

The PATHWAYS Church-Based Weight Loss Program for Urban African-American Women at Risk for Diabetes

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OBJECTIVE — This study was carried out to test the effectiveness of PATHWAYS, a weight loss program designed specifically for urban African-American women, when administered in urban churches by trained lay facilitators.

RESEARCH DESIGN AND METHODS — Thirty-nine obese women were recruited from three urban African-American churches. After randomization and the collection of baseline data on weight and lifestyle practices, subjects in the experimental group ($n = 19$) were assigned to receive a 14-week weight loss program (PATHWAYS) conducted by trained lay volunteers; control group subjects ($n = 20$) were put on a waiting list to receive the program at the conclusion of the study period.

RESULTS — Of the 39 women enrolled, 15 experimental group subjects and 18 control group subjects were available for posttreatment data collection. After completing the program, PATHWAYS participants lost an average of 10.0 lb, and the control group subjects gained an average of 1.9 lb. Posttreatment difference in weight loss between the groups was statistically significant ($P < 0.0001$). Waist circumference among PATHWAYS participants decreased 2.5 inches, while waist circumference among control group subjects remained relatively the same. This difference between the groups was statistically significant ($P < 0.05$).

CONCLUSIONS — A weight loss program administered by trained lay volunteers was effective in producing significant and clinically meaningful weight loss among African-American women who often do not benefit from typical weight loss programs. Ongoing research is focusing on whether the weight loss can be maintained or enhanced through monthly reinforcement sessions.

Obesity, a major risk factor for diabetes and other chronic conditions, is of epidemic proportion among black women. According to the National Center for Health Statistics, 48% of African-American women between the ages of 20 and 74 are overweight, compared with 32% of white women of the same age-group (1). Although as many black women as white women report that they are dieting to lose weight (2), fewer black women enroll in weight loss programs (3). Further, when African-American women enroll in weight loss programs, they appear less likely to benefit than white women. For example, in

two major national weight loss initiatives, white women lost more weight than black women (4). This differential response in weight loss has been attributed to the lack of sociocultural relevance of weight loss programs to the needs of black women (5,6).

The PATHWAYS program consists of 14 sessions conducted on a weekly basis for 1.5 h each. It is administered in a small group format with almost all content delivered via guided learning activities and small group instruction. Very little lecturing is done. Rather, group leaders assist and facilitate the completion of learning activities. The PATHWAYS weight loss program

was developed specifically to address behavioral and sociocultural issues related to urban African-American women. A number of behavioral and sociocultural factors have been suggested that mediate obesity in minority women, such as poverty and limited access to health-related services (7), poor understanding of the diet-health relationship (8), differences in dietary practices (9,10), and different social norms and perceptions of obesity (11,12). In developing the PATHWAYS program, we used information from the literature as well as focus groups we conducted with African-American women in our community (13) so that the program would be particularly suited to African-American women. PATHWAYS encourages weight loss but not "slenderness." Because a large body size may be more acceptable in the African-American culture, the program uses health benefits and general well-being as the motivation for weight loss rather than improved physical appearance (11,12). In all program material, PATHWAYS makes extensive use of ethnic foods and food combinations, as well as stressing inner city lifestyle issues. In addition, PATHWAYS makes use of discovery learning in which participants identify their own dietary problems and, with the assistance of group facilitators and their peer group, arrive at personally relevant solutions to overcome these problems (6,14). For example, participants are given small hand-held calculators and are taught to use them, along with a simplified food guide, to analyze their own dietary practices. In one activity, for instance, participants use the calculators and food guide to identify specific foods in their diet that are particularly high in fat. Using information gained from these exercises, participants are able to develop their own plans for changing their diets to lower the amount of dietary fat they consume. For many participants, this is their first experience in analyzing their own eating practices. Because participants set their own goals based on their own self-assessments, several African-American women who participated in the program reported that their successful weight loss was largely due to their being treated as

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Abbreviations: FBC, Food Behavior Checklist.

adults in the learning process (6). The dietary changes promoted by the program included reducing intake of dietary fat while increasing intake of dietary fiber. Changes were to be made gradually over time to avoid excessive caloric restrictions. By following the PATHWAYS program, it was expected that participants could lose from 0.5 to 1 lb per week. An exercise regimen of walking was an integral part of the program.

Preliminary studies of the PATHWAYS program had demonstrated its effectiveness in promoting weight loss among African-American women with diabetes when administered in a hospital-based clinical setting (14). However, in our hospital-based clinic environment, we were able to identify only a limited number of patients who would agree to come to the hospital to participate in the weight loss program. We felt that a community-based program would reach a wider group of participants. Further, we elected to deliver the program in urban African-American churches and to have it administered by lay health educators. There were several reasons for these decisions, all largely drawn from the literature (15–21). We reasoned that a church-based weight loss program would attract a broader group of participants than a clinic-based setting where the majority of participants are drawn from the patient population. Participation might be further enhanced by holding sessions in participants' own churches where they are accustomed to going on a weekly basis, rather than in a clinic where they generally go only when ill. Churches provide a ready source of fellowship and a stable peer group that can be effective in supporting health-related behavior change (15–19). Because of the evidence that preventive health programs conducted in churches by church members are effective in overcoming some of the barriers encountered when programs are administered in medical settings (20,21), PATHWAYS was designed to be administered by lay facilitators who would assume major responsibility for recruiting participants and conducting the sessions in their churches.

To determine whether the results of our clinic-based program could be translated to a community setting, the program was pilot tested in an inner-city African-American church. The sessions were led by a research dietitian assisted by a lay educator who was a church member. A total of nine women enrolled, seven of whom provided posttreatment data after completing the program. These seven subjects lost an

Table 1—Baseline demographic characteristics of randomized subjects by group

Characteristic	Experimental group	Control group	P value
n	19	20	—
Age (mean years \pm SD)	56.5 \pm 14.5	56.6 \pm 13.0	0.98
Married (%)	47	60	0.43
Employed (%)	58	50	0.62
Family history of diabetes (%)	58	45	0.42
Education less than high school (%)	11	15	0.68

average of 9.1 lb (range -3 to -20 lb), which was comparable to the weight loss attained in the earlier clinic-based study. The study described here builds on this previous research. To broaden the program's applicability for community use, PATHWAYS was revised to make it suitable for women at risk for diabetes by removing discussions of diabetes-related issues, such as diabetes medication and self-monitoring of blood glucose.

RESEARCH DESIGN AND METHODS

Subjects

Subjects were recruited from the membership of three urban African-American churches that had participated in a Health and Wellness Screening conducted by the investigators. Enrollment criteria for subjects in each church included being an African-American female with a BMI between 30 and 45 kg/m² and no known physical limitations that would prevent moderate exercise. Further, participants had to agree to accept random assignment to either the treatment group, which would receive PATHWAYS immediately, or to a "waiting list" control group, which would receive the program after posttreatment data on the 14-week core PATHWAYS program were collected on both groups. Of 47 women interviewed, 39 met the eligibility requirements and were randomized into the study. Of the subjects, 19 were enrolled in the experimental group and 20 in the control group. Baseline characteristics of these 39 subjects are shown in Table 1. No significant differences on demographic variables were noted between groups at baseline.

Data collection

Data were collected at baseline and 1 week after the 14-week core PATHWAYS program was administered (~ 4 months after enrollment). At each data collection point,

subjects without shoes in light clothing were weighed on a balance beam scale; height was obtained using the measuring rod of the balance beam scale and having subjects stand erect with heels together. Waist circumference was measured by a plastic tape placed tautly on the skin 1 in above the umbilicus, using a widely accepted protocol (22). Weight and waist measures were obtained by trained project staff who were blinded to group assignment of participants. Participants also completed a series of questionnaires regarding eating behavior. The Food Behavior Checklist (FBC) (23) was administered to assess the degree to which common high-fat and high-fiber foods were consumed. Designed to monitor dietary changes in intervention research, the FBC has been shown to provide a valid index of fat and fiber intake when compared with information collected during a professionally administered 24-h dietary recall (23); similar psychometric data have been obtained on the FBC when used with minority subjects (D. Hare-Joshu, personal communication).

The PATHWAYS Weight Loss Behavior Index was administered to measure behaviors and attitudes associated with successful weight loss. The index consists of 56 statements to which subjects respond either "not true of me," "somewhat true of me," or "very true of me." Three separate scores are derived from the instrument: 1) positive weight loss behavior score provides an index of the degree to which subjects engage in 21 different behaviors that are known to promote weight loss, 2) negative weight loss behavior score provides an index of the degree to which subjects engage in 21 behaviors that are counterproductive to successful weight loss, and 3) motivation for weight loss score consists of 14 statements pertaining to personal beliefs and attitudes that influence weight loss efforts. Each score on the index is expressed as the percentage of the total score possible

Table 2—Mean and change in body weight, BMI, and waist circumference at baseline and at posttreatment by group

	n	Baseline	Posttreatment	Change
Body weight (lb)				
Experimental group	15	199.0 ± 29.06	189.0 ± 27.69	-10.0 ± 10.28
Control group	18	196.9 ± 25.74	198.8 ± 27.32	1.9 ± 4.25
BMI (kg/m ²)				
Experimental group	15	33.9 ± 5.07	32.5 ± 5.41	-1.4 ± 1.61
Control group	18	33.1 ± 3.70	33.7 ± 4.07	0.6 ± 0.73
Waist circumference (inches)				
Experimental group	12	38.2 ± 3.62	35.7 ± 4.46	-2.5 ± 2.39
Control group	16	37.7 ± 3.75	37.3 ± 3.68	-0.4 ± 1.84

Data are means ± SD. At posttreatment, the experimental and control groups were significantly different in changes in body weight ($P < 0.0001$), BMI ($P < 0.0001$), and waist circumference ($P < 0.02$).

if all items were fully endorsed. Reliability (internal consistency) for each of the three subtest scores in the index exceeded 0.60 (Cronbach's alpha). Exercise behavior was assessed by asking subjects the frequency and duration with which they had exercised during the previous 7 days, as well as specifically what they did for exercise.

Training of group facilitators

At each of the three churches, a site coordinator and two lay facilitators (church members with some health education experience) were trained to conduct the PATHWAYS program in their respective churches. Investigators provided church volunteers with an initial 9 h of training in which volunteers were introduced to the structure and process of the PATHWAYS program, provided with instruction in group facilitation, and given opportunity to conduct three of the program sessions. Ongoing training continued throughout the first round of the PATHWAYS program, with research staff attending each session and providing feedback to facilitators on both the content and style of their presentations. At feedback sessions, facilitators were particularly instructed on how to help participants set and monitor reasonable behavior change goals.

Administering the PATHWAYS program

For subjects in the experimental group, small group sessions were held weekly for 14 weeks in each of the three churches. Following the PATHWAYS protocol, facilitators assisted subjects in the experimental group in setting weekly behavior change goals for themselves related to eating behavior, which were individualized to each par-

ticipant and related to the specific content of each weekly session. Led by group facilitators, subjects discussed their progress in meeting their goals in the session that followed. Group problem-solving techniques were used to help participants identify and overcome obstacles they had encountered in achieving their goals. In addition to making changes in their eating behavior, PATHWAYS subjects were instructed to begin an at-home exercise program, generally consisting of recreational walking.

Statistical analysis

Change scores were calculated as the difference between baseline and posttreatment values for each subject. Subjects with missing data at posttreatment were excluded from that analysis. Between-group differences on baseline characteristics and change scores were analyzed using *t* tests for independent samples, χ^2 , and Mann-Whitney *U* when appropriate. A *P*

value of 0.05 was considered significant. Results are presented as observed means and standard deviations.

RESULTS

Of the 39 women randomized into the study, 33 provided posttreatment data. Two subjects dropped out of the control group and four dropped out of the experimental group, two of whom did not attend any PATHWAYS sessions. For outcome data, independent sample *t* tests were used to compare change scores between groups. As shown in Table 2, after the completion of the 14-week core program, PATHWAYS participants lost an average of 5% of their body weight (-10.0 lb), while control group subjects gained an average of 1% of their body weight (+1.9 lb). The mean difference in weight loss between groups after the completion of the sessions was -11.9 lb, which was statistically significant; $t(31) = -4.49, P < 0.0001$. (An intent-to-treat analysis, in which the four dropouts in the experimental group were assigned a weight gain consistent with that seen in the control subjects [+1.9 lb] and the two dropouts in the control group were assigned no weight gain, yielded similar conclusions: $t[37] = -3.69, P < 0.001$.) Weight change by group is plotted in Fig. 1. BMI decreased in PATHWAYS subjects from 33.9 ± 5.1 at baseline to 32.5 ± 5.4 at posttreatment (change = -1.4); BMI in the control group subjects increased from 33.1 ± 3.7 at baseline to 33.7 ± 4.1 at posttreatment (change = +0.6). There was a statistically significant difference between groups in changes in BMI from baseline to follow-up; $t(31) = -4.69, P < 0.0001$.

In addition to the primary outcome measures of weight and BMI, several sec-

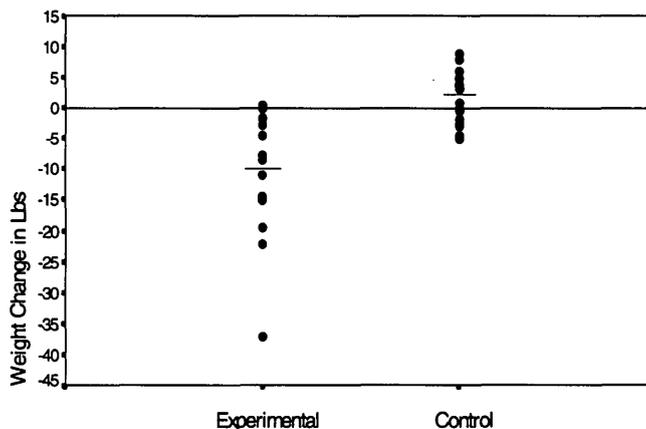
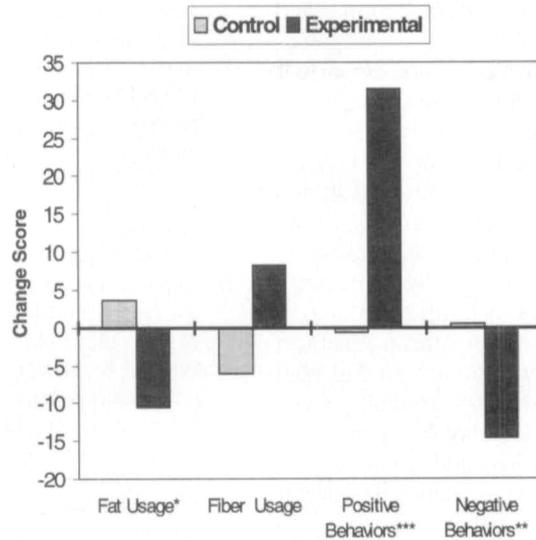


Figure 1—Plots of weight change by group.



*p<.05, **p<.01, ***p<.001

Figure 2—Changes in self-reported eating behaviors for experimental and control group subjects.

ondary measures of program impact were obtained. Twelve of the experimental group subjects and 16 of the control group subjects completed both baseline and post-treatment measures of waist circumference, eating behavior, and exercise behavior. Waist circumference among PATHWAYS participants who provided data decreased 2.5 inches (from 38.2 inches at baseline to 35.7 inches at posttreatment); waist circumference among control group subjects remained relatively the same (37.7 inches at baseline to 37.3 inches at posttreatment). Differences between the two groups on waist circumference changes were statistically significant; $t(26) = -2.59, P < 0.02$.

At posttreatment, the groups were significantly different with respect to changes in self-reported eating behavior (Fig. 2). PATHWAYS subjects reported a decrease in the amount of high-fat foods eaten at posttreatment over baseline, while control group subjects increased the number of high-fat foods eaten. The difference in change scores between the groups was statistically significant; $t(26) = -2.51, P < 0.05$. The PATHWAYS group also reported an increase in the amount of common high-fiber foods eaten, while control group subjects reported a decrease; however, the between-group difference in change scores was not statistically significant. On the PATHWAYS Weight Loss Behavior Index, PATHWAYS subjects reported an increase in the number of positive eating behaviors and a decrease in the number of negative eating

behaviors, while control group subjects reported little or no change in either; $t(26) = 6.88, P < 0.001$; $t(26) = -3.53, P < 0.002$.

At baseline, exercise averaged 5.0 ± 17.3 min/week for experimental group subjects and 23.8 ± 36.7 min/week for control group subjects. These differences between groups, though large, were not statistically significant at baseline, owing to the large variability in baseline exercise levels between subjects in the control group. At posttreatment, experimental group subjects had increased their weekly minutes of

exercise by an average of 36.7 ± 42.5 min, while control group subjects increased their weekly minutes of exercise by an average of 21.3 ± 22.5 min. Because of the skewed distribution, a nonparametric test (Mann-Whitney) was used to analyze changes in minutes of exercise between groups; the changes in weekly minutes of exercise did not differ significantly between groups. Even with the exclusion of outliers, the between-group differences in change in exercise levels were not significant.

We also examined program attendance to determine its effect on weight loss among experimental group subjects. The mean number of sessions attended by the experimental group subjects was 10, and 75% of the subjects attended 9 or more of the 14 sessions. Subjects who attended 75% or more of the program sessions lost an average of 12.5 ± 12.2 lb, while subjects who attended <75% of the sessions lost an average of 6.2 ± 5.4 lb. However, this difference in weight loss was not statistically significant.

CONCLUSIONS — Because clinic-based programs may not reach minorities and may not be successful with those they do reach (3,24), programs that are community based have become increasingly popular as a means of delivering health education programs to minorities (25). Along with this trend is the practice of making use of educators who are members of the community in which the intervention is delivered (26–28). In this study, the

Table 3—Summary of published behavioral weight loss programs for African-American women

Investigators	Duration of intervention (weeks)	Posttreatment weight loss (lb)
Controlled studies		
Stevens et al., 1993 (29)	14	-3.1
McNabb et al., 1993 (14)	18	-9.0
Domel et al., 1992 (30)	11	-3.1
Hypertension Prevention Trial Research Group, 1990 (31)	12	-5.7
Holm et al., 1983 (32)	12	-3.7
Uncontrolled studies		
Kanders et al., 1994 (33)	10	-6.5
Kumanyika and Charleston, 1992 (34)	8	-6.0
Pleas, 1988 (35)	12	-8.4
Sullivan and Carter, 1985 (36)	8	-0.4
Wassertheil-Smoller et al., 1985 (37)	8	-3.7
Kaul et al., 1979 (38)	7	-4.2

Controlled studies included either a randomized control group or a matched comparison group.

PATHWAYS weight loss program, which was developed for urban African-American women, was conducted by trained lay volunteers in three urban church-based settings. During the study period, participants in the PATHWAYS program lost an average of 5% of their body weight, while control group subjects experienced modest weight gains. At posttreatment, subjects in the experimental group reported eating fewer high-fat foods and engaging in more positive lifestyle behaviors associated with weight loss than subjects in the control group. Meaningful weight loss was obtained without placing subjects on very low calorie diets but by permitting them to reduce their own caloric intake gradually over time.

Apart from reaching a wider audience, administering the program in a community-based setting did not lead to any observable differences in outcomes compared with those obtained in the clinic administration. We consider this to support the value of community-based preventive health programs. It should be noted that it was not our specific intent in this investigation to compare directly the two different approaches to program implementation—that would require random assignment of participants to either a clinic-based program or a community-based program. Rather, our intent was to determine whether the PATHWAYS approach could be effectively translated in a community setting. Not only were the results similar without regard to site of administration, even more importantly, the results were obtained by lay facilitators rather than professional staff. This supports the value of the PATHWAYS program itself and the “active-learning” mode of delivery. In the implementation of the program, facilitators guide participants through structured self-directed learning activities. The content and delivery remain constant, regardless of setting or type of facilitator. It is important to note that the results were achieved through the use of a highly structured program that included carefully designed scripts for group facilitators and culturally appropriate self-directed learning activities for participants. The training of community educators to conduct the program was also highly structured and included on-site supervision and support by research staff.

The weight loss observed in this study (−10.0 lb) is comparable to or greater than that reported in other behavioral weight loss programs with black women. As shown in Table 3, of the five weight loss studies

(14,29–32) that involved black women and included a control or comparison group, the average weight loss ranged from −3.1 to −9.0 lb, with the greatest weight loss (i.e., −9.0 lb) obtained through the clinic-based administration of the PATHWAYS program (14). Of the uncontrolled studies (33–38), average weight loss ranged from −0.4 to −8.4 lb. Our results were quite similar to those obtained by Kumanyika and Charleston (34), who also conducted a weight loss program in African-American churches. Their program achieved a −6.0 lb weight loss and was delivered by registered dietitians. PATHWAYS achieved a −10.0 lb weight loss and, more importantly, was delivered by trained lay facilitators in their own churches.

Whether the weight loss observed can be maintained or enhanced through a longer follow-up period is the focus of ongoing research. Because studies have shown that African-American women may be less likely to stay with a diet plan (39), current plans are to continue monthly PATHWAYS sessions for 1 year to provide ongoing treatment in an effort to sustain or enhance the level of weight loss observed in the preliminary phase of the study.

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