Prime Time Sister Circles®II: Evaluating a Culturally Relevant Intervention to Decrease Psychological and Physical Risk Factors for Chronic Disease in Mid-Life African American Women

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Purpose: This article presents the results of two evaluation studies of the Prime Time Sister Circles® (PTSC). The PTSC is a gender, cultural, and age specific, curriculum-based, low-cost, short-term, replicable support group approach aimed at reducing key modifiable health risk factors for chronic illnesses in midlife African American women.

Methods: Study 1 includes an evaluation of 31 PTSCs (N=656 women) documenting changes in psychological and attitudinal outcomes (health satisfaction, health locus of control), behavioral outcomes (healthy eating patterns, physical activity, stress management), and clinical outcomes (weight, BMI, blood pressure, non-fasting blood sugar). Study 2 includes evaluation of a subset of the PTSC sites (N=211 women) with comparison (N=55 women) data from those same locations.

Results: Study 1 showed significant changes ($p<.0001$) in the PTSC women's reports of (lower) stress, (higher) health locus of control, (increased) health satisfaction, (increased) physical activity, and (healthier) eating patterns. The PTSC women demonstrated a significant weight reduction at posttest ($p<.0001$) and had slightly better clinical outcomes in BMI, hypertension, and non-fasting blood sugar. Results document the sustainability of selected changes over a six-month period. Findings from the Study 2 strengthen the effectiveness claims of the PTSC intervention with significant changes for the PTSC women on selected outcomes and little changes for the comparison women.

Conclusions: Results reaffirm findings regarding the effectiveness of the PTSC, as originally reported in Gaston, Porter, and Thomas (2007) and extends the credibility of findings by examining participants' clinical outcomes in addition to self-reports.

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INTRODUCTION

African American women in our Nation face major disparities in both physical and emotional illness, compared to Caucasian women, and are dying at rates that are greater than all other women in this country. They have higher rates of hypertension (twice as likely), breast cancer at young ages, diabetes and its complications (three times more likely), stroke, high cholesterol, lupus and heart disease.[1,2] African American women are more than twice as likely to have cardiovascular disease (CVD), hypertension, heart disease and stroke and 30% more likely to die from it (ibid). Despite these facts, they are also less likely to be aware that heart disease is their leading cause of death[3,4] and to make lifestyle changes that will substantially reduce their risk.

African American women's disparities in emotional health are also compelling. They report higher rates of emotional distress, depressive symptoms and panic attacks than do Caucasian women.[5-10] Health projections indicate that African American women experience depressive symptoms at some point during their lifetime and at a rate that is significantly higher than Caucasian women, yet far fewer of them receive treatment.[11-13] Further, African American women often cite stress as a greater threat to their health than heart disease.[14]

One of the major reasons that African American women are at increased risk for poor health and negative health is because they have the highest prevalence of major risk factors and multiple co-morbidities (i.e., overweight and obesity with inactivity and stress, depressive symptoms with high blood pressure, high blood cholesterol and diabetes) that contribute to both morbidity and mortality when compared to Caucasian women.[15,16] Chronic and acute psychological stress has been documented to have a

negative impact on morbidity and mortality rates especially in relationship to CVD.[17,18] Various studies have documented that an individual's response to stress can be a contributing factor to increased risk for CVD and cancer.[19-22] Further, higher levels of psychological stress may also lead to an increase in other negative behaviors such as overeating and increased smoking.[23]

Poor lifestyle habits are major contributors to poor health outcomes. Prevention and a healthy lifestyle are increasingly recognized by health professionals as the cornerstones to improving health outcomes and reducing risk factors for chronic diseases. The Centers for Disease Control & Prevention (CDC) has reported that a major determinant of health is lifestyle, exceeding the impact of genetics, the environment, and access to care.[24] Numerous studies have documented the negative impact of physical inactivity, poor nutrition, and stress in overall health outcomes, especially on major morbidity and mortality from cardiovascular disease (CVD).[25-27] According to the *Healthy People* (2010) report, poor nutrition, in conjunction with physical inactivity, leads to 300,000 deaths each year.[28] A review of mortality data reported to the CDC showed a substantial increase in the proportion of estimated deaths attributable to poor diet and sedentary behavior[29-32] in many segments of the population based on age, income, gender, race and ethnicity.

Various health statistics make a compelling case for the need for successful interventions to help African American women reduce and eliminate health risk factors. Further, more research in culture-specific strategies to reach African American women, particularly those in midlife, is of particular importance given the high level of risk factors and mortality rates in this population and the different constellations of their higher risks in comparison to other female ethnic populations. This article describes the results of an outcome evaluation of the Prime Time Sister Circles® (PTSC), a gender, cultural, and age specific, curriculum-based, low-cost, short-term, replicable support group approach aimed at reducing key modifiable risk factors in a socioeconomically and geographically diverse group of African American women.

PROGRAM NEED AND DESCRIPTION

The health outcomes of African American women not only play a critical role in their own lives, but also in the lives of their partners, children, grandchildren, and communities. Women in mid-life, in particular, are often considered role models and influence the health knowledge, attitudes and behavior of their families and communities. Thus, education of midlife African American women and improvements in their health outcomes are critical. However, there remains a paucity of culturally and gender-relevant interventions and evaluations of such interventions targeting improvements in the health outcomes of midlife African American women by reducing their risk of chronic diseases. The PTSC represents one of the few interventions targeting this specific population and one with existing evaluation data indicating positive changes in the women after PTSC participation.

The PTSC is a facilitated, curriculum-based, intensive, support group intervention with an average of 25 African American women per group. It consists of an initial 12-week two-hour weekly program that includes data collections at baseline, 12-week and six-month posttest, a training program for facilitators, and an Alumnae Association program for PTSC graduates. PTSC is a preventive program that is outcome driven, comprehensive, and replicable. It uses a cognitive behavioral modality to address three key modifiable health risk factors which are major contributors to morbidity and mortality from chronic diseases: unmanaged stress, physical inactivity, and unhealthy nutritional choices. It also addresses two additional risk factors which contribute to unhealthy lifestyles: lack of knowledge or misinformation about major illnesses—cardiovascular disease, hypertension, diabetes, cancer, and depression—and the failure of African American women to prioritize their health and take proactive steps to manage their health and health outcomes. PTSC gives African American women the information, motivation, tools, and consultative support they need to improve and maintain their health. The Circles meet in community settings (e.g., health centers, churches, public housing community rooms). An added benefit of PTSC is its low cost of $35 per woman per week (not including administrative and evaluation costs). It should be noted, however, that the women who participated in the PTSC, to date, have not incurred any financial cost since their fees were covered by external grant funds.

Conducted in a supportive group format, PTSC operates within a theoretical framework that characterizes cultural, gender, and age-specific factors as the key to understanding the unique values, beliefs, and preferences of African American women, modifying lifestyles, and improving health outcomes. It is also consistent with empirical work documenting the importance of social support and social circles in promoting positive health changes among African American women.[33]

The conceptual framework for this intervention is an integration of three theoretical approaches: (a) the social-cognitive theory that emphasizes the importance of self-efficacy and empowerment through modeling, communication, and role play,[34] (b) the transtheoretical model that illustrates stages of behavioral change and how

and why individuals adapt their behavior over time postulating a continuum of change that is influenced by an individual's knowledge and motivation to change;[35] and (c) the PEN (Person, Extended Family, Neighborhood) model, that focuses on the integration of health education, educational diagnosis of health behavior, and cultural sensitivity.[36] The PEN was initially used in African countries as a health promotion disease prevention strategy for the individual that was then spread to her/his family and community. These three models have a strong body of empirical evidence that document their effectiveness in promoting positive health related behavior changes. Further, all three approaches have been successfully utilized with women of color. In addition to the behavioral modification framework underlying these three theoretical approaches, the design and implementation of the PTSC were based on information derived from numerous focus groups conducted by the developers of the intervention and material incorporated within their book, *Prime Time: The African American Woman's Complete Guide To Midlife Health and Wellness*.[37]

OBJECTIVES OF PRESENT EVALUATION

The first published evaluation of the PTSC intervention was in 2007 by the present authors (Gaston, Porter, and Thomas) which documented statistically significant post intervention changes based on subjective self-reports.[38] This initial study included 106 African American women from eleven PTSCs located in Washington, DC, Chicago, Illinois, and Orlando, Florida. It also included a small ($N = 34$) comparison group. A major change in the implementation of the current set of PTSCs compared to those reported in the 2007 manuscript is the addition of objective pre/post clinical assessments of the women.

This article presents the results of two new evaluation studies of the PTSC. Study 1 is an evaluation of 31 new PTSC sites with 656 women. A one group time series evaluation design was implemented to assess changes in three major areas: psychological and attitudinal outcomes (i.e., health satisfaction, health locus of control), behavioral outcomes (i.e., healthy eating patterns, physical activity, stress management, and prioritization of their health), and clinical outcomes (i.e., weight, BMI, blood pressure, non-fasting blood sugar). Study 2, utilized a pretest/posttest quasi-experimental design and describes results from a subset of the PTSCs ($N = 211$ women) with comparison ($N = 55$) data from those same locations. Collectively, the findings of these two evaluation studies document the success of the PTSC intervention in reducing some of the major health risk factors in a large group of midlife African American women. The results also document the sustainability of selected changes among the intervention women over a six-month period.

EVALUATION STUDY 1 – CHANGES AMONG PTSC INTERVENTION WOMEN

Methodology

Data collection sites and participant description. The PTSC interventions were conducted in various sites located in Washington, DC, Tampa, Florida, and Baltimore, Maryland between 2008–2010. A total of 31 PTSC groups (656 participants), with an average of 21 women per group, were completed. These sites were community based (i.e., churches; public housing; a historically Black university; a state health education center; mental health and community health centers; a book store; and a hospital.

Each PTSC woman was given a copy of the Gaston and Porter's 2003 revised book, *Prime Time: The African American Woman's Complete Guide To Midlife Health and Wellness*[37] to use as the course text and curriculum/workbook and $10 per session to defray transportation or child care costs. Over the course of the 12-week intervention (two hours/week), the women received information from the PTSC facilitators and consultants related to prevention, spirituality, self-esteem, prioritizing their health first, stress, nutrition, exercise, chronic disease, and utilizing the health care system. Expert consultants were utilized to teach specific cognitive behavioral strategies and provide tools to improve stress management, nutrition and exercise habits, and to help the women develop and implement individualized health plans in the targeted areas.

The mean age of the women was 55.15 ($SD = 8.89$). Of the total, 25.7% of the women had a high school educational level or less; 28% had some college/technical level education, 19.5% had graduated from college; 26.7% had some post baccalaureate, graduate or professional degree. Almost one-third (28.2%) of the women had personal yearly incomes under $20,000 while 42.3% had personal yearly incomes of over $40,000 or above. Only 45.2% of the women were employed full-time and 17.2% were completely retired. Less than one-third (31.3%) were currently married; 24.0% were separated or divorced; 10.6% were widowed and 4.2% were unmarried, but had a live-in partner, and 29.0% were unmarried without a live-in partner. The overwhelming majority (82.1%) of the women had children. Slightly more than one-half (53.3%) of the women reported having grandchildren and 29.0% indicated that they had minor children living in their home. At baseline, many of the women reported that they had

been diagnosed by a physician with certain chronic or other diseases. Over one-half had been diagnosed with hypertension (56.7%). Additionally, some of the women reported being diagnosed with: hypercholesterolemia (37.7%); Type II diabetes (21.9%); depression (19%); a stress related illness (11.9%); heart disease (9.2%); cancer (5.5%); and a cerebrovascular event (stroke) (3.2%). The vast majority (89.9%) of the women reported having visited a doctor or health care provider for a routine checkup (or general physical examination) within the past 12 months.

INSTRUMENTS

The instruments used in the two studies reported in this article were selected because of their previous use with diverse populations and/or their ability to measure variables that were important for the present research. These instruments were also pretested and previously utilized, in whole or part, with other samples of PTSC women.[38,40]

In Study 1 the psychological/attitudinal and behavioral instruments of focus were included as items within a larger survey given to the PTSC women. The women's clinical assessments were taken by a set of subcontracted independently trained health care professionals.

Psychological/attitudinal outcomes. The psychological/attitudinal factors of interest in this evaluation included perceived stress, health locus of control, health satisfaction, and importance of engaging in physical exercise. *Perceived stress* was measured on a single item asking the women to indicate their current stress level, taking all things into consideration. This item was rated on a 7-point scale from 1, *"not at all stressed*" to 7, "*extremely stressed*."

Health satisfaction was a composite score, previously used by the authors,[38] that was calculated by summing the women's satisfaction rating across five items (i.e., satisfaction with weight, body shape, health knowledge, health attitudes, health behaviors). The total scale score was an average, which could range from 1−3, with higher scores indicative of greater levels of health satisfaction. The Cronbach internal consistency reliability coefficient for this measure for the PTSC women was .75.

Health locus of control was measured using the 11-item Health Locus of Control Scale.[39] The items, responded to on a 4-point Likert type scale, assessed the degree to which the women believe they possess control over their personal health. Sample items include (a) *People who never get sick are just plain lucky,* (b) *I can only do what the doctor tell me to do*, and (c) *When I feel ill, I know that it is because I have not been getting the proper exercise or eating right*. Total scores could range from 11 − 44, with higher scores indicative of higher levels of locus of control. The Cronbach internal consistency reliability coefficient for the Health Locus of Control Scale for the PTSC women was .64.

Attitudes toward engaging in physical activity. The women's attitude regarding engaging in physical exercise was assessed by a single 4-point item asking the women to rate the importance of engaging in physical exercise at least five times per week. They rated this item in terms of 1, "*not at all important," 2,"not too important," 3,"somewhat important," and 4,"very important."*

Behavioral outcomes. A number of self-reported behavioral outcome items were included in the larger PTSC survey. The specific behavioral outcomes examined in this evaluation included engagement in physical activity (i.e. exercise), healthy eating patterns, stress management, and prioritization of their health.

The *physical activity/engagement in exercise* questions asked the frequency (days per week) of engagement in exercise that was at least 20 minutes in duration. To assess *healthy eating patterns*, a Health Eating Measure, adapted and shortened from an instrument used by Gaston, Porter, and Thomas (38) to include 11 items, was utilized. Healthy eating items focused on those relevant behaviors documented in the literature such as consuming a balanced diet, watching one's caloric intake and food portions, and limiting the intake of sugar, salt, and unhealthy fats. These items were rated on a 3-point scale ranging from 1 "*never*" [engage in this eating pattern] to 3 "*always or almost always*" [engage in this eating pattern] The healthy eating pattern items included both positive (healthy) behaviors and negative (unhealthy) behaviors. For example, healthy eating behaviors included: (a) ate breakfast, (b) watched their caloric intake; and (c) watched serving size, etc.; unhealthy eating behaviors included, for example, (a) ate fast food and (b) ate high caloric sweets. The scores were summed and averaged, with possible scores ranging from 1−3, with higher scores indicative of more healthy eating patterns. The Cronbach internal consistency reliability coefficient for this measure for the PTSC women was .71.

A *stress management* survey was given that provided participants with a list of 19 behaviors and asked them to indicate if they engaged in these behaviors to help them reduce their stress levels. The investigators drew this list of behaviors from the literature and discussions with focus groups of African American women. Sample behaviors on the listing included more adaptive stress management behaviors such as: (a) praying, (b) deep breathing, (c) meditation, (d) talking with a minister, (e) talking with a professional mental health clinician and less adaptive stress management behaviors such as (a) going shopping,

(b) drinking alcohol, (c) avoiding [the stress], (d) forgetting[about it] or (e)"going off."

Clinical outcomes. Several clinical assessments of the PTSC women were taken. The clinical assessments included the women's (a) height, (b) weight, (c) body mass index (BMI), (d) blood pressure, and (e) non-fasting blood sugar level. The women's body mass index (BMI), a measure of body fat based upon height and weight, was calculated. In this evaluation, and in accordance with federal guidelines, a normal BMI is between 18.5-24.9; a BMI between 25−29.9 is considered overweight; a BMI between 30−40 is considered obese and a BMI greater than 40 is classified as extremely obese.

Blood pressure was classified into three groups including normal (120/70 or less), pre-hypertensive (> 120/70), and hypertensive (> 140/90). Non-fasting blood sugar levels were classified into three groups including normal (blood sugar less than 139), suspected pre-diabetic (blood sugar 140−199), and suspected diabetic (blood sugar greater than 200).

PROCEDURES

Research data (self-report and clinical assessments) were collected from PTSC women participants at three points-in-time: (a) pretest (baseline written surveys and clinical assessments) and (b) posttest written surveys and clinical assessments (12 weeks, 6-month follow up). The surveys were administered onsite and collected by the PTSC evaluator or the site-based facilitators. The clinical assessments, done by an independent group, were also conducted on-site.

Confidentiality of the Data and Informed Consent Procedures. All participants were provided an informed consent form to review and sign prior to their participation in the PTSC and completion of any data collection protocols. No identifying information was included on the data collection measures. Participants created a code number (using their mother's maiden name and the last four digits of their social security number). This information was also used to link the participants' self-report data to their clinical assessments.

Statistical Analyses

Three major outcome areas were analyzed in this study: (a) PTSC participant changes on selected psychological factors related to their health (i.e., stress) or health perception (i.e., health locus of control, health satisfaction), (b) PTSC participant changes on selected behavioral dimensions related to health (i.e., engagement in physical activity, healthy eating patterns), and (c) changes in PTSC participants' clinical outcomes (e.g., weight, blood pressure, BMI, blood sugar level). Descriptive statistics (e.g., frequencies, percentages) were done for each variable of interest. Internal consistency reliability statistics were calculated for each scale. Additionally, pre/post t-test analyses were performed to detect statistically significant changes.

EVALUATION STUDY I RESULTS

Participants, Follow-up Retention Rates-Evaluation

Among the PTSC women, 656 completed the survey at pretest, 447 completed at 12-week posttest, and 140 completed at 6-month follow up. Of these PTSC women, 521 clinical assessments were taken at baseline, 420 were taken at posttest and 149 were taken at 6-month follow up.

Pre/Post Changes in the PTSC Women

The effectiveness of the PTSC was evaluated in terms of the women's changes in the selected psychological, behavioral, and clinical outcomes of interest. The findings related to these changes are reported in the sections below.

Changes in psychological/attitudinal outcomes. There were significant improvements for the PTSC women for all the psychological/attitudinal outcomes of interest in this study. (See Table 1.) The women's reported level of stress changed significantly after the 12-week PTSC participation, $t(366) = 10.69$, $p < .0001$. In particular, PTSC participants reported lower stress levels ($M = 2.99$, $SD = 1.44$) after the intervention (12-week posttest) than at pretest ($M = 3.96$, $SD = 1.66$). There was also a significantly lower pre/post difference at 6-month follow up (pretest $M = 3.79$, $SD = 1.59$, 6-month post $M = 3.18$, $SD = 1.54$, $t(121) = 3.96$, $p < .0000$).

Results indicated a significant change in the PTSC women's health locus of control, $t(401) = 7.45$. They reported a significantly higher sense of control over their health outcomes at 12-week posttest ($M = 31.95$, $SD = 5.82$) than they did at pretest ($M = 29.24$, $SD = 7.04$). However, there was no significant pre/post difference in health locus of control at 6-month follow up.

The findings demonstrated change in the PTSC women's health satisfaction after the PTSC intervention. The women had a significantly higher level of health satisfaction at 12-week posttest ($M = 2.12$, $SD = .42$) than they did at pretest ($M = 1.75$, $SD = .44$), $t(401) = 15.95$, $p < .001$. They also had higher satisfaction scores at 6-month (pretest $M = 1.83$, $SD = .44$, 6-month post $M = 2.13$, $SD = .44$, $t(124) = 6.60$, $p < .0001$).

The women reported a significant change in attitude toward the importance of engaging in physical activity/exercise (at least five times per week). At pretest, 65.5%

Table 1. Study 1 PTSC Women's Pre/Post Changes on Selected Psychological and Behavioral Outcomes

Psychological Outcomes	Pretest Mean	Posttest Mean	t-value	df	p-value
PTSC stress level					
Pre/12-week post	3.96 (1.66)	2.99 (1.44)	10.69	366	<.000
Pre/6-month follow up	3.79 (1.59)	3.18 (1.54)	3.96	121	<.000
PTSC health locus of control					
Pre/12-week post	29.24 (7.04)	31.95 (5.82)	7.45	401	< .000
Pre/6-month follow up	27.26 (6.42)	27.36 (5.88)	.16	129	>.05
PTSC health satisfaction					
Pre/12-week post	1.75 (.44)	2.21 (.42)	15.95	401	< .000
Pre/6-month follow up	1.83 (.44)	2.12 (.44)	6.60	124	<.0001
Behavioral Outcomes	**Pretest Mean**	**Posttest Mean**	**t-value**	**df**	**p-value**
Engaging in exercise (physical activity)					
Pre/12-week post	2.21 days (1.98)	3.26 days (1.75)	10.06	414	<.000
Pre/6-month follow up	2.37 days (1.82)	2.87 days (1.93)	2.60	118	<.01
PTSC healthy eating patterns					
Pre/12-week post	2.14 (.39)	2.42 (.36)	15.51	416	< .000
Pre/6-month follow up	2.01 (.38)	2.18 (.29)	4.92	131	<.000

Note: Standard deviations are in parentheses. The mean score on the stress measure can range from 1–7, with higher scores indicating higher stress levels. The mean scores for day per week engaged in physical activity can range from 0 – 7 days. The scores on the Health Locus of Control scale could range from 11 – 44, with higher scores indicative of higher mean level of internal health locus of control. The scores on health satisfaction could range from 1 – 3, with higher scores indicative of higher mean level of satisfaction. The mean score on the exercise measure can range from 0–7 days. The scores of the healthy eating patterns can range 1 - 3, with higher scores indicative of engaging in more healthy eating behaviors. It should be further noted that the correlated t-test analyses only retained women in the pre/post analyses if they participated at both data collection points. For example, if a woman participated in the baseline and 12 week follow up, but not did not participated in the 6 month follow up, her pretest results will not be included in the pretest mean for the pre/6-month follow up data in the table. Therefore, pretest means can change across pre/ post data collection time periods.

rated this item as "*very important*." By 12-week and 6-month posttest, 77.9% and 79.6%, respectively, rated this item as "*very important*".

Changes in behavioral outcomes. There were statistically significant pre-post differences in the PTSC women's behavioral outcomes of interest in this evaluation. In particular, there were significant changes in the women's engagement in physical activity exercise. On average, at pretest, the PTSC women reported participating in exercise only 2.21 days per week ($SD = 1.98$); however, at 12 week posttest, the women reported participating in exercise, on average, 3.26 days per week ($SD = 1.75$), $t(389) = 10.06$. The range of engagement in physical exercise undertaken by the women, at pretest, included: 31% of the PTSC women reported engaging in physical exercise 0 days per week and 11.7%, 14.2%, and 43.2%, respectively, reported engaging in physical exercise 1, 2, or 3 or more days per week. By 12-week posttest, only 7.4% of the women reported engaging in physical exercise 0 days per week (a decrease of 23.6%); 8.1%, 16.2%, and 68.3%, respectively, reported engaging in physical exercise 1, 2, or 3 or more days per week. At pretest, only 30.2% of the women reported that they had exercised regularly over the past three months, whereas by 12-week posttest, 49.3% of the women reported that they had exercised regularly over the past three months. The PTSC women continued to report engaging in physical activity/exercise significantly more days at 6-month ($p < .01$) than they did at pretest.

Additionally, the PTSC women reported significantly higher levels of healthy eating patterns at 12-week posttest ($M = 2.42$, $SD = .36$) than they did at pretest ($M = 2.14$, $SD = .38$, $t(416) = 15.51$, $p < .000$. The positive changes remained at 6-month posttest. Upon closer examination of specific eating patterns, the results illustrated improvements toward healthier patterns. For example, at PTSC baseline, only 16.8% and 9.7% of the women reported,

on average, that they "*always or almost always*" watch their caloric intake and watch their serving size intake. By 12-week posttest, this percentage increased with 37.1% and 46.1%, respectively, reported "*always or almost always*" watching their caloric intake and watching their serving size. At baseline only 34.8% of PTSC women reported "*always or almost always*" reading food labels, whereas by 12-week and 6-month posttest, 53.9% and 54.2%, respectively, reported "*always or almost always*" reading food labels. Additionally, at baseline 42.1% of the PTSC women reported "*always or almost always*" baking, grilling, or broiling their food, whereas by 12-week and 6-month posttest, 59.9% and 60.8%, respectively, reported "*always or almost always*" baking, grilling, or broiling their food.

The most popular **stress management technique** utilized by the women included prayer (83.5% at pretest and 89.9% at 12-week posttest). Other stress management techniques reportedly used by over two-thirds of the women, at 12-week posttest, included watching television or a movie (82.2%), exercising (84.3%), talking with family or friends (79.8%), and listening to music (85.5%). The results demonstrated that a higher proportion of the PTSC women reported utilizing deep breathing and meditation (both skills taught in the PTSC 3-month period) at posttest (74.3%, 65.9% respectively) than they did at pretest (48.9%, 41.8% respectively).

Clinical changes. There were significant weight differences for the PTSC women from pretest to posttest. As expected, the PTSC women demonstrated a significant reduction in weight from pretest ($M = 199.94$ lbs., $SD = 45.34$) to 12-week posttest ($M = 194.95$ lbs, $SD = 46.21$), $t(305), = 5.20$, $p < .0001$ even though the PTSC is not mainly a "weight loss program." The PTSC women assessed at 6-month follow up continued to demonstrate a significant weight reduction (pretest $M = 200.15$ lbs, $SD = 50.3$, 6-month post $M = 198.05$ lbs, $SD = 48.5$, $t(131) = 2.06$, $p < .05$) in comparison to their pretest weight.

As illustrated in Table 2, the BMI classification showed at pretest, 46.7% ($N = 231$) of the PTSC women were classified as obese and 16.8% ($N = 83$) were classified as extremely obese. Only 7.5% ($N = 37$) of the sample was classified as normal and 29.1% ($N = 144$) were classified as overweight. There was a slight decrease of PTSC women classified as extremely obese and obese at 12-week posttest. Specifically, at 12-week posttest, 44.5% of the women ($N = 145$) were classified as obese and 16% ($N = 52$) were classified as extremely obese; 8.3% ($N = 27$) were classified as normal and 31.3% ($N = 102$) were classified as overweight. At 6-month follow up, very little change was observed 42.7% ($N = 61$) of the PTSC women being classified as obese and 17.5% ($N = 25$) were classified as extremely obese.

There were also pre/post changes in the women's blood pressure classification. At pretest, approximately 75% of the PTSC women had abnormal blood pressure readings (Table 2). That is, 39.1% ($N = 196$) were classified as hypertensive and 35.7% ($N = 179$) were classified as pre-hypertensive with only 25.1% ($N = 126$) being classified as normal. By 12-week follow up,

Table 2. Study1: PTSC Women's Pre/Post Clinical Results

Clinical Variables	% at Pretest	% at 12-Week Posttest	% at 6-Month Posttest
BMI Classification			
Normal (< 25)	7.5%	8.3%	8.4%
Overweight (25–30)	29.1%	31.3%	31.5%
Obese (> 30)	46.7%	44.5%	42.7%
Extremely Obese (> 40)	16.8%	16.0%	17.5%
Blood Pressure Classification			
PTSC Normal (120/70)	25.1%	27.8%	37.2%
Prehypertensive (121/71 to 139/89)	35.7%	42.4%	34.0%
PTSC Hypertensive (> 140/90)	39.1%	29.8%	28.8%
Non-Fasting Blood Sugar Classification			
PTSC Normal (less than 139)	84.1%	84.4%	86.7%
PTSC Suspected pre diabetic (140–199)	12.0%	12.2%	11.3%
PTSC Suspected diabetics (over 200)	3.9%	3.4%	2.0%

29.8% ($N = 116$) of the women were classified as hypertensive; 27.8% ($N = 108$) and 42.4% ($N = 165$), respectively, of the women were classified in the normal and pre-hypertensive categories, demonstrating a movement in the right direction of the hypertensive women into the pre-hypertensive and normal categories. At 6-month follow up, there was an even greater increase in normal values 37.2%, ($N = 58$) from the pre-hypertensive levels, and 28.8% ($N = 45$) of PTSC women were hypertensive.

At pretest, 84.1% ($N = 407$) of the women had normal non-fasting blood sugar levels, 12.0% (N=58) were suspected to be pre-diabetic and 3.9% ($N = 19$) were suspected diabetic. By 12-week posttest, 84.4% ($N = 318$) of the women were classified in the normal non-fasting blood sugar category; 12.2% ($N = 46$) were suspected to be pre-diabetic and 3.4% ($N = 13$) were suspected to be diabetic. Similarly, at 6-month follow up there was no notable change in suspected abnormal levels with 86.7% ($n = 130$) of the women classified as normal (Table 2).

EVALUATION STUDY 2 – PTSC VS. COMPARISON WOMEN METHODOLOGY

Data Collection Sites and Participant Description

The second evaluation study reported in this article presents findings from a subset of the PTSC sites with comparison data from those locations. This study limited intervention/comparison analyses to PTSC interventions taking place in Tampa, Florida and Baltimore, Maryland during 2009–2010. The Study 2 evaluation consisted of a pre/post quasi-experimental design.

The participants for the Study 2 evaluation included 211 African American women who received the PTSC intervention and 55 comparison women. Of the PTSC women, 165 completed the 12-week self-report posttest (78.2% survey retention rate), and 174 women completed the 6-month self-report posttest (82.5% survey retention rate). In addition, clinical assessments were taken at baseline ($N = 167$), 12-week posttest ($N = 137$) (82% clinical assessment retention rate), and 6-month posttest ($N = 109$) (65.2% clinical assessment retention rate) for the PTSC women. The 55 comparison women who completed the evaluation survey at baseline were recruited from one Tampa comparison site and one Baltimore comparison site. A total of 48 comparison women completed the posttest survey at 12 weeks (87.3% survey retention rate) and 42 (76.4% survey retention rate) comparison women completed the survey at the 6-month posttest. Of these comparison women, clinical assessments were taken at baseline ($N = 55$), 12-week posttest ($N = 42$) (76.4% clinical assessment retention rate) and 6-month posttest ($N = 32$) (58.2% clinical assessment retention rate).

The comparison women were comparable to the intervention demographically-age, race/ethnicity, and socioeconomic status (e.g., education, income). The instruments and procedures for Study 1 and Study 2 were identical, with the exception of activities of the comparison group. The comparison group received the copy of the Gaston and Porter (48) text, but did not receive a curriculum, facilitator, or expert consultants. The women in the comparison group received a stipend of $10 at pre/ post and 6 month follow-up.

RESULTS

The PTSC and comparison women were compared on the same dimensions as the participants in Study 1. Results showed positive differences in selected outcomes in the PTSC group relative to the comparison group (See Tables 3 and 4). The PTSC women reported significantly lower levels of stress at 12-week posttest and 6-month posttest than they did at pretest ($p < .05$), while the comparison group reported no significant pre/post changes in stress level at 12-week or 6-month follow up. The PTSC women reported a significantly higher level of health satisfaction at 12-week and 6-month posttest than they did at baseline ($p < .05$). There was also a significant pre/12-week post change in health satisfaction for the comparison women ($p = .05$). However, there were no significant differences in the PTSC or comparison women's locus of health control from baseline to posttest (12 week or 6 months).

The PTSC women reported engaging in more physical activity/exercise at posttest than they did a pretest ($p < .05$), whereas no significant change occurred for the comparison group. At pretest, 28.9% of the PTSC women (19.5% comparison women) reported engaging in physical exercise 0 days per week. By 12-week posttest, only 3.74% of the PTSC women (19.5% comparison women) reported engaging in physical exercise 0 days per week. In terms of the women's attitude toward the importance of engaging in physical activity/exercise (at least five times per week), at pretest, 68.8% PTSC women (64.8% comparison women) rated this item as "*very important*." By 12-week and 6-month posttest, 79.0% PTSC women (52.5% comparison women) and 76.4% PTSC women (58.1% comparison women), respectively, rated this item as "*very important*".

Table 3. Study 2: PTSC and Comparison Women's Pretest/12-Week Post Changes in Selected Psychological and Behavioral Outcomes

Psychological Outcomes	Pretest Mean	12-Week Posttest Mean	t-value	df	p-value
PTSC women stress level	3.61 (1.70)	2.99 (1.50)	3.68	117	.001
Comparison women stress level	3.97 (1.74)	3.92 (1.70)	.168	37	> .05
PTSC women health locus of control	26.98 (5.10)	27.67 (5.93)	1.24	129	>.05
Comparison women locus of control	28.6 (4.47)	30.29 (6.13)	1.43	38	>.05
PTSC women health satisfaction	1.86 (.43)	2.21 (.43)	8.12	121	.001
Comparison women health satisfaction	1.87 (.50)	2.02 (.52)	1.99	38	.05
Behavioral Outcomes	**Pretest Mean**	**12-week Posttest Mean**	**t-value**	**df**	**p-value**
PTSC women engaging in exercise (physical activity)	2.40 (1.82)	2.92 (1.91)	2.37	87	< .05
Comparison women engaging in exercise (physical activity)	2.78 (2.06)	2.75 (1.83)	.093	25	> .05
PTSC women healthy eating patterns	1.89 (.35)	2.25 (.35)	10.12	130	< .0001
Comparison women healthy eating	1.89 (.41)	1.93 (.30)	1.23	37	> .05

Note: Standard deviations are in parentheses. The mean score on the stress measure can range from 1–7, with higher scores indicating higher stress levels. The mean scores for day per week engaged in physical activity can range from 0 – 7 days. The scores on the Health Locus of Control scale could range from 11 – 44, with higher scores indicative of higher mean level of internal health locus of control. The scores on health satisfaction could range from 1 – 3, with higher scores indicative of higher mean level of satisfaction. The mean score on the exercise measure can range from 0–7 days. The scores of the healthy eating behaviors can range 1 - 3, with higher scores indicative of engaging in more healthy eating behaviors. It should be further noted that the correlated t-test analyses only retained women in the pre/post analyses if they participated at both data collection points. For example, if a woman participated in the baseline and 12 week follow up, but not did not participated in the 6 month follow up, her pretest results will not be included in the pretest mean for the pre/6-month follow up data in the table. Therefore, pretest means can change across pre/post data collection time periods.

Additionally, the PTSC women reported significantly higher levels of healthy eating patterns at 12 week and 6-month posttest than they did at pretest ($p < .001$). For the comparison group, there was no significant difference reported for healthy eating at 12-week posttest; however, the comparison group also reported a significantly higher level of healthy eating at 6-month follow up ($p < .05$).

A higher proportion of the PTSC women reported utilizing healthy stress management strategies such as exercise, deep breathing, and meditation at 12 weeks posttest (90.7%, 77.9%, 77.9% respectively) than they did at baseline (66.7%, 46.4%, and 41.1% respectively). This pattern of change was also evident for the comparison group. That is, among the comparison women, a much larger proportion of them reported utilizing exercise, deep breathing, and meditation stress management strategies 12 weeks posttest (73.8%, 53.7%, 64.3% respectively) than was the case at baseline (19.5%, 18.8%, 23.8% respectively)

Clinical changes. There were notable improvements for the PTSC women on various clinical outcomes. For example, there was a statistically significant reduction in the PTSC women's weight from baseline to 12-week and 6-month posttest ($p < .05$). No significant pre-post weight reduction emerged for the comparison women. Overall, changes in the PTSC women's BMIs showed positive improvement.

Additionally, the PTSC women did show improvement on other clinical outcomes. For example, in terms of blood pressure classification, a lower proportion of PTSC women were classified in the hypertensive category at 12-week (40.7%) and 6-month (34.3%) posttest than at baseline (45.7%). The results were mixed in terms of posttest blood pressure classification for the comparison women (i.e., higher proportion of comparison women in the normal category at 12-week posttest, 35.7%, than at baseline, 16.7%, or 6-month posttest, 6.5%). In terms of non-fasting blood sugar classification, a lower proportion of PTSC women had suspected diabetes readings at 12-weeks (32.5%) and 6-months (27.4%) than was the case at baseline (36.1%), whereas the suspected diabetes readings for the

Table 4. Study 2: PTSC and Comparison Women's Pretest/6-Month Post Changes in Selected Psychological and Behavioral Outcomes

Psychological Outcomes	Pretest Mean	6-Month-Week Posttest Mean	t-value	df	p-value
PTSC women stress level	3.55 (1.56)	3.09 (1.51)	**2.58**	**93**	**<.05**
Comparison women stress level	3.97 (1.75)	3.92 (1.69)	**.168**	**37**	**> .05**
PTSC women heath locus of control	27.53 (5.13)	27.0 (6.29)	**.827**	**95**	**>.05**
Comparison women health locus of control	28.8 (4.49)	27.81 (5.84)	**.96**	**30**	**>.05**
PTSC women health satisfaction	1.95 (.43)	2.13 (.43)	**3.41**	**.90**	**.0001**
Comparison women health satisfaction	1.81 (.50)	1.99 (.52)	**1.93**	**28**	**>.05**
Behavioral Outcomes	**Pretest Mean**	**6-month Posttest Mean**	**t-value**	**df**	**p-value**
PTSC women engaging in exercise (physical activity)	2.40 days (1.82)	2.92 days (1.91)	32.37	87	< .05
Comparison women engaging in exercise (physical activity)	2.78 (2.06)	2.75 (1.83)	.09	25	> .05
PTSC women healthy eating)	1.90 (.34)	2.22 (.29)	8.68	97	< .0001
Comparison women healthy eating	1.94 (.40)	2.20 (.36)	3.29	29	< .05

Note: Standard deviations are in parentheses. The mean score on the stress measure can range from 1–7, with higher scores indicating higher stress levels. The mean scores for day per week engaged in physical activity can range from 0 – 7 days. The scores on the Health Locus of Control scale could range from 11 – 44, with higher scores indicative of higher mean level of internal health locus of control. The scores on health satisfaction could range from 1 – 3, with higher scores indicative of higher mean level of satisfaction. The mean score on the exercise measure can range from 0–7 days. The scores of the healthy eating behaviors can range 1 - 3, with higher scores indicative of engaging in more healthy eating behaviors. It should be further noted that the correlated t-test analyses only retained women in the pre/post analyses if they participated at both data collection points. For example, if a woman participated in the baseline and 12 week follow up, but not did not participated in the 6 month follow up, her pretest results will not be included in the pretest mean for the pre/6-month follow up data in the table. Therefore, pretest means can change across pre/post data collection time periods.

comparison women did not consistently improve. (See Table 5 below)

LIMITATIONS

The results of these two evaluation studies must be considered in view of several limitations. First, while the response rate is quite respectable, there is attrition among the participants across the various testing periods (from baseline to 12-week posttest to 6-month posttest) that must be recognized as potentially influencing the results. Second, the Study 2 comparison group is relatively small which may limit its representativeness. Third, in responding, the women's self-reports may be influenced by social desirability bias, that is, the participants' tendency to respond in ways to present themselves in the best possible light. Fourth, we acknowledge that reports of statistical significance and standard deviations, alone, from self-report data do not provide sufficient information regarding the clinical or practical importance of the findings of this study. Therefore, another limitation is the inability to assess the clinical significance of all the findings, particularly those stemming from the self-report measures. However, the inclusion of clinical assessments provides some insight to the clinical value of findings from this study.

SUMMARY AND CONCLUSIONS

Despite the limitations, the major strength of the results reported from these present studies is its contribution to the literature of health outcomes of midlife African American women. Unfortunately, there continues to be a paucity of empirical research on midlife African American women's health and their risk for chronic disease. Particularly sparse are studies with large sample sizes, reflecting the outcomes of African American women from different regions of the country diverse socioeconomic levels and including both self-report and clinical data. The results reported in this article contribute to filling this void by extending the knowledge base about midlife African American women's health outcomes and the effectiveness of the PTSC on these outcomes over a 12-week and 6-month period.

Table 5. Study 2: PTSC and Comparison Women's Pre/Post Clinical Results

Clinical Variables	% at Pretest	% at 12-Week Posttest	% at 6-Month Posttest
BMI Classification			
PTSC BMI Normal (< 25)	**6.2%**	**11.5%**	**9.7%**
Comparison BMI Normal (< 25)	20.0%	19.0%	15.6%
PTSC BMI Overweight (25–30)	**32.9%**	**32.0%**	**31.1%**
Comparison BMI Overweight (25–30)	27.3%	21.4%	28.1%
PTSC BMI Obese (> 30)	**37.3%**	**36.1%**	**39.8%**
Comparison BMI Obese (> 30)	41.8%	50.0%	40.6%
PTSC Extremely BMI Obese (> 40)	**26.6%**	**20.5%**	**19.4%**
Comparison Extremely BMI Obese (> 40)	10.9%	9.5%	15.6%
Blood Pressure Classification			
PTSC Normal (120/70)	**20.1%**	18.5%	**29.5%**
Comparison Normal (120/70)	16.7%	35.7%	6.5%
PTSC Hypertensive (> 140/90)	**45.7%**	40.7%	**34.3%**
Comparison Hypertensive (> 140/90)	63.0%	54.8%	67.7%
Non-Fasting Blood Sugar Classification			
PTSC Normal (less than 139)	**38.7%**	**34.2%**	**43.4%**
Comparison Normal (less than 139)	14.5%	50.0%	6.5%
PTSC Suspected pre diabetic (140–199)	**36.1%**	**33.3%**	**29.2%**
Comparison Suspected pre diabetic (140–199)	43.6%	18.8%	25.8%
PTSC Suspected diabetics (over 200)	**36.1%**	**32.5%**	**27.4%**
Comparison Suspected diabetic (over 200)	43.6%	31.3%	67.7%

Note: The women classified as pre-hypertensive were not included in this table.

Findings from the evaluation of 31 groups of PTSC women ($N = 656$ at baseline) from Washington, DC, Tampa, Florida, and Baltimore, Maryland indicated significant changes in the women's psychological, behavioral, and clinical changes from baseline to 12-week and 6-month posttest. Key Study 1 findings included significant changes from baseline in the PTSC women's: (a) reported level of stress, (b) health locus of control, (c) health satisfaction, (d) engagement in physical activity/exercise, and reported healthy eating patterns. Additionally, based upon clinical data, the PTSC women demonstrated a weight reduction at posttest and slightly more women had better clinical outcomes in terms of classification of BMI, hypertension, and non-fasting blood sugar. The results from the Study 2 evaluation strengthen the claims of the effectiveness of the PTSC intervention with significant pre/posttest changes evident for the PTSC women on selected outcomes and little to no statistically significant pre/post changes for the comparison women on the health indicators under study.

The evaluation studies reported in this article reaffirm the findings regarding the effectiveness of the PTSC, as originally reported in Gaston, Porter, and Thomas.[38] The present evaluation extends the generalizability of the original findings across different samples, settings, and time frame. The current evaluation strengthens the credibility of findings by examining participants' clinical outcomes in addition to their self-reported data.

The data obtained in this evaluation provide important information about an underserved and neglected population, African American women in midlife, who are at the highest risk for chronic illnesses. This selected age group of women is critical to the spread of healthy lifestyle habits among their families and communities. The importance and utility of health promotion and disease prevention interventions, which are culturally sensitive and age and

gender-specific and have useful implications for clinicians and researchers, are documented. This evaluation, consistent with the 2007 study, demonstrates the positive interactive impact of a program, PTSC, on selected psychological, behavioral, and clinical dimensions of health. These results support the PTSC as a useful addition to ongoing quality primary care programs for this target population to enhance psychological and clinical outcomes and decrease African American women's risk factors for chronic diseases.

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