

Effectiveness of a Behavioral Weight Management Intervention by Race, Ethnicity, Income, & Education: A Meta-Analysis

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This file contains all reviewer reports in order by version, followed by all author rebuttals in order by version.

Version 0:

Reviewer comments:

Reviewer #1

(Remarks to the Author)

There are concerns regarding the lack of testing for overall subgroup interactions with the treatment group. If no interaction exists, then conducting within-subgroup comparisons may not be necessary. Similarly, bypassing an overall test of race—such as jumping directly to within-race subgroup analyses—overlooks the importance of assessing whether there are meaningful differences across racial groups as a whole.

Given the limited data available in the literature for non-Hispanic Whites, presenting results by racial and ethnic groups adds value. However, it is important to first establish whether an overall interaction with the treatment group exists, or whether there is a main effect of race or other subgroup characteristics. Acknowledging these broader effects ensures that subgroup analyses are appropriately contextualized and interpreted.

Minor notes/tipos:

1. Line 119: Lacks space between treatment and studies.
2. Table 3: Neither of the footnotes have corresponding superscript in the body of the table
3. Line 240: Should have “other race” in quotes rather than “any race”
4. Line 248: Has unnecessary and contradictory “but” near the end of the line.

Reviewer #2

(Remarks to the Author)

Thank you for the opportunity to review this well written paper.

The meta-analysis objective is relevant and timely to the field.

These data are significant findings for the effectiveness of the WW program, particularly in the NH Black community. Authors could be more clear about the implications of these findings, given that the WW program is the largest and most widely available community-based weight management program in the United States. Authors may also consider emphasizing the need for more research specific to updating the intervention/s in race and ethnic subgroups.

Version 1:

Reviewer comments:

Reviewer #1

(Remarks to the Author)

Thank you for your responses to the reviewer’s suggestions and for providing the reference for not utilizing the omnibus test of interaction between race/ethnicity and treatment group or overall test of significant of the effect of race in the logistic regression model of odds of 5% weight loss. Statistically speaking, I disagree with this choice. It should be noted that the test

of interaction between race / ethnicity and treatment group is an overall test of whether treatment effects are different across any of the race / ethnicity groups, regardless of the reference group. However, given the reference you provided, your epidemiologic approach, and the importance of reporting differences in effectiveness of interventions within racial and ethnic groups, I concede that the usual tests could be bypassed and results still be published. This lack of statistical rigor results in a modification of my review of some aspects of how the data analyses are presented.

Given that no overall tests are considered and this approach results in many more tests and as a result increases the concern for multiple comparisons, the authors should avoid using p-values and overstating conclusions. Rather than using p-values in tables 3 and 4 and in the text when citing results and conclusions, the authors should report confidence intervals for the estimates of mean weight loss for control, intervention, and the difference at each time point within table 3 and drop the SE values and p-value columns. In table 4, p-values should also be dropped considering there is no overall test of race or interaction test presented.

Throughout the paper, the authors note that there are comparisons 'across race' however many of the comparisons they reference are within race (page 8, first and third paragraphs; page 14, multiple instances in first paragraph). In the Conclusions section, the authors should revise the statement "among all racial and ethnic groups" to say "within all racial and ethnic groups" because there is no test of the effect among or across the groups, only within each group.

In the second sentence of the second paragraph on page 14, the authors state "NH Black participants had a 58% lower likelihood of the intervention resulting in a 5% clinically significant weight loss at 3 months,..." This phrase should be revised to remove references to the intervention effect because your subgroup analysis within the intervention group does not test the intervention effect given that it does not include a control group. The phrase in the sentence should be revised to remove the reference to the intervention effect as follows: "NH Black participants had a 58% lower likelihood of a 5% clinically significant weight loss at 3 months,..."

Reviewer #2

(Remarks to the Author)

Authors responses to my feedback and recommendations are sufficient and they strengthened the manuscript with additional clarity to conclusions and real world implications. No further comments. I support publication.

Version 2:

Reviewer comments:

Reviewer #1

(Remarks to the Author)

Thank you for your thoughtful consideration of suggestions. I support publication of this article.

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Response to Reviewers for COMMSMED-25-1775-T

Thank you for your consideration of our manuscript. We appreciate the value you see in its ability to make a contribution and the dedication of the reviewers to ensure it is of the highest quality possible. Below we offer a point-by-point response to the two reviewers' comments, highlighting the ways in which we have improved the manuscript based on their feedback.

Reviewer #1 (Remarks to the Author):

There are concerns regarding the lack of testing for overall subgroup interactions with the treatment group. If no interaction exists, then conducting within-subgroup comparisons may not be necessary. Similarly, bypassing an overall test of race—such as jumping directly to within-race subgroup analyses—overlooks the importance of assessing whether there are meaningful differences across racial groups as a whole.

Given the limited data available in the literature for non-Hispanic Whites, presenting results by racial and ethnic groups adds value. However, it is important to first establish whether an overall interaction with the treatment group exists, or whether there is a main effect of race or other subgroup characteristics. Acknowledging these broader effects ensures that subgroup analyses are appropriately contextualized and interpreted.

Thank you for this question. Our interpretation is that the reviewer is asking for a regression analysis of race*intervention status. An interaction here would give us information on the degree to which racially minoritized *treatment* (intervention) group participants were likely to have 5% weight loss, relative to the non-Hispanic White *control* group. Respectfully, we believe the data we provided address this question, and provides additional information that helps advance beyond the questions an interaction analysis would leave. An interaction term would, for example, tell us whether Hispanic/Latine treatment group participants did better than White control group participants, but we still would not know whether that is because they were in the treatment vs control group or because of some difference between Latine and non-Hispanic White groups in the sample. Instead, the information in Tables 3 and 4 answer both questions of the extent to which the intervention worked, and whether it worked as well among minoritized intervention participants as White intervention participants.

Table 3 shows the absolute differences in percent body weight loss for treatment and control groups, by race, at 3, 6, and 12 months, for direct comparison. We also footnote that the intervention was effective at weight loss for all racial groups: “within racial groups, all intervention participants lost significantly greater percent weight than controls at $p < .05$.”

While knowing that the intervention was effective compared to control groups, having this information does not answer our primary question of whether the intervention was *as effective* for all racial groups. That question is answered by our primary analysis in Table 4, where we show the odds of each racially minoritized treatment group member achieving >5% weight loss compared to White treatment group members. We believe this finding advances this conversation by examining whether, given the same treatment (as opposed to no treatment), does the intervention achieve equal gains.

With all due respect to the reviewers, we opted not to run interaction models for this analysis for several reasons. First, as outlined above, comparing to the White control group does not answer our key question. Second, we have cautioned against using interaction terms, as they

can easily miss differences by racial subgroups. Julia Ward and co-authors offer [guidance](#)¹ on why testing for interactions would be insufficient and may actually mask differences by racial and ethnic groups, especially when there are differences in prevalences of the exposure or outcome by race. Rather than examine interactions, we instead conducted our analysis to satisfy their criteria of examining (as they recommend) the distributions of the outcome (Table 3), and how the outcome differed within the exposed (treatment) group (Table 4).

Minor notes/typos:

- 1. Line 119: Lacks space between treatment and studies.**
- 2. Table 3: Neither of the footnotes have corresponding superscript in the body of the table**
- 3. Line 240: Should have “other race” in quotes rather than “any race”**
- 4. Line 248: Has unnecessary and contradictory “but” near the end of the line.**

Thank you for your attention to detail. We have made all of these changes in the manuscript.

Reviewer #2

**Thank you for the opportunity to review this well written paper.
The meta-analysis objective is relevant and timely to the field.
These data are significant findings for the effectiveness of the WW program, particularly in the NH Black community.**

Thank you for your praise and endorsement of the contribution this paper can make.

Authors could be more clear about the implications of these findings, given that the WW program is the largest and most widely available community-based weight management program in the United States.

Thank you for this suggestion and the opportunity to further highlight this manuscript’s potential contribution. We have updated the Discussion section to put the results in the context of a widely available, empirically validated program.

“Our results make an additional contribution because they come from a widely available, empirically validated community-based program, wherein people of different racial and ethnic backgrounds have access to a treatment that is effective across groups. This is in contrast to interventions specifically developed for a more focused population, limiting their generalizability and scalability.”

Authors may also consider emphasizing the need for more research specific to updating the intervention/s in race and ethnic subgroups.

We now add to the 5th paragraph in the Discussion, which reviews ways in which behavioral programs could be adapted for those in a variety of racial and ethnic subgroups. We have added that future research should also include qualitative methods and those using newer generation obesity medications.

“In addition to leveraging any available qualitative data to improve interventions, future

research should be grounded in methodologically rigorous qualitative data that directly capture the needs and perspectives of various racial and ethnic subgroups. The use of mixed methods approaches can be useful before, during and after an intervention. Given the advent of newer generation obesity medications, such as GLP-1s, future research should also focus on race and ethnicity differences for these weight-loss approaches.”

REFERENCES

1. Ward JB, Gartner DR, Keyes KM, Fliss MD, McClure ES, Robinson WR. How do we assess a racial disparity in health? Distribution, interaction, and interpretation in epidemiological studies. *Ann Epidemiol.* 2019;29:1-7.

Thank you for your continued consideration of our manuscript. We appreciate the thoughtfulness of the reviewers and have further revised the manuscript based on their requests.

Reviewers' comments:

Reviewer #1 (Remarks to the Author):

Rather than using p-values in tables 3 and 4 and in the text when citing results and conclusions, the authors should report confidence intervals for the estimates of mean weight loss for control, intervention, and the difference at each time point within table 3 and drop the SE values and p-value columns. In table 4, p-values should also be dropped considering there is no overall test of race or interaction test presented.

We have updated the presentation of results. Table 3 now reports mean weight differences for treatment and control groups, 95% confidence intervals. SE and p-values have been removed.

Table 4 includes confidence intervals for the ORs, and we have removed the p-values from the table and text.

The same changes have been made for the tables in the supplement.

Throughout the paper, the authors note that there are comparisons ‘across race’ however many of the comparisons they reference are within race (page 8, first and third paragraphs; page 14, multiple instances in first paragraph). In the Conclusions section, the authors should revise the statement “among all racial and ethnic groups” to say “within all racial and ethnic groups” because there is no test of the effect among or across the groups, only within each group.

Our analysis presents results both within and across racial groups. The Table 3 analysis is designed to see whether, within racial groups, the intervention produces greater weight loss than the control group. For example, whether the Hispanic/Latine participants in the treatment group lost more weight at 3 months than Hispanic/Latine participants in the control group at 3 months.

The Table 4 analysis is designed to compare across racial groups, among only intervention participants. In this case, we are answering the question of whether the intervention is equally effective for people of different races. For example, we can see that compared to the referent of NH White intervention recipients, NH Black intervention recipients were less likely to achieve 5% weight loss at 12 months.

When we are referring to conclusions drawn from Table 3, we will use “within race” and when we are referring to conclusions drawn from Table 4, we will use “across race”. We appreciate the reviewers’ attention to this nuance and have carefully re-reviewed the manuscript and updated the text in the following places to be more precise:

■ Abstract

- “T-tests compared weight loss between intervention and control participants within race, ethnicity, income and education subgroups.”
- “A widely available weight management program is more effective than controls for weight loss in all race, ethnicity, income, and education subgroups. However, the likelihood of clinically significant weight loss varies when comparing across racial and ethnic groups.”

■ Plain language summary

- “We combined data from 11 studies of a widely available weight management program to assess how well it produced weight loss by subgroups of race, ethnicity, income and education.”

■ Introduction

- “Due to small sample sizes, nearly all studies have focused on weight losses within the active treatment groups, comparing across racial and ethnic groups. While these are useful, they do not assess the extent to which observed differences between intervention and control groups persist within racial and ethnic groups.”
- “The purpose of this study was to examine two questions; 1) do the previously published overall intervention effects of a widely available behavioral weight management intervention relative to control groups persist within race, ethnicity, and SEP groups, and 2) within the intervention group, are there differences across race, ethnicity, or SEP groups in the likelihood of experiencing a 5% reduction in weight?”

○

■ Statistics:

- “To assess weight loss for intervention compared to control participants of the same (within) racial, ethnic, income or education group, we conducted independent samples t-tests...”
- “To assess differential weight changes resulting from the intervention comparing across race and ethnicity or income and education subgroups, we applied a fixed effects multivariable regression approach only to participants in the behavioral weight management intervention”

■ Discussion

- “This is one of the few studies to examine the intervention versus control effects within underrepresented groups.”
- “Our results make an additional contribution because they come from a widely available, empirically validated community-based program, wherein people of different racial and ethnic backgrounds have access to a treatment that is effective for various racial groups.”

In the second sentence of the second paragraph on page 14, the authors state “NH Black participants had a 58% lower likelihood of the intervention resulting in a 5% clinically significant weight loss at 3 months,...” This phrase should be revised to remove references to the intervention effect because your subgroup analysis within the intervention group does not test the intervention effect given that it does not include a control group. The phrase in the sentence should be revised to remove the reference to the intervention effect as follows: “NH Black participants had a 58% lower likelihood of a 5% clinically significant weight loss at 3 months,...”

Thank you for the opportunity to revise this for clarity. We had previously established that all participants in intervention groups had significantly greater weight loss than control participants, which holds for all racial groups. Thus, in this paragraph we were comparing intervention recipients across racial groups to show whether those in the intervention were able to achieve 5% weight loss, and whether that was different for people in different racial groups. We understand how our prior language could cause confusion and have taken the reviewer’s suggestion for revising.

Reviewer #2 (Remarks to the Author):

Authors responses to my feedback and recommendations are sufficient and they strengthened the manuscript with additional clarity to conclusions and real world implications. No further comments. I support publication.

Thank you for your support.