ORIGINAL RESEARCH

# Gospel Music: A Catalyst for Retention, Engagement, and Positive Health Outcomes for African Americans in a Cardiovascular Prevention and Treatment Program

Barry Bittman, MD; Indu Poornima, MD; Michael A. Smith, PhD; R. Eric Heidel, PhD


## ABSTRACT

**Context** • Mortality associated with cardiovascular disease is significantly higher in African Americans compared with people of other ethnicities, with hypertension being the single most significant risk factor in this population. Underdiagnosis and undertreatment of hypertension is common. Although cardiovascular lifestyle education and self-management programs are available for the general public, many African Americans prefer to learn about health-promoting activities through interactive programs led by church ministries.

**Objective** • This study examined the influence of adding a faith-based protocol using creative musical expression as a catalyst for improving retention, engagement, and positive health outcomes for African Americans participating in a 1-y, lifestyle skills program for reducing cardiovascular risk factors.

**Design** • The study was a randomized, controlled trial.

**Setting** • The study occurred at Rodman Street Missionary Baptist Church (Pittsburgh, PA, USA).

**Participants** • Participants were African Americans with at least 2 of the following medical conditions: high blood pressure, elevated cholesterol and/or triglycerides, heart attack, angina, stroke, irregular heartbeats, palpitations, shortness of breath, dizziness or fainting, diabetes, and tobacco use.

**Intervention** • Intervention and control groups both participated every other week in one 45-min structured cardiovascular risk reduction educational session over the course of 1 year. During alternative weeks, sessions comprised blood pressure checks, coupled with individualized support discussions focused on challenges and identified obstacles to adherence. In addition to the aforementioned sessions, the intervention group participated in a novel gospel music program with weekly, 45-minute vocal and instrumental sessions.

**Outcome Measures** • Outcome measures include retention, attendance, systolic and diastolic blood pressures, weight, body mass index, hip measurement, and waist measurement as well as the Short Form-12 (SH-12) Health Survey.

**Results** • Subjects in the intervention group demonstrated a statistically significant 83.3% retention rate in the course of 1 year compared with only 54.3% for the control group (cardiovascular lifestyle education sessions alone). Six dropouts were noted in the intervention group in sharp contrast to 16 dropouts in the control group. Participants in the intervention group were 4.21 times more likely to complete the program than the control group. A significant difference was also noted for attendance, which was higher for the intervention group (21.33 sessions for the intervention group vs 17.95 sessions for the control group). Statistically significant systolic blood pressure reductions noted in both groups were sustained 6 mo postprogram conclusion. In addition, a statistically significant pre-between post-between group improvement in SF-12 Physical Component Scores was noted for intervention subjects in sharp contrast with controls who actually demonstrated worsening scores.

**Conclusions** • The addition of a gospel music program as a catalyst for increase engagement in a sustainable, healthy lifestyle program warrants further consideration and additional study in African American churches. (*Adv Mind Body Med.* 2020;34(1):8-16).


**Barry Bittman, MD, is a neurologist at the Yamaha Music and Wellness Institute in Hilton Head, South Carolina. Indu Poornima, MD, is an Associate Professor of Medicine, Drexel University College of Medicine Program and Director, Cardiology Fellowship at Allegheny Health Network in Pittsburgh, Pennsylvania. Michael A. Smith, PhD, is Technical Lead, Digital Experiences Group, Apple Inc., Cupertino, California. R. Eric Heidel, PhD, is Associate Professor of Biostatistics in the Department of Surgery at the University of Tennessee Graduate School of Medicine.**

*Corresponding author: Barry Bittman, MD*
*E-mail address: barrybittman@mac.com*

## INTRODUCTION

Mortality associated with cardiovascular disease is significantly higher in African Americans compared with people of other ethnicities, with hypertension being the single most significant risk factor in this population. Underdiagnosis and undertreatment of hypertension is common. Diagnosis is often established only after detection of end organ damage, including renal failure, stroke, heart failure, and myocardial infarction.

Among African Americans adults, 48% of women and 46% of men have some form of cardiovascular disease, and African Americans have nearly twice the risk for a first-ever stroke than whites do.[1] Since 1975, death from heart disease has also been consistently higher among blacks than whites.[2] The excessive burden of heart disease and stroke in US African Americans accounts for the largest portion of the inequality in life expectancy between whites and blacks, despite the existence of low-cost, highly effective preventive treatments.[3]

Hypertension in African Americans is a major clinical and public health challenge in view of the high prevalence and premature onset of elevated blood pressure (BP) as well as the high burden of comorbid factors that can lead to resistance to pharmacological treatments: obesity, diabetes mellitus, depressed glomerular filtration rate, and albuminuria. BP control rates are lower for African Americans, especially for men, than for other major racial or ethnic groups.[4]

According to the CDC, hypertensive disease includes essential (primary) hypertension, hypertensive heart disease, hypertensive renal disease, and hypertensive heart and renal disease. Although death rates from hypertensive disease increased from 1999 to 2004 among African American men, white men, and African American women, the increase was largest among African American men. Death rates from hypertensive disease for both African American men and women throughout the period were more than double those of white men.[5] These unfortunate results are due in part to patient and health care system failures.

Contributing patient factors include therapeutic noncompliance such as lack of follow-up, poor adherence to dietary measures, failure to follow recommendations for weight loss and physical activity; and genetic predisposition, which requires further elucidation as the search for genetic differences has been largely unrewarding, except for the discovery of the role of APOL1, which is associated with a higher risk of cardiovascular disease.[6]

Health care delivery factors include failure to closely monitor patients; underuse of appropriate drug therapy, lack of insurance, high deductibles and copayments, paucity of culturally sensitive messaging regarding lifestyle modifications, and social factors that prevent close follow-up.

Although cardiovascular lifestyle education and self-management programs are available for the general public, many African Americans prefer to learn about health-promoting activities through interactive programs led by church ministries. The African American church often occupies a central place in their lives. Public health practitioners, researchers, and policy makers recognize this role and are increasingly using the church to access African Americans for health improvement efforts. Moreover, evidence is growing that religious involvement, in addition to greater access to health interventions, exerts positive and diverse health benefits for African Americans.[7]

Researchers surveyed more than 1200 members of 11 African American churches in North Carolina about their church attendance, diet, physical activity, beliefs regarding the church's role in health promotion, and interest in Bible-based healthy living.[8] Of the 1204 congregants who responded to the survey, 72% were female; 57% were 50 years or older; 84% had a high school education or more, and 77% had a chronic health condition. The majority of people surveyed said they were more interested in learning about healthy living through interactive workshops led by health ministry programs than from sermons.[7]

A faith-based, 6-month program for the treatment of hypertension in African Americans was recently carried out in 32 churches in New York City (NY, USA).[9] The study evaluated the comparative effectiveness of sessions on therapeutic lifestyle changes plus motivational interviewing versus health education only on BP reduction among African Americans with uncontrolled hypertension. The program, delivered by lay health workers, resulted in a significantly higher systolic BP reduction of 5.79 mm Hg at 6 months compared with the group that received health education only ($P$ = .029). The treatment effect on systolic BP persisted at 9 months, at 5.21 mm Hg (not statistically significant ($P$ = .068). The between-group differences at 6 months in diastolic BP reduction, at 0.41 mm Hg, and mean arterial pressure, at 2.24 mm Hg, were not statistically significant as well. A dropout rate of 30% was noted.

This study serves as a follow-up to an initial unpublished program intended to reduce cardiovascular risk in African Americans in Allegheny County (PA, USA) using African American churches as the hub for community-based education and monitoring. Volunteer health workers, chosen from local church congregations, were designated as health coaches to assist enrolled patients with in-home BP monitoring. Initial results, however, were unfavorable, and the program was discontinued due to poor patient retention.

Numerous scientific investigations have demonstrated multiple, positive, psychosocial, and biological outcomes associated with group-based creative musical expression.[10-16] From exercise, nurturing, social support, bonding, and spirituality to intellectual stimulation, heightened understanding, and enhanced capacity to cope with life's challenges, the benefits of recreational music making (RMM) extend far beyond music. RMM ultimately affords unparalleled creative expression that unites people's bodies, minds, and spirits. Of particular interest is the fact that according to the *Merriam Webster* dictionary, the term *recreational* is derived from the Latin root, "recreatio," which means "restoration to health."[11]

African American gospel music is a form of euphoric, rhythmic, spiritual music rooted in the solo and responsive church singing of the African American South.[18] The precursor to black gospel music is the African American spiritual, a type of religious folksong that is most closely associated with the enslavement of African people in the American South. The African American spiritual, also called the Negro spiritual, constitutes one of the largest and most significant forms of American folksong.

This study examined the effects of adding a faith-based protocol, using creative musical expression as a catalyst for promoting retention, engagement, and positive health outcomes for African Americans participating in 1-year, lifestyle skills program for reducing cardiovascular risk factors. The research team focused on reducing risk factors for cardiovascular disease through the integration of a church-based program of vocal and instrumental gospel music, as a means for building interpersonal support, camaraderie, and, ultimately, program retention.

## METHODS

### Participants

This study was performed at Rodman Street Missionary Baptist Church (Pittsburgh, PA, USA) using a comprehensive research protocol approved by the Advarra Institutional Review Board. To ensure a culturally sensitive program, Rodman Street Missionary Baptist Church, through its attendant health ministry, contacted potential African American participants through flyers, e-mails, phone calls, and service announcements distributed during church sessions.

Participants were 71 African Americans, 36 in the intervention group and 35 in the control group. The intervention group included 6 men and 30 women, with a mean age of 62.5 ± 11.13 years and a range in age from 34 to 79 years. The control group included 7 men and 28 women, with a mean age of 62.3 ± 11.09 years and a range in age from 26 to 81 years. The diagram of the study's design is depicted in Figure 1.

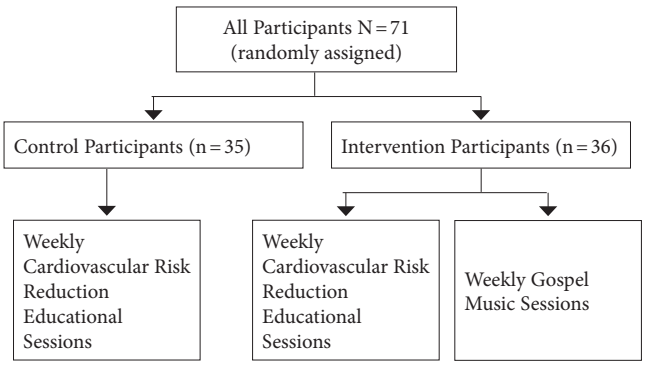
Individuals were initially assigned to the intervention or the control group using a random number generator and subsequently matched for age and gender.

Interviews of 20 to 30 minutes were conducted with all potential participants who were screened using a questionnaire that included a checklist for the following medical conditions: high BP, elevated cholesterol and/or triglycerides, heart attack, angina, stroke, irregular heartbeats, palpitations, shortness of breath, dizziness or fainting, diabetes, and tobacco use. Two of the aforementioned factors were required for inclusion in the study. All participants voluntarily agreed to participate and provided written informed consent.

### Procedures

Both groups participated every other week in one 45-minute structured educational cardiovascular risk reduction session, with the exception of holidays and inclement weather days, in the course of 1 year. On alternative weeks, sessions comprised BP checks, coupled with individualized support discussions focused on the challenges experienced during the prior week and identified obstacles to adherence.

**Figure 1.** Participant Flow Chart




In addition to cardiovascular risk reduction sessions, the intervention group participated in the gospel music program led by the 2 musicians, who facilitated weekly 45-minute vocal and instrumental sessions. These consisted of singing and playing musical instruments, including the Clavinovas, guitars, and drums. This unique approach engaged the participants through active participation in enjoyable, vocal, and instrumental gospel music, using various selections from the African diaspora and songs composed by the facilitators.

Both types of sessions were offered 2 times each week to allow for participants to choose a session most fitting for their schedules. Successful completion of the program required participants to attend a minimum of 12 sessions during the year and to continue through the program's final month at the end of the year.

**Cardiovascular Protocol.** The research team carried out multiple, preparatory, program-design discussions, and ongoing training and reviews were led by the principal researcher during the study. The 2 registered nurses who led the disease-based education program were members of and were well known and respected by the congregation. Sessions were conducted in a Socratic manner, with a focus on reducing cardiovascular risk factors in accordance with and supported by various handouts from the CDC, the American Heart Association, and the Department of Health and Human Services. Sessions focused on risk-factor knowledge building, insight sharing, strategies for moving past perceived obstacles, and psychosocial group support. Four areas were specifically emphasized: nutrition, exercise, stress reduction, and sleep hygiene.

Manual BP measurements were performed biweekly. If the blood BP was higher than 130/80, another reading was taken prior to the end of a session, with the lowest BP logged. A large cuff was specifically used for obese participants.

For the purpose of analysis, BP readings were averaged for the first 3 sessions—the baseline, and for the last 3 sessions—postintervention. In addition, the nurses recorded and submitted BPs for the principal researcher to review on a weekly basis. A cardiologist member of the research team, also met with the nurses and remained available to discuss health challenges that surfaced during the educational sessions.

Recommendations by the nurses to contact primary care and specialty physicians were prompted by elevated BP readings or symptoms conveyed during presentations or discussions. In addition, nurse educators provided personalized preventive recommendations during recording sessions.

One-on-one conversations between individual participants and nurse educators typically followed group sessions. Although an emphasis was placed on group support and the sharing of insights that enabled participants to move past perceived obstacles, nurse facilitators encouraged participants to address personal challenges on an individual basis. Nurse educators also reviewed all elevated BP measurements with each participant and the principal researcher and suggested visits to primary care physicians or specialists for improved BP control and follow-up when indicated.

**Creative Musical Expression.** The creative musical expression protocol using gospel music was specifically designed and developed with the goals of boosting nurturing, support, camaraderie, and a shared sense of spirituality among participants.

The program was established within the realm of RMM, which has been defined as "enjoyable, accessible, and fulfilling, group music-based activities that unite people of all ages regardless of their challenges, backgrounds, ethnicity, ability, or prior experience."[10]

In addition to group vocal expression, the facilitators blended RMM elements with use of clavinovas (digital pianos), world percussion drums, and guitars, which were used in part based on ease of use and lack of a sharp learning curve. The group keyboard and drumming protocols used in the study included the Clavinova Connection and HealthRHYTHMS Group Empowerment Drumming.[11-16] Both multifaceted protocols were designed to establish a relaxed, nonthreatening environment for creative musical expression.

The study's gospel music program was developed on a foundation of both protocols, with the addition of singing and playing guitars. It was specifically tailored to meet the needs of the intervention group by 2 highly experienced musician facilitators who were recognized as congregational leaders. Each session focused on progressive musical expression to promote group nurturing, support, and camaraderie.

**Outcome Measures**

Outcome measures include retention, attendance, systolic and diastolic blood pressures, weight, body mass index (BMI), hip measurement, and waist measurement as well as the Short-Form 12 (SF-12) Health Survey, one of the most widely used reliable validated, health-related, quality-of-life instruments[17] This survey includes 12 questions and reports physical component summary (PCS) scores and mental component summary (MCS) scores providing key indicators of self-reported mental and physical functioning in the context of overall, health-related, quality of life.

The PCS is composed of 4 scales assessing: (1) physical function; (2) role limitations caused by physical problems; (3) bodily pain; and (4) general health. MCS is composed of 4 scales assessing: (1) vitality; (2) social functioning; (3) role emotional; and (4) mental health.

The psychometric properties of the survey include convergent validity, discriminant validity, known-groups validity, factorial validity using confirmatory factor analysis, and internal consistency reliability.

All measures were recorded at baseline and postintervention. Participants' BPs were also measured 6 months postintervention.

In addition, participants were asked 2 questions: (1) As a result of participation in the study, did you see your physician more frequently?, and (2) Were your medicines changed as a result of blood-pressure measurements performed by the study's nurses?

**Statistical Analysis**

The statistical assumption of normality for continuous distributions was tested for skewness and kurtosis statistics. If either statistic was above an absolute value of 2.0, then the assumption was violated.

Assumptions were also checked before interpreting statistical results for the homogeneity of variance, using Levene's Test of Equality of Variances; the homogeneity of covariance, using Box's M Test; and sphericity, using Mauchly's Test. A mixed-effects analysis of variance (ANOVA) was used to compare changes in continuous outcomes across time within the intervention and control groups.

For each outcome measure, the study compared the difference in the change between baseline and postintervention for the intervention versus the control group as well as the changes between baseline and postintervention within each group.

Marginal means with 95% confidence intervals (95% CIs) were reported and interpreted for the interaction effects. Within-group and between-group effects for the mixed-effects analyses were also reported and interpreted. $\eta^2$ was reported as a measure of effect size for significant findings.

$\chi^2$ analysis was used to compare the treatment groups on categorical outcomes. Frequency and percentage statistics were reported for the $\chi^2$ analyses. When significant effects were detected for $\chi^2$, unadjusted odds ratio (OR) with 95% CI were calculated as a measure of the strength of the association. Independent samples *t* test was used to compare the treatment groups on normal continuous outcomes. Means (M) and standard deviations (SD) were reported for *t* test analyses. All analyses were conducted using SPSS Version 25 (IBM, Armonk, NY, USA), and statistical significance was assumed at an alpha value of 0.05.

## RESULTS

Comparing intervention and control groups at baseline, there was no significant difference for waist ($P$ = .14); SF-12 PCS ($P$ = .67); SF-12 MCS ($P$ = .86); systolic BP ($P$ = .47); and diastolic BP ($P$ = .08). However, statistically significant baseline measure differences between intervention and control groups were noted for weight $F(1,41)$ = 6.32, $P$ = .016, $\eta^2$ = 0.13, power = 0.69; BMI $F(1,36)$ = 5.84, $P$ = .02, $\eta^2$ = 0.14, power = 0.65; and hip circumference $F(1,41)$ = 9.34, $P$ = .004, $\eta^2$ = 0.19, power = 0.85, with the intervention group having a higher weight (198.43 vs 176.23), BMI (34.25 vs 28.86), and hip circumference (48.14 vs. 44.30) (Table 1).

Comparing intervention and control groups across time (pre- to post-), no significant between group effects were noted for weight $F(1,41)$ = 0.22, $P$ = .64; hip $F(1,41)$ = 0.16, $P$ = .70; waist $F(1,41)$ = 0.08, $P$ = .78; and SF-12 MCS $F(1,42)$ = 0.14, $P$ = .71. A significant between group effect, however, was noted for SF-12 PCS $F(1,42)$ = 7.57, $P$ = .009, $\eta^2$ = 0.15, power = 0.77 (Table 2) with a premean postmean increase (44.06 to 47.94) for the intervention group in contrast with a premean postmean decrease (46.20 to 43.64) for the control group (Table 2). The trend demonstrating improvement of PCS scores in the experimental group along with the inverse trend in the control group is depicted in Figure 2.

Although there was no significant baseline difference between intervention and control subjects for systolic BP, $P$ = .47 (Table 1), within-subjects effects analysis demonstrated a statistically significant decrease in systolic BP for all participants (baseline to 6 months

**Figure 2.** PCS Interaction Baseline to Postintervention

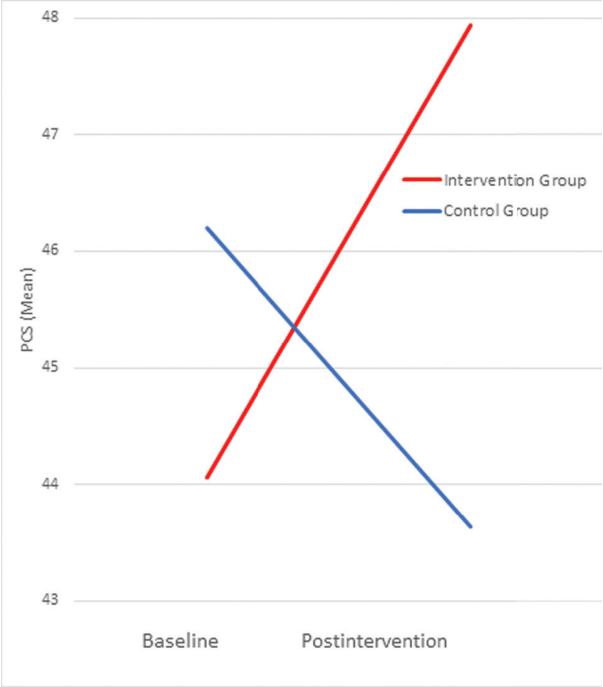



**Table 1.** Means and 95% CIs for Baseline Between-Subjects Effects

| Outcome | Control | Intervention | *P* Value |
|---|---|---|---|
| Weight | 176.23 (161.84 to 190.62) | 198.43 (187.90 to 208.96) | .016 |
| BMI | 28.86 (25.99 to 31.74) | 34.25 (31.26 to 37.24) | .02 |
| Hip | 44.30 (42.25 to 46.35) | 48.14 (46.64 to 49.64) | .004 |
| Waist | 40.37 (38.67 to 42.07) | 41.95 (40.70 to 43.19) | .14 |
| PCS | 44.82 (40.89 to 48.95) | 46.00 (42.95 to 49.05) | .67 |
| MCS | 53.11 (49.97 to 56.25) | 53.47 (51.09 to 55.84) | .86 |
| Systolic BP | 133.53 (129.55 to 137.50) | 135.41 (132.09 to 138.72) | .47 |
| Diastolic BP | 78.56 (75.89 to 81.24) | 81.65 (79.42 to 83.88) | .08 |

Note: Values are marginal mean (95% CI).

Abbreviations: CI, confidence interval; BMI, body mass index; PCS, physical component score; mental component summary; BP, blood pressure.

**Table 2.** Means With 95% CI for Preintervention and Postintervention Effects

| Outcome | Group | Preintervention | Postintervention | *P* Value |
|---|---|---|---|---|
| Weight | | | | |
| | Control | 174.07 (153.30 to 194.83) | 178.40 (159.00 to 197.80) | |
| | Intervention | 200.29 (185.09 to 215.48) | 196.57 (182.37 to 210.77) | .64 |
| Hip | | | | |
| | Control | 43.73 (40.89 to 46.58) | 44.87 (41.92 to 47.82) | |
| | Intervention | 48.07 (45.99 to 501.5) | 48.21 (46.07 to 50.37) | .70 |
| Waist | | | | |
| | Control | 40.87 (38.41 to 43.32) | 39.87 (37.47 to 42.27) | |
| | Intervention | 42.14 (40.35 to 43.94) | 41.75 (39.99 to 43.51) | .78 |
| PCS | | | | |
| | Control | 46.20 (41.83 to 50.58) | 43.64 (39.11 to 48.16) | |
| | Intervention | 44.06 (40.75 to 47.37) | 47.94 (44.52 to 51.36) | .009 |
| MCS | | | | |
| | Control | 54.25 (51.21 to 57.29) | 51.97 (47.52 to 56.42) | |
| | Intervention | 54.11 (51.81 to 56.41) | 52.82 (49.46 to 56.19) | .71 |

Note: Values are marginal mean (95% CI).

Abbreviations: CI, confidence interval; BMI, body mass index; PCS, physical component score; mental component summary.

**Table 3.** Means and 95% CIs for Preintervention, Postintervention, and Postintervention + 6 Months Within-Subjects Effects

| Outcome | Preintervention | Postintervention | Postintervention + 6 Mo | *P* Value |
|---|---|---|---|---|
| Weight | 187.18 (174.31 to 200.04) | 187.49 (175.47 to 199.51) | - | .97 |
| Hip | 45.90 (44.14 to 47.66) | 46.54 (44.71 to 48.37) | - | .61 |
| Waist | 41.51 (39.99 to 43.03) | 40.81 (39.32 to 42.30) | - | .52 |
| PCS | 45.13 (42.39 to 47.87) | 45.79 (42.95 to 48.63) | - | .58 |
| MCS | 54.18 (52.28 to 56.09) | 52.40 (49.61 to 55.18) | - | .19 |
| Systolic BP | 139.73 (135.94 to 143.53) | 132.04 (128.38 to 135.70) | 131.63 (127.98 to 135.28) | <.001 |
| Diastolic BP | 81.61 (78.71 to 84.51) | 79.25 (76.35 to 82.15) | 79.47 (76.43 to 82.50) | .14 |

Note: Values are marginal mean (95% CI).

Abbreviations: CI, confidence interval; BMI, body mass index; PCS, physical component score; mental component summary; BP, blood pressure.

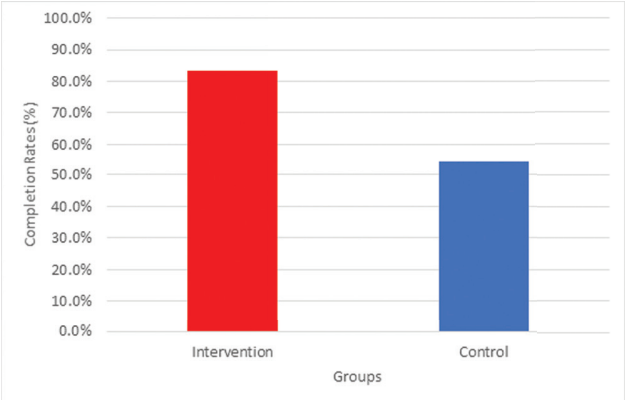
**Table 4.** Means and 95% CIs for Preintervention, Postintervention, and Postintervention + 6 Months Interaction Effects of Blood Pressure

| Outcome | Group | Preintervention | Postintervention | Postintervention + 6 Mo | *P* Value |
|---|---|---|---|---|---|
| Systolic BP | | | | | |
| | Control | 138.48 (312.65 to 144.31) | 130.10 (124.48 to 135.73) | 132.00 (126.39 to 137.61) | |
| | Intervention | 140.99 (136.12 to 145.85) | 133.97 (129.28 to 138.66) | 131.26 (126.58 to 135.94) | .54 |
| Diastolic BP | | | | | |
| | Control | 80.33 (75.88 to 84.78) | 76.29 (71.84 to 80.75) | 79.06 (74.40 to 83.72) | |
| | Intervention | 82.88 (79.17 to 86.60) | 82.20 (78.49 to 85.92) | 79.87 (75.98 to 83.76) | .41 |

Note: Values are marginal mean (95% CI).

Abbreviations: CI, confidence interval; BP, blood pressure.

**Figure 3.** Completion Rates for the Treatment Groups




postintervention), $F(2,36) = 12.30$, $P < .001$, $\eta 2 = 0.41$, power = 0.99 (Table 3). A nonsignificant interaction effect was detected, $F(2,74) = 0.55$, $P = .54$, suggesting that assignment to intervention or control groups did not have a differential effect on trends observed in systolic BP (Table 4). Unlike systolic BP, no significant prechanges postchanges were noted for diastolic BP ($P = .14$).

A significant higher rate of completion was noted across the intervention for the intervention group (n = 30, 83.3%) in comparison to the control group (n = 19, 54.3%), $\chi^2(1) = 7.00$, $P = .008$, OR, 4.21, 95% CI 1.40 to 12.65. Intervention participants were 4.21 times more likely to complete the program versus the control group. A significant difference was also found for the number of sessions between the intervention group (M = 21.33, SD = 4.11), $t(47) = -2.53$, $P = .015$ and the control group (M = 17.95, SD = 5.21). Figure 3 displays the rates of completion graphically for the treatment groups.

A significant difference in the rates of changing medications was not noted between the control group (n = 8, 44.4%) and the intervention group during the study (n = 10, 33.3%), $\chi^2(1) = 0.59$, $P = .44$.

## DISCUSSION

### Outcomes

In support of the hypothesis, and as demonstrated in Figure 2, the intervention group demonstrated a statistically significant 83.3% retention rate during a 1-year period compared with only 54.3% for the control group. Only 6 participants dropped out of the intervention group in sharp contrast to 16 dropouts in the control group.

Statistical analysis revealed that the intervention group was 4.21 times more likely to complete the intervention than the control group. In addition, a significant difference was also noted for attendance, which was higher for the intervention group, at 21.33 sessions, compared with the control group, at 17.95 sessions.

Although no statistically significant diastolic BP changes occurred, statistically significant systolic BP reductions were noted in both the intervention group—baseline, 140.99; postintervention; 133.97; diff = 7.02—and the control group—baseline, 138.48; postintervention, 130.10; diff = 8.38.

The failure to reduce diastolic BPs in this study is consistent with the results of the previously cited study, carried out by 32 churches in New York City (NY, USA).[9] It must be emphasized, however, for this study that although between-group differences were not statistically significant, both groups clearly demonstrated improvements in systolic BP to a similar degree ($P < .001$).

In addition, of the individuals who completed the study, 10 participants in the intervention group (33%) and 8 participants in the control group (42.1%) reported that their physician(s) changed their medications based on participation in the study. In addition, 6 participants in the intervention group (20%) and 3 participants in the control group (16.7%) reported being seen more frequently by their physician(s) as a result of participation.

The addition of the gospel music program clearly resulted in more individuals benefitting in the course of the study. Furthermore, 6 months after completion of the program, systolic BPs across both groups were maintained at postintervention levels, signifying a statistically significant enduring effect.

In terms of health-related quality of life, no statistically significant changes between baseline and postintervention were noted in the SF-12 MCS. However, a statistically significant SF-12 PCS improvement was noted in the intervention group—a change from 44.06 to 47.94—in sharp contrast with the control group, which demonstrated worsening scores—a change from 46.20 to 43.64 ($P = .009$). This suggests that participants in the intervention group noted improvements in overall physical functioning, a factor that may be associated with a sense of well-being related to the addition of the gospel music protocol.

### Gospel Music Intervention

The current study's gospel music program was designed by 2 church music facilitators. The program, based on extensive, RMM research, was noted to spiritually resonate with the study's participants.

Not surprising, participants initially shared reservations about singing and playing instruments together. However, despite these concerns, participants progressively developed confidence and improved musical proficiency. In addition, a refreshing sense of camaraderie evolved as they bonded in time. Facilitators observed that participants encouraged and demonstrated compassion for each other while they sang, played instruments, prayed, and laughed together. Creative musical expression often prompted discussions of current events or challenges deemed important to participants, who were often encouraged to take the lead.

When asked about the most memorable aspect of the program, both facilitators agreed that setting scriptures to music generated a deep sense of ownership by the participants. One facilitator remarked, "It was fulfilling and enjoyable for me to set scriptures to music for the group to sing. They sang jubilantly, often in a reflective mode. Not only did they fully invest themselves in the music, they asserted themselves to take ownership of the music that was written for the group to sing."

The other facilitator commented, "The camaraderie between participants visibly and musically grew with each class. Moreover, although we were not aiming for this, creativity and musicianship amongst novice musicians grew to a surprising level. My initial expectations were low as to people actually learning musical structure. To my surprise, many did, and as a result, wanted to pursue music further to help support healthy living and emotional well-being."

### Cardiovascular Intervention

The nurse educators reported that most participants actively participated in group sessions that addressed self-management skills pertaining to diet, exercise, stress reduction, and sleep hygiene. Participants routinely shared personal challenges associated with healthy eating and exercise, as well as current events that were often noted to be stressful. Lack of progress in weight reduction as noted in the results section prompted acknowledgement that lifestyle changes were difficult at best especially for older people.

### Challenges

Despite the availability of cardiovascular programs offering instruction in lifestyle self-management at hospitals, clinics, and wellness centers, and through health plans, the challenges of engaging at-risk individuals in sustainable lifestyle strategies should not be underestimated.

Resistance to changing life-long habits that are deeply ingrained and difficult to alter is a major treatment obstacle. Although statistically significant systolic BP reductions in this study were sustained 6 months after the completion of the program, anthropometric measurements that are clearly associated with cardiovascular risk were unsurprisingly not significantly altered in the course of the intervention.

When asked about the personal effects of the program-based recommendations for healthy eating, exercise, stress reduction, and sleep hygiene, participants frequently reported

making numerous healthy lifestyle changes that they attributed to participation in the study. Such behaviors may have been associated with the sustained systolic BP reduction recorded in both groups.

In the context of challenges, the lack of uniformity within the health care delivery system is a significant contributor to the often-devastating nature of cardiovascular disease. Although physicians often cite nonadherence to pharmacological and lifestyle interventions, lack of patient accountability, long asymptomatic phases, and failure to prioritize prevention, the health care delivery system does not consistently offer a standardized, high-level approach for cardiovascular prevention and risk-factor reduction.[19] The often-cited approach of extending health insurance coverage to at-risk populations will not by itself significantly improve cardiovascular health. Of critical importance is the positioning of this intervention within a comprehensive, coordinated, culturally sensitive, physician-led health initiative for cardiovascular risk-factor reduction.

In terms of this study's design, although church-based health promotion has garnered a great deal of interest in recent years, 4 significant challenges must be considered prior to offering a similar program. These include (1) effectively recruiting participants, (2) overcoming randomization tension between control and experimental groups coexisting in the same church; (3) boosting long-term sustainable engagement; and (4) discovering optimal educational strategies that facilitate effective lifestyle changes and outcomes.

Two additional considerations must also be prioritized: obtaining support from the lead pastor, and balancing community and academic interests.[20]

**Recruitment.** The design and execution of an effective recruitment strategy must be prioritized. Despite this study's comprehensive recruitment strategy, which included the extensive use of flyers and announcements during church services and meetings as well as personal word of mouth recommendations by congregation members, recruitment was far more difficult than anticipated. Many potential participants expressed reticence to enter the study and were clearly dissuaded based on the program's frank research nature.[20] Not surprising, a number of individuals were also disinclined to complete surveys, routine BP checks, and anthropomorphic measurements. Despite the maintenance of privacy, nurses often observed that many participants appeared embarrassed by the process and, as a result, avoided data collection sessions.

**Randomization Tension.** A major unanticipated obstacle was clearly the result of what the current research team describes as randomization tension. In accordance with informed consent disclosure policies, the nature of the study and the randomization were carefully explained to all potential applicants. However, a number of participants, after speaking with each other, ultimately elected not to participate on discovering they were assigned to the control rather than the intervention group. This resulted in additional and extended recruitment efforts to establish sufficient numbers of participants for the control group. It must be emphasized that without the lead pastor's extended time and dedicated efforts devoted to the final recruitment process, a sufficient number of control participants would not have been recruited.

**Long-term Engagement.** The prospect of a relatively long commitment—participating in a healthy lifestyle program spanning 1 year—seemed daunting for many individuals. Although people may be willing to participate in a 6-session, lifestyle improvement program, the willingness to commit to a long-term program is often lacking. A short-term intervention that achieves weight loss in the course of 3 months, with subsequent weight gain thereafter, cannot be considered successful. Ultimately, a successful intervention requires a deliberate sustainable focus that must be prioritized.

**Optimal Educational Strategies.** Perhaps the greatest challenge in the current study was discovering effective personalized strategies for inspiring people to take better care of themselves and helping them find the motivation required to maintain a sustainable healthy lifestyle. This is the first study to clearly demonstrate that the addition of an engaging RMM program can effectively serve as a tool for fostering sustainable participation in a program for cardiovascular risk reduction and self-management.

## Limitations

Considerations that must be considered for this study include a relatively limited sample size, the potential effects of selection bias based upon the previously noted randomization tension, the subjective nature of the SF-12, and the inconsistencies of self-reporting by participants to nurse educators.

## Recommendations

Based on the results of this initial study, the research team is convinced that coupling gospel music programs with educational programs for cardiovascular risk reduction in African American churches could potentially foster improved overall outcomes and sustainable commitments.

The following suggestions should be considered for future studies: (1) recruit a population of participants that spans multiple churches; (2) eliminate concomitant control and intervention groups in the same congregation; (3) directly link nurses to participants' primary care physicians through formal communications protocols; and (4) add an individualized, non-group-based, risk-factor reduction component.

**Multiple Churches Without Concomitant Control and Intervention Groups.** Given the participants' overwhelming preference for the combined cardiovascular risk reduction and RMM program, the investigators suggest that the control and intervention groups not be recruited from the same church. Furthermore, despite the potential absence of randomization tension with that separation, it

may be far more challenging to recruit the control group because many people are not sufficiently incentivized by health lifestyle educational sessions alone, even when provided at no charge. The consideration of additional group incentives from health plans warrants further consideration to boost control group participation.

**Link Nurses and Primary Care Physicians.** The linking of program nurses to the participants' physicians via direct communication protocols could yield greater influence.

**Individualized Component.** Coupling personalized care plans and individual follow-up visits in addition to group sessions could provide additional benefits.

The consideration of early interventions by offering a similar approach for adolescents, teens, and younger individuals in a church setting could ultimately serve to help to improve lifelong cardiovascular health and prevent unhealthy lifestyle habits that often lead to catastrophic complications.

## CONCLUSIONS

The addition of a gospel music program as a catalyst for increased engagement in a sustainable, healthy lifestyle program warrants further consideration and additional study in African American churches. In view of the markedly increased incidence and resulting devastating effects of cardiovascular disease in African Americans, church-centered health education and support should be prioritized, using gospel music programs to boost participation and engagement.


### AUTHOR DISCLOSURE STATEMENT

This project was funded by the Yamaha Music and Wellness Institute, a 501(c3) nonprofit corporation. Clavinova Connection is a registered trademark of the Yamaha Corporation. HealthRHYTHMS and Group Empowerment Drumming are registered trademarks of Remo.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