Published in final edited form as:

Am J Health Promot. 2018 February ; 32(2): 282–293. doi:10.1177/0890117117695218.

A Targeted Self-management Approach for Reducing Stroke Risk Factors in African-American Men who have had a Stroke or Transient Ischemic Attack

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Abstract

Purpose: This study compared a novel self-management (TargetEd MANageMent Intervention (TEAM)) vs. treatment as usual (TAU) to reduce stroke risk in African-American (AA) men.

Design: 6-month prospective randomized controlled trial with outcomes evaluated at baseline, 3 and 6 months.

Setting: Academic health center

Subjects: 38 (< age 65) AA men who had a stroke or TIA; Barthel Index score of >60, were randomly assigned to TEAM (N=19) or TAU (N=19).

Intervention: self –management training, delivered in 1 individual and 4 group sessions (over 3 months).

Measures: Blood pressure, HbA1c, lipids, medication adherence, weight, and standardized measures of health behaviors (Diet; exercise; smoking; substances), depression and quality of life. Qualitative assessments evaluated the perspectives of TEAM participants.

Analysis: T-tests for paired differences and nonparametric tests. Thematic content qualitative analysis.

Results: Mean age was 52.1 (SD=7.4) and mean body mass index was 31.4 (SD=7.4). Compared to TAU, TEAM participants had significantly lower mean systolic blood pressure by 24 weeks. By 24 weeks, there was also improvement in HbA1c and HDL cholesterol ($p=.03$) in TEAM participants. Other biomarker and health behaviors were similar between groups. Qualitative results suggested improved awareness of risk factors as well as positive effects of group support.

Keywords

stroke; transient ischemic attack; African-Americans; health disparities; hypertension

Introduction

Stroke is a leading cause of disability, death, and health resource use among Americans.^{1,2, 3} Although overall U.S. stroke mortality rates have declined since the 1950s, stroke deaths have remained high for African-Americans (AA) compared to white Americans.⁴ AA have higher stroke rates than whites, experience stroke at a younger age, have more disability, more complications, and slower recovery.^{5, 6, 7, 8}

Racial disparities in stroke outcomes are greatest in younger people and in particular among AA men^{9, 10}. Higher rates of hypertension and diabetes among AA contribute to disparity in stroke incidence.^{7, 11, 12, 13} Other factors include higher rates of smoking and obesity, social stressors, coping styles, unemployment and underemployment and health access issues.^{14, 15, 16}

Once they have had a stroke, AA stroke survivors are more likely to be discharged from acute care settings to home.¹⁷ Informal home care may be inadequate in some cases to provide the support needed for young AA men who have experienced a life-changing medical event. Targeting individuals with transient ischemic attack (TIA) who are at high risk of stroke,¹⁸ is another opportunity to help vulnerable groups.

For all stroke survivors, major areas of care include (1) managing stroke risk factors/ comorbid illness and treating medical complications; (2) training to enhance independence;

(3) supporting psychosocial coping and adaptation; (4) promoting community reintegration; and (5) enhancing quality of life.¹⁹ The American Heart Association (AHA) Guidelines²⁰ prioritize management of specific modifiable risk factors known to be disproportionately common in AA, such as hypertension, diabetes, hyperlipidemia, smoking, alcohol use, obesity, and inactivity. However, patient engagement with behavioral recommendations such as diet, exercise and smoking cessation can be difficult.²¹

Self-management is a care approach that enables individuals to solve problems as they arise, practice new health behaviors, and gain emotional stability.²² While a number of reports support self-management training for stroke survivors,^{23,24,25,26} there is limited data specific to young AA men.^{27, 28, 29} Kronish and colleagues^{30, 27} recently conducted the Prevent Recurrence of All Inner-city Strokes through Education (PRAISE) trial, which tested a peer-lead, group-format stroke risk-factor approach demonstrated to reduce blood pressure in individuals with stroke or TIA within the past 5 years. Peer support may be a relatively low-cost and yet effective way to engage minority or high risk populations.^{31, 32}

Approaches that target AA men with stroke or TIA and that address self-management could potentially reverse the often bleak prognosis for this high-risk group. This 6-month prospective, comparative trial evaluated effects of a novel behavioral **TargetEd MANageMent Intervention (TEAM)** vs. treatment as usual (TAU) in 38 young (< age 65) AA men with stroke or TIA. We hypothesized that TEAM would lead to improved medication adherence, risk-factor reduction, and more healthy behaviors compared to TAU.

Methods

Overview.

This report is part of a larger 2-phase U.S. National Institute of Health-funded project (NINR 1R21NR013001-01A1, PI Sajatovic) that used a community-engaged process to refine an existing behavioral intervention developed by the investigators,^{33, 34, 35} and conduct a randomized controlled trial (RCT) of the intervention. The intervention development process has been described elsewhere.^{36, 37}

This report describes the RCT comparing TEAM vs. TAU in 38 AA men < age 65 with stroke or TIA. Participants received either TEAM (N=19) or TAU (N=19). CONSORT guidelines informed study design and reporting,³⁸ Figure 1. Randomization assignment was determined using a pre-set computer-generated program and identified for each participant only after completion of baseline study assessment. The investigators conducted 3 separate TEAM “cohorts” with 6–7 AA men per cohort. The men were invited to include a care partner if their social network included such an individual. TEAM was quantitatively assessed for feasibility, acceptability, and fidelity, as well as preliminary efficacy in comparison to TAU for effects on medication adherence, biomarkers including blood pressure, serum HbA1c and lipid levels, as well as standardized assessment of health behaviors. A qualitative assessment evaluated the perspective of intervention participants.

Participants.

Individuals were recruited from the clinical practices of study investigators at 2 large academic medical centers, self-referred in response to Institutional Review Board (IRB) approved flyers and outreach to the AA community or identified via IRB-approved electronic health record identification with subsequent enrollment for individuals who agreed to screening and participation. AA ischemic stroke survivors and those with TIA were enrolled within 12 months of hospital discharge or release from an Emergency Room. Additional inclusion criteria were: 1.) Self-identified AA male, 2.) < Age 65 years, 3.) Planned or recent home discharge and 4.) Barthel Index (BI) score of > 60.^{39,40, 41} To enhance broad future generalizability, only those AA men unwilling or unable to provide informed consent were excluded. There was modest financial compensation for research assessments, but not for TEAM session participation.

Interventions.

TEAM: Similar to a previous self-management intervention developed by these investigators,^{33–35} TEAM is informed by principles of social cognitive theory.^{42, 43, 44} TEAM uses Peer Dyads (AA men who had a stroke or TIA and their care partners) to provide support and model behaviors intended to improve post-stroke care. Consistent with the focus on restoration of personal and social roles, the term “care partner” was used rather than “caregiver”, as is frequently seen in the stroke literature. Key components known to be critical for successful post-stroke care include content focused on patient and care partner needs, practice in problem-solving, and attention to emotional and role management.^{23, 24, 25} The investigators trained 2 Peer Dyads, using procedures similar to those conducted in previous work.^{33, 34} The TEAM intervention was delivered collaboratively by a Nurse Educator with expertise in stroke and by the Peer Dyad.

TEAM consisted of:

- 1) A 60 minute initial 1:1 session, in which the Nurse Educator and Peer Dyad met with the stroke/TIA survivor, and included introductions, orientation, and logistic planning;
- 2) Four 60-minute group sessions with 6–7 AA stroke/TIA survivors (sessions 2, 3 and 4 were held approximately 15, 30, and 60 days after the initial session). Group sessions were co-lead by the Nurse Educator and Peer Dyad, using a detailed curriculum with semi-formal scripting.
- 3) Seven brief (approximately 10–20 minute) telephone sessions implemented over the 6 months, to coincide with the 1:1, group sessions, and follow-up visits. Telephone sessions were between the AA stroke survivor/TIA patient and Peer Educator or Nurse Educator. Calls reinforced content from the group sessions, served as a behavioral model, provided social support, and facilitated linkage with other care providers (Stroke Nurse /Patients). The Nurse Educator conducted 4 of the telephone sessions, while the Peer Educator conducted 3 of the telephone sessions. The first call was within approximately 1 week of the individual session, the second to fifth calls were within approximately 1 week of

the respective group sessions, the sixth and seventh calls were 4 and 6 months after the first group session respectively.

All TEAM participants continued in treatment with their regular medical care providers. As part of the brief/minimal linkage with care providers in this self-management approach, the Nurse Educator provided a written overview of the TEAM study, information on patient-specific status, and contact information to the clinician shortly after TEAM initiation and at 12-week follow-up.

TAU: Individuals in TAU continued treatment with their regular medical care providers. Beyond follow-up research assessments at the same time points as TEAM, there was no interaction between the participants and the research team.

Outcome Measures.

The primary study outcome was change from baseline in self-reported medication treatment adherence with stroke risk-reduction pharmacotherapies (antihypertensive drugs, lipid or blood glucose lowering agents, antithrombotics) as measured by the Tablets Routines Questionnaire (TRQ).^{45, 46} Secondary outcomes included change in biologic parameters of stroke risk (blood pressure, diabetes control as measured by serum HbA1c, serum cholesterol and triglycerides, body mass index/BMI) and change in health behaviors (diet, exercise, smoking, alcohol/substance use) measured using standardized instruments. Diet was measured with the Diet Habit Survey (DHS),⁴⁷ exercise with the International Physical Activity Questionnaire (IPAQ) short form,^{48, 49} smoking with the Fagerstrom Test for Nicotine Dependence (FTND),^{50, 51} and substance use with the Addiction Severity Index (ASI).^{52, 53}

IPAQ scoring used Version 2, April 2004 available at the website: www.ipaq.ki.se.

Additional secondary outcomes included the Hospital Anxiety and Depression Scale (HADS)⁵⁴ and quality of life, as measured with the Stroke Impact Scale (SIS).⁵⁵

Quantitative outcome assessments were done at screening/baseline, 12-week follow-up and 24-week (6 month) follow-up. Qualitative assessments were done at the 6-month follow-up on a representative sub-set of 6 TEAM participants (recruited from each of 3 cohorts), with Peer Dyads, and the Nurse Educator.

Feasibility and Fidelity:

Attendance for each TEAM session was recorded. Following Fraser,⁵⁶ fidelity was assessed at each session by non-interventionist study staff both quantitatively (for example, yes /no assessment of complying with appropriate duration and content covered) and qualitatively (for example, participant and interventionist interaction). Non-interventionist study staff assessed each TEAM group with each fidelity dimension being rated on a 1–10 scale. Acceptability by participants was assessed at 12-weeks with a brief questionnaire developed for this project.

Qualitative Evaluation.

When complex interventions are administered in RCT's, it is difficult to determine precisely what factor(s) are responsible for the effect/outcome of the RCT. Where quantitative methods can demonstrate that a teaching intervention leads to better control of a disease, qualitative methods can provide an explanation and understanding of "why" and "how" it does.⁵⁷ We, therefore, asked participants about their perceptions of the intervention: "*How did the intervention influence outcomes and how did it influence the lives of the TEAM study participants?*".⁵⁸ In-depth interviews addressed these questions in 6/19 (32%) of TEAM participants at 6-month follow-up. This sample size is within the recommended range of 5–25 for individuals experiencing the same phenomenon.⁵⁹ We also interviewed the Nurse Educator and Peer Dyads (N = 5) to explore their perspectives. Two interviewers (CB, AP) conducted the interviews using separate semi-structured interview guides.

Data Analysis.

Quantitative analysis.

Descriptive analyses assessed change in primary and secondary outcomes. The American Heart Association thresholds (systolic blood pressure $\geq$ 140 mm Hg and/or diastolic pressure $\geq$ 90 mm Hg) were used to categorize hypertension at baseline. Although a one-time blood pressure reading is usually not considered sufficient for hypertension determination, study participants were less likely to have spurious/non-clinically relevant elevated blood pressure readings. Differences from baseline group comparisons were assessed using Mann-Whitney U tests. Both the 12-week outcome (end of the "intensive" group-format session) and the 24-week outcomes (end of telephone follow-up sessions) were of interest in the context of future intervention refinement.

For hypertension status (yes or no) at 12 and 24 weeks, group comparisons were conducted using logistic regression. Along with a dichotomous variable indicating group membership, covariates that were initially considered include age, diabetes status (yes or no), baseline hypertension status, and BMI. Similarly, group comparisons of systolic and diastolic measurements, HbA1c, serum cholesterol, LDL, and HDL levels were conducted via ANCOVA for both the 12 and 24-week periods. Covariates that were considered were the respective baseline measurements, age, diabetes status, and BMI.

Qualitative Analysis.

All interviews were audio-taped and transcript-based methodology^{60, 61} was used in data analysis. We used a thematic content analysis approach, encompassing open, axial and sequential coding, and the constant comparative method to generate constructs (themes) and elaborate thematic relationships.⁶⁰ We then constructed a coding dictionary that included mutually exclusive code definitions. The coding structure was reviewed after a preliminary analysis of a subsample of transcripts, and the dictionary was refined through comparison, categorization and discussion of each code's properties and dimensions.⁶¹ Two qualitatively trained investigators (CB, AP) independently coded each transcript to ensure consistency and reliability of the coding; discrepancies were resolved by discussion. To further ensure

qualitative rigor throughout the inquiry process, an audit trail was developed which documented all research discussions, meetings, and activities.

Results

Sample description.

Figure 1 illustrates a CONSORT diagram of participants into the study. Table 1 shows demographic and clinical variables in the group as a whole (N=38) and in TEAM (N=19) and to TAU (N=19) groups. Mean age of the sample was 52.1 (SD 7.4), with the majority (16/38, 42%) being single/never married and 14/38 (37%) being married. Half (N=19) individuals had TIA and half had stroke.

Mean BI at baseline was 97 (SD 6.30). Most individuals were overweight /obese, with a mean BMI of 31.4 (SD 7.4). Baseline systolic mean was 129 (SD 16.6) and diastolic mean was 84 (SD 11.1). At baseline, 29 /38 (76%) reported a previous diagnosis of hypertension. In those with hypertension history blood pressure was well controlled in 20 (69%) and elevated in 9 (31%). Of those without hypertension history, 2/9 (22%) had elevated baseline blood pressure. At baseline, the overwhelming majority reported taking all or most of prescribed stroke risk-reduction medications, with a mean proportion of missed medication of 5.9% (SD 14.4). Just over one-third (36.8%) had a previous diagnosis of diabetes. In diabetics, mean HbA1c values were 8.0, SD 1.8. Group baseline means on serum cholesterol, HDL, LDL and triglycerides were generally within desirable targets. Smokers with more than very occasional use comprised 11/38 (26.3 %) of the total sample.

TEAM and TAU interventions

Adverse events, attendance and study retention.

There were 10/38 (26.3%) individuals (5 in TEAM and 5 in TAU) who did not complete the study. Of those terminating prematurely, one participant declined further participation (1), one moved (1), seven were lost to follow-up (7), and one died in a traffic accident. Serious adverse events occurred in 11/38 (29%), and included kidney failure, seizure, re-current stroke, suicide attempt, symptomatic bradycardia, tachycardia, pacemaker placement, and hospitalizations for acute medical conditions. No adverse events were related to study participation. Most (17/19, 89.5%) TEAM participants attended the initial 1:1 session with an average of 70% group attendance (including make-up sessions).

There were 28 individuals (14 in TEAM and 14 in TAU) able to be assessed at 12-weeks and 28 individuals (14 in TEAM and 14 in TAU) able to be assessed at 24-weeks. Drop-out at 24-weeks was 26.3%. We conducted an analysis on drop-out versus completers, comparing a range of demographic and clinical variables. There were no significant differences for any variables. Since drop-out rates between TTIM and TAU were identical it seems reasonable to conclude that the data is missing completely at random, and that our analyses are not biased by differential attrition

Intervention effects.

Tables 2 and 3 show change on primary and secondary outcomes. There was little room for improvement in self-reported medication adherence and health behaviors. Biomarker outcomes are noted in Table 3, with unadjusted means reported. For hypertension outcomes, a final model included the group membership variable, age, and BMI. The group membership variable was statistically significant, with an estimated OR for having hypertension at 12 weeks for TEAM versus TAU being 0.77 ($p < .05$). For the 24-week outcome model, the group membership variable was not significant. Significant group differences were found for mean systolic pressure at 24 weeks ($p = 0.03$), but not 12 weeks (Figure 2). Covariates included in the respective ANCOVA models were baseline systolic pressure, age, diabetes status, and BMI. At 24 weeks, an unadjusted mean difference of 15.4 was observed, with TEAM having a lower systolic mean than TAU. For diastolic pressure, significant group differences were found at 12 weeks ($p < 0.05$), but not at 24 weeks. At 12 weeks, an unadjusted mean difference of 8.3 was observed, with the TEAM group having lower mean diastolic pressure than TAU.

For HbA1c, total serum cholesterol, HDL and LDL 24-week values, we used ANCOVA models with covariates of respective baseline measurements, age, diabetes status and BMI. For HDL, there was a significant group difference at 24 weeks ($p = 0.03$). The unadjusted mean difference was 6.9, with TEAM subjects having on average higher values. Other biomarkers were similar between groups.

We conducted a sub-analysis of diabetes control (HbA1c) change over 24 weeks in diabetics assigned to TEAM only, since HbA1c levels were available for only one TAU diabetic at 24-weeks. For the 8 TEAM diabetics with 24-week HbA1c, the mean change from baseline was a decrease of 1.04 ($p = 0.04$).

Qualitative Findings

Overall, TEAM participants found their experience to be a positive one:

“It was a wonderful experience...I learned a lot of stuff that I didn’t know before. ...certain things to eat...ways to take care of yourself where you won’t have another stroke. You know stuff with low sodium and you know stuff like that. I mean take your medication every day and you know, exercise, do a lot of walking... try to keep your weight down.” Respondent 1

Participants particularly enjoyed the group format, in which other AA men and Peer Dyads shared their own stories about the road to recovery. This group interaction provided a support system and reduced feelings of loneliness and isolation:

“It was helpful being in a group. I think all of us was all in the same age bracket, late 40s/early 50s. You get into knowing the people. The more you get to knowing those people from the heart, the more they’re going to open up and they’re going to talk to you, and they might tell you something that they might have been embarrassed to say around anybody else, but by them getting to know each other, you all have touched each other’s life. Because y’all have experienced an ordeal, a bad ordeal, but you make it something good come up out of it.” Respondent 3

The group format was so well received that several participants suggested that more sessions should be added to the TEAM program:

“To me it (number of sessions) wasn’t enough. I could have learned a little more, but it was okay. I mean two a month would have been I would say sufficient for maybe six months.” Respondent 1

Perhaps the most important issue for the participants was the feeling that TEAM had given them the tools to maintain a healthy lifestyle and prevent further strokes or TIAs:

“It’s like working on a car. If you don’t have all the tools you can’t fix nothing. So you got all the tools to manage it right, and it’s up to you if you want to have some good health or you want to fall behind and be in trouble. You have to use what you learned to make your health better. If you don’t use it and do every day the wrong way you know what’s gonna’ happen!” Respondent 4

TEAM processes and dynamics

Table 4 illustrates TEAM processes and dynamics that emerged from qualitative data. The Nurse Educator described the TEAM discussions as a powerful tool in facilitating cooperative learning and the inclusion of the peer dyads in these discussions as integral to the group process:

“I would say the most effective things were the discussions between the participants after information was given to them.rather than me just speaking to them as a health care provider I felt like having the Peer Dyads share their experiences certainly gave them a feeling like somebody else here has gone through what they’ve gone through; so they get it!” Nurse Respondent

The Peer Dyads found their experience to be positive for them personally, and the content of sessions helped some of the men improve their own self-management skills:

“I thought the experience was good. When I made the follow-up phone calls the people always seemed to be glad to hear from me and so that made me feel good!” Male respondent in Peer Dyad 1

“I think the discussion on diet is good because it even got me reading labels on cans to see how much sodium and I never did that before. I was never interested in that. Now I make sure I have my reading glasses so I can read and see what’s in there. I think that helped me more because I wasn’t doing that before, but I do it now.” Male respondent in Peer Dyad 2

Although they felt that the time and length of the group meetings (5–6 pm) were acceptable, the Peer Dyads and participants suggested adding more sessions.

“You should have 2 more sessions. Session 1 people are “not for sure” and afraid to talk, Session 2 they warm up a little. Session 3, they start to get into it. Session 4 they get it and then it’s over. You need two more.” Peer Dyad 2

Many of the participants felt more confident in their self-management skills and they were actively working to maintain a healthier lifestyle than before their stroke or TIA.

“I feel like my confidence is a lot higher and I can do much more than I did before.” Respondent 6

“Yeah, I cut down on a lot of stuff (food) using portion control. Helps you lose weight, I was like 260-something, now I’m down to 252. Now I got to read everything I think I want to buy. Certain ingredients you shouldn’t buy to maintain your diet properly. I’m learning how to cook more properly, but I miss the butter!” Respondent 5

Keeping to a routine was something participants learned was important, and several participants were actively practicing to maintain a healthier lifestyle:

“Okay. First thing I do every morning is what I call my morning steps; I take my glucose, I take my blood pressure, I get on the scale, I take my weight and, my body fat percentage. I mean that’s just my norm. I keep track of everything that I eat and write it down. ...Keeping a routine is a vital process for me in terms of keeping things organized. I’m in the catbird seat to kind of keep all balls rolling and as such I have to keep the balls as simple as possible.” Respondent 2

Discussion

Young AA men are at high risk for stroke and have poor prognosis and outcomes once they experience a stroke. A novel behavioral **TargetEd MAnageMent** Intervention (TEAM) in this pilot/development study has potential for engaging these high risk individuals and reducing key stroke risk factors. In spite of the small sample size and the fact that baseline biomarkers were generally within desirable targets there were significant differences in hypertension between TEAM vs. TAU participants, better systolic and diastolic pressures, and HDL cholesterol, generally favoring TEAM. Mean systolic blood pressure remained below the recommended threshold of < 140 mm Hg among men in the TEAM program at all time-points, compared to those in TAU, where the mean at 24 weeks increased to 143mmHg.

A recent Cochrane review²⁸ on interventions to improve modifiable risk factors in stroke survivors found no established evidence-based organizational, educational, or behavioral approaches. There is a need for care approaches that may move forward in reversing racial disparities.¹⁰ Of the individual stroke risk factors contributing to AA-white stroke risk disparity, it has been demonstrated that systolic blood pressure has the most powerful IMPACT, and accounts for approximately half of the combined Framingham risk factor effect.¹⁰

Kronish and colleagues^{27, 30} developed a peer-lead intervention targeted to diverse low-income communities, and conducted a randomized trial of self-management intervention (N= 301) vs. control, although their comparison group was a 12-month wait list (N=299) and their sample was predominantly female (59%) and older (mean age 63 years). Kronish et al²⁷ demonstrated effects on blood pressure, but no change in lipids. It is possible that observed lack of change with TEAM on lipids with the exception of HDL is due to the fact that values were mostly within target range at baseline.²⁰

In contrast to our original expectation, we found high baseline medication adherence rates (95%), contrasting substantially with the study by Kronish et al, which had self-reported rates of non-adherence in the order of 38–42%. It is possible that young AA men enrolled in our study may have felt reluctant to disclose missing medication. Social desirability, mistrust or difficulty with recall are all known factors in preventing a candid report on adherence.^{62,63} If self-report overestimated medication adherence any changes in adherence could have been obscured or swamped by the high reported baseline levels. Alternatively, it is possible that there was a temporary Hawthorne effect of improved adherence simply as a result of being monitored. Work in other therapeutic areas by this study team found that monitoring may increase adherence by >15%.⁶⁴ The notion that adherence was temporarily improved with monitoring is supported by the observation that systolic blood pressures, which may have been controlled by adherence to antihypertensive drugs, started out within target at baseline for both TEAM and TAU, and stayed within target for TEAM, but got worse over time for TAU. Possibly, antihypertensive adherence waned over time in TAU, while TEAM maintained adherence. Given the inherent limitations of self-reported behavioral measures, future studies in this area might preferentially use biological markers for inclusion targets (blood pressure, lipids) rather than self-reported measures, where social desirability bias could be an impediment.

Our findings did not identify changes in group means in health behaviors, although our qualitative findings noted that some individuals clearly were making changes in diet. While our analysis on diabetic control was confined only to TEAM participants, it is possible that dietary improvements could have been responsible for improvements in HbA1c. Although TEAM participants found exercise and activity to be helpful, we were not able to demonstrate change in activity levels. Perhaps a stronger focus on exercise would be necessary to change this aspect of health behavior.

The TEAM program was not able to engage all participants. Qualitative findings suggest that while the group format was highly acceptable, there are aspects of the program that might be improved. More sessions might have been helpful, as would encouraging telephone attendance for those with travel or logistic barriers. While TEAM targeted a young AA age group with the highest stroke disparities, participants suggested that the TEAM program would be helpful to older AA men, to AA women and to AA with stroke in the more remote past.

This study had a number of limitations including small sample size, limited duration and the fact that research staff were not blind to intervention assignment. Individuals in the study already had good control of many stroke risk factors at baseline which imposed a ceiling effect on outcomes and may not be entirely representative of the larger group of young AA men with stroke or TIA. There are limitations to using one-time blood pressure assessment including the possibility of elevation when measurement is done in a clinical setting (white-coat hypertension) and under-detection (masked hypertension). Approximately one-quarter of our study participants dropped out of the trial and were lost to follow-up. It is possible that individuals with the worst outcomes were the ones to preferentially drop out. On the other hand, our drop-out rates between TTIM and TAU were identical, and this may help reduce attrition bias at least with respect to intervention comparisons. Finally, there are

limitations to using subjective or self-report measures such as the IPAQ⁶⁵ and TRQ. Still, given the paucity of effective models of care that target AA, the TEAM approach may be a promising approach that can be further modified and studied in at-risk Americans.

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Implications for Health Promotion Practitioners and Researchers**What is already known on this topic?**

There are substantial health disparities in stroke-related morbidity and mortality that affect the African-American (AA) community, in particular younger AA men.

What does this article add?

This article describes preliminary positive findings with a self-management program that improves a key stroke risk factor (blood pressure) in AA men at high risk for stroke. The curriculum-guided program features leadership and delivery by AA men at risk for stroke and his care partner, the individual in his social network most substantively involved in the AA man's stroke reduction efforts. Program retention was relatively good and AA men gained confidence in managing their risk factors

What are the implications for health promotion practice or research?

Self-management approaches that tap into social environment strengths, engage AA men, and reduce stroke risk factors have the potential to reduce stroke-related burden in the AA community.

Figure 1:
CONSORT Diagram illustrating TEAM and TAU enrollment and participation in study

Figure 2:
Comparison of mean systolic blood pressure

Table 1:

Baseline demographic and clinical variables in young AA men with stroke or TIA

Variable	Entire sample N= 38	TEAM group N=19	TAU group N=19
Age (Mean, SD)	52.08 (7.42)	51.26 (7.01)	52.89 (7.92)
Education (in years) (Mean, SD)	13.30 (1.88)	13.42 (1.84)	13.17 (1.98)
Employment			
Full time	4 (10.5%)	2 (10.5%)	2 (10.5%)
Part time	2 (5.3%)	2 (10.5%)	0 (0.0%)
Unemployed	12 (31.6%)	6 (31.6%)	6 (31.6%)
Retired	6 (15.8%)	2 (10.5%)	4 (21.1%)
Self-Employed	1 (2.6%)	0 (0.0%)	1 (5.3%)
Other	13 (34.2%)	7 (36.8%)	6 (31.6%)
Marital status			
Single	16 (42.1%)	9 (47.4%)	7 (36.8%)
Married	14 (36.8%)	7 (36.8%)	7 (36.8%)
Separated	1 (2.6%)	0 (0.0%)	1 (5.3%)
Divorced	6 (15.8%)	2 (10.5%)	4 (21.1%)
Other	1 (2.6%)	1 (5.3%)	0 (0.0%)
BI (Mean, SD)	96.5 (6.3)	96.6 (6)	96.5 (6.8)
SIS (Mean, SD)			
Strength	62.86 (26.34)	59.72 (26.19)	66.18 (26.89)
Hand function	71.97 (31.63)	74.74 (30.07)	69.21 (33.72)
ADL/IADL	86.22 (12.69)	85.66 (13.01)	86.81 (12.68)
Mobility	75.77 (17.51)	75.00 (17.67)	76.63 (17.84)
Communication	86.58 (15.87)	89.29 (13.60)	83.71 (17.97)
Memory/thinking	76.69 (20.36)	77.58 (19.01)	75.79 (22.14)
Role function	66.51 (22.30)	60.96 (21.94)	72.07 (21.84)
HADS			
Anxiety (Mean, SD)	7.11 (3.87)	7.05 (3.72)	7.16 (4.11)
Depression (Mean, SD)	5.70 (3.57)	5.89 (3.31)	5.53 (3.88)
BIOMARKERS:			
AHA-defined hypertension*: N, %	11 (28.9%)	7 (36.8%)	4 (21.1%)
Systolic BP (Mean, SD)	129 (16.6)	130(16.8)	129 (16.7)
Diastolic BP (Mean, SD)	84 (11)	84 (11.1)	83 (11.2)
Diabetes at baseline**	14 (36.8%)	9 (47.4%)	5 (26.3%)
HbA1c (Mean, SD)			
Diabetic	7.97 (1.77)	8.31 (1.99)	7.36 (1.25)
Non-diabetic	5.60 (0.66)	5.45 (0.42)	5.73 (0.81)
Serum cholesterol Mean mg/dl (SD)	145.51 (39.77)	138.89 (26.70)	152.50 (49.94)
HDL Cholesterol Mean mg/dl (SD)	43.97 (11.84)	43.37 (12.28)	44.61 (11.68)

Variable	Entire sample N= 38	TEAM group N=19	TAU group N=19
LDL Cholesterol Mean mg/dl (SD)	76.59 (36.30)	69.26 (19.86)	84.33 (47.42)
Triglycerides Mean mg/dl (SD)	124.59 (54.81)	131.11 (62.40)	117.72 (46.29)
BMI (Mean, SD)	31.36 (7.41)	32.93 (7.21)	29.79 (7.47)
HEALTH BEHAVIORS:			
TRQ	5.92 (14.38)	6.09 (15.35)	5.71 (13.73)
Smoker with at least low dependence ***	10 (26.3%)	4 (33.3%)	6 (40.0%)
DHS total score (Mean, SD)	165.34 (38.28)	154.06 (28.43)	176.61 (44.61)
IPAQ walking (Mean, SD)	1329.01 (2288.16)	1484.08 (2735.63)	1182.09 (1832.09)
ASI			
No alcohol problem (N, %)	25 (65.8%)	13 (68.4%)	12 (63.2%)
No drug problem (N, %)	25 (65.8%)	13 (68.4%)	12 (63.2%)

BI: Barthel Index. Scores from 0-100 with higher score indicating higher functioning.

SIS= Stroke Impact Scale. Scores from 0-100 with higher scores indicating less stroke impact in each of 8 domains.

HADS= Hospital Anxiety and Depression Scale. Subscale scores from 0-21 with higher scores indicating more depression. Scores of 0-7 indicate normal levels of anxiety and depression

AHA defined hypertension= Systolic blood pressure $\geq$ 140 or diastolic blood pressure $\geq$ 90

BP= Blood pressure

BMI= Body mass index

TRQ= Tablets Routine Questionnaire (self-reported proportion of missed prescribed medication). Scores from 0-100 with higher scores indicating worse adherence.

DHS= Diet Habit Survey (Scores for men ideally <170 with higher scores indicating a diet that is less heart-healthy)

IPAQ walking= International Physical Activity Questionnaire, walking= number of minutes

ASI= Addiction Severity Index, need for treatment. Scores from 0 – 9, with higher scores indicating more need for treatment

*. Measured blood pressure at screening

***. Self-reported diabetes diagnosis

****. Smoker with at least low dependence as indicated by a score of ≥ 3 on the Fagerstrom Test for Nicotine Dependence

Table 2:

Medication adherence and behavioral effects of TEAM and of TAU in young AA men with stroke or TIA

Variable	TEAM	TAU
TRQ (Mean, SD)		
Baseline	6.09 (15.35)	5.71 (13.73)
12-week	2.17 (4.82)	1.67 (4.50)
24-week	2.38 (8.25)	4.03 (14.53)
IPAQ (Mean, SD)		
Baseline	3371.87 (5390.59)	2708.41 (3752.45)
12-week	949.90 (1481.55)	1661.13 (3371.00)
24-week *	655.97 (834.98)	1519.70 (3105.76)
DHS (Mean, SD)		
Baseline	154.06 (28.42)	176.61 (44.61)
12-week	159.83 (21.48)	153.70 (28.21)
24-week	155.11 (25.64)	170.25 (26.72)
FTND (Mean, SD)		
Baseline	1.67 (2.10)	2.07 (2.69)
12-week	1.00 (1.78)	1.67 (2.64)
24-week	2.00 (2.56)	2.50 (2.93)
HADS (Mean, SD)		
Baseline	12.72 (5.54)	12.68 (7.39)
12-week	13.79 (6.44)	11.71 (5.55)
24-week	10.85 (7.94)	11.36 (7.62)

TRQ= Tablets Routine Questionnaire (self-reported proportion of missed prescribed medication. Scores range from 1 (perfect adherence/no missed drug) to 100 (completely non-adherent/missing all prescribed medication)

IPAQ = International Physical Activity Questionnaire. Higher scores indicate greater activity

DHS= Diet Habit Survey (Scores for men ideally < 170 with higher scores indicating a diet that is less heart-healthy)

FTND= Fagerstrom Test for Nicotine Dependence. Scores range from 0-5. Higher scores indicate greater nicotine dependence

HADS= Hospital Anxiety and Depression Scale. Scores range from 0 to 21, with 8-10 indicate borderline anxiety and depression levels and 11-21 suggest abnormal levels of anxiety and depression

* no significant difference values between groups from baseline to 12 and 24 weeks were found, based on Mann-Whitney U test p-values being less than 0.05.

Table 3:

Biomarker effects* of TEAM and of TAU in young AA men with stroke or TIA

AHA Hypertension (% within group)	TEAM	TAU	Multivariate adjusted p-value
12-week	2 (10.5%)	7 (36.8%)	p< 0.05
24-week	6 (42.9%)	8 (57.9%)	p= 0.23
Systolic BP (Mean, SD)			
12-week	127.1 (20.3)	138.6 (19.4)	p= 0.17
24-week	128.1 (16.0)	143.5 (24.9)	p= 0.03
Diastolic BP (Mean, SD)			
12-week	77.7 (9.3)	86.0 (12.1)	p< 0.05
24-week	79.7 (8.6)	84.2 (10.8)	p= 0.28
Hb1Ac (Mean, SD)			
24-week	6.9 (1.4)	6.4 (N/A, n=1)	p= 0.82
Total cholesterol (Mean, SD)			
24-week	146.6 (29.9)	138.46 (41.2)	p= 0.39
HDL Cholesterol (Mean, SD)			
24-week	55.6 (21.9)	48.7 (13.8)	p= 0.03
LDL Cholesterol (Mean, SD)			
24-week	69.3 (20.7)	65.7 (41.4)	p= 0.66

AHA defined hypertension= Systolic blood pressure ≥ 140 or diastolic blood pressure ≥ 90

BP= Blood pressure

Hb1Ac= Glycosylated hemoglobin, a measure of diabetes control. Target is < 7 in individuals with diabetes. Higher scores indicate worse diabetes control.

* : for 12- and 24-week hypertension and BP outcomes, n=19 per group; for systolic and diastolic BP, 12- and 24-weeks, 14 TEAM and 13 TAU subjects; for other biomarkers, 12 TEAM and 12 TAU subjects at 24 weeks. Note that analyses were conducted on subjects with complete data.

Table 4:

TEAM Processes and Dynamics

Themes and Categories	Illustrative Quotations from Participants in TEAM (N=6)
Increased Illness and Prevention Knowledge	
<i>Stroke physiology</i>	<i>"I learned how the beginning of a stroke is happening. The blood doesn't come to the part of the brain, doesn't get the oxygen and a vessel could fail and then that part of the brain that's normally alive seeing as it's not getting what it needs, it dies. Respondent 5"</i>
<i>Lifestyle changes</i>	<i>"I learned a lot of stuff that I didn't know before. ...things to eat, ...and ways to take care of yourself where you won't have another stroke. ...stuff with low sodium and you know stuff like that. ...take your medication every day and you know, exercise do a lot of walking. You know and things like that, try to keep your weight down. Respondent 1"</i>
<i>Managing stress</i>	<i>"We learned how to manage and deal with stress in the book (manual). Don't let certain things, worry you that you have no control over. So that got me right there, when I read that. Makes you think even more. I heard it before, but when I read it made me think even more. Respondent 3"</i>
Group Process	<i>"It was good (being in a group) because I learned different things from other people, you know. I put a lot of input into it too, like things to prevent from getting another stroke, you know. And I learned a lot from the other men in the group and the Peer Educators too." Respondent 4"</i>
Follow-up Phone Calls	<i>"XX (peer dyad member), would call me like every other week to see how I was doing, you know. And I really liked that. He told me if I ever have any problems or any questions just to call him and ask him, you know. And I did call him the other day. The calls kept me on my toes". Respondent 2"</i>
Improved Self-Management Skills	
<i>Adherence with Medications</i>	<i>"Well I mean I have a pill bottle now. Well what I do is I keep it on the table next to my recliner and it reminds me every day. When I look at it I get up and take it. Respondent 3"</i>
<i>Eating healthier</i>	<i>"I learned what to eat and what not to eat. ...I'm eating more healthy. I learned to eat, you know, smaller portions and stuff like that." Respondent 1"</i>
<i>Increase in exercise</i>	<i>"I have an exercise program I'm into now; I do it where I live at. We have a fitness room. I got some people we all get together." Respondent 5"</i>