Trial of Family and Friend Support for Weight Loss in African American Adults

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Background: Family and friend participation may provide culturally salient social support for weight loss in African American adults.

Methods: SHARE (Supporting Healthy Activity and eating Right Everyday) was a 2-year trial of a culturally specific weight loss program. African American women and men who enrolled alone (individual stratum, 63 index participants) or together with 1 or 2 family members or friends (family stratum, 130 index participants) were randomized, within strata, to high or low social support treatments; 90% were female.

Results: At 6 months, the family index participants lost approximately 5 to 6 kg; the individual index participants lost approximately 3 to 4 kg. The mean weight change was not different in high vs low social support in either stratum and generally not when high or low support treatments were compared across strata. The overall intention-to-treat mean weight change at 24 months was –2.4 kg (95% confidence interval, –3.3 kg to –1.5 kg). The family index participant weight loss was greater among the participants whose partners attended more personally tailored counseling sessions at 6 months in the high-support group and at 6, 12, and 24 months in the low-support group (all $P < .05$). Also, in the 6-month intention-to-treat analysis, the percentage of weight loss of the family index participants was greater if partners lost at least 5% vs less than 5% of their baseline weight (respectively, –6.1% vs –2.9% [$P = .004$], high support; and –6.1% vs –3.1% [$P = .01$], low support).

Conclusions: Being assigned to participate with family members, friends, or other group members had no effect on weight change. Enrolling with others was associated with greater weight loss only when partners participated more and lost more weight.

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THE HIGH PREVALENCE OF OBESITY in African Americans, with its associated cardiovascular complications,[1,2] is a major public health concern.[3] Standard behavioral obesity treatment appears to be less successful in African Americans, particularly African American women, than in whites.[4-9] Cultural adaptation has been recommended

See also page 1788

to improve weight loss,[10] but no definitive models for such programs have been identified. The importance of family members and support networks is prominent in descriptions of African American social and cultural contexts,[11-13] suggesting that family involvement might be useful as a cultural adaptation strategy. Studies of family involvement in adult weight loss programs have suggested benefits,[14,15] but, to our knowledge, trials in African Americans have not been conducted.

Wing and Jeffery[16] studied obesity treatment in persons recruited with friends or alone and varied the level of social support provided within each group by including or not including teamwork within treatment sessions. The results indicated that both enrolling with friends and being assigned to social support were beneficial for weight loss and maintenance. In the SHARE (Supporting Healthy Activity and eating Right Everyday) study, we adapted the

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Wing and Jeffery[16] approach to examine the potential effects of social support from family members or friends in African American adults. The primary question in SHARE was whether participants with personally selected partners who were assigned to attend group sessions together (high support) would have greater weight loss than those assigned not to attend together (low support).

METHODS

STUDY DESIGN

SHARE was a randomized, controlled trial of high- and low-support versions of a weight loss intervention within 2 recruitment strata: (1) the family/friend stratum (family), for primary (index) participants who enrolled with 1 or 2 partners of their choosing; and (2) the individual stratum for index participants who enrolled alone. The individual stratum was a reference point for comparison (nonrandomized) with participants who enrolled with others. In the family stratum, the high- and low-support groups were defined by whether participant-selected partners were assigned to attend treatment and to work in teams with their index participant during group sessions. Other program elements were the same for family stratum participants in both treatment groups. In the individual stratum, high- and low-support groups were defined by whether index participants were instructed to partner with other group members during treatment sessions. Randomization of index participants to a high- or a low-support group was in a 1:1 ratio, stratified by recruitment type (enrolling with others vs alone), recruitment source (general advertisement vs pool of prior weight loss study participants), and whether participants were diagnosed as having diabetes. All procedures, including informed consent, were approved by the institutional review board of the University of Pennsylvania, Philadelphia. Study staff obtained verbal consent for prescreening and written consent separately for baseline assessments and randomization.

STUDY PARTICIPANTS

Eligible participants were self-identified African American (not required for partners) men and women, with a minimum age of 35 years (to increase the likelihood of clinically significant comorbidities that would motivate weight loss) and a maximum of 70 years (because the benefits of weight loss are less well established at older ages). The partners were 16 (to allow for feasible youth participation as partners) to 70 years of age. All participants had a body mass index (calculated as weight in kilograms divided by height in meters squared) of 27 to 55; no medical contraindications to participation; no current medications known to affect body weight; and willingness to participate in required procedures. The exclusions were poorly controlled hypertension; inability to engage in moderate physical activity; pregnancy; heart failure or a recent cardiovascular event; and other serious illness.

We used newspaper advertisements, provider referrals, community presentations, word of mouth, direct mailing from a prior study, and a telephone hotline to recruit participants from the Philadelphia area in May 2003 through July 2004. Recruitment targeted African Americans who would identify family members or friends to enroll with them. Enrollment involved telephone or in-person prescreening, a group orientation session, in-person assessments, and medical clearance. Potential participants with no primary care provider to provide clearance were given information about local primary care resources, including community health centers. Random assignment was managed by a separate clinical research unit. Family stratum participants were randomized after at least 1 partner was confirmed as eligible.

TREATMENT APPROACH

The intervention adapted concepts, strategies, and materials from prior trials, particularly the evidence-based lifestyle interventions used in the Diabetes Prevention Program[17] and Look AHEAD (Action for Health in Diabetes).[18] Including social support is consistent with the theoretical frameworks on which these interventions were based. The ability to enroll with members of natural support networks offered a potential for culturally mediated social support and for contextualization of learning that could provide ongoing cues to weight loss maintenance.[19] The goals were achievement, by 6 months, of a 5% to 10% weight loss and then weight loss maintenance. Counseling encouraged self-monitoring of food intake and physical activity for at least the first 6 months, caloric intake of 1500 to 1800 kcal/d (to convert to kilojoules, multiply by 4.186) or 1200 to 1500 kcal/d for men and women, respectively, and a gradual increase in physical activity to 180 minutes per week. Pedometers were provided. Most study interventionists had graduate level training in nutrition or exercise science, and some had prior experience with weight counseling. They were trained and monitored by a behavioral psychologist (T.A.W.), with the assistance of an experienced interventionist (S.D.B.).

Ninety-minute group sessions were held weekly for 6 months, biweekly for 6 months, and then monthly. These sessions included weight and activity checks, review of skill building (homework) assignments, a physical activity break, topic presentation, counseling in enhancing social support, and a closing/relaxation activity. Year 2 sessions reviewed the skills required for weight maintenance. Periodic personal sessions (45-60 minutes) for problem solving replaced several group sessions in each phase to allow individual tailoring. Participants received logo and other items as rewards for adherence. A quarterly newsletter facilitated motivation and provided information about raffles, community events, and resources. Parking was reimbursed when requested.

In addition to the manipulation of culturally mediated social support from family and friends, strategies to increase cultural specificity and contextual relevance included having African American program counselors, culturally based content within-group sessions, and community-based field workshops (eg, cooking demonstrations at grocery stores, visits to local gyms, and line dancing).

TREATMENT CONDITIONS

Family High-Support Group

Index participants and partners were expected to attend and participate fully in all treatment sessions. Index/partner teams were encouraged to work together during sessions, counseled on how to provide social support, and given assignments for working together between sessions.

Family Low-Support Group

Only index participants were allowed to attend group sessions. They were advised on ways to elicit social support from and work with their partners. The partners could attend personal counseling sessions and field workshops. Written materials given to index participants at sessions were mailed to partners.

Individual High-Support Group

Participants were assigned to or chose a team member from within their treatment group after several weeks in the program to allow them to identify commonalities that might facilitate supportive relationships. Teams were encouraged to work together within treatment sessions and advised about ways to support each other during and between sessions.

Individual Low-Support Group

This treatment was equivalent to a typical behavioral weight loss program for people who enrolled by themselves. No teams were created in this condition

DATA COLLECTION

Weight was the primary outcome, measured at visits scheduled 6, 12, 18, and 24 months after randomization; an additional, end-of-study measurement was taken if the last class occurred after the 24-month visit (n = 26 across all 4 treatment groups; median time [range] to last class was 25 [2-84] days). Follow-up data were collected by staff members who were not involved in the intervention (although they were aware of the intervention assignment). Weight was assessed with a digital scale (Tanita BWB-627A; Tanita Corporation of America, Arlington Heights, Illinois) with a 273-kg capacity. Height was measured at baseline using a free-standing stadiometer (Shorr Measuring Board [adapted for an obese population]; Shorr Productions, Olney, Maryland). Participants received $50 for attending the final visit. Blood pressure was taken from the right arm, using measured arm circumference to determine appropriate cuff size, with participants seated after a 5-minute rest.[20] A venous blood sample was obtained from index participants after a 12-hour fast and analyzed for fasting blood lipid levels and blood glucose levels at the General Clinical Research Center.

Participants completed a medical history and demographic, psychosocial, and behavioral questionnaires. Session attendance was recorded as a measure of participation.

STATISTICAL METHODS

Scannable data forms were used. Editing used range checks and logic algorithms. SAS version 9.1 (SAS Institute Inc, Cary, North Carolina) was used for analyses. A *t* test and 1-way analysis of variance were used, respectively, to compare means between 2 groups or more than 2 groups; χ^2 tests were used for categorical variables. The normality assumption was assessed via QQ plots and Shapiro-Wilk tests when needed. Mixed-effects models were used to answer the primary questions in SHARE. These models included a cluster-specific random-effect term, which is equivalent to fitting a generalized estimating equation model with an assumption of equal pairwise correlations within clusters. We included factors that substantially altered the treatment effects in the model, identified in a series of exploratory multiple regression analyses: baseline weight (in kilograms), professional occupation, history of respiratory disease, and history of diabetes (all coded yes or no). Program completers were defined as those who provided a 2-year weight measurement.

The recruitment target for the family stratum comprised 64 index participants per treatment arm; 32 index participants were sought for each arm of the individual stratum. In the family stratum, allowing for 22% attrition, the estimated 50 completers per arm provided 80% power to detect a 1-kg difference between high- and low-support index participants (eg, 2.4 kg vs 1.4 kg, assuming an SD of 1.8) at follow-up. The estimated 25 participants per condition after attrition in the individual stratum provided 80% power to detect a difference of 1.5 kg (eg, 2.9 kg vs 1.4 kg, assuming an SD of 1.8). For intention-to-treat (ITT) analyses, the approach suggested by Wadden et al[21] was used to impute missing values for patients without a final weight measurement by adding 0.3 kg/mo to the last observed weight up to the final visit. (No imputed values were carried beyond the baseline weight.) Multivariate regression (adjusted for baseline weight [in kilograms], professional occupation, history of respiratory problems, and history of diabetes) was used to assess the relationship between weight loss, treatment assignment, and partner session attendance. An interaction term, constructed as the product of treatment assignment and partner personal session attendance, was included to assess whether the impact of treatment assignment on index participant weight loss depended on partner attendance. All tests were 2-tailed at $\alpha = 0.05$.

RESULTS

PARTICIPANT CHARACTERISTICS

A total of 1081 applicants were prescreened, and 434 were further assessed for eligibility in person, 344 (81%) of whom were enrolled (193 index and l51 partners) (**Figure 1**). Not all potential participants who responded initially to recruitment were reached for further contact or were interested in a program like SHARE. Main reasons for ineligibility were BMI (too high [n = 33]; too low [n = 21]), medical conditions or medications (n = 50), or , for otherwise eligible index participants, lack of a partner. Fourteen persons were not able to obtain medical clearance. Participant characteristics, shown in **Table 1**, were generally similar for index participants by randomized groups within recruitment strata.

In the family stratum, 281 participants were randomized to 107 two-person and 23 three-person teams: 29 teams with a male partner (23 were husband and wife), 5 teams with a partner younger than 19 years, 17 teams with a parent and a child, 36 teams from the same household, 4 teams with unrelated men, and 68 teams with unrelated women (this breakdown counts some teams more than once). Unrelated partners included friends and coworkers. Related partners included siblings and 1 grandparent-grandchild combination. Types of teams were comparable in high- and low-support groups.

Follow-up visit completion was similar for index participants by randomized groups and recruitment strata. Partners in the family low-support group were the least likely to complete the study (Figure 1). More family index completers in the low- vs high-support group had a history of high blood pressure (63% vs 40%, respectively; $P = .03$) and an obesity-related comorbidity (74% vs 52%, respectively; $P = .04$). Family index high-support completers were more likely than the individual index high-support completers to rate their health excellent or very good (44% vs 14%, respectively; $P = .03$). Family index low-support completers were younger (46.4 years vs 50.7 years, respectively; $P = .03$), weighed less (94.9 kg vs 105.9 kg, respectively; $P = .02$)), and had lower waist circumference (112.5 cm vs 120.3 cm, respectively; $P = .05$) than individual index low-support completers. Family partner completers in high- vs low-support groups included more smokers (11.5% vs 0%, respectively; $P = .04$) and fewer persons with a history of diabetes (4% vs 17%, respectively; $P = .04$). One completer in the individual stratum, high-support group, who provided follow-up data at 24 months only, underwent bariatric surgery.

WEIGHT CHANGE

Index Participants

Family index participants in both high- and low-support groups lost approximately 5 to 6 kg at the 6-,

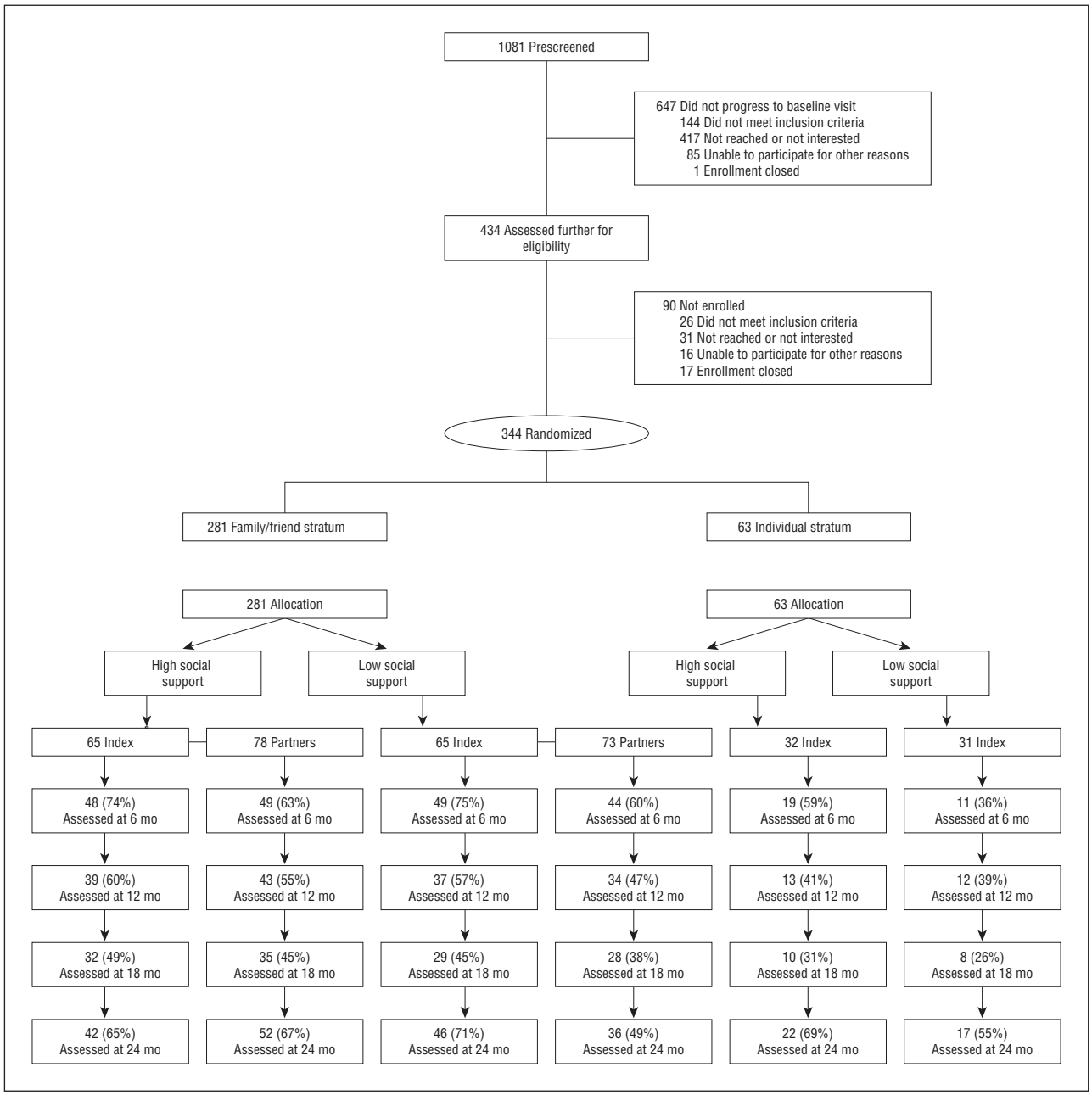

Figure 1. Flow of participant recruitment, randomization, and follow-up within recruitment stratum and treatment groups. Completion of the 24-month visit was lower for partners in the low-support group than for their index participants (P=.001) or for partners in the high-support group (P=.03).

12-, and 18-month assessments (**Table 2** and **Figure 2**). Losses declined to approximately 3 kg at month 24, with no statistically significant treatment group difference at any time (P=.27 to P=.98). In individual index participants, the same pattern of results (and statistical conclusions) was observed, although weight losses were smaller (approximately 3-4 kg at 6 months). The ITT weight change at 6 and 24 months showed the same pattern but was less than in the comparable observed data (Table 2 andFigure 2). Nonrandomized comparisons within high and low support across recruitment strata showed a statistically significant difference at 6 months (–3.5 kg vs –1.1 kg; P=.03) and a difference that approached significance in the observed data at 12 months (–6.1 kg vs –1.8 kg; P=.07) in low support (Table 2).

Partners (Family Stratum)

As shown in Table 2, weight loss in high-support partners was similar to that of high-support index participants, although it was significantly lower in the 6-month ITT analysis (P=.05). It was significantly lower in the low-support partners than in the index participants (both P=.006 in observed data) and the high-support partners (P=.006 and P=.05 in observed data) at 6 and 12 months.

ATTENDANCE AT TREATMENT SESSIONS

Attendance decreased after the weekly phase (**Table 3**). Group session attendance of the index participants was higher

Table 1. Baseline Characteristics of Randomized Participants by Recruitment Stratum and Treatment Group

Variable	All (N=344)	Family Recruitment Stratum				Individual Recruitment Stratum	
		High Support: Index (n=65)	Low Support: Index (n=65)	High Support: Partner (n=78)	Low Support: Partner (n=73)	High Support (n=32)	Low Support (n=31)
Age, mean (SD), y	46.5 (9.4)	47.2 (7.3)	49.8 (7.9)[a]	44.0 (11.5)	44.5 (10.4)	48.8 (8.0)	46.6 (6.4)
Female, %	89.8	95.4	89.2	83.3	89.0	93.8	93.6
Education >12 y, %	76.7	84.6	75.4	74.4	71.2	84.5	73.3
Professional occupation, %	39.3	40.0	39.1	43.6	36.6	43.8	29.0
Married or cohabiting, %	23.3	20.0	26.2	16.7	17.8	37.5	40.0
Children <18 y, %	45.1	47.7	36.9	52.6	42.5	43.8	45.2
Current smoker, %	9.4	10.8	3.1[b]	12.8	5.6	6.3	23.3[c]
Current drinker, %	28.7	29.5	30.5	30.7	26.9	25.0	26.9
Weight, mean (SD), kg	103.5 (19.8)	104.6 (19.8)	107.4 (17.5)	104.3 (21.7)	99.8 (19.1)	105.8 (22.8)	97.6 (15.6)[d]
BMI, mean (SD)	38.0 (6.4)	38.4 (6.2)	39.3 (6.2)	37.7 (6.4)	36.8 (6.5)	38.7 (7.3)	37.0 (5.5)
Waist circumference, mean (SD), cm	116.6 (16.1)	116.8 (14.0)	120.9 (15.0)	116.1 (16.4)	113.4 (17.7)	119.1 (17.4)	113.5 (14.8)
Self-rated health, %							
Excellent or very good	27.7	37.5	25.4	29.5	24.7	25.0	16.7
Good	43.8	35.9	44.4	44.9	42.8	56.3	46.7
Fair	26.2	26.6	27.0	23.1	30.1	15.6	33.3
Poor or very poor	2.3	0.0	3.2	2.6	2.7	3.1	3.3
Medical history, %							
Cardiovascular disease	1.5	1.5	3.1	0.0	1.4	3.1	0.0
Respiratory problems	14.0	16.9	14.1	19.2	5.5[e]	15.6	13.3
High blood pressure	43.0	47.7	56.9	35.9	38.4	37.5	38.7
Diabetes	13.4	12.3	13.9	6.4	16.4[f]	18.1	19.4
Musculoskeletal problems	43.6	43.1	44.6	43.6	41.1	50.0	41.9
Any obesity-related comorbidity	53.8	56.9	67.7	46.2	49.3	46.9	54.8
Any positive history, %	72.7	75.4	78.5	68.0	68.5	71.8	77.4
Systolic blood pressure, mean (SD), mm Hg	121.9 (13.6)	123.5 (12.2)	124.0 (10.4)	120.4 (16.4)	119.7 (14.5)	123.5 (13.6)	121.8 (11.9)
Diastolic blood pressure, mean (SD), mm Hg	76.8 (10.0)	76.7 (9.3)	76.4 (8.7)	76.4 (9.9)	75.3 (10.9)	80.3 (12)	78.2 (9.1)
Total to high-density lipoprotein cholesterol ratio, mean (SD)[g]	3.8 (1.0)	3.6 (1.0)	3.9 (1.1)	NA	NA	3.9 (1.2)	3.7 (0.9)
Triglycerides, mean (SD), mg/dL	86.7 (47.4)	74.1 (31.3)	96.0 (48.2)[h]	NA	NA	82.8 (37.2)	99.4 (86.8)
Fasting glucose, mean (SD), mg/dL	88.6 (29.3)	90.4 (33.9)	84.2 (16.0)	NA	NA	94.0 (46.9)	91.6 (14.9)

Abbreviations: BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); NA, not applicable.
SI conversion factors: To convert glucose and triglycerides to millimoles per liter, multiply by 0.0555 and 0.0113, respectively.
[a] $P = .05$ for difference between family high- and low-support index participants.
[b] $P = .09$ for difference between family high- and low-support index participants.
[c] $P = .06$ for difference between individual high- and low-support index participants.
[d] $P = .01$ for difference between individual high- and low-support index participants.
[e] $P = .01$ for difference between family high- and low-support partners.
[f] $P = .05$ for difference between family high- and low-support partners.
[g] Blood measures were not collected for partners.
[h] $P = .009$ for difference between family high- and low-support index participants.

in the family high-support group than in the family low-support group during the biweekly phase and generally higher in the family high-support group than in the individual high-support group. Personal session attendance was also generally higher in the family high-support group than in the family low-support group, higher in the family stratum than in the individual stratum for both high- and low-support groups, and higher in partners in the family high- vs low-support group.

WEIGHT LOSS OF FAMILY INDEX PARTICIPANTS BY PARTNER ATTENDANCE AT TREATMENT SESSIONS

The effect of personal session attendance at 6 and 24 months is shown in **Figure 3**. At 6 months (Figure 3A and B), index participant weight loss in high- and low-support groups showed similar downward trends in weight with higher partner attendance at personal sessions. At 24 months, there was no clear trend in index participant weight loss with partner attendance in the high-support group (Figure 3C), but a downward gradient was evident for partner attendance from 0 to 5 sessions in the low-support group (Figure 3D); only 2 partners in the family low-support group attended more than 5 sessions. Confirmatory multivariate regression models after adjustment for index baseline weight, professional occupation, and diabetes history did not show an interaction between index weight loss and partner personal session attendance at 6 months ($P = .63$), but a statistically significant interaction was observed at 24 months ($P = .04$). For example, although at 24 months, high-support index participants lost 1.5 kg more than low-support index participants, there was no difference in their

Table 2. Weight Change from Baseline (Mean [SD] and % ≥ 5% Weight Loss From Baseline) at 6, 12, 18, and 24 Months After Randomization[a] and ITT Data at 6 and 24 Months, By Recruitment Stratum and Treatment[b]

	Family Recruitment Stratum							Individual Recruitment Stratum		
Follow-up Visit	Index: High Support	Index: Low Support	Difference: High Minus Low	Partners: High Support	Partners: Low Support	Difference: High Support Index Minus Partner	Difference: Low Support Index Minus Partner	High Support	Low Support	Difference: High Minus Low
6 mo										
No.	48	49		49	44			19	11	
Weight change, kg	−5.6 (4.9)	−4.6 (5.0)	−1.0 (4.9)	−4.4 (5.0)	−1.4 (3.8)[c]	−1.2 (4.9)	−3.3 (4.5)[d]	−3.8 (5.3)	−3.1 (4.0)	−0.7 (4.8)
% With ≥5% weight loss	45.8	36.7		40.8	13.6	5.0	23.1	36.8	27.3	9.6
6 mo, ITT weight change										
No.	65	65		78	73			32	31	
Weight change, kg	−4.1 (4.9)	−3.5 (4.8)[e]	−0.6 (4.8)	−2.8 (4.5)	−0.8 (3.0)[c]	−1.4 (4.6)[f]	−2.7 (3.9)[d]	−2.3 (4.4)	−1.1 (2.7)	−1.2 (3.7)
% With ≥5% weight loss	33.9	27.7		25.6	8.2	8.3	19.5	21.9	9.7	12.2
12 mo										
No.	39	37		43	34			13	12	
Weight change, kg	−5.8 (5.1)	−6.1 (6.2)[e]	0.3 (5.7)	−4.3 (6.2)	−1.4 (5.2)[c]	−1.5 (5.7)	−4.7 (5.8)[d]	−4.4 (5.4)	−1.8 (3.7)	−2.6 (6.4)
% With ≥5% weight loss	51.3	56.8		41.9	17.7	9.4	39.2	38.5	25.0	13.5
18 mo										
No.	32	29		35	28			10	8	
Weight change, kg	−4.8 (6.8)	−5.1 (5.9)	0.3 (6.4)	−4.0 (6.9)	−2.8 (7.7)	−0.8 (6.8)	−2.3 (6.9)	−4.3 (7.1)	−2.8 (3.4)	−1.6 (5.7)
% With >5% weight loss	28.1	31.0		28.6	28.6	−0.4	2.5	40.0	25.0	15.0
24 mo[a]										
No.	42	46		52	36			22	17	
Weight change, kg	−3.1 (5.9)	−2.7 (6.2)	−0.4 (6.1)	−2.4 (7.3)	−1.9 (6.4)	−0.7 (6.7)	−0.8 (6.3)	−3.3 (11.2)[g]	−3.2 (6.3)	−0.1 (9.4)
% With >5% weight loss	28.6	30.4	−1.8	25.0	22.2	3.6	8.2	27.3[g]	29.4	−2.1
24 mo, ITT weight change										
No.	65	65		78	73			32	31	
Weight change, kg	−2.8 (5.7)	−2.3 (5.6)	−0.5 (5.7)	−1.5 (6.2)	−0.9 (4.9)	−1.3 (6.0)	−1.4 (5.3)	−2.2 (9.4)[g]	−1.8 (4.9)	−0.4 (7.5)
% With >5% weight loss	23.1	24.6	−1.5	16.7	12.3	6.4	12.3	18.8[g]	16.1	2.7

Abbreviation: ITT, intention-to-treat analysis.

[a] Final weight measurement was at 24 months after randomization or, for 26 participants, after the last intervention class if later than 24 months after randomization.

[b] The footnotes in the table give the *P* values for comparisons by treatment assignment and, within treatment type, across strata for observed and ITT weight changes (in kilograms) based on multivariate analyses adjusted for baseline weight, professional occupation, history of respiratory disease or diabetes (observed data only), and history of diabetes.

[c] High- and low-support partners were different; $P < .006$ at 6 months (observed) and $P = .02$ (ITT); $P = .05$ at 12 months (observed).

[d] Low-support index and partners were different; $P = .006$ at 6 months (observed) and $P = .003$ (ITT); $P = .06$ at 12 months (observed).

[e] Low-support index participants in individual stratum were different from index participants in family low-support group; $P = .03$ at 6 months (ITT) and $P = .07$ at 12 months (observed).

[f] High-support index and partners were different; $P = .05$ at 6 months (ITT).

[g] When the participant who underwent bariatric surgery and lost 44.1 kg was removed, the observed and ITT mean (SD) weight losses were 1.3 (6.7) kg and 0.9 (5.5) kg, respectively; the observed and ITT percentages with at least 5% weight loss were 23.8% and 16.1%, respectively.

weight change (gain of 0.2 kg) if their partners attended the same number of personal sessions. In contrast, low-support index participants lost an additional 1.0 kg for each additional personal session attended by their partner. The ITT results were similar.

WEIGHT LOSS OF INDEX PARTICIPANTS BY PARTNER SUCCESS IN WEIGHT LOSS (FAMILY STRATUM)

In ITT analysis at 6 months, index participant weight losses were approximately twice as large among participants whose partners lost at least 5% of their baseline weight compared with those whose partners lost less weight (**Table 4**). This effect was not evident in the observed or ITT data at subsequent visits.

OVERALL WEIGHT CHANGE

The mean (SD) weight loss for all index participants was 4.7 (4.9) kg at 6 months and 3.0 (7.2) kg at 24 months with observed data and 3.1 (4.6) kg at 6 months and 2.4 (6.3) kg at 24 months with ITT analyses. When the participant who underwent bariatric surgery was removed, the mean (SD) 24-month weight loss was 2.7 (6.2) kg (observed) and 1.8 (5.2) kg (ITT). The weight loss for the lowest-dose intervention—family low-support partners—was 0.9 (4.9) kg at 24 months (ITT). In all participants, 6-month and end-of-study weight change were correlated ($r = 0.62$; $P < .001$). No treatment-related serious adverse events were identified.

COMMENT

To our knowledge, SHARE is the first weight loss study to formally evaluate family and friend support as a cultural adaptation for African Americans. The design provided a formal, randomized comparison of effects of being assigned to participate with a partner, and it allowed, through analyses of attendance data, an examination of the effect of actual partner participation. The results suggest that having family members or friends involved works when, and only when, they participate and are successful in losing

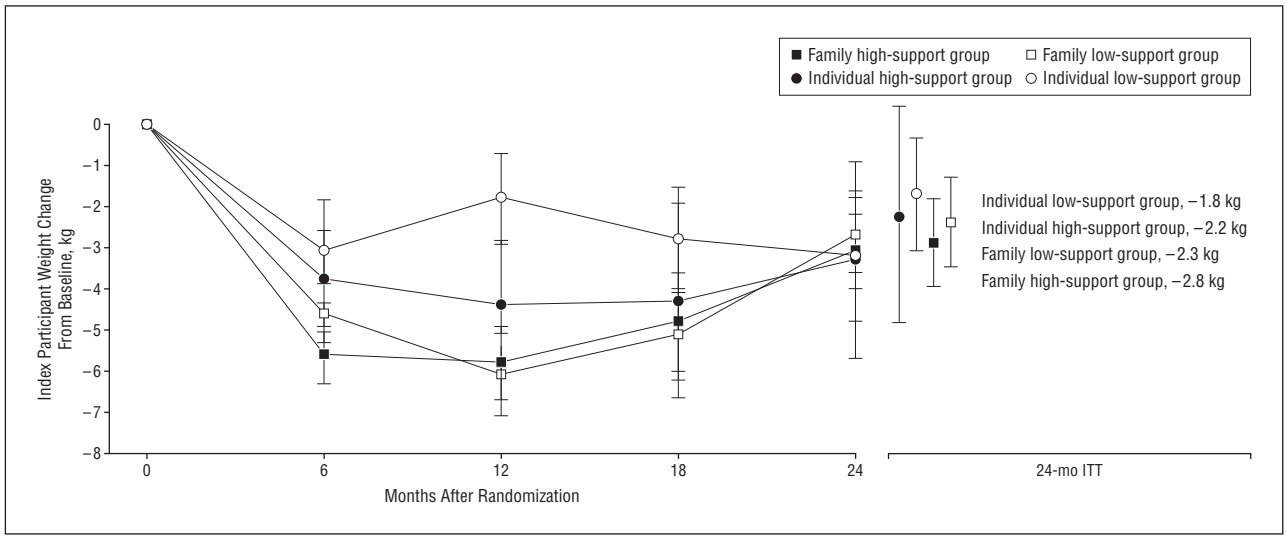

Figure 2. Weight changes in index participants based on available observations at each follow-up visit. Intention-to-treat (ITT) estimates are also shown for 24-month weight loss with imputed values for missing observations. When the participant who underwent bariatric surgery was removed from the 24-month data for individual high support, the mean weight loss declined from 3.3 to 1.3 kg (observed) and from 2.2 to 0.9 kg (ITT). Error bars indicate SE.

Table 3. Attendance at Scheduled Group and Personal Counseling Sessions, by Recruitment Stratum and Treatment Group for All Participants and for Completers Only (Median of Distribution of Number of Sessions Attended)[a]

	Family Stratum				Individual Stratum	
Phase of Study and Type of Session	High Support: Index (n=65) [42]	Low Support: Index (n=65) [46]	High Support: Partner (n=78) [52]	Low Support: Partner (n=73) [36]	High Support (n=32) [22]	Low Support (n=31) [17]
Group sessions						
Phase 1, 23 weekly sessions	13 [14]	11 [13.5]	11 [12]	Not applicable	8.5[b] [10][c]	5[d] [9]
Phase 2, 12 biweekly sessions	4 [5][e]	1 [2.5]	2 [3]	Not applicable	1[f] [3]	0[d] [0]
Phase 3, 12 monthly sessions	0 [3]	0 [1]	0 [2]	Not applicable	0 [0.5]	0[d] [0]
Overall study, 47 total sessions	18 [21]	14 [17]	14.5 [17.5]	Not applicable	10.5[b] [17][c]	5[d] [11]
Personal sessions						
Phase 1, 3 sessions	2 [2.5][g]	1 [1]	2 [2]	0 [1]	0[h] [0.5][i]	0[j] [1][k]
Phase 2, 2 or 3 sessions	1 [1]	0 [1]	0.5 [1]	0 [0]	0[h] [0]	0 [0][k]
Phase 3, 3 sessions	0 [1]	0 [1]	0 [1]	0 [0]	0 [0][i]	0[j] [0][kj]
Overall study, 8 or 9 sessions	3 [5][g]	2 [3]	2.5 [4.5]	1 [1]	1[h] [1][i]	0[j] [1][k]

[a] *P* values for comparison of medians are based on Wilcoxon Mann-Whitney tests. Numbers in brackets represent completers only.
[b] $P = .01$ for comparison of all index participants in family high vs individual high support.
[c] $P = .04$ (phase 1) and $P = .03$ (overall) for comparison of index completers in family high vs family low support.
[d] $P = .02$ to $P = .002$ for comparison of all index participants in family low vs individual low support.
[e] $P = .03$ for comparison of all index completers in family high vs family low support.
[f] $P = .05$ for comparison of all index participants in individual high vs individual low support.
[g] $P = .009$ (phase 1) and $P = .03$ (overall) for comparison of index completers in family high vs low support.
[h] $P = .04$ to $P < .001$ for comparison of all index participants in family high vs individual high support.
[i] $P = .05$ to $P < .001$ for comparison of index completers in family high vs individual high support.
[j] $P = .006$ to $P < .001$ for comparison of all index participants in family low vs individual low support.
[k] $P = .04$ to $P = .003$ for comparison of index completers in family low vs individual low support.

weight as well. The effect of partner attendance was specific to personally tailored counseling sessions rather than to group sessions. Partner success with weight loss was also associated with greater index participant weight loss in both family high- and low-support groups, although this association diminished over time. The individual stratum had lower attendance and less weight loss initially, but the initial differences in weight loss were not statistically significant and decreased over time.

Although SHARE had less strict body mass index and other eligibility requirements than other relatively recent trials that enrolled substantial numbers of African Americans,[7-9] our overall 6-month ITT weight loss of 3.1 kg compares favorably with weight losses observed in those studies. For example, in PREMIER,[9] African American women in each of the 2 weight loss arms lost a mean of 3.2 kg at 6 months; African American men in these 2 arms lost 3.2 and 5.1 kg. The 6-month ITT weight loss in family index (–4.1 and –3.5 kg in high- and low-support groups, respectively) was similar to that reported for African American women (–4.1 kg) in the 6-month weight loss induction phase of the Weight Loss

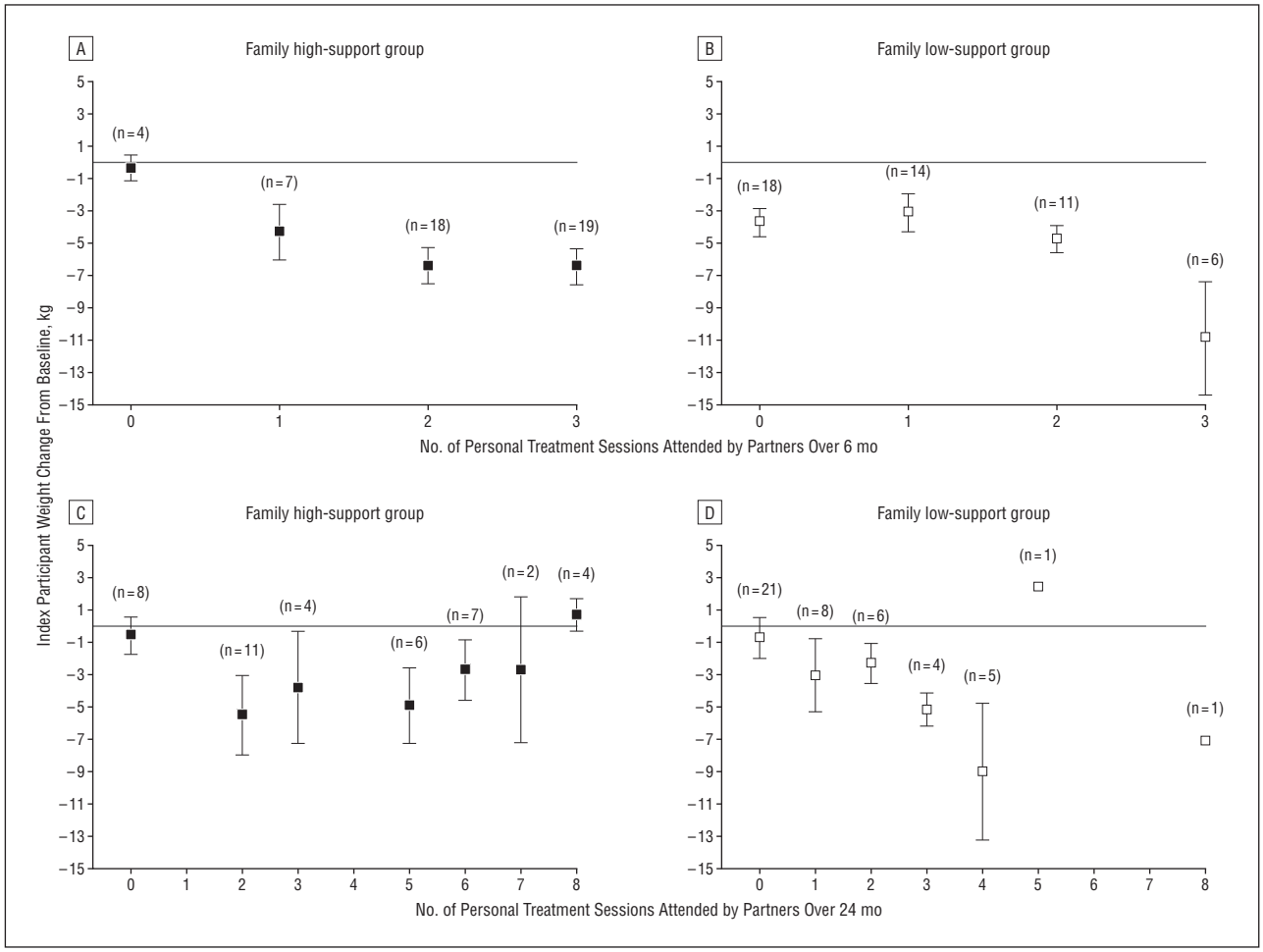

Figure 3. Weight changes in index participants in the family stratum according to the number of personal treatment sessions attended by their partners. Parts A (high-support group) and B (low-support group) show the first 6 months of treatment (weekly phase). Parts C (high-support group) and D (low-support group) show the entire 24-month study period. Error bars indicate SE.

Table 4. Percentage of Weight Change in Index Participants in the Family Stratum by Partner Weight Loss at the Same Visit[a]

	High Support			Low Support		
Variables	**Partner Lost ≥5%**	**Partner Lost <5%**	***P* Value**	**Partner Lost ≥5%**	**Partner Lost <5%**	***P* Value**
No.of pairs[b]	19	46		6	59	
6 mo, %	–6.1	–2.9	<.01	–6.1	–3.1	.01
No. of pairs[b]	16	49		6	59	
12 mo, %	–4.8	–2.9	.16	–6.9	–3.0	.10
No. of pairs[b]	11	54		7	58	
18 mo, %	–2.5	–1.8	.68	–3.6	–1.6	.34
No. of pairs[b]	12	53		7	58	
24 mo, %	–2.8	–1.9	.57	–3.4	–1.6	.38

[a] Analyses are based on intention-to-treat data in which missing weight data were imputed.
[b] If 2 partners were enrolled, the average was used.

Maintenance Study.[8] Our overall ITT weight loss (–2.4 kg) at 24 months was only slightly less (by about 1 kg) than that observed at 24 months in the Diabetes Prevention Program.[7]

The SHARE results for partner participation differ somewhat from those obtained in a study of predominantly white participants by Wing and Jeffery[16] in which there were favorable effects of recruitment with others on both study completion and weight loss. However, a subsequent study by Gorin et al[22] found that involving 0 to 4 partners had no effect on weight loss.[22] Instead, and consistent with our findings, weight loss in the primary participant was linked to partner weight loss success. The effect of partner weight loss was observed through 18 months in Gorin and colleagues' study, whereas in our study the effect diminished over time. Attenuation over

time of the effects of social support was reported from a meta-analysis of couples' therapy for weight loss.[23]

Specific cultural adaptations that can improve weight loss in African Americans have been difficult to identify.[24] Two randomized trials, both in African American women, evaluated the effect of adding a spiritual component to an otherwise culturally adapted program: Yanek et al[25] reported no difference in weight loss in a 12-month study, and Fitzgibbon et al[26] reported a suggestive but not statistically significant effect in a 12-week study. Ard et al,[27] based on a nonrandomized substudy among African Americans in the Weight Loss Maintenance Study weight loss induction phase, reported no difference in weight losses at 20 weeks (−4.2 kg in both groups; $P = .97$) between those in an African American only group and those in an ethnically mixed group, both of which were led by the same African American interventionist.

A strength of our design was evaluation of partner support on both weight loss and maintenance over 2 years. Attrition and variance in weight loss were greater than estimated, but mean weight changes did not suggest that clinically meaningful treatment effects were missed owing to a lack of statistical power. An important limitation was the absence of an untreated control group. Offering some level of treatment to all participants made recruitment easier, and it seemed ethical for this high-risk population, but this precluded assessment of weight losses associated with SHARE compared with no intervention. Another potential limitation on generalizability was the requirement that participants provide medical clearance, but only 14 interested participants were excluded on this basis.

In conclusion, SHARE resulted in meaningful weight loss in African Americans who were relatively typical of individuals, primarily women, who might be reached through outpatient or community programs. We evaluated family and friend social support as a specific cultural adaptation strategy, which was added to an ethnic-specific program that was also adapted in other respects. Beneficial effects on weight loss were linked to actual rather than assigned partner participation and to partner success in losing weight. Further studies may elucidate ways to facilitate effective family or friend participation and to improve absolute weight losses.

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Author Contributions: Drs Kumanyika, Shults, and Wu and Ms Fassbender had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. *Study concept and design:* Kumanyika, Wadden, Bowman, and Whitt-Glover. *Acquisition of data:* Kumanyika, Wadden, Fassbender, Brown, Bowman, Brake, West, Frazier, and Desnouee. *Analysis and interpretation of data:* Kumanyika, Shults, Bowman, Kallan, and Wu. *Drafting of the manuscript:* Kumanyika and Wu. *Critical revision of the manuscript for important intellectual content:* Kumanyika, Wadden, Shults, Fassbender, Brown, Bowman, Brake, West, Whitt-Glover, and Desnouee. *Statistical analysis:* Shults, Kallan, and Wu. *Obtained funding:* Kumanyika and Whitt-Glover. *Administrative, technical, and material support:* Kumanyika, Fassbender, Brown, Bowman, Brake, West, Frazier, Whitt-Glover, and Desnouee. *Study supervision:* Kumanyika, Wadden, and Fassbender.
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INVITED COMMENTARY

The Interdisciplinary Approach to Culturally Tailored Medical Care: "Social Networking" for Decreasing Risk

The prevalence of obesity and diabetes mellitus continues to increase in the United States. Minority populations are disproportionately affected by obesity, with studies showing increased prevalence in the African American community.[1,2] Obesity and the associated complications that can result, including diabetes and cardiovascular disease, are one of the most troublesome and challenging issues in this population.

See also page 1788

Recent data show that 69% percent of African American men and 81% percent of African American women are overweight, primarily because of dietary habits and a sedentary lifestyle.[3] The relationship between obesity and the establishment of diabetes has been well established.[4] The prevalence of type 2 diabetes mellitus in persons older than 20 years has been shown by the Centers for Disease Control and Prevention to be 14.7% in the African American community, nearly 50% higher than the 10.7% population average in the United States.[5] Weight loss is an effective strategy for decreasing the rate of the development of diabetes and for decreasing the complications of diabetes. However, weight loss and, just as important, maintenance of weight loss are among the most difficult goals for patients to accomplish. Successful weight management requires education, social support, and, often, an individualized approach. More data are needed on a culturally tailored approach to these issues.

The Institute of Medicine, in a landmark report on ethnic and racial disparities in health care titled "Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care," acknowledged the challenges in delivering health care to ethnically diverse populations.[6] The report included recommendations to devise culturally tailored interventions to improve patient care and education. Barriers to good health, particularly in African Americans, have been described in the literature.[6,7] The major obstacles identified include access to care, cultural barriers, poor communication, perceived racism, and stressful treatment settings.[7]

The question remains whether novel interventions using community health workers are effective in improving knowledge, compliance, and health practices in at-risk African American communities. Recent data from the REACH (Racial and Ethnic Approaches to Community Health) project showed the effectiveness of a culturally tailored diabetes lifestyle intervention program for African Americans with a history of diabetes mellitus.[8] Two articles in this issue of the *Archives* present data to support the use of culturally designed interventions for patient risk reduction related to diabetes mellitus and weight loss.

Kumanyika et al report the results of a 2-year study of African American participants with support of family or friends in a lifestyle modification program for weight loss. In the SHARE (Supporting Healthy Activity and eating Right Everyday) study, the investigators evaluated the effect on weight loss outcomes in cohorts of patients who participated independently vs those who had family and friend support. The results showed that it was not enough to have support at the beginning of the program; active participation by the supporters was also needed throughout the program. The patients who had the most success in weight loss were "partnered" with others who were also successful in their weight loss. Kumanyika and colleagues' article provides insight into the supportive role that is played by family and friends as active team members.

In a study of the effects of a culturally tailored intervention involving a nurse case manager and a community health team worker on emergency department visits and hospitalizations, Gary et al discuss their findings in a cohort of 542 urban African Americans with diabetes mellitus. The patients were divided into 2 groups and