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Weight Loss and Black Women: A Systematic Review of the Behavioral Weight Loss Intervention Literature

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Abstract

Background—The excess burden of obesity among black women is well-documented. However, the behavioral weight loss intervention literature often does not report results by ethnic group or gender.

Purpose—The purpose of this article is to conduct a systematic review of all behavioral weight loss intervention trials published between 1990 and 2010 that included and reported results separately for black women.

Methods—The criteria for inclusion included: 1) participants age ≥18 years; 2) a behavioral weight loss intervention; 3) weight as an outcome variable; 4) inclusion of black women; and 5) weight loss results reported separately by ethnicity and gender.

Results—The literature search identified 25 studies that met inclusion criteria. Our findings suggest more intensive randomized behavioral weight loss trials with medically at-risk populations yield better results.

Conclusions—Well-designed and more intensive multi-site trials with medically at-risk populations currently offer the most promising results for black women. Still, black women lose less weight than other subgroups in behavioral weight loss interventions. It is now critical to expand on individual-level approaches and incorporate the biological, social, and environmental factors that influence obesity. This will help enable the adoption of healthier behaviors for this group of women disproportionately affected by obesity.

Keywords

black women; African-American; weight loss; intervention; obesity

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Conflict of Interest Statement

The authors have no conflicts of interest to disclose.

INTRODUCTION

The high prevalence of obesity in the United States is a public health concern (1). Overweight (BMI ≥ 25 kg/m² and < 30 kg/m²) and obesity (BMI ≥ 30 kg/m²) are more prevalent among black adults (74%) than white adults (67%) with the highest rates among black women (78%), (1) and black women experience higher morbidity and mortality than other populations with respect to obesity-related diseases such as cardiovascular disease, type 2 diabetes, and some cancers (2–3). Findings from recent studies suggest that even modest weight loss is associated with an improved cardiovascular risk profile (4). For example, a 5–10% reduction in body weight can reduce low-density lipoprotein cholesterol by approximately 15%, reduce triglycerides by 20%, and increase high-density lipoprotein by 8% to 10%. (5–6) Findings from other studies suggest that weight loss reduces metabolic syndrome, (7–8) and participants in the Diabetes Prevention Program (DPP) achieved a 16% reduction in diabetes incidence per kilogram of weight lost (9). These findings indicate that even modest weight loss may have important effects on the incidence and course of obesity-related chronic disease. Identifying behavioral weight loss interventions that are effective in black women is essential for addressing the epidemic of obesity-related diseases in this population. In recent years, multi-center trials have recruited substantial numbers of black participants, (10–12) and other interventions have been designed specifically for black women (13–25). However, often black women are underrepresented in behavioral weight loss intervention trials or outcome results are not reported ethnicity or gender (26–34). One recent review addressed weight loss interventions that included only ethnic minority populations (35), and another examined weight loss interventions in black women, only (36). Our review extends the literature by including studies that reported on interventions that included both minority and non-minority populations and that included and reported results for black women separately.

We sought to provide a focused synthesis of behavioral weight loss interventions in order to provide an overview of the effectiveness of these interventions for black women. We reviewed the behavioral weight loss intervention literature published between 1990 and 2010. We chose 1990 as a starting point because “Healthy People 2000,” which set goals for reducing the prevalence of overweight and obesity in the United States, was released that year (37). Although the first set of national health targets was published in 1979 (Healthy People: The Surgeon General’s Report on Health Promotion and Disease Prevention) (38), “Healthy People 2000” was the first comprehensive preventive health agenda for the nation (37).

The aims of this review are 1) to summarize the sample characteristics and intervention features of the behavioral weight loss interventions and 2) to provide a critique of the literature and suggest areas for future research.

Note: We recognize that the racial/ethnic category “black” describes a diverse group of people descended from many different cultures of Africa and the Caribbean, including those whose families have lived in the United States for hundreds of years and those who more recently emigrated. However, since national data are reported using the term “black,” we will use this term to broadly characterize individuals in this manuscript.

METHODS

Search Strategy and Inclusion and Exclusion Criteria

The search strategy for this article involved several stages. First, we searched the Ovid MEDLINE database for studies published from January 1990 through December 2010.

Combinations of the following search terms were used to identify relevant articles: obesity, weight loss, dietary intervention, African American, black. Surgery was used as an exclusion term because the focus of the study is behavioral weight loss interventions. English language articles published in peer-reviewed journals were screened for inclusion. The criteria for inclusion included 1) a sample of adults aged 18 and older, 2) a behavioral weight loss intervention, 3) weight as an outcome variable, 4) inclusion of black women in the sample, and 5) weight loss results reported separately by ethnicity and gender. Studies were excluded if they 1) were published in a language other than English, 2) they studied a post-partum sample, 3) the primary focus was a surgical or pharmacological weight loss intervention, 4) prepared meals were provided, or 5) the amount of weight lost was not reported. Studies that used liquid meal replacements as the primary intervention were also excluded, though studies in which meal replacements were used as one component of an intervention were included.

Figure 1 shows the study attrition diagram and the number of publications included at each step of the literature search. The initial database search yielded 264 publications. After eliminating duplicates, the total was reduced to 243. The titles and abstracts were reviewed by two of the authors (LTH and MF) for possible inclusion. Articles in which the abstract did not allow for a clear decision for inclusion or exclusion were reviewed by all authors, and a consensus was reached about whether the article met criteria. After reviewing the titles and abstracts from the primary search, 222 articles were excluded, leaving 21 articles. A secondary search involved searching Pubmed for studies published between 1990 and 2010 using the terms weight loss, African American, black, and obesity as well as checking the references in the articles from the primary search; 16 additional articles were identified and reviewed. The secondary search resulted in identifying 3 additional articles for inclusion. In total, 24 articles met our inclusion criteria; one article (39), reported weight loss results for two separate multicenter hypertension trials (Hypertension Prevention Trial and the Trials of Hypertension Prevention). Thus, this article (39) was coded as two separate studies, giving a total of 25 studies included.

For each of the 25 studies, we extracted the following data (Table 1): 1) author and year of publication; 2) design and setting; 3) sample size and sample characteristics; 4) intervention duration and frequency; 5) mode of delivery and training, as well as the ethnicity of the interventionist(s) (e.g., dietitian, psychologist, physician, peer-leader, exercise physiologist); 6) theoretical framework; 7) behavioral intervention components; 8) cultural adaptation; 9) outcome measures; 10) mean baseline weight in kilograms and/or BMI; 11) mean weight change (Δ) in kilograms; and 12) retention and adherence. Some articles did not report all these variables. Some articles reported weight loss maintenance or longer-term follow-up, but this review only discusses the initial treatment or active weight loss phase results. Some multi-center trials published multiple articles on the same trial (e.g., DPP, Weight Loss Maintenance trial (WLM), the PREMIER trial, the Hypertension Prevention Trial (HPT), and the Trial of Hypertension Prevention (TOHP).) We incorporated all relevant data regarding each of these trials even if the data came from a source other than the study reporting weight loss by gender and race/ethnicity.

RESULTS

We categorized and reviewed the 25 studies with attention to study quality. We identified four categories: 1) multi-site randomized trials, 2) single-site randomized trials, 3) quasi-experimental trials; and 4) pre-post-single group trials.

Sample Characteristics

Race/Ethnicity and Gender—Group composition (all black vs. mixed racial composition) has been suggested as one of a number of cultural adaptations that can potentially affect weight loss among black participants (40). Also, some data suggest that programs are more effective when delivered solely to female samples versus male or mixed-gender samples (41). In reviewing the racial and gender composition of the 25 studies included in this review, we found that four of the five multi-site trials included black and white men and women (10, 12, 39), and the DPP trial included white, black, Hispanic, and Asian men and women (11). All of the single-site randomized trials ($n = 9$) focused exclusively on women, with one including both black and white women (42) and the other eight including only black women (15–16, 18–21, 23, 43). The three quasi-experimental trials focused on black women (17, 22, 44). Of the 8 pre-post trials, five recruited black women only (14, 24–25, 45–46), and three recruited both black and white women (47–49).

Health Status of Participants—In several studies examining motivations for weight loss, concerns about health are cited as the most common motivator (50–52). Given this, we expected that interventions that focused on medically at-risk populations would show greater weight loss than those that focused on healthy populations. Three of the five multi-site weight loss trials focused on at-risk populations. The DPP trial (11) included participants with impaired glucose tolerance, the PREMIER trial (12) included participants at risk for hypertension, and the WLM trial (10) included participants with hypertension and/or hyperlipidemia; the two other multi-site trials, the HPT (39) and the TOHP (39), recruited moderately overweight but otherwise healthy individuals. With the exception of one trial that recruited breast cancer survivors (43), all the single-site randomized trials (15–16, 18–21, 23, 42–43) recruited healthy participants. Of the three quasi-experimental trials, one (22) recruited individuals diagnosed with diabetes, and the other two (17, 44) recruited healthy individuals. Similarly, seven of the pre-post studies (25, 45–49) recruited healthy individuals, one recruited breast cancer survivors (24), and one recruited hypertensive participants (14).

Intervention Features

Design—*Because random assignment is the best strategy to obtain groups that are comparable on potentially meaningful variables at baseline, it should minimize the possibility that these variables are correlated in the intervention group. This should strengthen the ability to detect differences between the intervention and control conditions, if they actually occur.* Five (20%) of the 25 trials were multi-site randomized trials (10–12, 39). Nine (36%) were single-site randomized trials (15–16, 18–21, 23, 42–43). Three (12%) were quasi-experimental (17, 22, 44) and eight (32%) employed a pre-post design (14, 24–25, 45–49).

Sample Size—The multi-site trials recruited the largest number of participants. The HPT recruited 246 participants, including 28 black women. The TOHP recruited 303 participants, including 33 black women. The DPP trial recruited 2,921 individuals, including 341 black women. The PREMIER trial recruited 810 participants, including 211 black women. Finally, the WLM trial recruited 1,685 participants, including 540 black women. All of the single-site and quasi-experimental trials recruited only black women except one (42). The samples recruited in single-site randomized trials ranged from a low of 24 participants (43) to a high of 213 participants (23). The three quasi-experimental trials ranged from a low of 24 (22) to a high of 57 participants (17), and the pre-post design trials recruited a low of 21 black participants (14) to a high of 67 black participants (45).

Duration and Frequency—It has been suggested that multi-session interventions of longer duration produce better results (53–54). We expected that the more intensive interventions would produce better weight loss results. Overall, the five multi-site trials were rather intensive in their delivery. The DPP (55) lifestyle arm included 16 individually-delivered behavioral management sessions conducted over 6 months (11), and meal replacements were used as part of a “Tool Kit” in the intervention (11). The PREMIER trial included two lifestyle conditions that offered 14 group sessions and four individual counseling sessions delivered over 6 months (12). The WLM trial phase 1 intervention included 20 weekly group sessions and the option of phone or individual sessions as needed (10). Both the HPT and TOHP had an initial intensive phase that included an individual session followed by 14 weekly group meetings. The single-site randomized trials varied in their duration and frequency. The least intensive were six sessions over a six-month period (16) and 12 weekly sessions (19). Others were more intensive and included 16 weekly sessions and four individual sessions (15), 14 weekly sessions (21), twice weekly sessions for 20 weeks (18), twice weekly sessions and once monthly individual session for six months (23), weekly sessions for three months followed by bi-weekly sessions through the sixth month (43), and three days weekly for 18 weeks (42). Another single-site trial offered one session each month for six months, but also provided fruits and vegetables to participants weekly for 24 weeks (20). The three quasi-experimental trials met for 10 weeks (44), 11 weeks (17), or 18 weeks (22). Of the eight pre-post design trials, one met three times weekly for 10 to 15 weeks (48), one met weekly for four months (25), one met weekly for 10 weeks (45), another met monthly for 12 months (14), and two met weekly for six months (46–47), one included three exercise sessions per week for 20 weeks plus six information sessions (49), and one offered twice weekly sessions for six months (24).

Intervention Components Directed at Weight Loss—Comprehensive lifestyle interventions that include diet, exercise, and behavior management techniques have generally demonstrated weight losses of 10% in 4 to 6 months (50). Therefore, we expected that behavioral interventions that included these three components would show greater weight losses than those that did not. One of the three multi-site trials, the PREMIER trial, included a dietary component, self-directed physical activity, and behavior modification strategies in the lifestyle arm (11–12). The WLM and DPP trials included these same three components, but in addition, some of the physical activity was supervised (10). The HPT and TOHP included nutrition and behavior modification but did not include an activity component (39). Five of the single-site randomized trials included a dietary component, self-directed physical activity, and behavior modification strategies (15–16, 20–21, 43). Three others included these components plus supervised activity (18–19, 23). One of the single-site trials included only supervised physical activity (42). One of the quasi-experimental trials included a dietary component, self-directed physical activity, and behavior modification strategies (22), one included nutrition and self-directed physical activity without behavior modification (44), and one included nutrition and behavior modification without physical activity (17). Of the eight pre-post design studies, one included a dietary component, self-directed physical activity and behavior modification strategies (45) and five included these three components plus supervised activity (24, 46–49). One included self-directed and supervised activity (14), and another included diet, self-directed physical activity, and behavior modification strategies (25).

Cultural Adaptations—Studies that include cultural adaptations report a range of weight loss results and most studies that include cultural adaptations incorporate numerous adaptations (11, 14, 18–19, 23–24). Nonetheless, we considered that interventions that were attentive to cultural preferences would produce greater weight loss than those that did not provide any adaptations. Three of the five multi-site trials - DPP, PREMIER, and WLM -

were designed to address issues specific to black culture (10–12), but the other two multi-site trials did not include any formal adaptations (39). Of the nine single-site randomized trials, six included formal cultural adaptations (15–16, 18–19, 21, 23) whereas three did not report any formal adaptations (20, 42–43). All three quasi-experimental studies reported cultural adaptations (17, 22, 44).

Of the eight pre-post design studies, four did not report emphasizing culture in the curriculum (14, 24, 48–49) and four reported incorporating cultural strategies to enhance behavior change (25, 45–47).

Theoretical Framework—It is not clear from the literature whether behavioral weight loss interventions that incorporate an explicitly stated theoretical underpinning (e.g. Social Cognitive Theory (SCT) (56), Health Belief Model (57), Theory of Planned Behavior (58), or the Transtheoretical Model (59) are more effective in producing weight loss than interventions with no formal theoretical basis (60). One review reported that there was no evidence that incorporating a formal theory enhanced weight loss (60) and another review did find an association (61). Of the five multi-site trials, PREMIER trial and WLM trial combined SCT and the Transtheoretical Model with behavioral self-management strategies in the delivery of the intervention. The DPP, HPT, and TOHP (11, 39) incorporated behavioral self-management strategies but were not based on any formal theoretical framework. Four of the nine single-site randomized trials were based on social cognitive theory (18–19, 23, 43) and one was based on a combination of SCT and the Transtheoretical Model (16). Four were not based on any formal model (15, 20–21, 42). The three quasi-experimental trials also had no formal theoretical basis (17, 22, 44). Of the eight pre-post design studies, six had no formal theoretical basis (14, 45–49), one was based on the Social Cognitive Theory (25) and one on both the SCT and the Health Belief Model (24).

Weight Loss Results—It is noteworthy that in two of the multi-site trials, weight loss for black women was higher than usually reported: DPP (mean (SD) = −4.7 (5.1) kg) and WLM (−4.1 (2.9) kg) (10–11). Black women in the lifestyle arm of the PREMIER trial lost somewhat less weight on average (−3.2 (4.7) kg) (12) compared to DPP and WLM trials. In the HPT and TOHP trials, weight loss among black women was significantly less than among white women. In HPT, mean weight loss was −4.7 (4.3) kg compared to −2.6 (3.9) kg for white and black women respectively and in TOHP, mean weight loss was −4.9 (4.8) kg and −1.9 (3.5) kg for white and black women, respectively. In the eight single-site randomized trials that included only black women, mean weight change ranged from +0.5 kg to −4.6 kg (15–16, 18–21, 23, 43). In the one randomized trial that included both black and white women, the white women lost −3.4 kg compared to a loss of only −0.4 among the black women (42). All three of the quasi-experimental trials included only black women. The mean losses were −0.61 kg (44), −1.41 kg (17), and −4.4 kg (22). Of the pre-post design studies that recruited only black women, weight losses ranged from −2.5 kg (24) to −8.4 kg (14). However, it should be noted that the initial sample in this latter study included only 21 women, and only 62% (n=13) provided follow-up data (14).

Retention and Adherence—Improved retention and adherence to intervention sessions helps promote weight loss (62). All of the studies reported retention and/or adherence either in the text, in a table, or in supplemental data from which retention and/or adherence could be calculated. We defined retention as the percentage of participants who completed the post-intervention assessment(s) and adherence as 1) the percentage of participants attending all or a designated number of classes or 2) the average number of sessions participants attended. Three studies reported a lower retention rate for black participants than for white participants (39, 42, 48). No ethnic differences were reported for adherence (39, 42, 47–48). Overall, the five multi-center trials reported very high retention rates, ranging from 92% for

black and white individuals in WLM trial to 97% for black individuals in TOHP (39). Adherence to intervention sessions for the multi-site trials ranged from a low of approximately 55% for the TOHP trial to a high of approximately 93% for the DPP trial (39, 63). The nine single-site randomized trials had retention rates ranging from a low of 45% for the black women (42) to a high of 100% (18) and adherence ranged from a low of 41% (18) to a high of 88% (42). Two of the single site trials did not report adherence rates (20, 43). The three quasi-experimental studies that included all black women reported retention rates ranging from a low of 72% (17) to a high of 80% (44). Only one of these three trials reported an adherence rate of 83% (17). Finally, the eight pre-post single group designs reported a wide range of retention rates, from a low of 37% for black women compared to 67% for white women (48) to a high of 95% for black women (46). One study in the pre-post design category did not report retention rates (49). For the pre-post trials, two of the seven did not report adherence rates (14, 25) and the other five reported rates ranging from approximately 67% (24) to a high of 85% (45).

DISCUSSION

This manuscript reports on a systematic review of behavioral weight loss interventions that targeted or included black women. The review covers articles that were published between January 1990 and December 2010. In addition to summarizing sample characteristics and intervention features, our intent is to provide a critique of the literature, highlighting opportunities for future research. Overall, our results show that two of the five multi-site trials conducted with medically at-risk populations, the DPP (11) and WLM trials (10), resulted in more robust weight loss for black women than single-site randomized trials (15–16, 18–21, 23, 42–43), quasi-experimental trials (17, 22, 44) or pre-post, non-randomized trials (14, 24–25, 45–49) that recruited healthy populations. Some of the studies with small sample sizes were not adequately powered to assess differences between the treatment and control groups, and the pre-post design trials were more often designed to test the feasibility of the intervention. (e.g., Stolley (24), Banks-Wallace (14), Walcott-McQuigg (25).) Other trials were most likely insufficient in intensity or length to produce significant weight change (e.g., Parker (44), Domel (17).) Stolley and colleagues (24) conducted an intervention with medically at-risk women (i.e., breast cancer survivors) of comparable intensity to the multi-site trials (twice weekly for 20 weeks.) However, the minimal weight loss achieved in this trial may have been due to recently documented adverse weight changes among breast cancer survivors, particularly for black women (64–65).

On average, black women in the lifestyle arms of the DPP and WLM trials lost more weight (−4.7 kg (5.1) and −4.1 kg (2.9), respectively) than black women recruited into smaller trials that did not specifically target higher-risk women (15, 18–20, 23, 46). Notably, in these two trials, the participants were recruited with strict inclusion criteria (10–11), participants received intensive group or individual treatment that was implemented with strong fidelity procedures (11, 66) and each trial had substantial resources available to help facilitate participant weight loss and monitor adherence and retention (10–11, 66).

Attention to cultural preferences may have also contributed to the improved results in these two multi-site trials. The inclusion of cultural adaptations has been recommended to improve weight loss in black populations (67). Although a number of the interventions in our review were developed based on input that black women deemed culturally salient (e.g., Befort, (15) Djuric, (43) Karanja, (46) Kennedy, (20) Parker, (44) Stolley, (23–24) Fitzgibbon, (18–19)), but, the adaptations in the single-site trials may not have been delivered with the level of precision that they were delivered in the multi-site trials. For example, in the WLM, a minority implementation committee conducted trial-wide training for all staff in an effort to underscore the importance of the cultural context for both black

and non-black participants (68). Also, for both the DPP and WLM trials, teleconferences were conducted to monitor progress and intervention quality and to refine the delivery of the intervention if necessary (10, 66). Therefore, consistent attention refining interventions to address cultural relevance may be the key to achieving the benefits that appear to be associated with cultural adaptations. These results are encouraging, but a clearer definition of what constitutes a cultural adaptation and a better understanding of the mechanistic relationship between cultural adaptations and the weight loss process are needed. It may be that a range of adaptations is needed, despite the assessment and comparison challenges this presents. For example, racial composition and family support have been suggested as culturally salient adaptations for black adults (40, 67). However, when empirically tested, neither being assigned to a group with family members (69) nor being in a group with all blacks improved weight loss (40), suggesting that combinations of adaptations are necessary to achieve meaningful improvements in outcomes.

Interestingly, the inclusion of a theoretical framework did not appear to enhance or diminish weight loss results. (70). For example, interventions based on either SCT (56) or the Health Belief Model (12, 16, 18–19, 23–25, 57) were no more effective than interventions based on behavioral self-management without an explicit theoretical framework (e.g., Befort, (15) Kennedy, (20) McNabb, (21–22) West (11).) Relevant to the most successful multi-site trials, the DPP employed behavioral self-management strategies (11, 66), and the WLM trial used a combination of SCT (56), behavioral self-management (71), and the Transtheoretical Model (59). The key to improved outcomes appeared to be with having participants adopt behavioral self-management skills including reduction in dietary fat and overall caloric intake, monitoring physical activity and food intake, and consistently attending sessions (10–11, 55).

It is not clear why the third multi-site trial included in this review, the PREMIER trial, (12) that recruited medically at-risk participants and provided a more intensive and culturally adapted intervention (14 group meetings and four individual counseling sessions) did not report results for black women (–3.2 kg) comparable to outcomes achieved in the WLM and DPP trials. One partial explanation for the better results in the WLM compared to the PREMIER trial is that there were a number of overlapping investigators on the two trials, and “best practices” from the PREMIER trial may have informed the refinement and delivery of the WLM (10, 12, 72).

The rather minimal weight loss observed in black women in the HPT and the TOHP most likely reflect the small sample sizes of 28 and 33 black women, respectively, (39) and the focus on a healthy, rather than a medically at-risk population. In addition, the interventions were focused entirely on behavioral self-management techniques related to dietary change without a physical activity component or cultural adaptations, which may have lessened their impacts.

Despite better than usual results reported in two of the well-designed multi-site trials, black women still lost considerably less weight than men or women in any other ethnic group (10–11). While reports from these trials included speculation regarding potential socio-cultural contributors to the lower weight loss in black women as compared to other subgroups, these larger trials were not designed to further our knowledge of potential explanatory factors. However, as the field progresses, toward a more systems-oriented and multi-level approach to address obesity, a few areas should be highlighted and considered for future research. First, it is important to underscore the fact that a greater percentage of black Americans live below the federal poverty line (24.7%) compared to Americans overall (13.2%) (73–74). Consequently, blacks may be at a disadvantage when participating in interventions that address only individual health behavior change because participants who have more choices

regarding their environment are at an advantage (75). Limited affordability of healthful foods is also closely linked to access, and smaller stores that do not stock high quality produce and lower fat food options are more often found in lower-income neighborhoods (76–78). It is becoming increasingly clear that there are intricate linkages between affordability and availability. These factors influence both individual intake and cultural ethnic preferences, which are reinforced by family, peer, and social networks that reside in similar environments (67). Identifying the optimum levels for intervention on these complex inter-connections is a challenge.

Second, as we move forward, we may find that some of the factors that contribute to higher rates of obesity among black women are not readily amenable to intervention research as it is typically designed. Many questions require further reflection, such as why there are significant disparities in obesity between black women and black men who have similar family structures, genetic backgrounds, and living environments. Negative life experiences such as socioeconomic deprivation in childhood (79), dysfunctional social networks (80), and perceived racial discrimination are also associated with weight gain and obesity (81–82). These factors are developed and shaped by large social structures, and it will be necessary to understand their impact on biological mechanisms that may influence eating and activity preferences.

LIMITATIONS AND CONCLUSIONS

Some limitations in our study deserve mention. We included multi-site randomized trials, single site randomized trials, quasi-experimental trials, and pre-post non-randomized trials. The sample sizes also ranged from a small non-randomized randomized trial of 21 participants to a large multi-site trial that included 2,921 participants. Therefore, bias is enhanced by non-randomized trials that included small samples sizes. Additional limitations include the exclusion of studies not published in the English language and the exclusion of studies predating 1990. We also focused on initial weight loss, rather than weight loss maintenance.

The studies in this review focused on individual behavior change. None of the behavioral weight loss interventions reported in these studies addressed the powerful effects of socio-environmental influences upon eating and exercise behaviors (83–85). This may be due to the relatively recent development of social ecological models as they relate to the obesity epidemic. (86–87). We also did not fully explore non-treatment related factors such as fuel oxidation (88), lower resting energy expenditure (89–90) and greater reduction in energy expenditure as a function of weight loss, which could reduce weight loss in black women (91–92).

These limitations notwithstanding, this review is comprehensive, systematic, timely, and included only studies that used objective outcome measures. We reviewed studies of diverse quality. Results showed that well-designed and intensive behavioral multi-site trials, recruiting medically-at risk populations, reported the most promising weight loss results to date for black women. It is now critical to understand how these individual-oriented approaches can be expanded (75). Clearly, behavior is not only affected by individual level factors, but also by biological, social, cultural, and environmental underpinnings that must be addressed in order to more readily enable the adoption of healthy behaviors to reduce obesity prevalence among black women.

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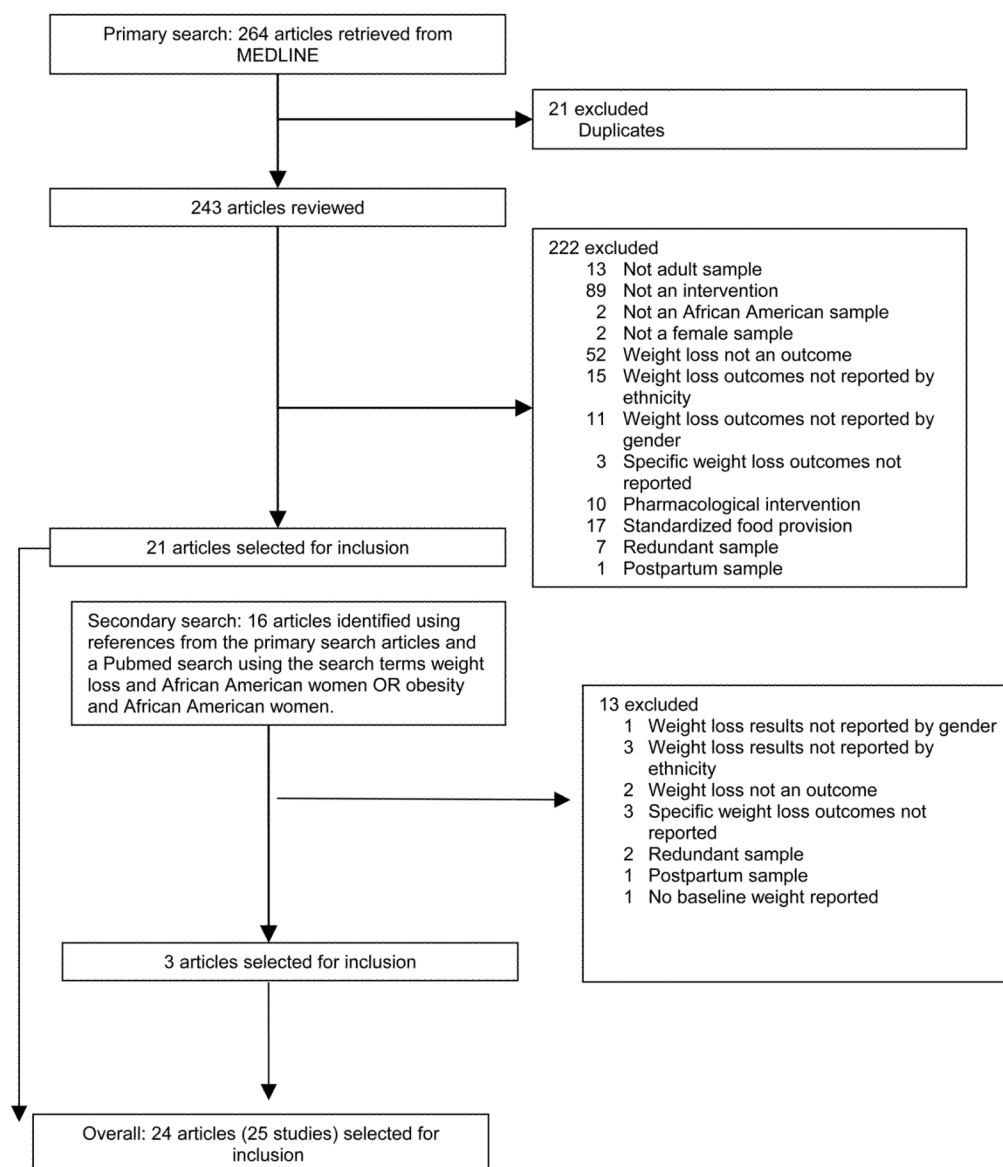


Figure 1.
Article Search Results

Table 1
Descriptions of Sample Intervention Components and Findings from Behavioral Weight Loss Intervention Trials

Study	Setting	Sample size and Sample characteristics [†]	Duration/Frequency	Mode of delivery/ Training and race/ethnicity of interventionists	Theoretical framework	Intervention components	Cultural adaptation	Outcome Measures	Mean baseline weight (kg) and/or BMI (kg/m ²)	Mean weight (±SD) (kg)	Retention/ Adherence
Multi-site Randomized Controlled Trial Design (n=5)											
1. Kumanyika (1991) * (39) Hypertension Prevention Trial (HPT)	Setting Clinical/University	n=246 (28 B women (42 W women) Age (y) 25–49 (all participants) SES NDR Education College graduate: 48% (all participants) Health status Healthy, Normotensive	Duration 6 months (intensive WL period) Frequency Weekly	Delivery Group (93) Training and race/ethnicity of interventionists Trained behaviorists (93) (race/ethnicity NDR)	Behavioral self-management	Nutrition Behavioral components	NDR	Weight/BMI	B: 77.2 kg W: 78.0 kg 28.5 kg/m ² (B and W)	B: −2.6 (±3.9) W: −4.7 (±4.3)	Retention 93% (B/W) Adherence 63.9% (93)
2. Kumanyika (1991) * (39) Trials of Hypertension (TOHP)	Setting Clinical/University	n=303 (33 B women) (48 W women) Age (y) 30–54 (all participants) SES NDR Education College graduate: 50% (all participants) Health status Diastolic BP 80–89 mmHg	Duration 6 months (intensive WL period) Frequency Weekly	Delivery Group (94) Training and race/ethnicity of interventionists Registered dietitian, psychologist and exercise physiologist (94) (race/ethnicity NDR)	Behavioral self-management	Nutrition Behavioral components	NDR	Weight/BMI PA	B: 79.9 kg W: 79.7 kg 29.6 kg/m ² (B and W)	B: −1.9 (±3.5) W: −4.9 (±4.8)	Retention B: 97% W: 100% Adherence 55.6% for men and 56.6% for women (94)
3. Svetkey (2005) (12)	Setting Clinical/University	n= 810 (211 B women) (292 W women) Mean Age (y) 48.6 (B women) 50.7 (W women) SES B women: 72% > \$30,000 W women: 91% > \$30,000	Duration 6 months Frequency 14 group meetings 4 individual meetings	Delivery Group and Individual Training and race/ethnicity of interventionists Certified interventionists (race/ethnicity NDR)	Social cognitive theory Behavioral self-management TTM	Nutrition (IL + DASH group only) PA (self) Behavioral components	Yes (95)	Weight/BMI BP VO ₂ max Diet Self-report PA 24 hour urine Health survey	I (B): 95.5 kg I + DASH (B): 93.7 kg C (B): 92.0 kg I (W): 90.3 kg I + DASH (W): 94.4 kg C (W): 91.1 kg	IL (B): −3.2 (±4.7) IL + DASH(B): −3.2 (±3.7) C (B): −0.8 (±2.8) IL (W): −5.7 (±5.6)	Retention 94–95% (B/W) Adherence B: mean 74% of 18 sessions W: mean 84% of 18 sessions

Study	Setting	Sample size and Sample characteristics [†]	Duration/Frequency	Mode of delivery/ Training and race/ethnicity of interventionists	Theoretical framework	Intervention components	Cultural adaptation	Outcome Measures	Mean baseline weight (kg) and/or BMI (kg/m ²)	Mean weight (±SD) (kg)	Retention/ Adherence
Multi-site Randomized Controlled Trial Design (n=5)											
		Education College graduate: 47% (B) 53% (W) Health status Healthy, pre- hypertensive and stage I hypertension								IL + DASH (W): −6.7 (±5.7) C (W): −1.9 (±3.8)	
4. Hollis (2008) (10) * Note: Results reported for Phase I NR SG only	Setting Clinical/University	n=1685 (540 B women) (594 W women) Mean Age (y) 52.3 (B women) 56.2 (W women) SES B: 84% > \$30,000/year W: 92% > \$30,000/year Education Completed HS: 100% (B and W women) Health status Hypertensive and/or Dyslipidemic	Duration 6 months Frequency 20 sessions, approximately once per week (90–120 min)	Delivery Group Training and race/ethnicity of interventionists Nutrition and behavior counselors (race/ethnicity NDR)	Social cognitive theory Behavioral self-management TTM	Nutrition PA (S and self) Behavioral components	Yes	Weight/BMI Diet Self-report PA	B: 95.1 kg/35.6 kg/ m ² W: 89.2 kg/33.6 kg/ m ²	B: −4.1 (±2.9) W: −5.8 (±6.1)	Retention 92% (B/W) Adherence mean 68% of 20 sessions (B) mean 75% of 20 sessions(W)
5. West (2008)* (11)	Setting Clinical/University	n=2921 IL: 120 B women/381 W women SL+ Metformin: 110 B women/ 377 W women SL+placebo:111 B women/402 W women Age (y) 77.4% B women: > 40 years 75.6% W women : > 40 years	Duration 6 months (Active WL phase) Frequency IL: 16 sessions SL+(Metformin/SL+ placebo: 1 individual session and written materials	Delivery Individual Training and race/ethnicity of interventionists Case managers (race/ethnicity NDR)	Behavioral self-management	IL: Nutrition PA (S and self) Behavioral components SL+ Metformin 850 mg BID, Diet Rx Standard care SL+Placebo BID, Diet Rx. Standard care	Yes (IL only)	Weight/BMI	I (IL): 82 kg (B) I (Metformin): 86.4 kg (B) C (placebo): 85.2 kg (B) I (IL): 95.1 kg (W) I (Metformin): 92.1 kg (W) C (placebo): 93.7 kg (W)	IL: −4.7 (±5.1) (B) SL +Metformin: −2.1 (±3.6) (B) SL + placebo: +0.02 (±3.7) (B) IL: −7.5 (±5.6) (W) SL +Metformin: −2.3 (±4.2) (W)	Retention (6 months) I (IL):93.3% (B) I (Metformin): 93.6% (B) C (placebo): 90% (B) I (IL):98.9% (W) I (Metformin): 96.0% (W) C (placebo): 94% (W) Adherence

Study	Setting	Sample size and Sample characteristics [†]	Duration/Frequency	Mode of delivery/ Training and race/ethnicity of interventionists	Theoretical framework	Intervention components	Cultural adaptation	Outcome Measures	Mean baseline weight (kg) and/or BMI (kg/m ²)	Mean weight (±SD) (kg)	Retention/ Adherence
Multi-site Randomized Controlled Trial Design (n=5)											
		SES NDR Education NDR Health status Impaired glucose tolerance								SL+ placebo: −0.05 (±4.4) (W)	lifestyle arm 93% (63)
Single-site Randomized Controlled Trial Design (n= 9)											
1. McNabb (1997) (21)	Setting Community church	n=39 (I:19 B women) (C: 20 B women) Mean Age (y) I:56.5/C:56.6 SES NDR Education I: Completed HS: 89% C: Completed HS :85% Health status Healthy (Disease prevalence: NDR)	Duration 14 weeks Frequency Weekly (90 min)	Delivery Group Training and race/ethnicity of interventionists B site coordinator and lay health educators	NDR	Nutrition PA(self) Behavioral components	Yes	Weight/BMI WC Diet Psychosocial survey	I:90.5 kg/33.9 kg/m ² C:89.5 kg/33.1 kg/m ²	I: −4.6 (±4.7) C:+0.9 (±1.9)	Retention 85% (I/C) Adherence I:mean 71% of 14 sessions
2. Fitzgibbon (2005a) (18)	Setting University	Cohort 1 n=27: (I:13 B women) (C:14 B women) Cohort 2 n=37: (I:18 B women) (C:19 B women) Mean Age (y) Cohort 1: 44.4 Cohort 2: 45.1 SES Median income: \$42,500 Education Cohort 1: 14.7 y Cohort 2: 14.9 y Health status Healthy or medically cleared (Disease	Duration 20 weeks Frequency Twice weekly sessions Session 1: didactic/ PA (S) (90 min) Session 2: PA (S) (45 min)	Delivery Group Training and race/ethnicity of interventionists NDR	Social cognitive theory	Nutrition PA (S) Behavioral components	Yes	Weight/BMI Diet Self-report P/A Breast health behavior Breast self-exam proficiency	Cohort 1: I:101.1 kg/37.7 kg/m ² C:98.2 kg/35.9 kg/m ² Cohort 2: I:93.9 kg/35.7 kg/m ² C:95.8 kg/36.3 kg/m ²	Cohort 1: I:+0.5 (±2.2) C:+0.7 (±2.6) Cohort 2: I: −3.4 (±3.8) C: +0.9 (±3.4) Cohort 1: I:100% C: 93% Cohort 2: I: 83% C: 95% Adherence Cohort 1: 41% of 37 sessions Cohort 2: 55% of 38 sessions	

Study	Setting	Sample size and Sample characteristics [†]	Duration/Frequency	Mode of delivery/ Training and race/ethnicity of interventionists	Theoretical framework	Intervention components	Cultural adaptation	Outcome Measures	Mean baseline weight (kg) and/or BMI (kg/m ²)	Mean weight (±SD) (kg)	Retention/ Adherence
Multi-site Randomized Controlled Trial Design (n=5)											
		prevalence: NDR)									
3. Fitzgibbon (2005b) (19)	Setting University	n=59 [I:30 B women (faith-based WL)] [C:29 B women (WL only)] Mean Age (y) I:47.8/C:49.1 SES Median income: \$20,500 Education I:13.6 y/C:12.9 y Health status Healthy or medically cleared (Disease prevalence: NDR)	Duration 12 weeks Frequency Twice weekly: Session 1: didactic/ PA (S) (90 min) Session 2: PA (S) (45 min)	Delivery Group Training and race/ethnicity of interventionists NDR	Social cognitive theory	Nutrition PA (S) Behavioral components	Yes	Weight/BMI Diet Self-report PA Breast health Faith-based surveys	I:103.7 kg/39.9 kg/ m ² C:103.0 kg/38.4 kg/ m ²	I: -2.6 (±3.5) C: -1.6 (±3.2)	Retention I:77% C:79% Adherence I:mean 53% of 12 sessions C:mean 54% of 12 sessions
4. Brandon (2006) (42)	Setting University	n=52 (I:15 B women/ 13 W women) (C:12 B women/ 12 W women) Mean Age (y) I:34.0 B/40.5 W C:36.0 B/42.0 W SES NDR Education NDR Health status Medical clearance if 2 or more CVD risk factors (Disease prevalence: NDR)	Duration 18 weeks Frequency 3 sessions per week. First 2 weeks used as walking conditioning and instruction sessions; last 16 weeks training sessions (50 min)	Delivery Group Training and race/ethnicity of interventionists NDR	NDR	PA (S)	NDR	Weight/BMI WC HC Body composition VO ₂ max Diet BP	I (B): 90.9 kg/34.0 kg/m ² C (B): 83.1 kg/33.0 kg/m ² I (W): 80.2 kg/29.5 kg/m ² C (W):85.7 kg/32.8 kg/m ²	I (B): -0.4 C (B): +2.4 I (W): -3.4 C (W): +2.7	Retention ^{††} 45% (B) 74% (W) Adherence ^{††} I: 88% of 54 sessions (B/ W)
5. Martin (2006) (16)	Setting Community clinic	n=144 (I:71 B women) (C:73 B women) Mean Age (y) I:40.7/C:42.9 SES	Duration 6 months Frequency Monthly (15 min)	Delivery Individual Training and race/ethnicity of interventionists	Social cognitive theory Stages of change Other varied tenets from behavioral theories	Nutrition PA (self) Behavioral components	Yes	Weight/BMI WC Diet Food preference Self-report PA Psychosocial surveys	I:100.9 kg/38.1 kg/ m ² C:103.0 kg/39.6 kg/ m ²	I: -2.0 (±3.2) C: +0.20 (±2.9)	Retention 73.6% (I/C) Adherence I:mean 50% of 6 sessions

Study	Setting	Sample size and Sample characteristics [†]	Duration/Frequency	Mode of delivery/ Training and race/ethnicity of interventionists	Theoretical framework	Intervention components	Cultural adaptation	Outcome Measures	Mean baseline weight (kg) and/or BMI (kg/m ²)	Mean weight (±SD) (kg)	Retention/ Adherence
Multi-site Randomized Controlled Trial Design (n=5)											
		Low income Education NDR Health status Healthy and medically cleared (Disease prevalence: NDR)		Primary care physician (race/ ethnicity NDR)							
6. Befort (2008) (15)	Setting Community clinic	n=44 [I: 23 B women (WL + MI)] [C: 21 B women (WL + HE)] Mean Age (y) I: 41.6/C:47.2 SES Low income Education Completed HS: 74% Health status Approx 50% had at least one co- morbid condition Medically cleared	Duration 16 weeks Frequency Weekly WL session (90 min) Four MI or HE sessions (30 min)	Delivery Group and Individual Training and race/ethnicity of interventionists Psychologist; counselor; registered dietitian (race/ ethnicity NDR)	NDR	Nutrition MI or HE PA (self) Behavioral components	Yes	Weight/BMI Diet Self-report PA Psychosocial surveys Adherence	I:103.7 kg/39.4 kg/ m ² C:109.6 kg/40.4 kg/ m ²	I: -2.6 (±4.2) C: -3.2 (±5.7)	Retention 77.3% (I/C) Adherence mean 55% of 16 group sessions (I/C) mean 80% of 4 individual sessions (I/C)
7. Djuric (2009) (43) Note: Results reported for NR SG Active WL phase only	Setting University	n= 24 [I: 12 B women (WL + spirituality maintenance)] [C:12 B women (WL only maintenance)] Mean Age (y) I:55.0/C: 56.0 SES I: <\$30,000/ year= 25% C: <\$30,000/ year= 25% Education I: College graduate: 67%	Duration 6 month (Active WL) Frequency 0-3 months: weekly 4-6 months: biweekly	Delivery Individual (in person and phone-based) Training and race/ethnicity of interventionists Registered dietitian (race/ ethnicity NDR)	Social cognitive theory	Nutrition PA (self) Behavioral components	NDR	Weight/BMI Diet Self-report PA WC HC Health status Spirituality	I: 93.8 kg/36.0 kg/ m ² C: 94.9 kg/36.0 kg/ m ²	I: -1.5 (±6.5) C: -2.5 (±5.1)	Retention 92% Adherence NDR

Study	Setting	Sample size and Sample characteristics [†]	Duration/Frequency	Mode of delivery/ Training and race/ethnicity of interventionists	Theoretical framework	Intervention components	Cultural adaptation	Outcome Measures	Mean baseline weight (kg) and/or BMI (kg/m ²)	Mean weight (±SD) (kg)	Retention/ Adherence
Multi-site Randomized Controlled Trial Design (n=5)											
		C: College graduate; 50% Health status Diagnosed with breast cancer in last 10 years, at least 3 months post-treatment									
8. Kennedy (2009) (20)	Setting: Community	n=40 (I:20 B women) Mean Age (y) I:45.5/C:36.4 SES NDR Education NDR Health status Healthy (Disease prevalence NDR)	Duration 6 months Frequency Once monthly session and once weekly fresh fruit and vegetable distribution	Delivery Group, Training and race/ethnicity of interventionists Peer educator (race/ethnicity NDR)	NDR	Nutrition PA (self) Behavioral components	NDR	Weight/BMI Diet BP WC Self-report PA Quality of life Health survey	I: 89.8 kg/33.2 kg/m ² C: 89.1 kg/34.3 kg/m ²	I: -2.0 (±3.2) C: +1.1 (±2.0)	Retention 93% (I/C) Adherence NDR
9. Stolley (2009a) (23)	Setting: University	n=213 (I:107 B women) (C:106 B women) Mean Age (y) I:46.4/C:45.5 SES Median income: \$42,500 Education I:14.6 y/C:15.1 y Health status Healthy or medically cleared (Disease prevalence: NDR)	Duration 6 months Frequency Twice weekly sessions Session 1: didactic/ PA (S) (90 min) Session 2: PA (S) (45 min) Once monthly MI session	Delivery Group and Individual (MI) Training and race/ethnicity of interventionists Training NDR Race/ethnicity included white, Black and Asian interventionists (96)	Social cognitive theory	Nutrition PA (S and self) Behavioral components	Yes	Weight/BMI Diet Self-report PA	I: 104.3 kg/38.8 kg/m ² C: 105.8 kg/39.6 kg/m ²	I: - 3.0 (±4.9) C: + 0.20 (±3.7)	Retention I: 93.5% C: 92.5% Adherence I: 53% of all sessions I: 53% of MI sessions
Quasi-experimental Design (n= 3)											
1. Domel (1992) ^{††} (17)	Setting: Community center	n=57 (I:43 B women) (C:14 B women) Mean Age (y) 37.0	Duration 11 weeks Frequency Weekly	Delivery Group Training and race/ethnicity	NDR	Nutrition Behavioral components	Yes	Weight/BMI Nutrition knowledge	I: 35.3 kg/m ² C: 37.8 kg/m ²	I: - 1.41 C: -0.14	Retention 72% Adherence mean 83% of 11 sessions

Study	Setting	Sample size and Sample characteristics [†]	Duration/Frequency	Mode of delivery/ Training and race/ethnicity of interventionists	Theoretical framework	Intervention components	Cultural adaptation	Outcome Measures	Mean baseline weight (kg) and/or BMI (kg/m ²)	Mean weight (±SD) (kg)	Retention/ Adherence
Multi-site Randomized Controlled Trial Design (n=5)											
		SES Low income Education Low literacy Health status NDR		of interventionists Registered dietitian (race/ethnicity NDR)							
2. McNabb (1993) (22)	Setting Community clinic	n=24 (I: 13 B women) (C: 10 B women) Mean Age (y) I:57/C:62 SES NDR Education I: Completed HS: 89% C: Completed HS :85% Health status Healthy (Disease prevalence: NDR)	Duration 18 weeks Frequency Weekly	Delivery Group Training and race/ethnicity of interventionists NDR	NDR	Nutrition PA (SD) Behavioral components	Yes	Weight/BMI HbA1c	I/C: 93.5 kg/35.6 kg/m ²	I: -4.4 C: +1.4	Retention I: 77% Adherence NDR
3. Parker (2010) (44)	Setting Community church	n=35 [I: 24 B women (spiritual WL)] [C: 11 B women (non-spiritual WL)] Mean Age (y) I: 49.8/C:52.4 SES I: <\$10,000/year= 11% C: < \$10,000/year= 25% Education I: College graduate: 21% C: College graduate: 56% Health status Self-reported health status	Duration 10 weeks Frequency Weekly	Delivery Group Training and race/ethnicity of interventionists NDR	NDR	Nutrition PA (self)	Yes	Weight/BMI BP Self-report PA Diet	I: 98.5 kg/37.71 kg/m ² C: 73.5 kg/28.16 kg/m ²	I: -0.61 C: -1.3	Retention 80% Adherence NDR

Study	Setting	Sample size and Sample characteristics [†]	Duration/Frequency	Mode of delivery/ Training and race/ethnicity of interventionists	Theoretical framework	Intervention components	Cultural adaptation	Outcome Measures	Mean baseline weight (kg) and/or BMI (kg/m ²)	Mean weight (±SD) (kg)	Retention/ Adherence
Multi-site Randomized Controlled Trial Design (n=5)											
Non-randomized Single Group Design (n= 8)											
1. Kanders (1994) [‡] (45)	Setting University	n=67 B women Mean Age (y) 49.0 SES \$1000–5000 monthly Education Completed HS: 95% Health status Healthy and medically cleared (Disease prevalence: NDR)	Duration 10 weeks Frequency Weekly (60 min)	Delivery Group Training and race/ethnicity of interventionists B nutritionist	NDR	Nutrition PA (self) Behavioral components	Yes	Weight WC Insulin Glucose Self-repot PA Diet	92.3 kg	–2.9	Retention 91% Adherence 85% attendance first 5 weeks 70% attendance last 5 weeks
2. Glass (2002) (48)	Setting University	n=55 (27 B women) (28 W women) Mean Age (y) 33 (B women) 38 (W women) SES NDR Education NDR Health status Healthy (Disease prevalence: NDR)	Duration 10–15 weeks Frequency Four sessions per week : 3 PA (S) (20–40 minutes) 1 PA (self) (20–40 minutes)	Delivery Group Training and race/ethnicity of interventionists Exercise physiologist (race/ethnicity NDR)	NDR	Nutrition PA (S and self) Behavioral components	NDR	Weight/BMI RMR Blood lipids Girth measurements Body composition VO ₂ max BP	B: 91.8 kg/34.3 kg/ m ² W: 98.5 kg/35.0 kg/ m ²	B: –2.8 (± 1.0) W: –4.0 (±0.7)	Retention B: 37% W: 68% Adherence ^{††} mean 75% of 4 sessions per week (B/W)
3. Karanja (2002) (46)	Setting Community center	n=66 B women Mean Age (y) 44.0 SES NDR Education NDR Health status Healthy and medically cleared (Disease prevalence: NDR)	Duration 6 months Frequency Weekly (120 min) Not required but encouraged to attend once weekly PA session (S) (60 min)	Delivery Group Training and race/ethnicity of interventionists B instructors (training NDR)	NDR	Nutrition PA (S and self) Behavioral components	Yes	Weight/BMI Self report PA Diet	107.0 kg/39.0 kg/m ²	–3.7 (±5.1)	Retention 95% Adherence 75% of participants attended at least 13 sessions

Study	Setting	Sample size and Sample characteristics [†]	Duration/Frequency	Mode of delivery/ Training and race/ethnicity of interventionists	Theoretical framework	Intervention components	Cultural adaptation	Outcome Measures	Mean baseline weight (kg) and/or BMI (kg/m ²)	Mean weight (±SD) (kg)	Retention/ Adherence
Multi-site Randomized Controlled Trial Design (n=5)											
4. Walcott-McQuigg (2002) (25)	Setting University	n=23 B women Mean Age (y) 38 SES Mean income: \$29,000 Education College graduate: 32% Health status Healthy, medically cleared (Disease prevalence: NDR)	Duration 16 weeks (Active WL phase) Frequency Weekly (60 min) One visit with a registered dietitian	Delivery Group and Individual Training and race/ethnicity of interventionists B registered dietitian and nurse	Social cognitive theory	Nutrition PA (self) Behavioral components	Yes	Weight/BMI Body composition WC HC BP Blood lipids Self report PA Psychosocial surveys	36.4 kg/m ²	-2.02 (±1.2)	Retention 69.6% Adherence NDR
5. Nicklas (2003) (47)	Setting University	n=124 (35 B women) (89 W women) Mean Age (y) 60 (B and W women) SES NDR Education NDR Health status Healthy (Disease prevalence: NDR)	Duration 6 months Frequency Twice weekly: Session 1: didactic Session 2:PA (S) (30–45 min)	Delivery Group Training and race/ethnicity of interventionists Registered dietitian (race/ ethnicity NDR)	NDR	Nutrition PA (S and self) Behavioral components	NDR	Weight/BMI Diet WC HC Body composition VO ₂ max OGTT Blood lipids Leptin BP Sex hormones	B: 94 kg/35.0 kg/ m ² ^{††} W: 84 kg/32.0 kg/ m ² ^{††}	B: -3.9 (±3.6) W: -5.4 (±3.6)	Retention ^{††} 61% (B/W) Adherence ^{††} B: 72% attendance at all sessions W: 74% attendance at all sessions
6. Annesi (2007) (49)	Setting Community center	n=64 (30 B women) (34 W women) Mean Age (y) 43.8 (B and W women) SES NDR Education NDR Health status Medically cleared (Disease prevalence: NDR)	Duration 20 weeks Frequency Once monthly instruction on exercise equipment and cognitive behavior therapy related to PA 3, 30 minute PA sessions per week (self) 6 nutrition sessions	Delivery Individual and Group Training and race/ethnicity of interventionists Wellness expert and registered dietitian (race/ ethnicity NDR)	NDR	Nutrition PA (S and self) Behavioral components	NDR	Weight Psychosocial surveys	B: 97.6 kg W:96.3 kg 36.2 kg/m ² (B and W)	B: -4.1 (±6.2) W: -7.0 (±6.5)	Retention NDR Adherence mean 76% of PA sessions per week(B/ W) mean 80% of nutrition sessions(B/ W)

Study	Setting	Sample size and Sample characteristics [†]	Duration/Frequency	Mode of delivery/ Training and race/ethnicity of interventionists	Theoretical framework	Intervention components	Cultural adaptation	Outcome Measures	Mean baseline weight (kg) and/or BMI (kg/m ²)	Mean weight (±SD) (kg)	Retention/ Adherence
Multi-site Randomized Controlled Trial Design (n=5)											
7. Banks-Wallace (2007) (14)	Setting NDR	n=21 B women Mean Age (y) 50.3 SES 62% < \$24,000 Education Completed HS: 100% Health status Hypertensive	Duration 12 months Frequency Monthly (3 hours)	Delivery Group Training and race/ethnicity of interventionists Nurses (race/ethnicity NDR)	NDR	PA (S and self)	NDR	Weight BP Steps/day Self-report PA	93.7kg	-8.4	Retention 62% Adherence NDR
8. Stolley (2009b) (24)	Setting University	n=23 B women Mean Age (y) 51.4 SES 87% > \$20,000/year Education Beyond HS: 87% Health status Breast cancer survivor; at least 6 months post-treatment	Duration 6 months Frequency Twice weekly sessions Session 1: didactic/PA (S) (120 min) Session 2: 60 min PA (S)	Delivery Group Training and race/ethnicity of interventionists Certified exercise instructor (race/ethnicity NDR)	Social cognitive theory Health belief model	Nutrition PA (S and self) Behavioral components	Yes	Weight/BMI Diet Self-report PA Psychosocial surveys	88.0 kg/34.1 kg/m ²	-2.5	Retention 87% Adherence mean 67% of 46 classes

* Secondary analysis

[†] Data reported for African American women or African American and White women only unless indicated otherwise

^{††} Data reported for completers only

Abbreviations: B, Black; BID, twice daily; BMI, body mass index; BP, blood pressure; C, control; CRC, clinical research center; HbA1c, hemoglobin A1c; HC, hip circumference; HE, health education; HS, High school; I, intervention; IL, intensive lifestyle; MI, motivational interviewing; NDR, No data reported; NR, non-randomized; OGTT, oral glucose tolerance test; PA, physical activity; RCT, randomized controlled trial; RMR, resting metabolic rate; S, supervised; SD, standard deviation; self, self-directed; SG, single group; SL, standard lifestyle; TTM, transtheoretical model; W, White; WC, waist circumference; WL, weight loss