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A Behavioral Weight Loss Program for Low-Income Adults with Obesity and HIV

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B. S. in Nursing, Saint Louis University, 2013

A Dissertation Submitted to The Graduate School at the University of Missouri-St. Louis

in partial fulfillment of the requirements for the degree

Doctor of Nursing Practice

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Advisory Committee

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Abstract

Problem: Obesity, having a body mass index (BMI) of 30 kg/m^2 or greater, increases the risk for cardiovascular disease. For people living with HIV (PLWH), this increases their risk for myocardial infarctions by 50% and causes this life-threatening event to occur at a younger age compared to those who are not diagnosed with HIV.

Methods: With obesity disproportionately affecting people with low income, this study aims to evaluate the effects of a 12-week behavioral weight loss program that utilizes journaling as a self-monitoring tool, weekly educational classes, and individualized goal-setting on PLWH with obesity who live in a residential facility for the low-income, formerly homeless. Outcome measures include average weight, BMI, waist circumference (WC), intake of the five food groups per MyPlate recommendations, water intake, sugar-sweetened beverage (SSB) intake, minutes of physical activity (PA), and quality of life (QoL). A convenience sample (n=2) were recruited.

Data: Findings from this cohort study showed the following: average weight increased, BMI increased, WC decreased, protein intake increased, dairy intake decreased, vegetable intake decreased, grain intake increased, fruit intake decreased, water intake increased, SSB intake decreased, minutes of PA increased, and QoL decreased.

Implication: Providing a behavioral change strategy and health education encouraged participants to desire choosing healthy behaviors; however, without access to fresh produce, significant changes in BMI may continue to be difficult to achieve.

A Behavioral Weight Loss Program for Low-Income Adults with Obesity and HIV

Current antiretroviral drug therapy (ART) has increased the longevity of people living with HIV (PLWH). With the life expectancy nearly matching that of the general population, PLWH are now at risk for the same chronic conditions (Crum-Cianflone, Tejidor, Medina, Barahona, & Ganesan, 2008). It is estimated that approximately 25% of deaths among PLWH are caused by AIDS while about 50% are caused by noninfectious diseases such as cardiovascular disease (CVD) (Thompson-Paul et al., 2015).

Obesity, defined as having a body mass index (BMI) of 30 kg/m^2 or above, is linked to CVD. Adipose distribution also impacts the effects of CVD; those with abdominal obesity are more likely to suffer worse outcomes (Mandviwala, Khalid, & Deswal, 2016). CVD poses a greater risk to PLWH than the general population. PLWH have a 50% higher risk of having heart attacks than people without HIV and are more likely to occur at a younger age (Papadakis, McPhee, & Rabow, 2017; Thompson-Paul et al., 2015). Obesity along with its comorbidities is also associated with a decreased quality of life (QoL) (Ambak et al., 2018).

The prevalence of obesity among PLWH is 40% in women and 20% in men (Thompson-Paul et al., 2015). Although weight management is a common recommendation to treat this condition, developing behaviors that lead to lower BMI can be challenging. The current guidelines for the management of overweight and obesity by the National Institute of Health (NIH) and the National Heart, Lung, and Blood Institute (NHLBI) (2000) recommends diet modification, increasing physical activity (PA), and behavioral therapy for weight loss.

The purpose of this project is to improve nutritional intake, increase PA, and improve QoL and in adults aged 18-65 years who live in a residential community for individuals with HIV/AIDS, using a 12-week behavioral weight loss program to elicit changes in behavior. The objectives of this program are to decrease weight, BMI, waist circumference (WC), and sugar-sweetened beverages (SSB) intake; while increasing water intake, the consumption of recommended food groups, number of minutes of PA per week, and the QoL in adults aged 18-65 years who live in a residential community for individuals with HIV/AIDS. To assess whether the objectives are met, the following PICO(T) questions will be used to guide the assessment.

In adults aged 18-65 years who live in a residential community for individuals with HIV/AIDS and who complete a 12-week behavioral weight loss program:

- What is the average weight, BMI, and WC at the beginning of the program when compared to the end of the program?
- What is the average consumption of the recommended amount of each of the five food groups according to MyPlate at the beginning of the program when compared to the end of the program?
- What is the average water intake and average SSB at the beginning of the program when compared to the end of the program?
- What is the average number of minutes of PA per week at the beginning of the program when compared to the end of the program?
- What is the change (if any) in the Centers for Disease Control and Prevention Health-Related QoL (CDC HRQOL-4) score at the beginning of the program when compared to the end of the program?

Literature Review

A literature search was performed using MEDline, CINAHL, and the University of Missouri-St. Louis' (UMSL) library online search engine. The search strategies included the following keyword combinations; *obesity, weight loss, weight loss programs,* weight loss interventions, *low income, HIV, people living with HIV, journaling, diet modification,* and *increasing physical activity*. Eligible articles included those published from 2013-2018; those with participants ages 19+; those which selected only controlled clinical trial as publication type; and those written in English. The search yielded 27 articles from MEDline and CINAHL databases and 17 articles from UMSL library online search engine. Exclusion criteria included children under the age of 18, adults over the age of 65, pregnant and postpartum women, interventions that utilized drug or surgical therapy, interventions lasting more than 12 weeks, and school or work-based programs. After an abstract review, seven articles were selected based on relevancy. Three articles outside of the inclusion time frame and a textbook were included due to relevancy. National guidelines were also used, as a source of expert advice and to compare findings to evidence from the literature search. National guidelines used for this literature review are:

- The Practical Guide Identification, Evaluation, and Treatment of Overweight and Obesity in Adults by the NIH and the NHLBI
- Managing Overweight and Obesity in Adults: Systematic Evidence Review from the Obesity Expert Panel, 2013 by the U.S. Department of Health and Human Services (DHHS), NIH, and NHLBI

- Dietary Guidelines for Americans 2015-2020 Eighth Edition by the DHHS and the U.S. Department of Agriculture (USDA)
- 2008 Physical Activity Guidelines for Americans by the DHHS
- 2018 Physical Activity Guidelines Advisory Committee Scientific Report by the DHHS

Interventions that promoted weight loss included elements of nutrition, exercise, and behavioral change strategies (DHHS, 2008; DHHS & USDA, 2015; Harvey & Ogden, 2014; Laz, Rahman, Pohlmeier, & Berenson, 2014; Moredich & Kessler, 2014; NIH & NHLBI, 2000). When used together, these interventions promoted greater weight loss than when they are used separately.

BMI and HIV

There appears to be an inverse relationship between BMI and HIV progression (Crum-Cianflone et al., 2008; Jones et al., 2003). A BMI of less than 25 kg/m^2 is associated with lower CD4 counts and greater than 25 kg/m^2 is associated with higher CD4 counts (Jones et al., 2003). The CD4 count is an indicator of immunologic response. Normal CD4 counts are 500-1,500 cells/mm3; AIDS is diagnosed when CD4 counts drop below 200 cells/mm3 (Papadakis et al., 2017). With a BMI of 30 kg/m^2 or greater putting PLWH at higher risk for CVD and a BMI under 25 kg/m^2 increasing their risk of disease progression, achieving a BMI of 25-29.9 are ideal for PLWH.

Nutrition and Exercise

Nutritional knowledge influences health behaviors that affect BMI (Laz et al., 2014; Moredich & Kessler, 2014). In a cross-sectional survey of 1,052 women ages 16-40, those who had higher nutritional scores were more likely to participate in healthy

weight behaviors compared to women who scored lower (Laz et al., 2014). Moredich & Kessler's (2014) systematic review estimated that the addition of nutritional lessons into weight management programs added an additional loss of 0.3-0.5 lb a week.

The addition of exercise with nutrition produces greater weight reduction than either intervention alone (Moredich & Kessler, 2014). Exercise is known to help with weight loss, but it can be challenging if barriers exist such as time, money, energy, transportation, or motivation (Harvey & Ogden, 2014; Moredich & Kessler, 2014). A lack of resources may decrease accessibility to exercise options which contributes to a lack of exercise. In Moredich & Kessler's (2014) systematic review, studies that had successes with promoting exercise took place within the community where individuals had peer support and a safe space made available for them to exercise. As for the lack of intrinsic motivation, Harvey and Ogden (2014) suggest using monetary incentives to stimulate extrinsic motivation.

Behavioral Change Strategies

Interventions that utilize behavioral change strategies had a positive impact on weight reduction (Becofsky, Wing, McCaffery, Boudreau, & Wing, 2017; DHHS, NIH, & NHLBI, 2013; Harvey & Ogden, 2014; Moredich & Kessler, 2014; NIH & NHLBI, 2000). Research shows that self-monitoring, goal-setting, and peer support are efficacious methods to promote weight reduction (Becofsky et al., 2017; Harvey & Ogden, 2014; Moredich & Kessler, 2014; NIH & NHLBI, 2000).

Self-monitoring is a behavioral change strategy that involves record-keeping, either through journaling or use of mobile applications, of an individual's chosen behavior. Individuals who utilize this behavior change strategy are more likely to lose

weight compared to those who do not (Becofsky et al., 2017; Harvey & Ogden, 2014; Moredich & Kessler, 2014).

The NIH and NHLBI (2000) also recommend goal-setting as an intervention for weight reduction. After discussing dietary and exercise recommendations, individuals should be encouraged to set their own goals (NIH & NHLBI, 2000).

Group interventions not only provide moderate weight reduction, 0.3-0.44 lb, but it is also the preferred method of learning by participants (Moredich & Kessler, 2014). In Moredich & Kessler's (2014) systematic review, group programs were more effective at promoting weight loss than individual programs. Group intervention allows peer support, learning of new behaviors through peer observations, and group interaction to problem-solve when obstacles arise (Moredich & Kessler, 2014). The ability to problem-solve when obstacles prevent the performance of new healthy behaviors is key to maintaining long-term weight reduction (Moredich & Kessler, 2014).

The NIH and NHLBI's (2000) practical guide for the assessment and treatment of overweight and obesity recommend the goal of weight reduction of 10% in six months or 1-2 lbs a month. Even as little as 2-5% in weight reduction can reduce triglycerides and HA1c levels (DHHS, NIH, & NHLBI, 2013; Harvey & Ogden, 2014). Systematic reviews have shown that the recommended goal of the NIH and NHLBI for weight reduction of 10% in six months is difficult to achieve (Harvey & Ogden, 2014; Moredich & Kessler, 2014). Harvey & Ogden (2014) identified only 20% of the participants' weight loss was clinically significant. Likewise, Becofsky et al. (2017) only achieved a 30% clinically significant weight reduction of 5% or more in their 12-week weight loss program for HIV participants with obesity. This may indicate that six months is too short

of a time period to achieve a 10% weight reduction or that interventions for weight reduction that is considered clinically significant may need to be personalized because what works for one person in a program may not work for another person in the same program.

Gaps in Literature

There is limited data on the impact of journaling as a self-monitoring and goal-setting tool. Commonly used self-monitoring and goal-setting tools are electronic-based which is limited to those who can afford smartphones or have reliable internet access (Ambak et al., 2018; Becofsky et al., 2017; Harvey & Ogden, 2014). There is a lack of studies evaluating the combined use of journaling, diet modification, and increasing PA on weight reduction. Furthermore, only one study was found for weight loss interventions for PLWH and obesity despite this population's higher risk of obesity complications.

The social cognitive theory (SCT) was used as the framework of this study to promote behavioral change through the use of journals to self-monitor and set goals.

Methods

Design/Setting

This was a descriptive prospective cohort study that was implemented at a residential facility that provides housing to formerly homeless PLWH and their families. Residents here make less than 25k/year, have Medicaid or is Medicaid eligible, have limited support outside the residential facility, and live in an area that is considered a food desert.

Sample

A convenience sample of residents were recruited through promotional flyers and emails that were disseminated upon IRB approval. To be eligible for this study, the residents must have a HIV diagnosis, a BMI of 30 or greater, and be between the ages of 18 and 65 years. Residents who do not meet the inclusion criteria were excluded from the study. Additionally, residents who are pregnant, had plans to move out of the residential facility any time before the program end date, and had health conditions that may be aggravated by exercise or increase the risk of injury during exercise.

Approval Process

Approval for this project was obtained by the residential facility's Chief Program Officer, the Client Service Housing Coordinator, and the Residential Program Director as well as the UMSL College of Nursing doctoral committee, and UMSL Institutional Review Board.

Data collection/Analysis

Confidentiality was maintained through the de-identification of participants' data. Data were stored in separate password-protected folders and destroyed after the conclusion of the study. Data was de-identified and coded as 001, 002, 003, 004, etc. Participants' codes were placed in the front cover of their journal.

Demographic data including age, gender, race, income level, and education were collected (see Appendix A). Before the beginning of the first module on week one and after the last module on week 12, each participant's weight, WC, and journal entries were recorded into Excel. The journal entries contained self-reported daily intake of food, beverages, and minutes of exercise. Food intake was converted to servings using

MyPlate's equivalent tables. Descriptive statistics were used to analyze these data since the sample size was too small to run any inferential statistical tests.

Procedures

The project began with an introduction meeting, followed by a 12-week-program consisting of weekly 1-hour modules, and ended with last measurements of weight and waist circumference taken the week after completion of week 12 (see Appendix B). At the introduction meeting, explanations on the project were provided and signed consents obtained. Those who were interested in participating in this program were asked to complete a physical activity readiness questionnaire. At week 1 and week 12, data was collected on weight, WC, and journal entries, and QoL scoring. These data collections were optional during modules 2-11. Education were provided through PowerPoint presentations on healthy behaviors, demonstrations of those behaviors, and group discussions each week. Participants were contacted after the modules to discuss individual goals and to provide support.

Results

Two individuals completed the 12-week behavioral weight loss intervention program (n=2). The average age of the participants was 48.5 years old at the start of the program. One participant was female and the other self-identified as transgender while both were African-American. Only one participant identified income information which showed less than 25k/year. Both participants had less than a high school education.

The average weight for participants at the beginning of the study was 212.5 lb and was 217.8 lb at the end of the study (see Appendix C). The average BMI at the beginning of the study was 36.05 kg/m^2 and was 36.95 kg/m^2 at the end of the study (see Appendix

D). The average WC at the beginning of the study was 46.1 in. and was 44.85 in. at the end of the study (see Appendix E).

The average number of protein servings was 2.47 servings at the beginning of the study which increased to 5.11 servings at the end of the study (see Appendix F). Dairy consumption at the start of the study period was at 0.57 serving and decreased to 0.43 serving at the end of the study period. Vegetable consumption at the start was at 0.61 serving and decreased to .41 serving at the end of the study. Grain consumption started at 1.86 serving and increased to 2.21 servings. Fruit started at .18 serving and decreased to 0 at the end of the study period. The two participants belong in different age and gender categories per MyPlate's recommendations (see Appendices G and H). Only Participant 002 reached and surpassed the recommended protein intake.

The water intake at the beginning of the study was 3.72 cups of water and was 4.86 cups of water at the end of the study (see Appendix I). The SSB intake at the beginning of the study was 2.57 cups and decreased to .9 cup at the end of the study.

The average number of minutes of PA per week at the start of the study was 6.43 minutes and increased to 15.61 minutes at the end of the study period (see Appendix J).

The QoL score started at 28.5 and increased to 43 at the end of the study period (see Appendix K).

Discussion

This study evaluated the effects of a12-week behavioral weight loss program in these outcome measures: weight, BMI, WC, and SSB intake, water intake, the consumption of recommended food groups, minutes of PA per week, and the QoL in low-income adults with obesity and HIV who live in a residential community for individuals

with HIV/AIDS. Due to the low sample size in this study, statistical significance cannot be determined but clinical significance can be observed. The increase in weight in this study may be attributable to the encouragement of increasing daily intake of nutritious foods and less emphasis on decreasing daily intake of non-nutritious food. Mental health may also have an effect on this weight gain. In the evaluation of their self-reported QoL outcome measure, the values of the mental health questions on the QoL questionnaire increased. Literature shows that there is a bidirectional association between weight gain and depression and that depression may even lead to weight gain which seems to correlate with the increase in weight in this study (Pan et al., 2012; Singh, Jackson, Dobson, & Mishra, 2014). BMI is not the most accurate measuring tool for obesity because it does not differentiate between body fat, muscle, water and hormone fluctuations. This could be an explanation to why there is an increase in weight but a decrease in waist circumference. Since abdominal obesity is associated with worse outcomes in CVD, the decrease in WC may help these participants reduce the severity of those outcomes (Mandviwala et al., 2016). The decrease in WC in this study may be caused by a decrease in caloric intake or increase in energy expenditure. The varied changes in food group consumption is mostly due to accessibility. Residents at this facility have limited income and limit food choices. During discussions of individualized goals, access to fresh produce was a common obstacle brought up by the participants in this program. Although fruits and vegetables did not meet the recommended amounts per MyPlate's guidelines for either participants, average protein intake doubled. This finding was clinically significant because the increase in protein intake can be a protective health behavior to slow muscle catabolism and enhance the defense against infections (Hsu,

Pencharz, Macallan, & Tomkins, 2005). Common behavioral goals discussed were increasing PA, increasing water intake, and decreasing SSB intake. Unlike increasing fruits and vegetables in their diet, these changes were reported to be easier to make. The continuation of these behaviors of decreasing SSB intake and increasing PA can help them reduce weight with long-term compliance (Lorts & Ohri-Vachasati, 2016). The decrease in QoL were reported to be influenced by current health condition and low-income-related stressors.

One limitation to this study was the small sample size which means that the study cannot be generalized to all low-income adults with HIV. Another limitation to this study was that the data such as food intake, fluid intake, and minutes of PA were self-reported. Lastly, the timeframe for this project was not long enough to see any statistically significant changes. Per NIH and NHBLI's (2000) recommendations, six months is the time frame needed to see any significant changes.

These findings may indicate that QoL may need to be addressed to help with weight loss or healthy behavior development efforts. Removing barriers to healthy choices may encourage people in this community to attempt to make healthier choices as evidenced by the decrease in SSB, increase in water intake and PA. The low amounts of fruits and vegetables intake along with the participants' complaints of affordability of fresh produce indicate that increasing accessibility may make it easier for them to choose fresh whole foods over other more accessible processed foods. Providing a behavioral change strategy and health education encourages participants to desire choosing healthy behavior; however, without access to fresh produce, significant changes in BMI may continue to be difficult to achieve.

Conclusion

Although this 12-week behavioral weight loss program did not produce statistically significant results in weight, BMI, WC, consumption of the five food groups per MyPlate's recommendations, water intake, SSB intake, minutes of PA per week, and QoL, there is potential for change. Participants were taught behavioral change strategies to help sustain healthy changes made. The residential facility could also help these participants and other residents start and/or sustain healthy changes to meet the target BMI range through addressing QoL. Residents should be encouraged to be screened and treated for depression. The second recommendation is to make fresh produce accessible through partnering with community garden associations. The third recommendation is to encourage the continuation of health behavioral changes through providing health education. In order to make healthy choices, it is important for the residents to know what those healthy choices are and why it is important for their health.

References

Ambak, R., Nor, N. S. M., Puteh, N., Tamil, A. M., Omar, M. A., Shahar, S., Ahmad, N. A., & Aris, T. (2018). The effect of weight loss intervention programme on health-related quality of life among low income overweight and obese housewives in the MyBFF@home study. *BMC Women's Health, 18*(Suppl 1), 17-23. doi: 10.1186/s12905-018-0591-3

Becofsky, K. Wing, E. J., McCaffery, J., Boudreau, M., & Wing, R. R. (2017). A randomized controlled trial of a behavioral weight loss program for human immunodeficiency virus–infected patients. *Clinical Infectious Diseases, 65*(1), 154-157. doi: 10.1093/cid/cix238

Center for Disease Control and Prevention (CDC). (n.d.) *CDC HRQOL-14 "Healthy Days Measure".* Retrieved from https://www.cdc.gov/hrqol/hrqol14_measure.htm

Crum-Cianflone, N., Tejidor, R., Medina, S., Barahona, I., & Ganesan, A. (2008). Obesity among patients with HIV: The latest epidemic. *AIDS Patient Care and STDS, 22*(12), 925-930. doi: 10.1089/apc.2008.0082

Harvey, J. R. & Ogden, D. E. (2014). Obesity treatment in disadvantaged population groups: Where do we stand and what can we do? *Preventive Medicine, 68,* 71-75. doi: 10.1016/j.ypmed.2014.05.015

Hsu, J., W-C., Pencharz, P. B., Macallan, D., & Tomkins, A. (2005). Macronutrients and HIV/AIDS. *World Health Organization Department of Nutrition for Health and Development.* Retrieved from https://www.who.int/nutrition/topics/Paper%20Number%201%20-%20Macronutrients.pdf

Jones, C. Y., Hogan, J. W., Snyder, B., Klein, R. S., Rompalo, A., Schuman, P., & Carpenter, C. C. (2003). Overweight and human immunodeficiency virus (HIV) progression in women: Associations HIV disease progression and changes in body mass index in women in the HIV epidemiology research study cohort. *Clinical Infectious Diseases, 37*(2), S69-S80.

Laz, T. H., Rahman, M., Pohlmeier, A. M., & Berenson, A. B. (2014). Level of nutrition knowledge and its association with weight loss behaviors among low-income reproductive-age women. *Journal of Community Health, 40*(3), 542-548. doi: 10.1007/s10900-014-9969-9

Lorts, C. & Ohri-Vachasati, P. (2016). Eating behaviors among low-income obese adults in the United States: Does health care provider's advice carry any weight. *Preventive Medicine*, 87, 89-94. doi: 10.1016/j.ypmed.2016.02.015

Mandviwala, T., Khalid, U., & Deswal, A. (2016) Obesity and cardiovascular disease: a risk factor or a risk marker? *Current Atherosclerosis Reports, 18*(5), 1-10. doi: 10.1007/s11883-016-0575-4

Moredich, C. A. & Kessler, T. A. (2014). Physical activity and nutritional weight loss interventions in obese, low-income women: An integrative review. *Journal of Midwifery & Women's Health, 59*(4), 380-387. doi: 10.1111/jmwh.12061

National Institute of Health (NIH) & the National Heart, Lung, and Blood Institute (NHLBI). (2000). *The practical guide identification, evaluation, and treatment of overweight and obesity in adults.* Retrieved from https://www.nhlbi.nih.gov/files/docs/guidelines/prctgd_c.pdf

Papadakis, M. A., McPhee, S. J., & Rabow, M. W. (2017). *Current medical diagnosis &*

treatment 2017. (56th ed.). New York: McGraw-Hill Medical.

Pan, A., Sun, Q., Czernichow, S., Kivimaki, M., Okereke, O. I., Lucas, M., Manson, J. E., Ascherio, A., & Hu, F. B. (2012). Bidirectional association between depression and obesity in middle-aged and older women. *International Journal of Obesity, 36*(4), 595-602. doi: 10.1038/ijo.2011.111

Singh, G., Jackson, C. A., Dobson, A., & Mishra, G. D. (2014). Bidirectional association between weight change and depression in mid-aged women: a population-based longitudinal study. *International Journal of Obesity, 38*(4), 591-596. doi: 10.1038/ijo.2013.127

Thompson-Paul, A. M., Wei, S. C., Mattson, C. L., Robertson, M. Hernandez-Romieu, A. C., Bell, T. K., & Skarbinski, J. (2015). Obesity among HIV-infected adults receiving medical care in the United States: Data from the cross-sectional Medical Monitoring Project and National Health and Nutrition Examination Survey. *Medicine, 94*(27), e1081. doi: 10.1097/MD.0000000000001081

U.S. Department of Health and Human Services (DHHS). (2008). *2008 Physical activity guidelines for Americans.* Retrieved from https://health.gov/paguidelines/pdf/paguide.pdf

U.S. Department of Health and Human Services (DHHS). (2018). *2018 Physical Activity Guidelines Advisory Committee Scientific Report.* Retrieved from https://health.gov/paguidelines/secondedition/report/pdf/PAG_Advisory_Committee_Report.pdf

U.S. Department of Health and Human Services (DHHS) & U.S. Department of

Agriculture (USDA). (2015). *2015–2020 Dietary guidelines for Americans,* 8th edition. Retrieved from http://health.gov/dietaryguidelines/2015/guidelines/.

U.S. Department of Health and Human Services (DHHS), National Institute of Health (NIH) & the National Heart, Lung, and Blood Institute (NHLBI). (2013). *Managing overweight and obesity in adults: Systematic evidence review from the Obesity Expert Panel, 2013.* Retrieved from https://www.nhlbi.nih.gov/sites/default/files/mediadocs/obesity-evidence-review.pdf

Appendix A

Table 1

Demographic Data

Characteristic	Total
Age, average y (SD)	48.5 (9.5)
Gender, n (%)	
Female	1 (50%)
Male	
Other	1 (50%)
Race, n (%)	
Caucasian	
African American	2 (100%)
Hispanic	
Other	
Income, n (%)	
<$25,000/y	1 (50%)
$25,001-$50,000/y	
>$50,000/y	
Education, n (%)	
Less than High School	2 (100%)
High School or General Equivalent Development	
2 y/Some College	
≥4 y College	

Note. y = year; SD = standard deviation; n = number.

Appendix B

Table 2

Weekly Modules

Module	Topic
1	Relationship between BMI, Health, and Behavior Development
2	Impact of Food and Exercise on Health
3	Preparation: Budgeting, Reading Labels, Meal Preparation, and Scheduling Time to Exercise
4	Preparation: Portion Control, Resources on Nutrition and Exercise, and Planning Exercises
5	MyPlate Food Groups and Recommendations.
6	Fluid Intake
7	Sugar
8	Fat
9	Cravings
10	Mental Health Exercises
11	Self-Care
12	Motivation and Maintenance

Appendix C

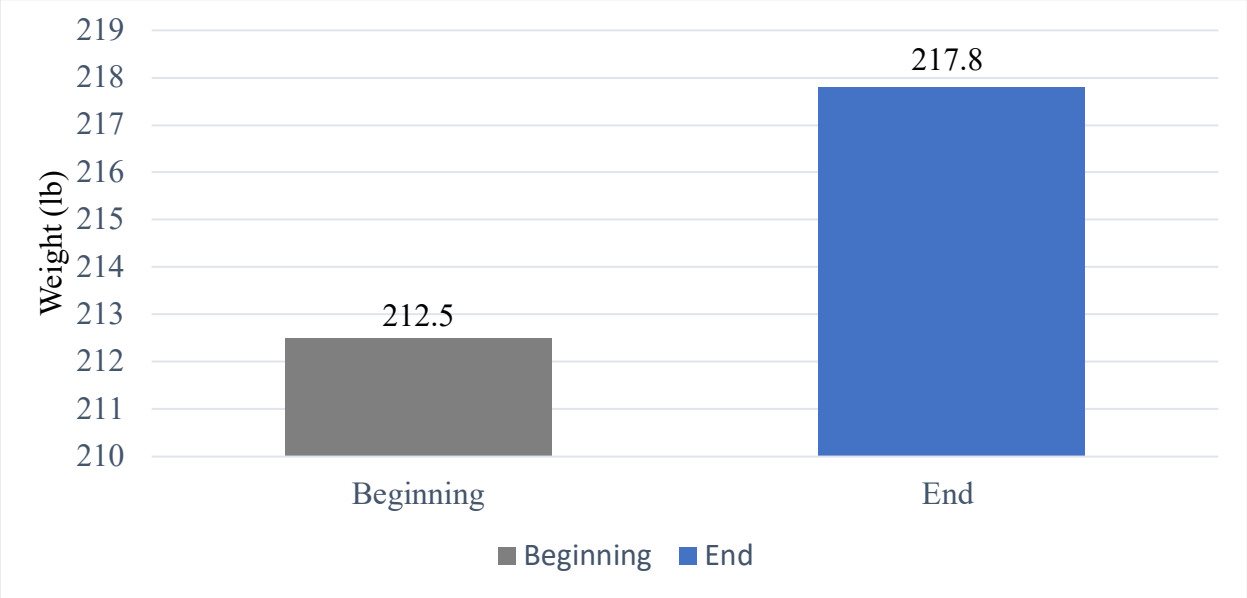

Figure 1. Average weight differences at the beginning and end of the program

Appendix D

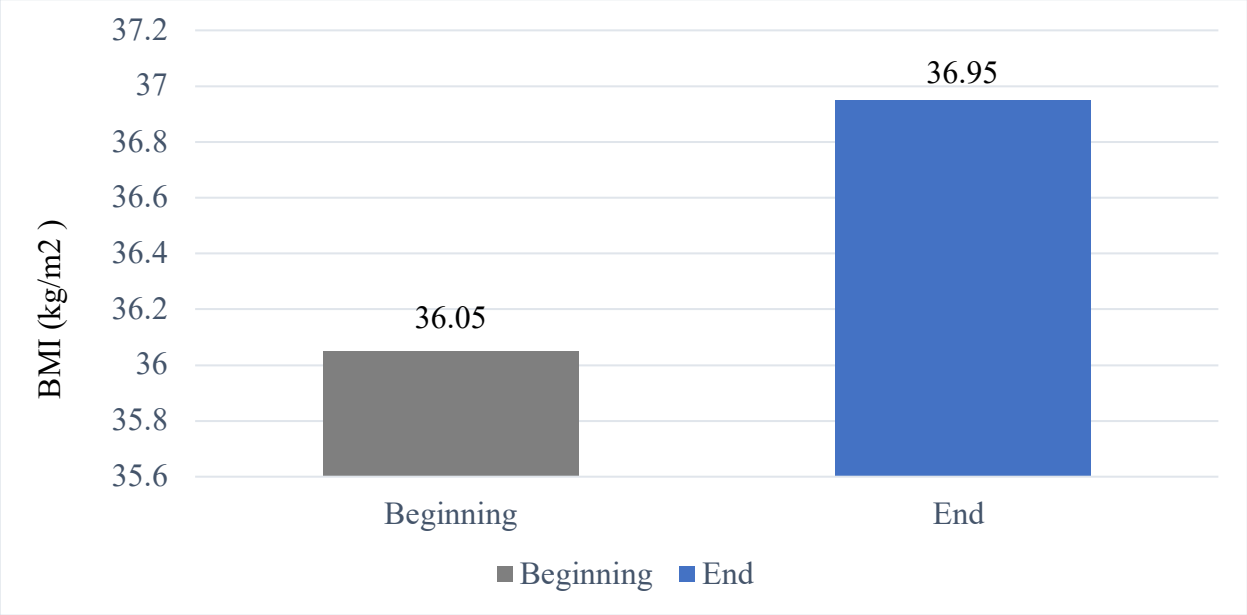

Figure 2. Average BMI differences at the beginning and end of the program

Appendix E

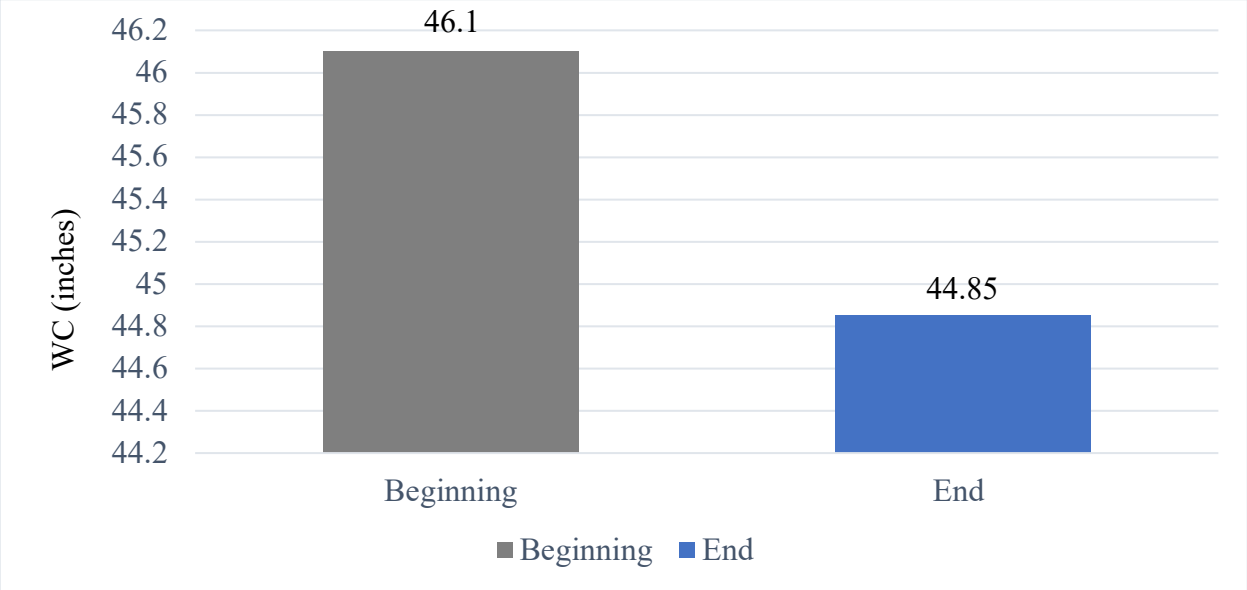

Figure 3. Average WC differences at the beginning and end of the program

Appendix F

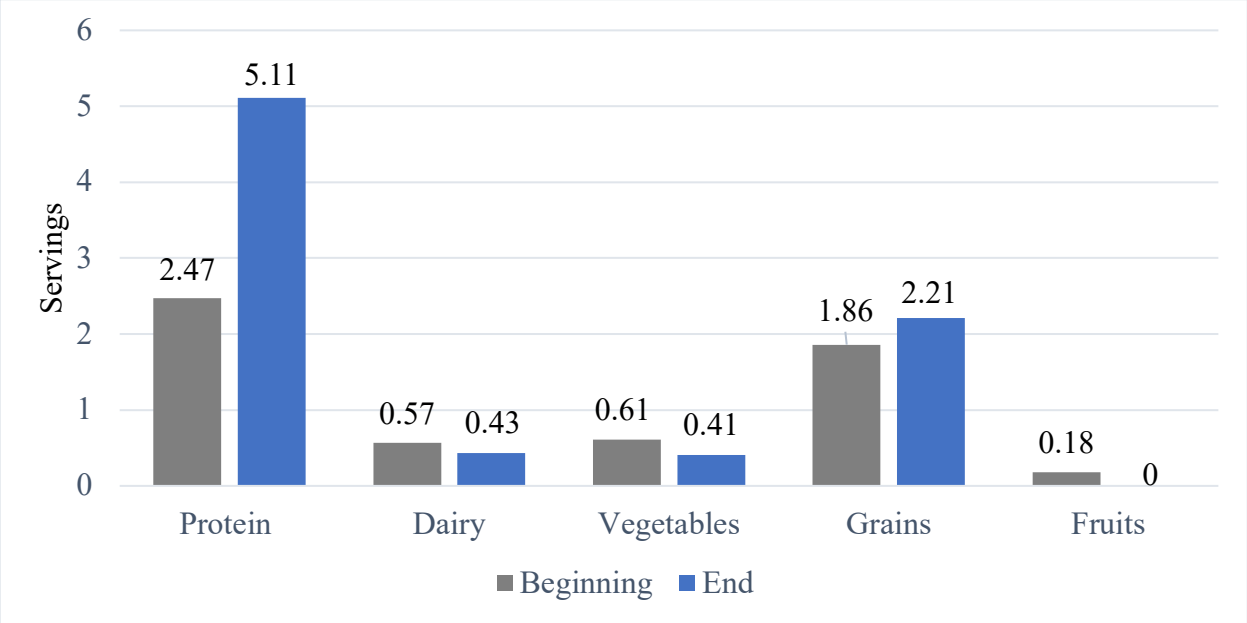

Figure 4. Average food group differences at the beginning and end of the program

Appendix G

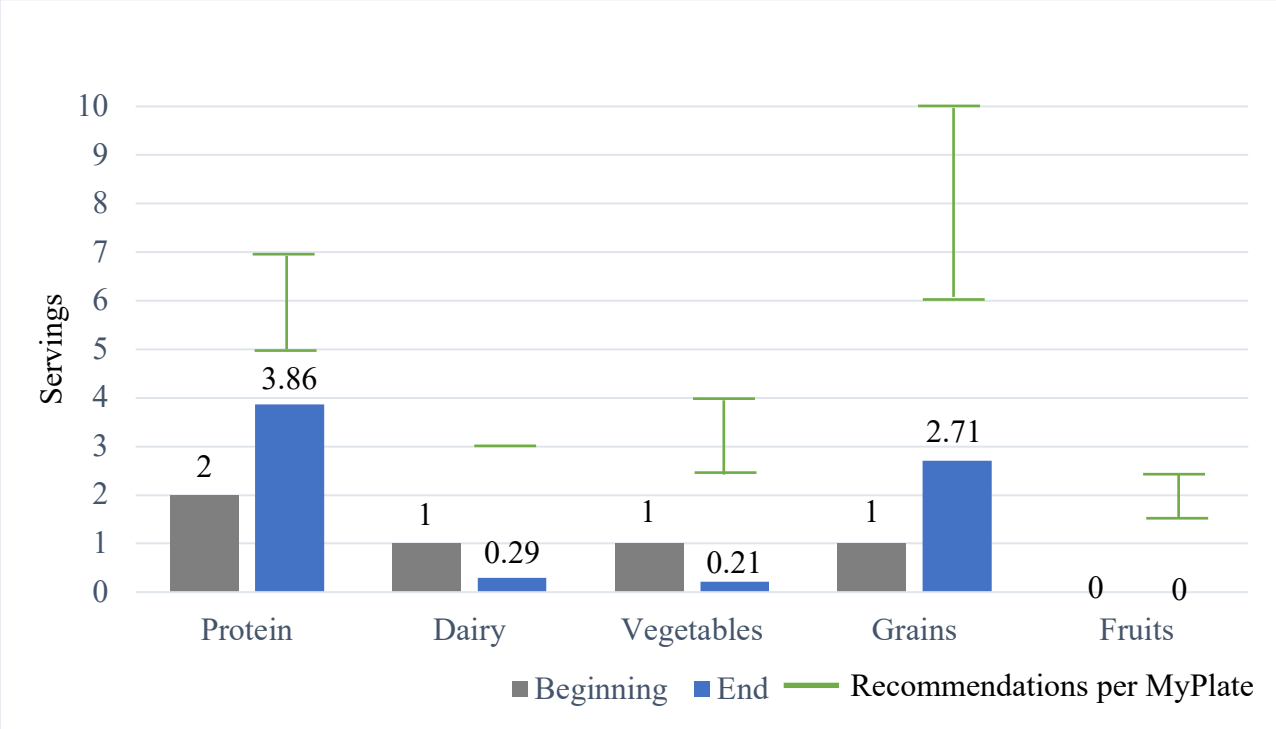

Figure 5. Average food intake and recommendations for participant 001 at the beginning and end of the program

Appendix H

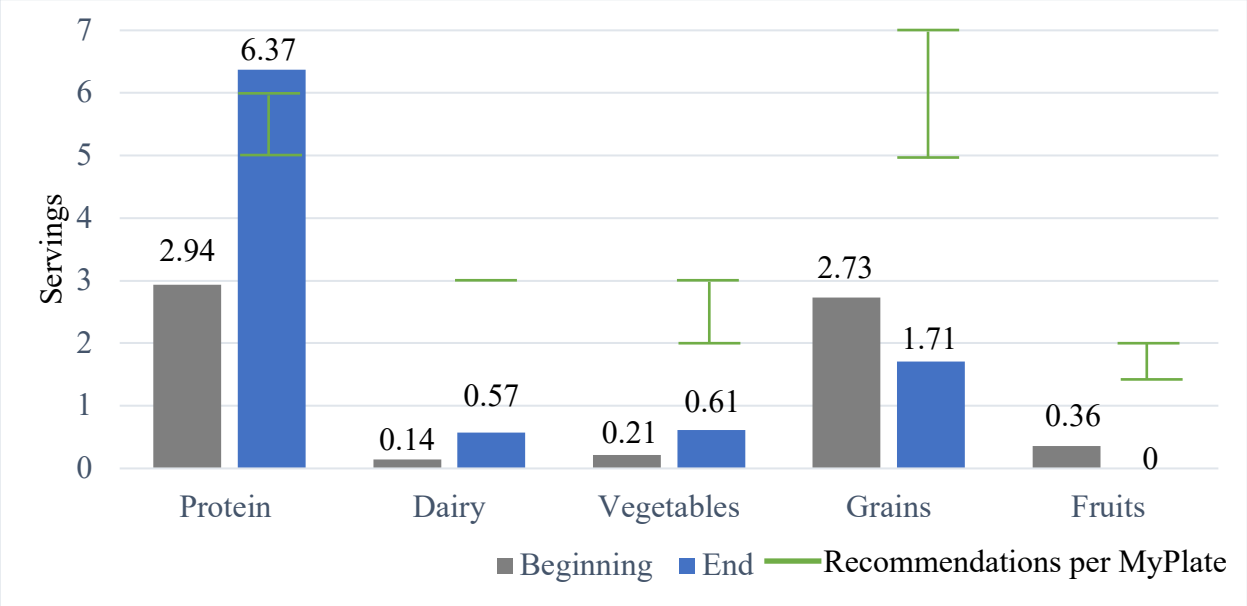

Figure 6. Average food intake and recommendations for participant 002 at the beginning and end of the program

Appendix I

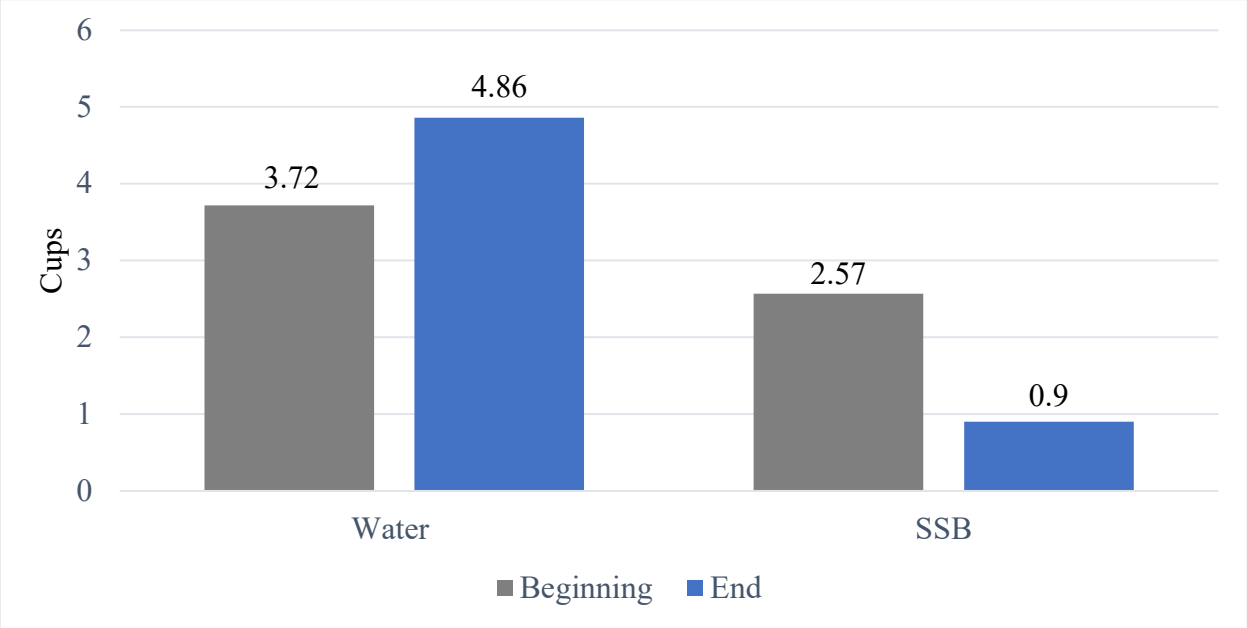

Figure 7. Average water intake and average SSB differences at the beginning and end of the program

Appendix J

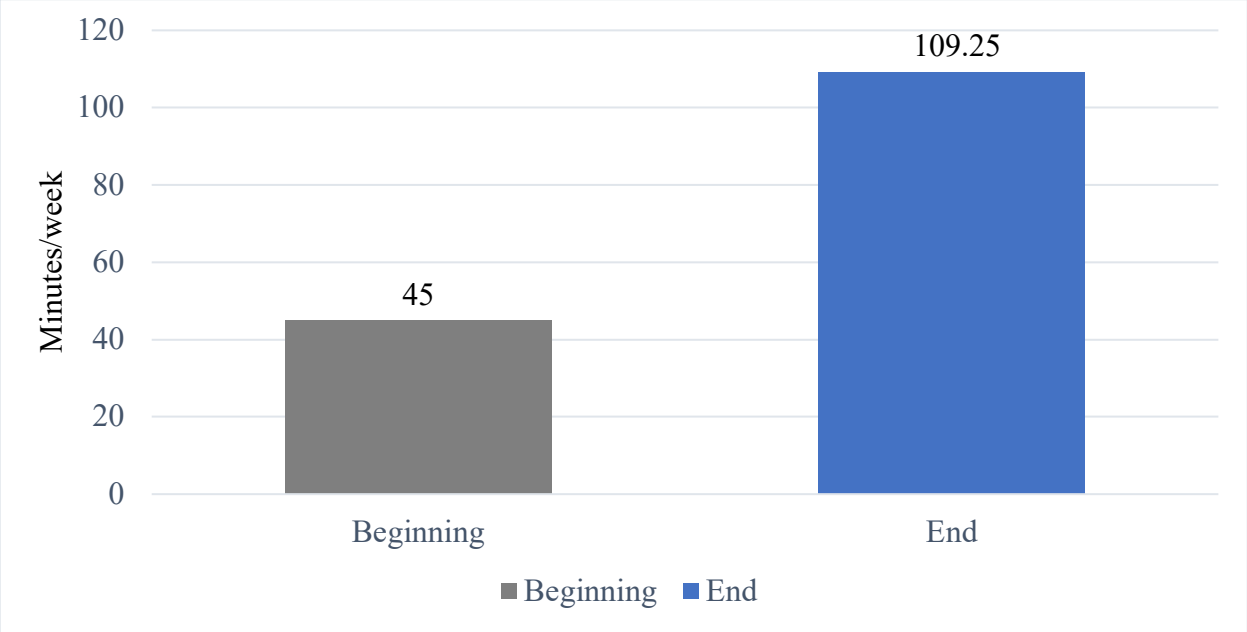

Figure 8. Average physical activity differences at the beginning and end of the program

Appendix K

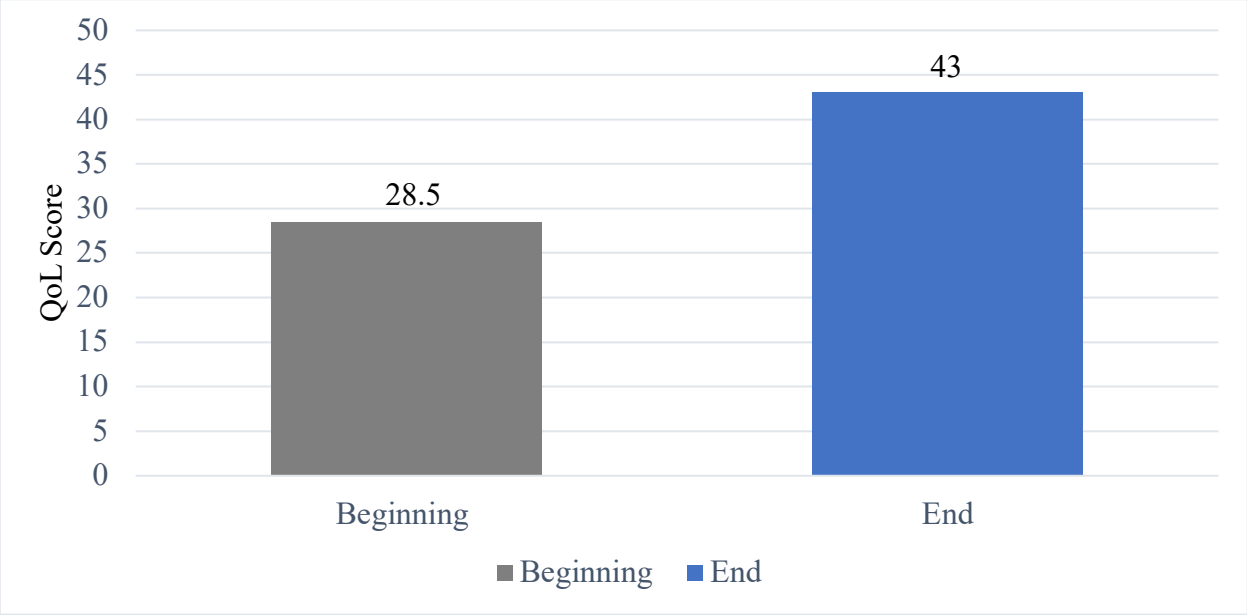

Figure 9. Average QoL score at the beginning and end of the program