Barbershops as Hypertension Detection, Referral, and Follow-Up Centers for Black Men

Paul L. Hess, Jason S. Reingold, Jennifer Jones, Melissa A. Fellman, Premere Knowles, Joseph E. Ravenell, Stacey Kim, Jamie Raju, Erica Ruger, Sharonda Clark, Chibuike Okoro, Ore Ogunji, Patricia Knowles, David Leonard, Ruth P. Wilson, Robert W. Haley, Keith C. Ferdinand, Anne Freeman, Ronald G. Victor

Abstract—Barbershops constitute potential sites for community health promotion programs targeting hypertension (HTN) in black men, but such programs have not been evaluated previously. Here we conducted 2 nonrandomized feasibility studies to determine whether an enhanced intervention program of continuous blood pressure (BP) monitoring and peer-based health messaging in a barbershop lowers BP more than standard screening and health education (study 1) and can be implemented by barbers rather than research personnel (study 2). In study 1, we measured changes in HTN treatment and BP in regular barbershop customers with poorly controlled HTN assigned for 8 months to either an enhanced intervention group (n=36) or a contemporaneous comparison group (n=27). Groups were similar at baseline. BP fell by 16±3/9±2 mm Hg in the enhanced intervention group but was unchanged in the comparison group ($P<0.0001$, adjusted for age and body mass index). HTN treatment and control increased from 47% to 92% ($P<0.001$) and 19% to 58% ($P<0.001$), respectively, in the enhanced intervention group, whereas both remained unchanged in the comparison group. In study 2, barbers were trained to administer the enhanced intervention continuously for 14 months to the entire adult black male clientele (n=321) in 1 shop. Six barbers recorded 8953 BP checks during 11 066 haircuts, thus demonstrating a high degree of intervention fidelity. Furthermore, among 107 regular customers with HTN, treatment and control increased progressively with increasing intervention exposure ($P<0.01$). Taken together, these data suggest that black-owned barbershops can be transformed into effective HTN detection, referral, and follow-up centers. Further research is warranted. **(*Hypertension*. 2007;49:1040-1046.)**

Key Words: population science ■ special populations ■ blood pressure measurement/monitoring ■ blacks ■ hypertension

Hypertension (HTN) is more prevalent, more severe, and causes disproportionate numbers of premature disabilities and deaths from heart attack, stroke, and end-stage renal disease in blacks than in all other racial/ethnic groups in the United States.[1–3] HTN is present in 40% of blacks, with blood pressure (BP) being controlled with medication to a recommended value of <140/90 mm Hg in less than one-third of these affected high-risk individuals.[2,4] In the other two-thirds, HTN either is untreated or undertreated.

Among black women, HTN treatment rates are high, and most of the uncontrolled HTN occurs under the watchful eye of the healthcare system.[2,5] Black men have less frequent contact with the healthcare system and considerably lower rates of HTN detection and treatment.[2,5–8] The black church has been a conventional site for medical outreach and HTN screening programs.[9,10] However, regular church attendance is much less common among black men than women.[6,11]

To reach a larger fraction of the at-risk male population, we approached the black-owned barbershop, a cultural institution that regularly attracts large numbers of black men and provides an open forum for discussing any number of topics with peers.[12] Barbershops previously have been used for BP screening, but the effectiveness and sustainability of such programs have never been evaluated.[13–16] We hypothesized that the barbershop constitutes a uniquely receptive environment for regular BP monitoring and health messages based on positive experiences of peers, a powerful motivator of health behavior.[17]

This article reports on 2 nonrandomized feasibility studies to determine whether an enhanced intervention of continuous

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From the Division of Hypertension (P.L.H., J.S.R., J.J., M.A.F., Premere.K., J.E.R., S.K., J.R., E.R., S.C., C.O., O.O., Patricia.K., D.L., R.G.V.), Department of Internal Medicine, and Donald W. Reynolds Cardiovascular Clinical Research Center, University of Texas Southwestern Medical Center. Dallas; African-American Studies Department (R.P.W.), College of Social Sciences, San José State University, San José, Calif; the Division of Epidemiology, Department of Internal Medicine (R.W.H.), and Division of Community Outreach, Department of Health Care Science, Allied Health, Science School (A.F.), University of Texas Southwestern Medical Center at Dallas; and the Association of Black Cardiologists, Inc (K.C.F.), Atlanta, Ga.

Correspondence to Ronald G. Victor, Hypertension Division, University of Texas Southwestern Medical Center, Room J4.134, 5323 Harry Hines Blvd, Dallas, TX 75390-8586. E-mail ronald.victor@utsouthwestern.edu

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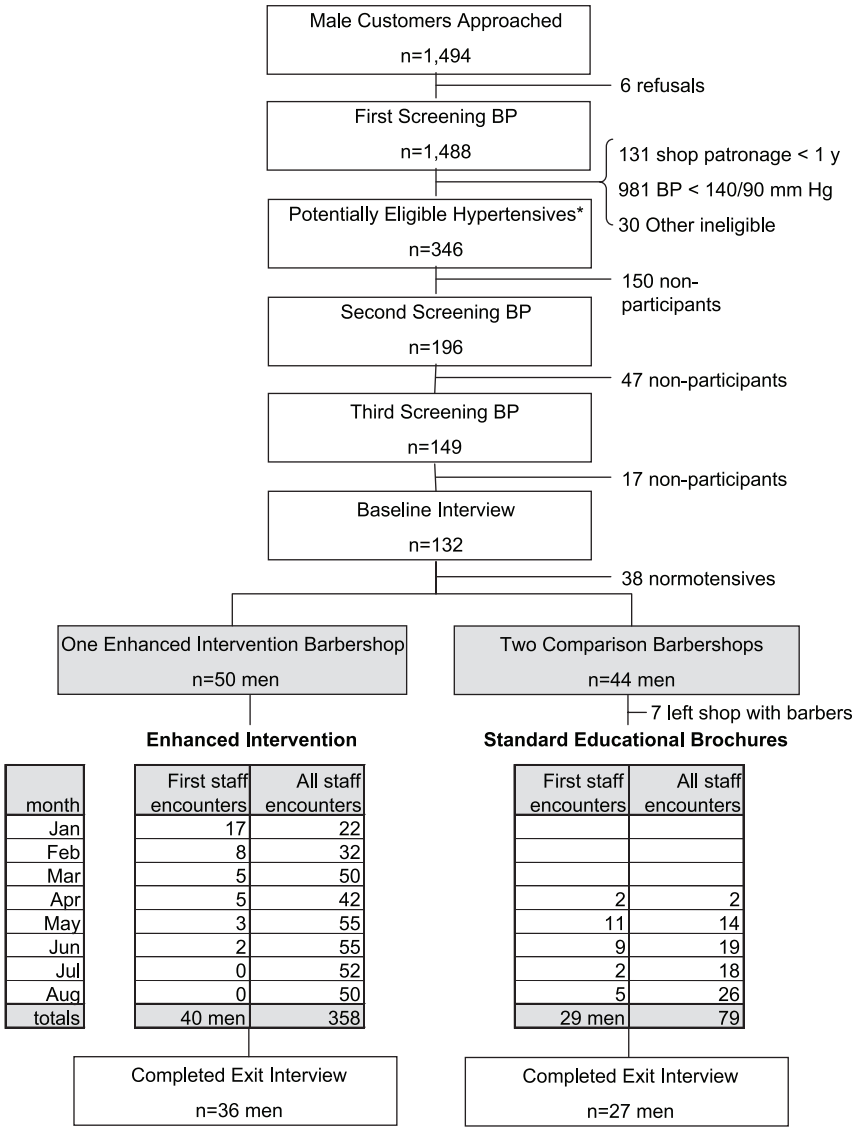


month	First staff encounters	All staff encounters	First staff encounters	All staff encounters
Jan	17	22		
Feb	8	32		
Mar	5	50		
Apr	5	42	2	2
May	3	55	11	14
Jun	2	55	9	19
Jul	0	52	2	18
Aug	0	50	5	26
totals	40 men	358	29 men	79

Figure 1. Cohort recruitment and retention for study 1. *Eligibility criteria: first screening BP ≥140/90 mm Hg and barbershop patronage ≥1 year.

BP monitoring and peer-based health messaging in a barbershop lowers BP more than standard screening and health education (study 1) and can be implemented by barbers rather than research personnel (study 2).

Methods

Human Subjects and Research Setting

The study population was restricted to adult black male customers of 3 black-owned barbershops in the southern sector of Dallas County, Tex, a low-to-middle income area of 85% to 96% black households.[11] The protocols were approved by the University of Texas Southwestern Institutional Review Board, and all of the subjects gave their informed consent to participate. All of the data collection occurred in the barbershops.

Study 1: Research Staff Intervention (April 2002 to August 2003)

Study Design

The study design and participant flow are depicted in Figure 1. Trial participants were long-term customers (>1 year of barbershop patronage) with persistent HTN after 3 sequential on-site screening visits. Condition assignment was nonrandom and based on staffing requirements; the enhanced intervention group was recruited from 1 large barbershop and a contemporaneous comparison group from 2 smaller shops. Both groups received written results of the 3 BP screenings and standard recommendations for interval medical follow-up.[18] For the next 8 months, the comparison group also received a continual supply of the American Heart Association brochure titled *High Blood Pressure in African Americans* (product code 50–1466), whereas the enhanced intervention group received the theory based intervention described below.

Behavior Theory–Based Intervention

Social cognitive theory[17,19] drove the intervention depicted in Figure 2. With accurate electronic BP monitors and medical research personnel in the barbershop as environmental facilitators, intervention messages emphasized the gravity of the personal health risk from elevated BP and the need for a regular medical provider, prescription medication, and continuous BP monitoring for effective risk reduction.

The intervention was conducted by black research assistants and medical/premedical students supervised by a black nurse who was either on-site or available by telephone to facilitate referral to community physicians. Based on individual insurance policies, participants were referred either to physician offices within walking distance of the barbershop or to a physician within their provider networks. Uninsured low-income participants were referred to the

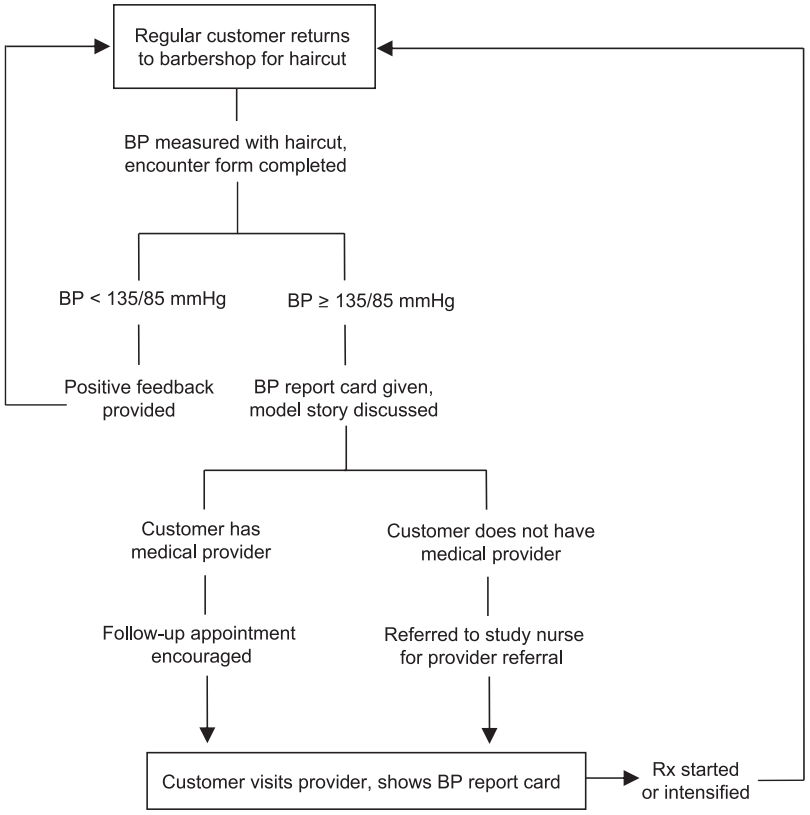


Figure 2. Intervention protocol for study 1 (and study 2). Rx indicates prescription BP medication. In study 2, the main differences were that the enhanced intervention was administered by barbers rather than research personnel and the BP report cards were to be signed by the healthcare providers and returned to the barber in return for a free haircut.

Parkland Health and Hospital System.[20] Patients with undertreated HTN were referred back to their established providers.

The main intervention tools were "BP report cards" giving customers and their providers on-going feedback about the need to initiate or intensify antihypertensive therapy and role model stories depicting successful risk reduction strategies adopted by other members of the target community with whom study participants could readily identifyorreal hypertensive customers in the intervention barbershop (please see the data supplement for these materials, available online at http://hyper.ahajournals.org). Discounted haircuts ($6 off the regular price of $12) were provided as an incentive for continued intervention participation.

BP Measurement

All of the BPs were measured in the barbershops with validated electronic oscillometric monitors (Series 52 000, Welch Allyn)[21] after 10 minutes of rest using an appropriately sized arm cuff with the participant seated in a barber chair. At each encounter, 4 consecutive BP readings were taken, and the last 2 readings were averaged to calculate a BP value; 2 sets of readings on separate days were averaged to calculate initial and final BP values for each participant.

Evaluation

Serial cross-sectional face-to-face structured interviews were conducted by black surveyors to measure group differences in the BP change over the intervention period (the prespecified primary end point), as well as changes in HTN treatment rate (percentage of hypertensive subjects receiving prescription BP medication) and HTN control rate (percentage achieving BP <140/90 mm Hg). Data also were collected on numerous other individual characteristics shown in Table 1. Treatment status was validated by inspection of prescription pill bottles brought to the barbershop.

Study 2: Barber Intervention (December 2003 to March 2005)

Under nurse supervision, the barbers in one of the previous comparison shops from study 1 conducted the intervention outlined in Figure 2, with minor refinements explained in the figure legend. All of the adult black male customers were eligible to participate in a continuous onsite BP monitoring and referral program. Training and supervision of barbers, as well as encounter forms and other intervention materials, are available in the online data supplement. Financial incentives to the barbers were $3 per recorded BP and $50 for each BP report card signed by a medical provider and returned to the barber with proof of a new BP prescription.

Evaluation

The prespecified primary end point was the proportion of haircuts in which the barber recorded a BP. A secondary end point was the proportion of recorded BPs correctly interpreted by the barbers on encounter forms. Research staff regularly checked the validity of the encounter form data against data stored in the electronic monitors and intermittently observed customer flow to validate the barbers' counts of adult and child business.

After the intervention, for 2 months surveyors approached all black male customers every day to complete a 10-minute face-to-face structured exit interview and 2 final sets of BP measurements to assess a tertiary end point—HTN treatment and control in relation to intervention exposure (total number of BP monitoring sessions with one's barber during the preceding 14 months). Age, insurance status, and other potential covariates were also assessed. Treatment status was verified as in study 1. For each completed exit interview, the customer received a free haircut ($12), and his barber received a $5 tip for encouraging customer participation.

Statistical Analyses

SAS/STAT software version 9.1 was used for all of the analyses. Baseline characteristics of study participants in study 1 (Table 1) were tested against the null hypothesis of no difference between the enhanced intervention and comparison groups under the assumptions of Student's *t* test. Group differences in baseline and final BP were tested using paired *t* tests. Group differences in baseline and final treatment and BP control status were tested using Fisher's exact tests. Systolic and diastolic BP changes over the course of the intervention were tested

TABLE 1. Participant Characteristics at Baseline for Study 1

Baseline Characteristics	Completed Baseline Interview			Completed Baseline and Exit Interviews		
	Enhanced Intervention Group (n=50)	Comparison Group (n=44)	*P*	Enhanced Intervention Group (n=36)	Comparison Group (n=27)	*P*
Biological Characteristics						
Age, y	49.5±1.7	49.0±1.7	0.83	49.9±2.4	53.0±1.8	0.32
BMI, kg/m^2	30.7±0.8	30.6±0.8	0.91	30.7±0.8	30.1±0.9	0.63
Systolic BP, mm Hg	149.2±2.0	146.8±1.7	0.38	148.8±2.6	145.8±2.5	0.42
Diastolic BP, mm Hg	87.8±1.3	87.5±1.1	0.84	87.2±1.6	86.7±1.7	0.84
Demographic data, %						
Married or living with partner	58	66	0.44	59	74	0.24
Education beyond high school	64	75	0.25	66	85	0.09
Employed full time	76	77	0.89	69	74	0.66
Healthcare characteristics, %						
Has a primary source of health care	68	72	0.67	75	73	0.87
Has health insurance	88	80	0.27	88	89	0.87
Aware of hypertension	68	66	0.83	66	67	0.93
Seeing a physician for hypertension	46	52	0.31	44	52	0.46
Taking antihypertensive medication	40	43	0.69	38	44	1.00
Controlled to BP <140/90 mm Hg	16	16	0.84	19	22	1.00
Self-reported diabetes	16	27	0.19	19	30	0.34
Barbershop patronage						
Years at current barbershop	12.8±1.4	11.8±1.2	0.59	11.8±1.7	11.7±1.4	0.96
Haircuts per month	2.8±0.2	2.4±0.2	0.26	3.0±0.3	2.1±0.2	0.03

Baseline characteristics of the special intervention and comparison groups both for all of the subjects who completed the baseline interview and for only those subjects who completed the entire study including the exit interview. Expressed as mean±SE for continuous and percentage of discrete variables. BMI indicates body mass index.

against the null hypothesis of no difference between enhanced intervention and comparison groups under the assumptions of a mixed linear model with fixed group×time effects and random effects of barbershops and customers within barbershops. Additional models included baseline age and body mass index as fixed effects.

In study 2, the barbers' completed encounter forms were electronically scanned into a Microsoft Access database. The cumulative effect of the intervention was tested by applying a Jonckheere–Terpstra nonparametric trend test to HTN awareness, treatment, and control across 4 ordered levels of exposure determined by the number of haircuts accompanied by BP measurement. To control for potential confounding by insurance status, exposure was expressed as a two-level variable (0 to 11 or 12 to 52 barber BP sessions), and the relationship between exposure level and HTN control was tested across two insurance strata (presence or absence of health maintenance organization/private insurance) using a Cochran–Mantel–Haenszel χ^2 test.

Results

Study 1: Research Staff Intervention

Cohort Recruitment and Retention

Cohort recruitment and retention are presented in Figure 1. Successful screening of 1488 (of 1494) adult black male barbershop customers (age: 43.1±0.3 years, mean±SE) yielded 346 potentially eligible hypertensive subjects, 38% of whom completed 2 additional screening visits followed by a baseline interview. The 132 baseline interview participants were similar to the 214 nonparticipants in all of the measured characteristics including initial BP (152/88 versus 152/90 mm Hg), age (48.0 versus 47.9 years), years of patronage (11.8 versus 11.9), and haircuts per month (2.7 versus 2.2). After 3 sets of BP measurements, 38 men no longer met criteria for HTN.

In the enhanced intervention group, 40 (80%) of 50 men participated in the intervention and had a total of 358 staff encounters (including exit BP measurements); 36 men completed the entire exit interview (Figure 1). In the comparison group, 7 men were lost to follow-up because of barber turnover; exit BPs were obtained on 29 (78%) of the remaining 37 men and complete data on 27 men.

Regression to the Mean

Among the 149 men who completed all 3 of the screening visits, BP fell from the first to the second screening visit but remained stable between the second and third visits. At the 3 screening visits, systolic BP was 151.6±1.0, 143.8±1.3, and 142.1±1.1 mm Hg, respectively; diastolic BP was 88.7±.7, 85.5±.8, and 85.4±.8 mm Hg, respectively.

Baseline Characteristics After Condition Assignment

The 2 experimental groups were well matched for numerous baseline characteristics, except for the frequency of haircut visits (3.0 versus 2.1 haircuts per month; $P<0.05$ enhanced intervention versus comparison group; Table 1). Despite cohort attrition, the initial and final cohorts were similar in all of the measured baseline characteristics (Table 1).

Primary and Secondary End Points

In the enhanced intervention group, BP fell 16±3/9±2 mm Hg (systolic: 149.1±2.2 to 133.4±2.2 mm Hg; diastolic: 87.4±2.6

TABLE 2. Hypertension Outcomes for Study 1

	Enhanced Intervention Group (n=36)			Comparison Group (n=27)		
Hypertension Outcomes	Initial	Final	*P*	Initial	Final	*P*
Systolic BP, mm Hg	149.1±2.2	133.4±2.2	<0.001	146.4±2.4	146.7±2.5	0.89
Diastolic BP, mm Hg	87.4±2.6	78.8±2.6	<0.001	87.9±2.2	88.0±2.2	0.94
Treated with BP medication, %	47	92	<0.001	56	67	0.60
BP controlled to <140/90 mm Hg, %	19	58	0.002	26	22	1.0

Initial and final hypertension outcomes for the enhanced intervention and comparison groups. Expressed as mean±SE for continuous and percentage for discrete variables.

to 78.8±2.6 mm Hg) but remained unchanged in the comparison group (systolic: 146.4±2.4 to 146.7±2.4 mm Hg; diastolic: 87.9±2.2 to 88.0±2.2 mm Hg; Table 2). The intervention effect remained significant ($P<0.0001$) after adjustment for age and body mass index. With the enhanced intervention, HTN treatment increased from 47% to 92% ($P<0.001$), and HTN control increased from 19% to 58% ($P<0.001$), whereas both remained unchanged in the comparison group (Table 2 and Figure S3 from data supplement 1).

Study 2: Barber Intervention

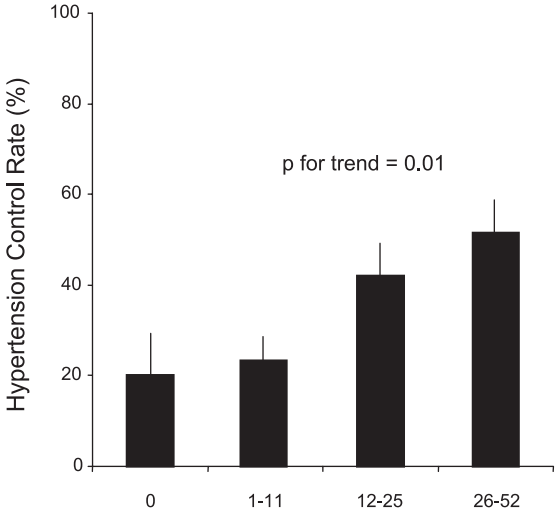
The barbers recorded 8953 BP checks during 11 066 haircuts (Figure S3 from data supplement 2). They correctly staged 8237 of 8953 BPs (92%) recorded on the encounter forms as "normal" (<135/85 mm Hg), "high" (135/85 to 179/109 mm Hg), or "very high" (≥180/110 mm Hg).

After the intervention, 308 of 321 regular male customers completed the exit interview. Of these, HTN was present in 107 men. HTN control rate increased progressively with increasing levels of intervention exposure ($P=0.01$), from 20±10.7% in those who did not participate in the intervention to 51±9% in those with maximum intervention exposure (Figure 3). The relationship between intervention exposure and HTN control remained significant after controlling for insurance status ($P=0.01$).

Discussion

The principal new findings are 2-fold. First, in a cohort of hypertensive barbershop customers, an enhanced intervention program of continuous on-site BP monitoring and peer-based health messaging was more effective than intermittent BP screening and standard educational brochures for increasing treatment rates and lowering BP. Second, with nurse supervision, much of the responsibility for administering the intervention could be shifted from research personnel to barbers, who demonstrated a high degree of sustained intervention fidelity.

We are not the first to propose barbershops for HTN surveillance in black men, but the existing peer-reviewed literature is scant.[14,15] Black barbers and stylists have been taught previously to measure BP, enabling screening and referral in low-income neighborhoods.[14,15] Our work confirms and extends these earlier studies by providing quantitative data on barbershop patronage,



No. of Hypertensive Customers	15	30	31	31	
Age, y, mean (SE)	50.9 (3.3)	50.1 (1.9)	50.8 (2.1)	51.4 (2.1)	p=ns
HMO/Private Insurance, % (SE)	80.0 (0.1)	76.7 (0.1)	90.0 (0.1)	71.0 (0.1)	p=ns
Hypertension Awareness Rate, % (SE)	73.3 (11.8)	70.0 (8.5)	80.6 (7.2)	90.3 (5.4)	p=0.06
Hypertension Treatment Rate, % (SE)	53.3 (0.1)	54.3 (0.1)	75.0 (0.1)	78.4 (0.1)	p=0.01
Hypertension Control Rate, % (SE)	20.0 (10.7)	23.3 (7.9)	41.9 (9.0)	51.6 (9.1)	p=0.01

Figure 3. HTN control as a function of intervention exposure for study 2. Intervention exposure is measured as the total number of BP monitoring and interpretation sessions with a barber. In the first level (no exposure), customers participated in the exit interview for a monetary incentive, but they did not allow the barbers to measure their BP during the intervention; the other 3 levels represent tertiles of exposure. HMO indicates health maintenance organization.

demographics, research participation, intervention fidelity, exposure, treatment rates, and BP.

We found that barbershops constitute efficient HTN screening sites because of high rates of customer participation and of uncontrolled HTN. The majority of customers were 40 to 60 years of age, which is old enough for HTN to be prevalent but still young enough for an intervention to prevent premature hypertensive complications. Because most hypertensive study participants had health insurance, and the uninsured participants had access to the county public healthcare system,[20] there was a large opportunity to improve low baseline rates of HTN treatment and control.

Study 1: Research Staff Intervention

The 16/9 mm Hg BP fall in the enhanced intervention group is equivalent to that produced by the addition of 1 or 2 antihypertensive drugs from different drug classes.[18] This sizeable BP fall is not regression to the mean, because most of the regression to the mean occurred by the second set of measurements during cohort recruitment, providing a stable baseline on which to test for an intervention effect, and BP remained unchanged in the contemporaneous comparison group, an important strength of the study design.

This lack of BP change in the comparison group confirms and extends previous data documenting the ineffectiveness of standard community HTN screening and health education.[22] After standard screening events, only a minority of those found to have elevated BP pursue medical follow-up. Extensive interval tracking and appointment reminders by community health workers has been shown in 1 study to increase short-term clinic appointment keeping among low-income individuals, including African-American men.[22] However, it is unknown whether the effect can be sustained and can improve HTN control. Here we found that, without the enhanced behavior theory-based intervention, even repeated documentation of elevated out-of-office BP together with standard health education did not motivate most men to seek medical follow-up.

Our observed intervention effect is consistent with a behavior change model in which knowledge of a personal health risk must be coupled with peer influence: peers modeling specific health behaviors plus frequent social support and peer approval for adopting these new behaviors.[17] This model previously has been used successfully to increase risk-reduction behaviors for avoidance of HIV infection[17] but not for management of HTN or other cardiovascular risk factors.

Although further research is needed to pinpoint the most successful intervention elements, the customers' remarkable barbershop patronage deserves special note. That most customers regularly visit the same barbershop twice monthly afforded intervention staff a ready-made opportunity for frequent face-to-face interaction with study participants. Although ethnically congruent intervention staff (eg, community health workers) have been a common component of several different HTN intervention models,[23–25] home visits to study participants typically are scheduled only once or twice per year. Furthermore, barbershops offer a more receptive environment for health messaging than standard medical clinics where 10 minutes are allotted for a routine office visit.[20]

Because we did not intervene directly with the customers' medical providers, greater increases in HTN control may be achievable if our community-based intervention were linked directly to a clinic-based intervention that provided standardized antihypertensive drug therapy in a culturally competent healthcare setting. When administered by nurse practitioner–community health worker–physician teams, a comprehensive educational–behavioral–pharmacological intervention has been shown previously to improve HTN control and slow progression of hypertensive heart disease in urban black men.[24]

Potential Limitations

Study 1 has all of the limitations of a small nonrandomized feasibility trial.[26] In addition to small sample size, other methodologic limitations include a high rate of nonparticipation in the early multistep recruitment process followed by significant cohort attrition. We attribute the early nonparticipation to both incomplete research staffing during the barbershops' long business hours and customers' initial reluctance to pursue medical follow-up for elevated BP (even additional on-site BP measurement). Although the trial participants resembled the nonparticipants in all of the measured characteristics, the study's positive outcomes are limited to those hypertensive barbershop customers who were early adopters of the health promotion program. Excluding cohort attrition because of barber turnover, we were able to track BP for 8 months in $\leq$80% of the remaining hypertensive study participants. Despite cohort attrition and lack of randomization, the 2 experimental groups who completed the entire study were well matched for numerous baseline characteristics, and they closely resembled the original study population. Thus, methodologic limitations not withstanding, the positive findings of study 1 suggest that the barbershop intervention model merits further testing.

Study 2: Barber Intervention

In study 2, a much higher and more sustained level of customer participation was achieved when the multistep recruitment was eliminated and BP monitoring was offered continuously to all of the adult male customers by their barbers rather than research personnel. Black barbers constitute an existing workforce of influential peers[12] and, with the legacy of barber surgeons,[27] are uniquely positioned to administer the HTN intervention provided that they acquire the requisite skills and motivation. Thus, the salient finding is that barbers successfully incorporated BP monitoring, as well as health education and medical referral, into their daily routine for the full 14-month study period. Their continued fidelity to the intervention protocol is evidenced by the high percentage of haircuts accompanied by a BP recording, as well as BP readings interpreted correctly.

Potential Limitations

Study 2 was not designed to test for a treatment effect. Nevertheless, that HTN treatment and control were graded to intervention exposure suggests but does not prove a positive influence of frequent BP monitoring and barber approval on treatment-seeking behavior. This interpretation is further supported by a progressive increase in the return of physician referral cards.

That barbers were paid financial incentives for their participation may limit the generalizability of the present findings. However, the total reimbursement to 6 barbers combined was

less than the stipend for 1 entry-level research assistant. To develop a model program that can be widely disseminated, further research is needed to devise a cost-effective reimbursement structure that is attractive to the major stakeholders (barbers, healthcare providers, and third-party payers).

In conclusion, these 2 feasibility studies suggest that barbershops can be transformed into effective HTN detection, referral, and follow-up centers for black men. Further investigation is warranted.

Perspectives

If these positive findings can be replicated in a randomized multicenter trial, this innovative biobehavioral approach could serve as a new model to help manage other cardiovascular risk factors and other chronic diseases that disproportionately affect black men. If a fall in systolic BP of 10 to 20 mm Hg could be sustained for 5 years, the risk of fatal myocardial infarction could be reduced by ≈30% and the risk of fatal stroke by ≈40%.[28] The potential public health impact of this community-based research is high, with thousands of black-owned barbershops nationwide.[12]

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Disclosures

None.

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