewed and recommended by an advisory committee chaired by John A. DiBiaggio, DDS, president of the University of Connecticut. Appointments will be made by February 1985.

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