Does adherence to a motivational counseling program impact weight loss?

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Introduction

The increasing prevalence of obesity is of particular concern, in part, because it has the potential to influence the health of and health-care cost of today’s generation. Internationally, the World Health Organization states approximately 1.9 billion adults in 2014 were as overweight.¹ Preventive services are critically important for early diagnosis of these aforementioned health problems and for promoting healthy behaviors that can reduce the occurrence of chronic conditions.²

Motivational counseling (MC) is a technique designed to enhance an individual’s central understanding of the counseling topics, and it is being applied to various types of behavior-change counseling, including obesity-related behaviors.³ The purpose of the current study was to determine whether the level of adherence to MC sessions within a weight management program in a group of college aged individuals enhances long-term weight loss.

Methods

Design and subjects

A total of 156 college aged participants who visited the University student health center (Mississippi, USA) from 2009 to 2013 and were referred for weight management counseling were enrolled in the study design prospective longitudinal study. Preliminary enrollment criteria included a body mass index (BMI) of 27 or greater. They were told about an on campus weight loss program, but it was up to the participant to initiate study participation. Participants were required to complete a full lipid profile panel, blood pressure, blood glucose, cholesterol (low-density lipoprotein [LDL] and high-density lipoprotein [HDL]), and triglyceride test before the initiation of the MC sessions.

A total of 120 students (69 males and 51 females) received individual meetings with an obesity-related health promotion practitioner for an initial motivational counseling session, lasting 20-30 min. Each participant continually attended a brief, weekly individual meeting of approximately 15-20 min to follow-up on each weekly health behavior change initiated by the participant. The availability of the sessions mirrored the academic calendar, allowing students to meet when the University was open. The number of interventions each participant completed varied on each’s ability to commit to weekly meetings, which may be cancelled per the student’s request due to illness, academic and/or personal obligations. Some students individually rescheduled when prior notice to scheduling conflicts was made, whereas others may...
have missed their weekly session. The number of sessions each student encountered depended on his/her individual consistency. During these meetings, the participant had time to ask questions and receive personal feedback on perceived barriers/obstacles. Specifically, the focus of the MC sessions was focused on discussions related to behavioral changes and the individual’s commitment, while engaging in discussions of what motivated change, the uncertainty about changing eating and exercise habits, and how behavioral changes might be consistent with the participant’s personal values and future goals. At the end of each MC session, the participant’s weight was recorded and the following MC session was scheduled. The on-going sessions continued until the student graduated or no longer wished to participate; there was no limit to the time one may continue to be in the program. Written consent was acquired from each participant. This study was approved by University Institutional Review Board.

Statistical analysis

We test the impact of MC on weight loss using both uni- and multivariate tests using Stata 13.0 (Stata Corp, College Station, TX). Furthermore, we test the relation between gender, race, and the degree of adherence to the MC sessions on weight loss controlling for common health examination measures. We conduct a standard independent univariate comparison between gender and change in weight and race and change in weight. We compute the change in weight from the initial visit to the final visit. Recognizing the need to control for physiological differences in participants we include the initial visit to the final visit. The dependent variable is the ΔWeight from the initial visit to the final visit. Using the following equations:

\[ \Delta \text{Weight}_{\text{initial-final}} = \beta_0 + \beta_1 \text{Height}_{\text{initial}} + \beta_2 \text{HDL}_{\text{initial}} + \beta_3 \text{LDL}_{\text{initial}} + \beta_4 \text{Triglyceride}_{\text{initial}} + \beta_5 \text{Blood-Sugar}_{\text{initial}} + \beta_6 \text{Systolic}_{\text{initial}} + \beta_7 \text{Diastolic}_{\text{initial}} + \beta_8 \text{Gender} \times \text{Attendance} + \epsilon_{i,t} \]

\[ \Delta \text{Weight}_{\text{initial-final}} = \beta_0 + \beta_1 \text{Height}_{\text{initial}} + \beta_2 \text{HDL}_{\text{initial}} + \beta_3 \text{LDL}_{\text{initial}} + \beta_4 \text{Triglyceride}_{\text{initial}} + \beta_5 \text{Blood-Sugar}_{\text{initial}} + \beta_6 \text{Systolic}_{\text{initial}} + \beta_7 \text{Diastolic}_{\text{initial}} + \beta_8 \text{Race} \times \text{Attendance} + \epsilon_{i,t} \]

\[ \Delta \text{Weight}_{\text{initial-final}} = \beta_0 + \beta_1 \text{Height}_{\text{initial}} + \beta_2 \text{HDL}_{\text{initial}} + \beta_3 \text{LDL}_{\text{initial}} + \beta_4 \text{Triglyceride}_{\text{initial}} + \beta_5 \text{Blood-Sugar}_{\text{initial}} + \beta_6 \text{Systolic}_{\text{initial}} + \beta_7 \text{Diastolic}_{\text{initial}} + \beta_8 \text{Attendance} + \epsilon_{i,t} \]

Table 1 shows descriptive statistics. Columns 1 and 2 report characteristics based on gender, while columns 4 and 5 reports characteristics based on race. Columns 3 and 6 report the differences. There were statistically significant differences in initial weight and ending weight between males and females, whereas initial physiological characteristics across gender and race were insignificant.

Table 2 illustrates the impact of motivational counseling on weight loss across race and gender specifically across attendance levels to the MC sessions. To gauge the amount in which a participant attended sessions, we stratify adherence to the MC sessions as attending >75% of the sessions (Adhere 1), 50% of the sessions (Adhere 2), and <50% of the sessions (Adhere 3), significant differences between initial weight and exit weight were found. Table 3 shows significant differences across the attendance groups. Although there are no significant differences in initial weight, we reported significant differences in exit weight. Specifically, we reported participants in the higher attendance groups realized greater weight loss.

Table 4 presents regression findings. Columns 1-3 report gender, race, and adherence, respectively. Similar to Tables 2 and 3, we reported an insignificant relationship between gender and race to change in weight. However, controlling for physiological characteristics we reported a positive and significant relationship of adherence and change in weight. We further reported no differences across gender or race and adherence to weight loss. As such our findings are consistent with the idea adherence to MC sessions impact weight loss regardless of gender or race.
The findings of the current study showed that the level of adherence to a MC weight management program plays a role in the amount of weight an individual may lose. Previous research has focused on a one-to-one comparison of MC to a non-MC group. These studies showed positive results across a myriad of health disparities and disease from diabetes to smoking cessation. While other studies have examined the effectiveness of MC and its ability to reduce comorbidities associated with overweight/obesity in a primary care clinic, our study is one of the first to evaluate college-aged individuals and the level of adherence to the MC program across race and gender.

Table 1: Demographic characteristics and differences in means

| Demographics | Male | Female | Δ Male-female | White | Black | Δ White-black |
|--------------|------|--------|--------------|-------|-------|--------------|
| Initiation weight (lbs) | 244  | 189    | 55***        | 194   | 201   | 7            |
| Exit weight (lbs) | 231  | 170    | 61***        | 183   | 187   | 4            |
| Height (in) | 69   | 64     | 5            | 66    | 68    | 2            |
| HDL | 52   | 59     | 7            | 58    | 62    | 4            |
| LDL | 108  | 126    | 18*          | 114   | 129   | 15*          |
| Triglyceride | 118  | 121    | 3            | 122   | 131   | 9            |
| Blood sugar | 97   | 104    | 7            | 101   | 113   | 12*          |
| Systolic | 74   | 82     | 8            | 82    | 84    | 2            |
| Diastolic | 128  | 124    | 4            | 116   | 122   | 6            |
| N | 69   | 51     | 18           | 63    | 57    | 6            |

***P<0.001, **P<0.05, *P<0.1

Table 2: Differences in means for gender and race by change in weight across adherence to MC sessions

| Gender | Adhere 1 (>75%) | Adhere 2 (>50%) | Adhere 3 (<50%) |
|--------|----------------|-----------------|-----------------|
|        | Initiation weight (lbs) | Exit weight (lbs) | Δ (lbs) | Initiation weight (lbs) | Exit weight (lbs) | Δ (lbs) | Initiation weight (lbs) | Exit weight (lbs) | Δ (lbs) |
| Male   | 236  | 212   | 24*** | 236  | 228   | 11**  | 236  | 232   | 4            |
| Female | 187  | 168   | 19*** | 181  | 174   | 7*    | 179  | 175   | 4            |
| White  | 192  | 162   | 20*** | 199  | 184   | 15*   | 186  | 183   | 3            |
| Black  | 198  | 187   | 11*   | 204  | 188   | 16**  | 194  | 191   | 3            |

***P<0.001, **P<0.05, *P<0.1

Table 3: Differences in means by differences in adherence to MC sessions

| Gender | Adhere 1 | Adhere 2 | Adhere 3 | Δ Adhere 1-2 | Δ Adhere 1-3 | Δ Adhere 2-3 |
|--------|----------|----------|----------|--------------|--------------|--------------|
|        | Initiation weight (lbs) | Initiation weight (lbs) | Initiation weight (lbs) | Initiation weight (lbs) | Initiation weight (lbs) | Initiation weight (lbs) |
| Male   | 236  | 239    | 236     | 3            | 0            | 3            |
| Female | 187  | 181    | 179     | 6            | 8*           | 2            |
| White  | 192  | 199    | 186     | 7            | 1            | 13**         |
| Black  | 198  | 204    | 194     | 6            | 4            | 10*          |

**Discussion**

The favorable impact of MC has been reported in as few as 2 MC sessions with greater weight loss being proportional to the length of the program. Our results extend these findings by not only supporting the notion that adherence to a program impacts weight loss, but the level of adherence to the program is a driving factor to overall weight loss. These findings can impact the motivational discussions of behavioral changes impacting attendance to MC sessions.

West et al. reported MC amplified weight loss by increasing attendance at group sessions, which improved the self-monitoring aspects of the program. Streit et al. showed a significant relationship between self-monitoring and weight loss,
Further suggesting that attendance at MC sessions may play a role in long-term weight loss. The study findings directly tested this notion by measuring the actual attendance of participants across the length of the program and find that the actual percentage of attendance days relative to the whole program is a significant factor in change in weight. These findings are particularly interesting as prior work has shown long-term adherence is an important factor while not directly testing attendance to the MC sessions. These findings have strong implications for the structure of discussions in the MC sessions about the importance of regular attendance and not just adherence to the behavioral changes discussed in the MC sessions.

MC has been shown to elicit an individual’s intrinsic motivation in a directive way shown to be effective in eliciting and sustaining behavior change. Prior research by Gourlan et al. indicates adolescents not only decrease BMI after six sessions of MC sessions during a weight loss program, but an increase in physical activity and autonomy as well. While our study shows that MC significantly influences the magnitude of weight loss observed in college-aged individuals who consistently participate in MC sessions compared to individuals who participate at a lesser rate, we also report no differences in gender and few differences in race. An important aspect that has been reported across MC papers is the difference in outcomes across race. Wing and Anglin reported African–American women experienced significantly less weight loss than white women in MC weight loss studies. These findings were consistent with previous studies of obesity treatment studies of diabetic populations and in obese individuals.

These findings have practical implications in following Resnicow et al. who show a culturally tailored program yields greater results than a standard program of a generic form. In summary, using MC is an effective method that should be used when designing and implementing weight loss programs.

Conclusions

The findings of our study are consistent with previous work showing increased weight loss was apparent in both white and black women over 12 months period, however black women did not realize the same long-term benefits as white women over the next 12 months. These findings combined with our results indicate a slight cultural bias in MC sessions and more importantly in the adherence to the program.

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