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Impact of participant and interventionist race concordance on weight loss outcomes

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Abstract

We have previously shown that racial composition of behavioral intervention groups does not affect achieved weight loss. However, it is unclear if the race of the interventionist affects intervention outcomes. The objective of this analysis is to estimate the impact of race concordance between participant and interventionist on weight change in the initial weight loss phase (phase 1) of the Weight Loss Maintenance trial (WLM).

A total of 1,685 overweight or obese adults (body mass index [BMI] 25–45 kg/m^2) who were taking medication for hypertension and/or dyslipidemia participated in Phase I of the WLM trial. All participants received a 6-month intensive behavioral intervention in groups of 15–20 facilitated by a trained interventionist. The main outcome is change in weight at 6 months.

Participants were on average 55 years of age, 67% female and 44% AA. Three of seventeen interventionists were AA, 14 were non-AA. Seventy-three percent of participants shared race concordance with the interventionist. There was a small but statistically significant difference in

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Disclosures

None

weight change of participants who were the same race as the interventionist (−5.84 kg, SE 0.17) compared to those who were not race concordant (−5.04 kg, SE 0.33), a difference of 0.8kg, (p= 0.04). The impact of concordance on weight change differed by race (i.e., interaction of race and concordance was significant, p= 0.02).

In a post-hoc analysis of a group-based behavioral intervention, race concordance for Non-AA participants was associated with slightly greater weight loss. Race concordance was not associated with weight loss for AA participants.

Introduction

Overweight and obesity have increased in epidemic proportions in the United States. In 2007–2008 the age adjusted prevalence of overweight/obesity (BMI≥25) was 72.3% in men, 64.1% in women and 68% overall (1). This trend is alarming as it is well known that individuals who are overweight/obese are at increased risk for a wide range of morbidity and mortality most notably hypertension (HTN), diabetes mellitus (DM), dyslipidemia, coronary heart disease (CHD), cardiovascular disease (CVD) and some types of cancer (2). Racial and gender disparities in the prevalence of overweight/obesity are reflected in disparities in the prevalence of obesity-related diseases like diabetes and hypertension (3,4). 44% of Non-Hispanic Blacks are obese in the US as compared to 32% of non-Hispanic whites (1).

Fortunately, modest amounts of weight loss lead to substantial clinical benefits regardless of race or sex. For example, 5% weight loss is sufficient to reduce incident hypertension by 40% (among persons with pre-hypertension) and diabetes by over 50% (among those with impaired glucose tolerance) (5,6). Numerous trials indicate that a substantial proportion of adults are able to achieve this degree of weight loss with behavioral intervention (5, 6, 7, 8, 9). There are, however, disparities in the response to weight loss interventions, particularly in black women. For example, the Weight Loss Maintenance (WLM) trial (7), which enrolled 1685 overweight or obese adults in a group-based 6-month behavioral intervention, resulted in an average weight loss of 4.4% among African American (AA) women compared to 6.5% in non-AA women. Similar disparities have been seen in other trials (10, 11, 12).

Previous work in physician-patient communication has shown that race concordance (defined as a patient and physician sharing the same race) can modify the patient's perception of the encounter and in some instances can affect the patient's adoption of lifestyle recommendations (13, 14, 15, 16). Given the impact of race concordance between patient and doctor we considered the possibility that race concordance (or discordance) between behavior change interventionists and participants may influence adoption of recommendations and thus weight loss outcomes. This paper reports on the association of race concordance and weight loss for AA and non-AA participants enrolled in the WLM trial.

Methods and Procedures

WLM was an NHLBI-sponsored multicenter study that tested strategies for sustained weight loss in a diverse population with CVD risk factors (7). The study included an initial weight

loss phase (Phase I) in which 1685 participants all received a 6-month intensive behavioral intervention. This analysis focuses on Phase I only. WLM was approved by the Institutional Review Board at each participating institution, as well as an NIH-appointed Data and Safety Monitoring Board. All participants provided written informed consent. The WLM methods and main results have been described in detail elsewhere (7, 17), are available at http://www.kpchr.org/wlmpublic and are summarized below.

Participants

Participants were recruited from mass mailings, printed advertisements in local newspapers, radio advertisements, e-mail broadcasts, and word of mouth. Minority specific recruiting efforts included community based-screening events and public service announcements to radio stations, and newspapers serving minority populations.

Participants were overweight or obese adults (body mass index [BMI] 25–45 kg/m^2) who were taking medication for hypertension and/or dyslipidemia. Exclusion criteria included medical conditions that precluded full participation in the study; weight loss of greater than 9kg in the last 3 months; recent use of weight loss medications; history of weight loss surgery; and diabetes mellitus.

Weight was measured using a calibrated digital scale with the participant wearing light, indoor clothes without shoes. Height was measured at entry using a wall-mounted stadiometer. Dietary intake was assessed by the Block Food Frequency Questionnaire (FFQ) (18).

Participants wore a triaxial accelerometer (RT3, Stayhealthy, Inc, Monrovia, California) for at least four days to estimate total weekly minutes of moderate-to-vigorous physical activity (MVPA) (19, 20). Participants also completed questionnaires to assess demographic characteristics and medication usage.

The initial weight loss intervention consisted of 20 weekly group sessions conducted over approximately 6 months. Intervention goals were 180 minutes per week of moderate-intensity physical activity, reduced caloric intake, consumption of the Dietary Approaches to Stop Hypertension (DASH) dietary pattern (21–24), and weight loss of approximately 1–2 lbs/week. The intervention was based on behavior change theory (25, 26) and incorporated behavior change tools such as setting short-term behavior change goals every week, developing specific action plans to accomplish those goals, self-monitoring of dietary intake using daily food diaries, self-monitoring of physical activity, social support, problem solving, relapse prevention, and motivational interviewing. For more detail regarding the weight loss intervention methods used in the first phase of WLM, see the results of Phase I published by Hollis et al (7).

Participants were assigned to intervention classes in cohorts of 15–20 individuals, and each intervention cohort was led by a single professional interventionist. A total of 17 interventionists participated in the study, three of whom were AA (one each at the Baltimore, Durham, and Baton Rouge sites). Fifteen of the interventionists were registered dieticians, one was a health educator and one was a behavioral counselor. All

interventionists were experienced in leading behavioral group interventions and received centralized as well as local training throughout the study and used standardized program content, activities and materials. Additionally, a minority implementation committee conducted trial-wide training programs for all staff to highlight the cultural context for both AA and Non-AA (7). By design, 14 groups led by an AA interventionist consisted only of AA participants.

Race was self identified by participants and interventionists. Interventionists and participants were defined as being race concordant if both individuals shared the same race. This analysis focuses on the relationship of race concordance with change in weight (as a continuous variable) from entry to the end of Phase I in AA and non-AA participants. We also assessed the impact of race concordance on the binary outcome of whether participants achieved a five percent or greater weight loss.

All participants who entered Phase I are included in this analysis, with missing values imputed as noted below. We used one way ANOVA (continuous variables) and Pearson chi-square tests (categorical variables) to compare Phase I process measures and intermediate outcomes (e.g. behavior change) across race concordance groups. We used multiple linear regression and multiple logistic regression to compare the impact of race concordance on our continuous and dichotomous weight change outcomes, respectively, while adjusting for entry level covariates. Two separate classes of models were fit. Model 1 controlled only for entry level variables (age, sex, entry weight and site) and assumed the effect of race concordance was constant across race and gender subgroups. Model 2 allowed the race concordance effect to vary by race and by gender, but still adjusted only for entry level variables.

We used multiple imputation procedures (27, 28) to impute missing data, including end of Phase I weight for 132 individuals. We then performed separate data analyses on each of the imputed datasets and followed Rubin’s rules (27) for combining results across these datasets.

Results

Phase I participants averaged 55 years of age; 67% were female and 44% were African American. Almost three-quarters of participants were the same race as the interventionist (i.e., race-concordant, table 1). Of the discordant cases, most (375 of 454) were AA participants in groups led by non-AA interventionists.

Overall, AA participants weighed more at the start of intervention, were more likely to be on medications for hypertension and less likely to be on medications for dyslipidemia than Non-AA participants. Education and income were similar for AA and Non-AA participants (see table 1).

Table 2 shows the key intervention adherence measures for each concordance/discordance category. Note that session attendance, number of food diaries kept, and the dietary measures were shown to be predictors of weight loss in previous analyses of the phase 1 weight loss (7). At least 45% of participants in each concordance/discordance category

attended at least 17 of 20 group sessions. Additionally, participants in each category kept an average of at least 2.4 food records per week, increased consumption of fruit/vegetable by at least 3.1 servings per day and decreased their percent calories from fat by at least 6.8 percent. Non-AA participants who were race concordant with the interventionist completed the highest number of food records per week (4.2 ± 2.2) and increased their consumption of fruits and vegetables (4.1 ± 3.8) the most as compared to all other groups.

Weight change in Phase I by race was −5.4 kg (4.4) in AA men, −4.1 kg (2.9) in AA women, −8.5 kg (12.9) in white men and −5.8 kg (6.1) in white women (7).

We observed a small but statistically significant difference in weight change for participants who were the same race as the interventionist (−5.84 kg, SE 0.17) compared to those who were not race concordant (−5.04 kg, SE 0.33), a difference of 0.8 kg, p= 0.04. The impact of concordance on weight change differed by race (i.e., interaction of race and concordance was significant, p= 0.02). Therefore, adjusted linear models were evaluated separately by race group (table 3).

After adjusting for age, sex, entry weight, and site, there was a small but statistically significant greater weight loss for Non-AA participants with a race-concordant interventionist versus those with a race-discordant interventionist (−6.66 ± 0.18kg vs. −5.19±.62 kg, p=0.02, 95%CI for the difference = −.20, −2.74). There was not a statistically significant difference in weight loss for AA participants with an AA interventionist vs. a Non-AA interventionist (−4.58 ± 0.29kg vs. −4.94 ± .28 kg, p=0.37, 95%CI for the difference = −.42, −1.14) (see table 3). In a sensitivity analysis where only 2 sites (those with all four levels of race concordance) were included in the model the results were similar. Non-AA participants with a race-concordant interventionist versus those with a race-discordant interventionist lost more weight (−6.55 ± 0.29 kg vs. −5.02±.59 kg, p=0.02, 95%CI for the difference = −.27, −2.78). There was not a statistically significant difference in weight loss for AA participants with an AA interventionist vs. a Non-AA interventionist (−4.24 ± 0.30kg vs. −4.84 ± .38 kg, p=0.21, 95%CI for the difference = −.35, 1.55).

Discussion

In a cohort of overweight or obese adults there was a small (0.8kg) difference in weight loss between participants who were race concordant versus discordant with the interventionist. Further, there was a small but statistically significant difference in weight loss for Non-AA participants but no difference in weight loss for AA participants. This finding highlights the potential importance of race concordance between a Non-AA interventionist and a participant. Further, the results in AA suggest that cultural tailoring in WLM may have been successful, and could account for the null finding in AA participants.

Concordance in this context can be described as a “similarity or shared identity based on a demographic attribute such as race, sex or age” (29). Researchers have looked to race concordance, in particular, as a possible explanation for disparities that exist in health care. AA and Hispanic patients are more likely to report less continuity in care and perceive poorer quality of care and dissatisfaction with their relationship with physicians and the

medical system overall (30). There is evidence that in the context of the physician patient relationship race concordance is associated with increased health services utilization and satisfaction (31) and increased trust in the physician (32).

Unlike the WLM Trial, a study by Cooper and colleagues demonstrated that patients had higher satisfaction and perceived their physicians as more participatory when the encounter occurred with a physician of the same race (14). Further, Traylor and colleagues showed a positive association between race concordance and CVD medication adherence for AA patients (16). However, our findings are consistent with studies which demonstrate a lack of association of race concordance with management of cardiovascular risk factors (33) and weight-related counseling (34). Our null findings in AA may be related to our efforts to employ cultural tailoring of all aspects of the trial. These efforts included a minority implementation committee that advised the intervention development team, a racially diverse team of investigators and study personnel, and “diversity training” for all study personnel, including the interventionists. It is very possible that these efforts enhanced cultural sensitivity and tailoring, and thereby allowed for similar weight loss outcomes regardless of race concordance between interventionists and AA participants. Additionally, the experience of many AA includes frequently interacting with non-AAs in different settings. It may be that participants in this trial had a higher level of comfort in heterogeneous group settings. Lastly, the group dynamic could have created an atmosphere of familiarity that helped both participants and interventionists overcome barriers in communication that may have existed secondary to race.

Non-AA in this analysis who were in a group with a Non-AA interventionist lost slightly but significantly more weight than Non-AA participants who were in a group with an AA interventionist. One might assume that Non-AA who were race discordant with the interventionist were not as successful in their weight loss secondary to race discordance alone. In reality, there are many potential factors like personal beliefs and values and communication style that play a role in establishing a good working relationship with another individual. And, for each individual, the importance of the individual factors is different. Indeed, Street et al (29) discuss the importance of taking into account multiple factors of both members of a dyad as well as the contextual factors that play a role in an interaction.

A study by Schnitter and Liang suggests that in some cases patients who prefer racial concordance with their physician perform better when concordance exists (15). That is, the effect of concordance on behavior change was only important when a patient expressed a preference for a physician who was concordant. In this case, a pre-determined preference by the patient drove the perception of the relationship and the health outcomes that resulted were directly affected by racial concordance of the patient and physician. Perhaps patient preference is driving the association of race concordance and weight loss, albeit small, in the Non-AA participants.

Group dynamics may have influenced the results in the 79 Non-AA participants who were discordant with the interventionist. The conduct of the behavioral intervention groups in WLM (and other studies) involves a great deal of peer-mentoring and social support. The

interventionist facilitates the groups, but is trained to avoid didactic or overly directive behavior. The relationships among participants in a group may contribute to their success with weight loss, and in fact may be more important than their interactions with the interventionist. Indeed, the engagement and success of a "partner" in weight loss efforts is associated with success of the index individual (35). The group setting in WLM phase I may have simulated this type of partnership. Indeed, it may be important that many of the AA participants (271 of 678) were in all-AA groups. Although there was no significant effect of all-AA verses mixed race groups on weight loss outcomes (36), the combination of an all-AA group with an AA interventionist may have enhanced weight loss in AA. Unfortunately, we have inadequate sample size to test for this 3-way interaction.

It is possible that the difference in weight loss for Non-AA participants who were race concordant versus discordant with the interventionist may be related to the level of comfort AA interventionists had in interacting with Non-AA participants. The traditional focus of diversity training and cultural tailoring has been from the perspective of training study personnel to be able to relate to the AA participant's cultural perspective. Perhaps cultural tailoring and diversity training should address any potential lack of familiarity or differences that exist between the interventionist and participants of a different race.

Lastly, the number of Non-AA who had an AA interventionist was small (n=79). Three of the WLM clinical centers (Baltimore, Baton Rouge and Durham) participated in an ancillary study in which some of the weight loss groups were structured to include only AA participants to evaluate the impact of racial mix on weight loss results in the AA participants. The 3 AA interventionists in the trial were principally assigned to lead the all AA groups leaving them limited capacity to run the mixed groups. Hence, the small number of non-AA participants assigned to groups with an AA interventionist. With so few participants in this category it is difficult to separate personalities and other important characteristics, from potential race concordance effects.

The strengths of this study are the size and diversity of the cohort as well as the interventionists. Also, the analysis is unique in that to our knowledge this is the only manuscript to date that has looked at the impact of participant and interventionist race concordance. The fact that the interventions were developed for cultural appropriateness for AA allows us to assess this impact in a perhaps optimal setting.

The limitations of the study include the fact that the cohort of individuals was relatively well educated, potentially limiting generalizability. However, this fact also eliminates socioeconomic factors as confounders for race. In addition, this analysis demonstrates association but cannot determine cause and effect. As noted above, group dynamics that varied considerably between groups may have influenced the results leading to coincidental association with interventionist race. Lastly, we cannot isolate particular elements of the WLM intervention or the training of the interventionists that prevented differences in weight loss by concordance/discordance between AA participants and interventionists or led to such differences in non-AA participants. Ideally, future research will determine what aspects of cultural tailoring were most effective for AA and what aspects may be needed for non-AA.

The results of this study demonstrate that although there was a small difference in weight loss in participants who were race concordant versus discordant with the interventionist, the difference was not a critical factor in determining successful weight loss as participants in Phase I had a mean (SD) weight loss of 5.8kg (4.4). However, the interaction of race and concordance demonstrated that, to the extent that concordance mattered, race concordance was associated with more weight loss in Non-AA than AA participants.

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TABLE 1

Baseline characteristics

	Overall	Participant AA Interventionist AA	Participant AA Interventionist Non-AA	Participant Non-AA Interventionist Non-AA	Participant Non-AA Interventionist AA
N	1685	361	375	870	79
Age, years [a]	54.8 ± 9.1	51.7 ± 9.4	52.8 ± 9.0	56.9 ± 8.5	54.4 ± 7.8
Female, %	67.3	69.8	76.8	62.1	67.0
Weight, kg [a]	96.5 ± 16.5	99 ± 16.4	97.8 ± 16.2	95.1 ± 16.5	94.4 ± 17.6
BMI, kg/m^2 [a]	34.3 ± 4.8	35.1 ± 4.9	35.3 ± 4.8	33.6 ± 4.7	33.9 ± 5.0
Income, $, %					
< 30,000	9.4	14.3	11.9	6.2	9.6
30,000–59,000	35.2	36.2	39.7	33.2	30.9
60,000–89,000	30.7	30.2	31.1	31.0	27.8
>90,000	24.7	19.3	17.3	29.6	31.6
Education, %					
High School	9.0	7	7.5	10.3	11.4
Some College	33.7	35.8	38.3	30.6	36.7
College	22.2	24.8	23.1	19.9	31.6
Post College	35.1	32.3	31.0	39.3	20.3
On medications for hypertension, %	87.5	92.5	93.6	83.1	83.5
On medications for dyslipidemia, %	38.3	26.5	27.7	47.5	40.5

[a]Continuous variables expressed as mean + standard deviation

TABLE 2

Intervention attendance and lifestyle change outcomes

	Participant AA Interventionist AA	**Participant AA Interventionist Non-AA**	**Participant Non-AA Interventionist Non-AA**	**Participant Non-AA Interventionist AA**
N	361	375	870	79
% attending ≥ 17 group sessions	46	47	61	52
# Sessions attended[a]	13.4 ± 6.4	13.7 ± 5.8	15.2 ± 5.3	14.1 ± 6.2
# of food records completed/week	3.1 ± 2.4	3.2 ± 2.1	4.2 ± 2.2	2.4 ± 1.9
Servings of Fruits and Vegetables per day[a]				
Follow-up	7.9 ± 4.3	8.2 ± 3.7	9.5 ± 3.9	8.7 ± 4.2
Change	3.1 ± 4.4	3.2 ± 3.4	4.1 ± 3.8	3.5 ± 4.3
% calories fat[a]				
Follow-up	31 ± 7	32 ± 8	29± 7	29± 7
Change	−7 ± 8	−7 ± 8	−9 ± 8	−11 ± 8
Minutes of moderate to vigorous physical activity per week				
Follow-up	177 ± 204	159 ± 142	181 ± 157	125 ± 112
Change	62 ± 201	48 ± 117	49 ± 148	19 ± 90

[a] continuous variables expressed as mean + SD

Table 3

Weight change by race concordance of participant and interventionist

	Absolute weight change		Percent with weight change of at least 5%		
	Mean (95% CI)[a]	**p-value[b]**	**Mean**	**Odds Ratio (95%CI) [a]**	**p-value[b]**
Non-AA participant	−6.7 kg (−6.3, −7.0)		70%		
Non-AA interventionist		.02		.7 (.4, 1.3)	.25
Non-AA participant, AA interventionist	−5.2 kg (−4.0, −6.4)		59%		
AA participant	−4.6 kg (−4.0, −5.1)		46%		
AA interventionist		.37		1.3 (.9, 1.7)	.16
AA participant	−4.9 kg (−4.4, −5.5)		53%		
Non-AA interventionist					

[a] estimates constructed using LSMEANS statement in SAS

[b] two-tailed p-values for effect of race discordance differences within each race/gender subgroup based on linear or logistic regression after adjusting for (age, sex, entry weight, site).