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An overview of the "Positive Action for Today's Health" (PATH) trial for increasing walking in low income, ethnic minority communities

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Abstract

Background—Ethnic minorities and lower-income adults have among the highest rates of obesity and lowest levels of regular physical activity (PA). The Positive Action for Today's Health (PATH) trial compares three communities that are randomly assigned to different levels of an environmental intervention to improve safety and access for walking in low income communities.

Design and setting—Three communities matched on census tract information (crime, PA, ethnic minorities, and income) were randomized to receive either: an intervention that combines a police-patrolled-walking program with social marketing strategies to promote PA, a police-patrolled-walking only intervention, or no-walking intervention (general health education only). Measures include PA (7-day accelerometer estimates), body composition, blood pressure, psychosocial measures, and perceptions of safety and access for PA at baseline, 6, 12, 18, and 24 months.

Intervention—The police-patrolled walking plus social marketing intervention targets increasing safety (training community leaders as walking captains, hiring off-duty police officers to patrol the walking trail, and containing stray dogs), increasing access for PA (marking a walking route), and

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utilizes a social marketing campaign that targets psychosocial and environmental mediators for increasing PA.

Main hypotheses/outcomes—It is hypothesized that the police-patrolled walking plus social marketing intervention will result in greater increases in moderate-to-vigorous PA as compared to the police-patrolled-walking only or the general health intervention after 12 months and that this effect will be maintained at 18 and 24 months.

Conclusions—Implications of this community-based trial are discussed.

Keywords

Physical activity; Ethnic minorities; Walking interventions; Perceptions of safety and access

1. Introduction and rationale for the PATH trial

The important influence of physical activity (PA) on reducing chronic disease, including obesity, has been well-established [1,2]. National studies have demonstrated that moderate intensity activity equivalent to a brisk walk provides enough benefit to improve fitness and prevent poor health outcomes, including obesity, disability, and death [1–3]. National studies have also shown that PA may be associated with weight loss resulting in reductions in blood pressure, serum triglycerides, total serum cholesterol, low-density lipoprotein cholesterol, blood glucose, HbA1c, and abdominal fat [4–6]. Despite the strong positive relationship between PA and health, more than half of the U.S. population is not regularly active at recommended levels of 30 min/day [1,7]. Physical inactivity is also more prevalent among African American than Caucasian adults [8]. The high rate of inactivity in African Americans has led to national concern for better understanding the determinants and mediators for increasing PA in ethnic minorities [9–11].

A number of previous studies have highlighted key barriers to PA among low income African American adults. Focus groups conducted as preliminary support for this study [12] revealed that low income African American adults had barriers to PA. These barriers included concerns about safety (presence of drug dealers and stray dogs), concerns about access to places to be active (sidewalks, facilities, and parks), and not having family and community support. Other studies have shown similar barriers to PA among African American adults including lack of motivation, lack of role models, lack of social support for PA, and having competing family obligations [13–21]. Cross sectional studies have also examined associations between environmental and social supports for PA in low income and ethnic minority communities. The CDC [22] reported a higher prevalence of physical inactivity among persons who perceived their neighborhoods as unsafe (vs. safe). In a study of African American older adults it was shown that measures of neighborhood disorder (e.g. physical neglect) were negatively associated with walking [23]. In another study, women of lower (vs. higher) income levels described more negative aspects of their neighborhood (e.g., aesthetics and safety) as factors affecting their lack of PA [24]. In a study by our group, fewer adults in low (vs. high) income neighborhoods met the recommendations for PA and they reported higher perceptions of crime, unattended dogs, unpleasantness of neighborhoods, untrust-worthy neighbors, and less access to recreation facilities [25]. Having and using trails also predicted PA and walking for individuals in low income areas but not from high income areas [25]. Several studies [26,27] have also shown, that although a majority of residents in rural areas reported being aware of walking trails nearby, only 30% reported using the trails. These studies highlight the importance of developing interventions to address concerns about safety and access for PA in low income, ethnic minority communities. Thus, the present study evaluates the efficacy of an environmental

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intervention to improve safety, access and family/community involvement for walking in low income, African American communities.

The PATH trial uses an ecological model in developing an environmental intervention to increase PA in underserved communities [28,29]. This approach assumes that health is shaped by environmental subsystems including intrapersonal factors (individual characteristics), interpersonal processes and primary groups (formal and informal social networks), institutional factors, community factors (physical and social environment supports), and public policy [28,29]. Only a limited number of longitudinal studies have evaluated the efficacy of interventions that specifically target social and environmental supports for PA (e.g., safety and access). In one intervention study involving African American women, perceptions of negative neighborhood environments resulted in women being less physically active [30]. Brownson et al. [31], evaluated the impact of the community coalitions on increasing PA that included walking clubs, aerobic classes, and fitness festivals with exercise demonstrations. Among well-organized coalitions, these activities significantly decreased sedentary behavior. Fisher and Li [32] randomized participants to either a neighborhood peer-led walking group or an information-only control group. Compared to the control neighborhoods, residents in the intervention neighborhoods showed increases in walking after 6 months. King et al. [33] found that study participants who reported seeing their neighbors walking engaged in higher levels of PA over 24 months than those who did not report seeing neighbors walking. Based on the studies it is not clear that simply building a walking trail will promote walking without active engagement of community residents.

The present study combines a police-patrolled-walking program with social marketing strategies to promote walking and PA in low income, African American communities. Thus, the primary aims of the PATH trial are: 1) To examine increases in MVPA in a community randomly assigned to a police-patrolled-walking and social marketing intervention as compared to a community assigned to a police-patrolled-walking only intervention or a community assigned to no-walking intervention (general health education only) after 12 months; 2) To examine maintenance in MVPA in the combined patrolled-walking and social marketing community as compared to a patrolled-walking only community or a no-walking community over 18 month and 24 month assessments. Secondary aims of the trial are: 1) To examine cost-effectiveness in the combined patrolled-walking and social marketing intervention community vs. the patrolled-walking only community; 2) To examine changes in casual blood pressure and body composition in the three communities; 3) To examine whether improvements in psychosocial factors and perceptions of safety and access to PA opportunities will mediate increases in PA.

2. Study design and recruitment

The PATH trial is designed to examine a 24-month environmental intervention designed to improve safety and access for PA and trail use in three underserved communities. Three communities have been identified and matched based on census tract level information (see Table 1). The three communities have been randomized to receive one of the three interventions: an intervention that combines a police-patrolled-walking program with a social marketing intervention, a police-patrolled-walking program only, or no-walking-related intervention (general health education only). Assessments are being conducted on residents in each of the three community identified census areas at baseline, 6, 12, 18, and 24 months.

Local community centers within each census tract area serve as the community facility for all project related activities. Community relationships have been established with the

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directors of the three centers who currently serve as community liaisons. The community liaisons and other community leaders meet each month as part of a steering committee to guide the process for developing their programs. They also identify community program coordinators and walking leaders (for the trail communities only) who manage the logistics of the program.

Two recruitment strategies have been used to recruit participants from each community into the study. First, participants were actively recruited from a random list of households in the census tracts that were provided by the University of South Carolina Survey Lab and Survey Sampling Group. These lists were purchased from Survey Sampling Incorporated. Recruitment letters were mailed to each participant and each household received a follow-up phone call and/or personal visit from a community steering committee member. Of the 1986 households called, 770 did not answer. Of the 1216 persons reached, 581 declined and 734 participants were invited to participate. Of those who were invited to participate 305 enrolled and provided baseline information. Approximately 54% of the final sample was actively recruited from the randomized phone lists. The other 46% of participants were recruited through volunteer advertisements. In all three communities, flyers were distributed, ads were placed in the local newspaper, and posters and banners were put up in churches, schools, and at local businesses in each community. A total of 434 participants are currently enrolled in the project across all three communities combined (see Table 2).

Inclusion criteria included 1) African-American (three of four grandparents of African heritage), 2) age 18 years or older, 3) no plans to move in the next 2 years, 4) no medical condition that would limit participation in moderate intensity exercise including life-threatening illness (e.g., immobile, severely disabled, or bed ridden), 5) residing in the census area, 6) availability to participate in the evaluations and intervention over the study period, and 7) controlled blood pressure (<180/<110) and blood sugar levels (<300 non-fasting, ≤250 fasting). Based on national recommendations [34] participants whose blood pressures were above this inclusion criteria are classified as stage 3 hypertension and were immediately referred to the local emergency room for follow-up care.

3. Integration of ecological and behavioral theories in the PATH intervention

The PATH intervention integrates principles from ecological and social marketing perspectives that highlight the promotion of a safe and accessible place to walk in the neighborhood on a regular basis. Social marketing has been defined as the design and implementation of programs to increase the acceptance of a new practice in a target group [35] to improve health or personal welfare [36]. McGuire [37] has developed an information-processing model that suggests the impact of persuasive communication is mediated by three message-processing phases: attention to the message, comprehension of the message propositions, and acceptance of the content. Variations in communication sources, messages, dose, channels, receivers, and target behaviors impact the persuasion process by affecting attention, comprehension, and/or message acceptance. Alcalay and Bell [38] reviewed social marketing studies to promote PA and concluded that many investigators failed to have measurable objective outcomes, failed to apply behavioral theory; failed to use consumer research about the audiences of interest; and rarely pretested concepts and health communication messages. Thus, Alcalay and Bell [38] recommended that social marketing research give more attention to audience segmentation, measurable outcomes, adherence to social marketing principles in strategy design, application of behavioral theory, and inclusion of efforts to create a supportive social and physical environment. The current PATH trial incorporates these suggested recommendations in developing an innovative social marketing strategy based on community input.

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After recruitment and baseline measurement assessments were completed, communities were randomized to receive either: an intervention that combines a police-patrolled-walking program with social marketing strategies to promote PA, a police-patrolled-walking only intervention, or no-walking intervention (general health education only). Program coordinators and walking leaders in the two walking-trail communities were trained in CPR and safety prevention in leading the walkers on the approximately 2 mile trail in each community. Off-duty police officers were hired to patrol the trail during the regular daily scheduled walks (once a day on 6 days/week) in both walking trail communities. The general health education community is developing general health events (every other month) that focused on chronic disease prevention (unrelated to PA).

The community assigned to the police-patrolled walking plus social marketing intervention also participated in developing social marketing strategies to promote residents to walk on the neighborhood trail. Community focus group data were used by a hired communications firm to develop a comprehensive strategy to improve perceptions of safety and access for walking on the trail. Strategic planning focused on individual, interpersonal, and community motivators for walking and overcoming barriers to walking. Guided by the community steering committee, the communications firm developed a grass-roots approach to social marketing to motivate residents to use the identified walking trail. Five specific message objectives were developed as part of the social marketing campaign by community members and leaders which included highlighting 1) safety related to walking on the identified neighborhood path (beliefs about safety and access), 2) improving physical health (beliefs and attitudes), 3) improving mental health and well-being (beliefs and attitudes), 4) building self-confidence in engaging in regular walking (self-efficacy), and 5) improving community connectedness (social norms, community connectedness, and collective self-efficacy).

The community steering committee guided the development of the overall police-patrolled and social marketing approach. The primary means for delivering messages is through a 12-month calendar that features photographs of residents walking on the trail. Each month focuses on one of the five objectives (described above) and every month of the calendar is designed to allow participants to engage in goal setting, self-rewards, and tracking of progress. Thus, the calendar serves as a tool for increasing self-efficacy for walking, communicating messages promoting the five objectives, and logistical planning of community walks. The second set of print materials includes door-hangers, which are designed to personally invite new walkers to the group. The door hangers also reinforce the monthly messages in the calendar and highlight incentives that can be earned for walking at least five times per month (hand held fan, grip ball, shopping bag etc.) with the trail group at regularly scheduled walks. Through grass-roots networking, program leaders are also responsible for engaging local residents to lead peer walking groups called Pride Strides. Pride Stride leaders use the door hangers and a Field Guide to invite neighbors, family and friends to walk, and to personalize the Pride Stride. The Field Guide outlines project details, walking protocols (e.g. safety rules), and reinforces the calendar messages with talking points (e.g., inspirational poems and prayers that reflect the social marketing objectives). Thus, the Pride Stride leaders enable an interpersonal, grass-roots channel for dissemination of the social marketing messages.

4. Approach to process evaluation

PATH uses FORECAST modeling to guide tracking and process evaluation of program implementation [39]. FORECAST is framed around four critical components: models, markers, measures and meaning. The model provides a visual of the nature of the problem and the proposed intervention actions. The PATH research model (see Fig. 1) illustrates the program elements that target specific mediating factors which collectively should impact the

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projects primary and secondary aims. A program model based on this research model was developed in collaboration with steering committee members for each community. The program model guides the identification and development of markers that correspond with program essential elements (see Table 3).

Quantitative and qualitative process evaluation measures are collected through a variety of different data collection mechanisms. Intervention staff members from the research team provide process evaluation data via 1) internal observation and feedback forms and 2) intervention team weekly journals that are derived from community updates and progress reports. Two to four times each month staff attend community walks in each of the police-patrolled-walking communities to assess adherence to walking protocols, characteristics of the walking trail, presence of stray dogs, safety along the trail, and also social interaction among walking leaders, walkers, police support, and pedestrians. After participating in the walks, staff provided walking leaders and off-duty police officers with positive and constructive feedback. For example, after completing a walk, staff sometimes review and demonstrate stretching techniques or pedestrian safety guidelines. In addition to this internal evaluation, a staff member who is external to the intervention team assesses the same variables through an external/objective observation that is conducted two times each month in each walking community. During this external evaluation, the evaluator does not provide feedback to the community leaders as these data will be used for summative purposes at the end of the trial.

Intervention staff and volunteers in the local communities provide process evaluation tracking data through attendance forms, walking leader logs, program coordinator journals, and Pride Stride leader logs. Attendance forms track the following: 1) total number of walkers participating in each scheduled walk or Pride Stride; 2) number of PATH participants walking; 3) number of PATH steering committee members walking; 4) number of new walkers; and 5) reasons that new walkers initiated participation. Walking leader logs also track characteristics of the walking trail, the presence of stray dogs, perceptions of safety while on the trail, walking activities completed (e.g. stretching and walking education), equipment used during the walk (e.g. walkie-talkies and first aid-kits), police support, and, in the full intervention community only, distribution of incentives, distribution of social marketing materials, and social interaction among the walking participants. Community walking participants and PATH walking participants provide feedback about the program through participant feedback surveys that are completed and collected periodically after walks in the walking intervention communities. The surveys assess participants' satisfaction with the intervention, perceptions of support from staff, volunteers and other walkers, and level of connectedness to their neighbors. In the health education (no-walking intervention) community, participants complete evaluation forms related to the monthly health events.

Process evaluation data are shared with the community members and university intervention team members on a monthly basis. During these discussions the data is reviewed to assess progress in program implementation, program participation and fidelity to essential elements (see Table 3). Fidelity of implementation is based on whether the program implementation addressing trail maintenance issues (litter and overgrowth), safety issues (e.g. first aid kits available), having police present, and having walking leaders assist with warm-ups and supervision while participants walk on the trail. In the social marketing intervention community fidelity checks also include observing positive social interactions and distribution of incentives to first time walkers and those who participate in at least five walks per month. Weekly feedback is provided by the research staff to the walking community leaders to ensure full implementation, participation, and fidelity. For example, based on the process evaluation findings the implementation team has enhanced walking

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leader training in areas such as: personal safety factors (e.g. warming-up, stretching, and cooling down, having safety equipment on all walks); protocols for making weather related decisions about walking on the trail or in the community center; and continually encouraging residents to walk. The process data are also used to update the monthly FORECAST model for each community and to set quarterly goals.

5. Outcome measures and psychosocial mediators

PATH research staff conduct health screenings and measurement assessments in the community centers at baseline, 6, 12, 18, and 24 months. Health screenings are conducted simultaneously in all three communities to control for extraneous environmental factors. Measures include 7-day accelerometry estimates of PA, casual blood pressure, height, weight, blood sugar levels, waist circumference, medications use, psychosocial surveys, and a four week PA recall (see Tables 4 and 5). Trained and certified measurement staff collect anthropometric data (height, weight, and waist circumference), administer the psychosocial questionnaires, and place accelerometers on each participant at each assessment. Participants receive a $10 gift for participating in the screening and they are eligible to have their name entered into a drawing for a $25–$50 gift card when they returned their accelerometers to the center the following week.

6. Overview of data analyses

The primary aim of this study is to examine differences between communities in PA at 12 months following the start of the intervention and to examine the stability of these effects over the following year. While random effects for individuals over time are estimated, because treatment status and community overlap in this study with one community per treatment condition, random effects for community cannot be included in these analyses. Thus, the inferences which can be drawn from this study are limited to the testing of differences between the communities participating in the trial. Inferences to a larger population of communities are not possible.

The aims of this study lend themselves well to a longitudinal growth curve analyses in which PA from 12 to 24 months is modeled as a linear trend described here in the notation of Raudenbush and Bryk [40] the statistical model is:

Time within individuals

$$Y_{ti}=\beta_{0i}+\beta_{1i}\quad Time+e_{ti}$$

Individuals

$$\begin{aligned}\beta_{0i}&=\gamma_{00}+\gamma_{01}Baseline\quad PA+\gamma_{02}Walking+\gamma_{03}Walking\quad Plus+\gamma_{04}Spring\quad Assesment+\gamma_{0}Covariates+r_{0i}\\ \beta_{1i}&=\gamma_{10}+\gamma_{11}Baseline\quad PA+\gamma_{12}Walking+\gamma_{13}Walking\quad Plus+\gamma_{14}Spring\quad Assesment+\gamma_{1}Covariates+r_{1i}\end{aligned}$$

where Y_{ti} is MVPA at time t for individual i. Differences between communities in PA at the start of the growth curve (12 months) are assessed by γ_{02} and γ_{03}, and differences in the slope of the growth curve are assessed by γ_{12} and γ_{13}. Baseline status will be used as a control variable. Because baseline data were collected in either the Spring or the Fall before randomization, a dummy variable representing Spring vs. Fall baseline data will also be included in the analyses and the need for the interaction between this dummy variable and baseline status will also be examined. Growth curve models require that the appropriate functional form of the model be specified and in this case with three data points only a linear

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slope is possible. The appropriateness of modeling linear change will be examined through a careful examination of individual changes in PA over time, an assessment of the reliability of the intercept and slope of the model with the inclusion of the baseline values, and examination of residuals. The advantage of this approach is that it provides more reliable estimates of levels of PA at 12 months into the intervention and allows us to examine the impact of the intervention on subsequent changes in PA. If the model assumptions are not meet a simpler repeated measures framework will be adopted, with baseline measures still included as a covariate.

A maximum likelihood approach to dealing with missing data will be used to reduce the chance that differential attrition will bias the estimates of the treatment effect [40–42]. Potential covariates and interaction terms include: perceptions of safety, sex, ethnicity, education, and BMI. The analyses proposed are intent to treat analyses, all individuals recruited into the study will be included in data analyses regardless of their level of participation in the intervention, additional secondary analyses using complier average causal effect (CACE) estimation [43–45] will be conducted to assess intervention effects for those who participated in the intervention.

Power for this trial to detect differences in outcomes 1 year into the trial and the maintenance of outcomes from month 12 to 24 were calculated using a simplified version of the models described above. Analyses assume that to have a clinically meaningful effect the patrolled walking plus social marketing community should have an increase of 8 min/day of MVPA over either of the other communities [46], this translates into an effect size of 0.35 standard deviation units, assuming a standard deviation of 23 which is in the range of what was observed in the Behavioral Risk Factor Surveillance Survey (BRFSS) validation study [46]. Power is estimated for an ANCOVA model rather than the growth curve models proposed above because information about slopes over time and their variability are not available. Power for detecting differences in slopes is not estimated because of the lack of existing data on the variance of change over time in this population. Power was estimated via Monte Carlo simulation using 1000 simulations for each model. The final model proposed above is likely to be even more powerful because it incorporates multiple time points to increase the precision of the follow-up measure. Further, our estimate of the correlation between baseline and follow-up activity (r=.50) is likely to be low, and the model will benefit from the inclusion of other covariates. For an effect size of 8 min/day of MVPA and a final sample of 100 subjects in each community, power was estimated as .90 when the standard deviation of the outcome was 20 (effect size=.40), power was .79 when the standard deviation of the outcome was 23 (effect size=.35), and power was .67 when the standard deviation of the outcome was 26 (effect size =.31). We expect that the models proposed and addition of other covariates will increase power in the final analyses so that effect sizes of .30 will be detectable. Finally, as noted above, power to detect differences in slopes was not explicitly calculated because of the lack of data to base these analyses on. However, based on the above analyses we should be able to detect effect sizes in the .30–.40 range with power of .80.

7. Baseline data

Demographic and baseline characteristics for the study sample are presented in Table 2. Participants were mostly women (63%) with a mean age of 51 years (SD=16). The majority of participants were non-working (61%), not married (77%), had no children at home (63%), had obtained a high school diploma or less (67%), and were making less than $25,000/year (62%). The majority of participants (73%) were overweight or obese, with an average body mass index (BMI) of 30 (SD=8). The average blood pressure reading was in the prehypertension range (note individuals with stage 3 hypertension were excluded from the

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study), and the average waist circumference measure was in the substantial risk category [47] for metabolic syndrome (>88 cm for women, >102 cm for men). On a scale from 1 to 4, with 4 being a more positive perception, indexed scores on the perceptions of access to places for walking and perceptions of safety from crime measures averaged 2.32 (SD=0.85) and 2.73 (SD=0.70), respectively.

There were a few significant differences between the communities at baseline. The full intervention community was significantly older than the walking only group ($F(2,431)=5.74$, $p<0.01$). There was a significant difference in employment status, with the full intervention community having fewer working and more retired individuals, $\chi^2(8, 424)=3.96$, $p<0.05$ as compared to the other communities. There was a significant difference in diastolic blood pressure mm Hg, with the general health group averaging significantly higher than the other two communities ($F(2,430)=4.26$, $p<0.02$). The general health community also had significantly higher perceptions of safety from crime as compared to the other two communities ($F(2,431)=17.01$, $p<0.01$).

8. Study implications

Preliminary analyses of the baseline data reveal that, indeed, these underserved communities are at risk for diseases related to obesity, such as hypertension and diabetes. Furthermore, confirming results of our preliminary focus groups, perceptions of access to places for walking and safety from crime are poor for our participants. In other words, baseline data reflect a reality of poor health and lack of places for PA in these underserved neighborhoods.

Our study is the first that involves evaluating an environmental walking intervention that incorporates a police-patrolled walking plus social marketing strategies for promoting walking in low income, ethnic minority communities. However, because treatment status and community overlap in this study with one community per treatment condition, random effects for community cannot be included in these analyses proposed for the present trial. Thus, the inferences which can be drawn from this study are limited to the testing of differences between the communities participating in the trial, and inferences to a larger population of communities are not possible. Despite this limitation, this project will document the process of understanding how an environmental intervention and/or a social marketing grass-roots campaign may change perceptions of safety and access to PA and community connectedness in low income, ethnic minority communities. By utilizing the FORECAST model approach and extensive process evaluation and tracking, this study is providing groundbreaking insight into how to best impact PA and health outcomes in low income, ethnic minority communities.

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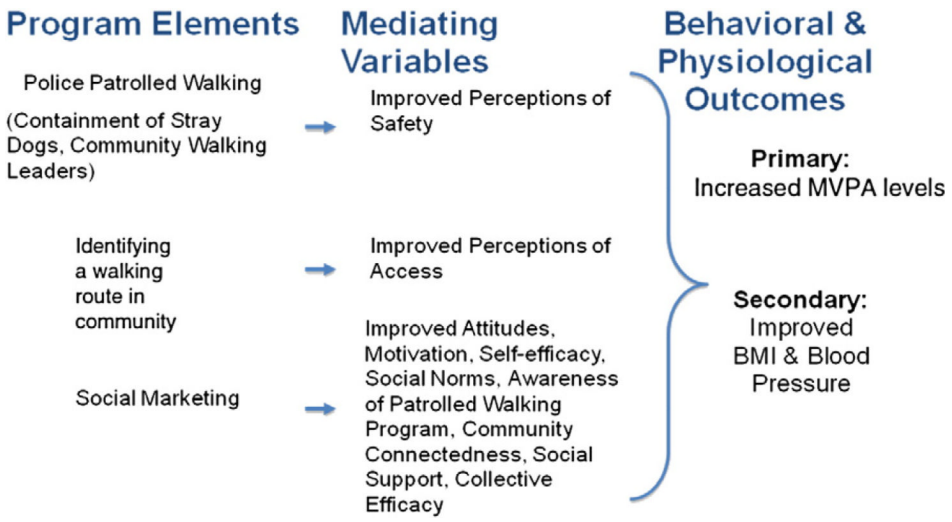

Fig. 1.
Research model.

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Table 1

Baseline variables for matching the three communities.

Variable	Full intervention	Walking only	General health
African American (%)	99	99	93
Median household income	$16,804	$22,088	$17,695
Poverty status (%)	38	32	39
Murders	1	1	1
Rapes	4	4	2
Agg. assault	87	67	65
Breaking and entering	160	141	149
Index total per capita (crime)	0.0058	0.0057	0.0068
Physical inactivity (%)	30	38	38
Health index score	124	129	134

Note: Crime data are population rates; crime stats for each county from: http://www.ors2.state.sc.us/abstract/chapter6/crime4.asp.

Note: Census data from www.census.gov.

Note: Health status from the South Carolina BRFSS.

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Table 2

Baseline demographics and psychosocial characteristics (total sample N = 434).

Characteristic	Full intervention	Walking only	General health
Gender			
Male	44 (33)	57 (35)	61 (44)
Female	89 (67)	107 (65)	76 (56)
Age			
Mean (S.D.)[a]	54.18 (15.58)	48.14 (15.64)	51.85 (15.39)
18–24	8 (6)	15 (9)	10 (7)
25–44	22 (17)	52 (32)	28 (20)
45–64	67 (50)	70 (42)	70 (51)
65+	36 (27)	27 (17)	29 (21)
Marital status			
Married	36 (27)	32 (20)	32 (23)
Separated	18 (14)	20 (12)	21 (15)
Divorced	16 (12)	18 (11)	15 (11)
Widowed	30 (23)	27 (17)	24 (18)
Never married	23 (17)	54 (33)	34 (25)
In an unmarried couple	9 (7)	13 (8)	9 (7)
No response	1 (1)	0 (0)	2 (1)
Children living in household			
No	91 (68)	97 (59)	87 (64)
Yes	42 (32)	67 (41)	50 (36)
Employment[a]			
Working	38 (29)	71 (43)	60 (44)
Laid off/unemployed	29 (22)	32 (20)	24 (18)
Retired	39 (29)	26 (16)	29 (21)
Disabled	7 (5)	19 (12)	9 (7)
Other	19 (14)	16 (10)	14 (10)
No response	1 (1)	0 (0)	1 (1)
Education			
<HS degree	36 (27)	43 (26)	39 (29)
HS degree or GED	49 (37)	76 (46)	49 (36)
>HS degree	45 (34)	43 (26)	44 (32)
No response	3 (2)	2 (1)	5 (4)
Income			
<$10 K	42 (32)	42 (26)	41 (30)
$10–24 K	43 (32)	61 (37)	41 (30)
$25–39 K	24 (18)	24 (15)	29 (21)
$40 K +	20 (15)	27 (17)	16 (12)
No response	4 (3)	10 (6)	10 (7)
Health factors			

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Characteristic	Full intervention	Walking only	General health
BMI			
Mean (S.D.)	31.05 (7.93)	30.26 (8.34)	31.40 (9.03)
<25	30 (23)	49 (30)	33 (24)
25–<30	34 (26)	40 (24)	31 (23)
>30	67 (50)	73 (45)	71 (52)
Waist circumference			
Mean (S.D.)	97.24 (16.15)	95.47 (18.91)	98.28 (18.59)
Men, >102 cm	17 (39)	16 (28)	21 (34)
Women, >88 cm	60 (67)	74 (69)	61 (80)
Blood pressure			
Mean (S.D.)[a]	131/80 (17.2/10.8)	131/80 (19.0/11.3)	135/83 (17.1/10.5)
Normal (<120/<80)	34 (26)	49 (30)	22 (16)
Pre-hyperten. (120–139/80–89)	52 (39)	55 (34)	49 (36)
Stage 1 (140–159/90–99)	37 (28)	44 (27)	49 (36)
Stage 2 (<180/<110)	10 (8)	14 (9)	16 (12)
Environmental perceptions			
Access to places for walking	2.31 (0.87)	2.33 (0.80)	2.35 (0.87)
Safety from crime[a]	2.61 (0.61)	2.61 (0.56)	2.97 (0.62)

Note: Demographics reported as number (percentage); health factors and environmental perceptions reported as mean (standard deviation).

[a]Significant differences (p<.05) were found in age, employment status, diastolic BP, and perceptions of safety from crime.

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Table 3

Essential elements for the three invention communities.

Essential element category	Essential element	Presence at intervention level		General health education
		Walking plus social marketing	Walking only	
Individual level factors	Knowledge about PATH program and walking trail	X	X	
	Beliefs about walking benefiting health	X		
	Attitude towards walking in neighborhood	X		
	Motivation to walk	X		
	Self-efficacy for walking	X		
	Walking personal safety (injury prevention)	X	X	
Interpersonal	Social norms for walking in neighborhood	X		
	Intention to walk with others in neighborhood	X		
	Opportunities to walk with friends and family	X	X	
	Walking in neighborhood provides opportunity to see/meet/connect with neighbors	X		
	Walkers feel supported by neighborhood	X		
Physical environment	Marked walking trail in neighborhood	X	X	
	Safe trail – lighting; no stray dogs; good sidewalks; proper water drainage; bushes and greenery cut back	X	X	
	Aesthetically pleasing trail	X	X	
Community collaboration	A hub neighborhood based organization that coordinates program	X	X	X
	A neighborhood based, involved Steering Committee	X	X	X

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Table 4

Outcome measures for the PATH trial.

Variable	Equipment/measure	Description	References
Primary outcome			
PA estimates	Actical min MVPA/day	Omni-directional accelerometer.	Welk, 2004[48]
	MET-weighted min MVPA/day	Device worn for 8 consecutive days.	Heil, 2006[49]
Secondary outcomes			
Blood pressure	Dinamap Pro Care (GE Medical)	Three readings at 1-minute intervals after a 5-minute rest period.	Parra-Medina [50]
	SBP/DBP mm Hg		Grundy, 2005[47]
Body mass index (BMI)	Shorr Height Board	Height measured twice to 0.1 cm by certified staff.	Wilson, 2008[51]
	SECA 880 scale kg/m^2	Weight was measured twice to 0.5 kg by certified staff.	
Additional measures			
Waist circumference	Flexible measuring tape centimeters	Measured to 0.1 cm by using a modified natural waist protocol.	Carson, 1994[52]
			Grundy, 2005[47]
Blood glucose	Accu-Check Compact Plus mg/dL	Trained community nurses collected a single reading	
Four week health history	Pencil/paper survey min MVPA/day	Self-reported PA. Participants recall types of leisure time PA	Richardson, 1994[53]

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Table 5

Psychosocial (mediator) measures for the PATH Trial.

Theoretical construct	Description	Mean score range	References
Motivation for PA	Behavioral Regulation in Exercise Questionnaire (BREQ); 8 self-administered items; assesses the reasons why people exercise; 4-factor structure includes sub-Scales assessing external, introjected, identified, and intrinsic regulations.	1–5	Mullan, Markland, and Ingledew, 1997 [54] Mulland and Markland, 1997 [55]
Self-concept and motivation for PA	Self Concept and Motivation to Exercise Scale; 10 self-administered items; assesses "health self concept" concerning the importance of increasing PA and motivation to change PA behaviors.	1–6	Wilson, Friend, Teasley, et al., 2002 [56] Wilson, Evans, Williams, et al., 2005 [57]
Attitudes towards PA	Attitudes Questionnaire; 5 self-administered items; assesses beliefs about the consequences of being active.	1–5	Motl et al., 2000 [58]
Self-efficacy for PA	Self-Efficacy for Exercise Questionnaire; 16 self-administered items; assesses confidence in ability to exercise in spite of potential barriers (e.g., when tired or on vacation).	0–100%	Garcia and King, 1991 [59]
Intentions for PA	1 item from Bourdreau and Godwin (2007); 1 item assesses whether or not the participants intends to exercise in the next 6 months;	1–5	Boudreau and Godin, 2007 [60]
Perceptions of access to services	3 items from the Neighborhood Environment Walkability Scale (NEWS) Subscale C; assesses perceptions of availability of services within walking distance to home, a construct related to overall neighborhood walkability.	1–4	Saelens, Sallis, Black and Chen, 2003 [61]
Perceptions of places for walking and cycling	5 items from the NEWS Subscale E; assesses perceptions of places and the quality of those places for walking and biking.	1–4	Saelens, Sallis, Black and Chen, 2003 [61]
Perceptions of neighborhood surroundings	3 items from the NEWS Subscale F; assesses aesthetic qualities such as trees and litter in the neighborhood;	1–4	Saelens, Sallis, Black and Chen, 2003 [61]
Perceptions of safety from traffic	3 items from the NEWS Subscale G; assesses perceptions of traffic concerns such as quantity and speed.	1–4	Saelens, Sallis, Black and Chen, 2003 [61]
Perceptions of safety from crime	6 items from the NEWS Subscale H; assesses perceptions of crime and neighborhood characteristics related to crime, such as lighting.	1–4	Saelens, Sallis, Black and Chen, 2003 [61]
Community connectedness	6 items from the NEWS I Subscale; assesses satisfaction with neighborhood qualities related to community relations and general quality of life.	1–4	Saelens, Sallis, Black and Chen, 2003 [61]
Perceptions of neighborhood walking behavior	3 items assess personal walking behaviors and perceptions of neighbor's walking behaviors.	1–4	Created by PI
Social support for PA	Family and Friends Support for Exercise Scale; 17 self-administered items, assesses exercise support for family (12 items) and friends (5 items).	1–5	Sallis, Grossman, Pinski, Patterson, and Nader, 1987 [62]