

Introduction of Important Lifestyle Modifications to Prediabetes Patients At an Urban Family Primary Care Setting



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Abstract

Purpose:

The purpose of this DNP quasi-experimental project is to introduce important lifestyle modifications to prediabetes patients at an urban family primary care setting. With the introduction of a food and exercise log, weight monitoring pre and post-study and 2 remote 15-minute group counseling sessions in a 4-week study period, the end goals include weight loss, increase in physical activity and improved food choices in pre-diabetic subjects.

Methodology:

The Rutgers University Library, Pubmed, and reputable organizations such as the CDC and the American Diabetes Association (ADA) websites were utilized and searched using key terms. In light of the Covid-19 pandemic, the methodology of this project was adjusted to adhere to Rutgers University's social distancing guidelines. To avoid direct study participant contact, the co-principal investigator (PI) facilitated subject recruitment, requesting for consent and group counseling Zoom follow ups remotely at the project site for HIPAA compliance.

Results:

Out of 20 potential participants, $n=7$ consented to participate as subjects in this research study. The results are as follows: 3 subjects dropped out mid-study, 2 subjects reported weight loss, 2 subjects reported weight gain, 4 subjects reported eating smaller portions and chose healthier options in their diet and 4 subjects reported at least 30 minutes of physical activity once a week. Unfortunately, 0 subjects completed the food and activity log and 0 subjects attended both group counseling sessions.

Conclusion:

Utilizing evidence-based screening tools can be effective in recognizing patients who may be at risk for prediabetes. In that manner, referral for Hgb A1c testing, introduction of lifestyle modifications and continuing evaluation and education can help mitigate the progression of prediabetes to diabetes.

Keywords: Prediabetes diabetes, screening tool, referral, follow up, hgb A1c

Background

Prediabetes is "a serious health condition in which blood sugar levels are higher than normal, but not high enough yet to be diagnosed as type 2 diabetes" (CDC, 2019). Prediabetes is a precursor to T2DM (Murphy & Winmill, 2013). It is a reversible condition but if left undiagnosed or untreated, approximately two-thirds of those affected will develop T2DM. People who are at risk usually present with hallmark indicators such as obesity, age, a family member with type 2 diabetes, reduced amount of physical activity, a history of gestational diabetes or are of the African American, American Indian, Asian American or Hispanic heritage. Another risk factor is smoking (CDC, 2019).

The chosen project site was located in Essex County. For a county with a population of 798,975 (United States Census Bureau, 2019), the prevalence of diabetes in adults 18 years and older is 10.4%. It is considered high on the list of counties with a prevalence of diabetic adults in New Jersey (NJDOH, 2017). Studies have shown that screening of prediabetes in patients is critical. Early detection and screening can mean early intervention and treatment

Hemoglobin A1c is one of the primary tests to assess and evaluate an individual's glycemia status (Sacks, 2012) It is used to measure "the percentage of your red blood cells that have sugar-coated hemoglobin" (CDC, 2018). Although it is also used in conjunction with glucose testing, "Hgb A1c in the blood reflects the average glucose over the preceding 8-12 weeks" (Sacks, 2012, p.2674) in contrast to glucose testing that can get modified by different factors such as food intake, stress level, medication or activity at the time of the test (Sacks, 2012). Hgb A1c requires no fasting, blood samples can be taken at any time of the day, has very little biological variability and the samples are stable (Sacks, 2012).

There is overwhelming evidence in research that shows lifestyle modifications that include weight reduction, physical activity and incorporating a healthy, well-balanced diet can prevent prediabetes and/or delay diabetes progression (Galaviz, Narayan, Lobelo & Weber, 2015). This parallels the goal of the National Diabetes Education Program to increase physical activity and improved nutrition for those with prediabetes (Daftarian & Bowen, 2020).

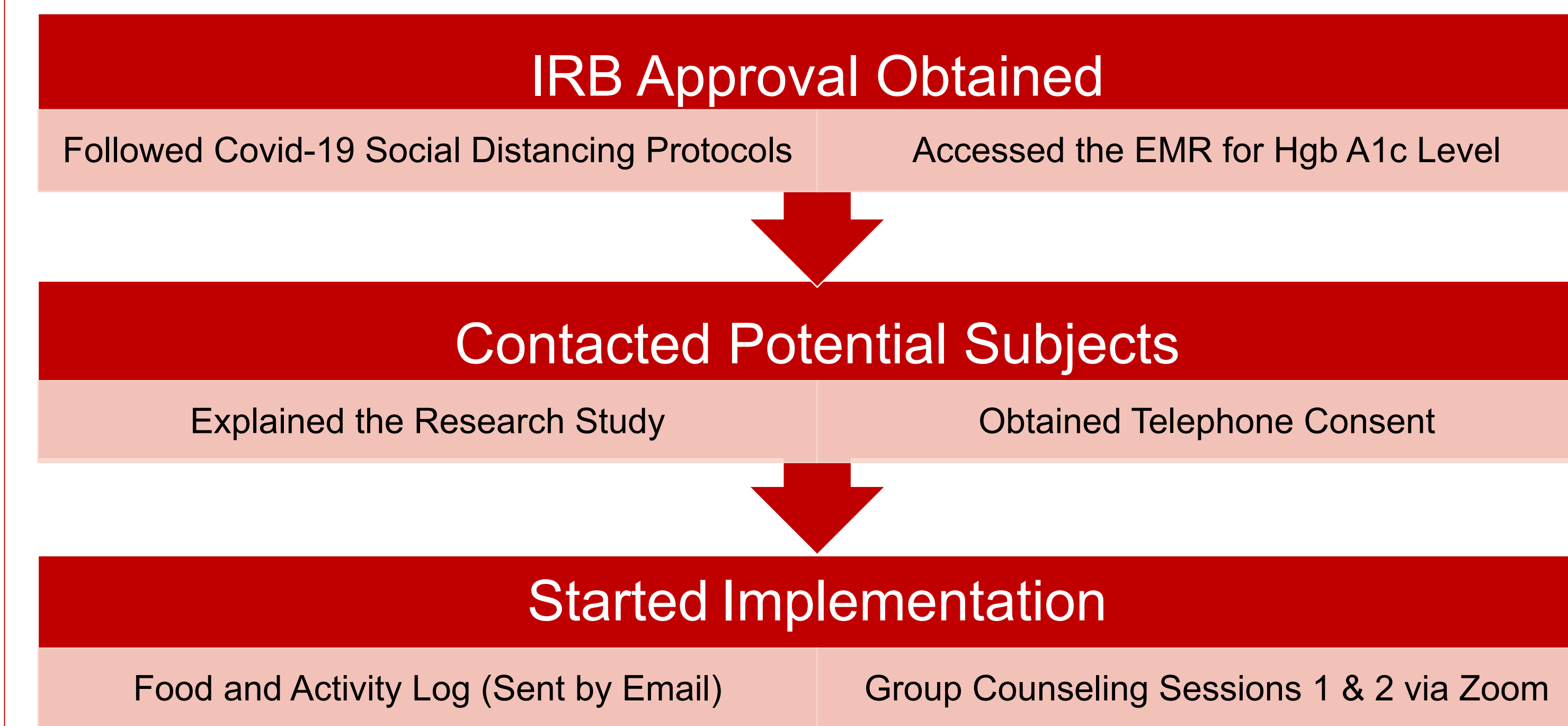
Methodology

This project is a quasi-experimental project. Systematic sampling was adopted to recruit the subjects in the study.

Inclusion and Exclusion Criteria:

Patient Inclusion Criteria:	Patient Exclusion Criteria:
<ul style="list-style-type: none"> Registered patient in the EMR (In the alphabetical order list of patients in the EMR, starting from patient number 2 onwards, every 2nd patient on the list is selected (patient 2, 4, 6, and so on) until N=20 is obtained. New or established patient Non-pregnant Hgb A1c result between 5.6% to 6.5% within the last year English speaking patient Phone and Internet access 	<ul style="list-style-type: none"> Diagnosis of diabetes with Hgb A1c of >6.5% Less than 18 years of age Currently pregnant Non-English speaking patient No phone or internet access

Research Procedures:



Study Duration:

The recruitment process started on April 27, 2021. The four-week study window started on April 30, 2021 and ended on May 21, 2020. The final data collection was finalized on May 21, 2020.

Results

Table 1: Hgb A1c

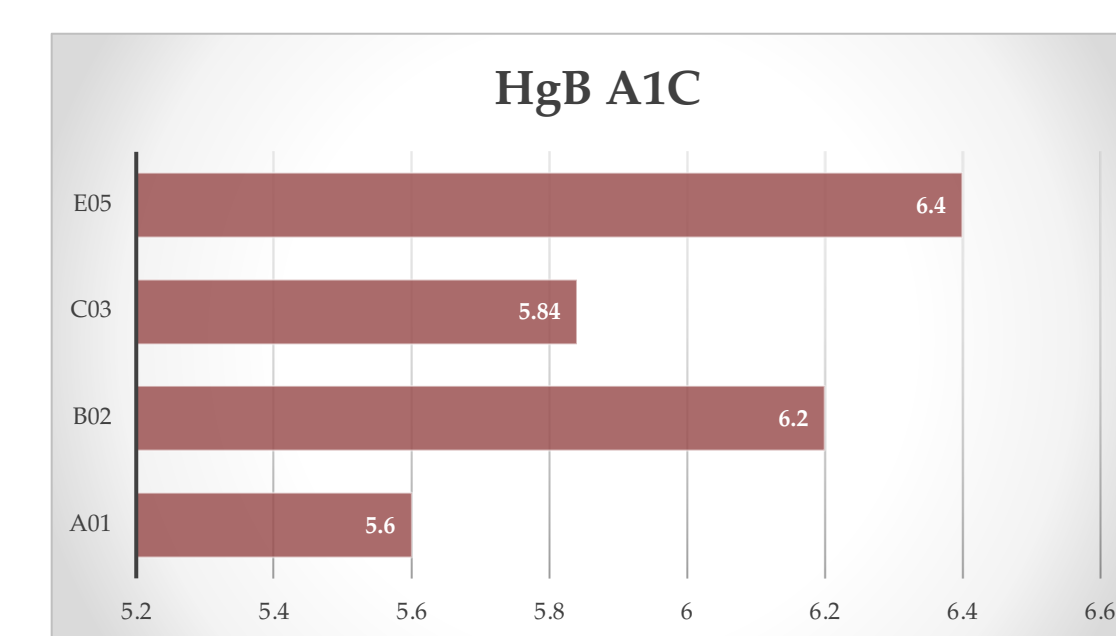


Table 2: Total Weight Loss



Table 3: Pre & Post Intervention Weight

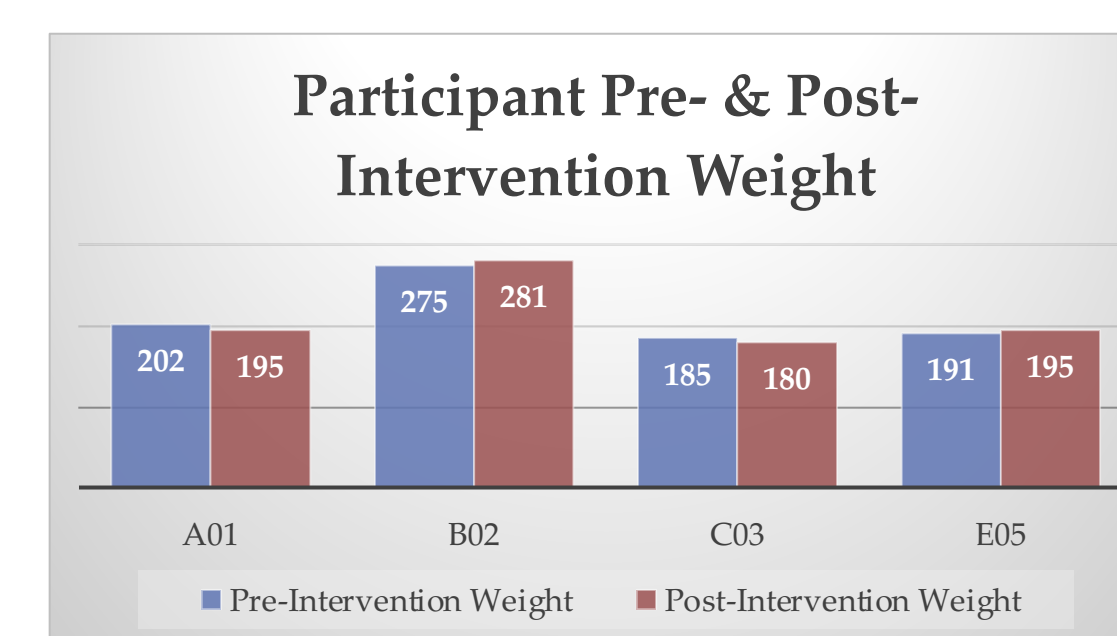
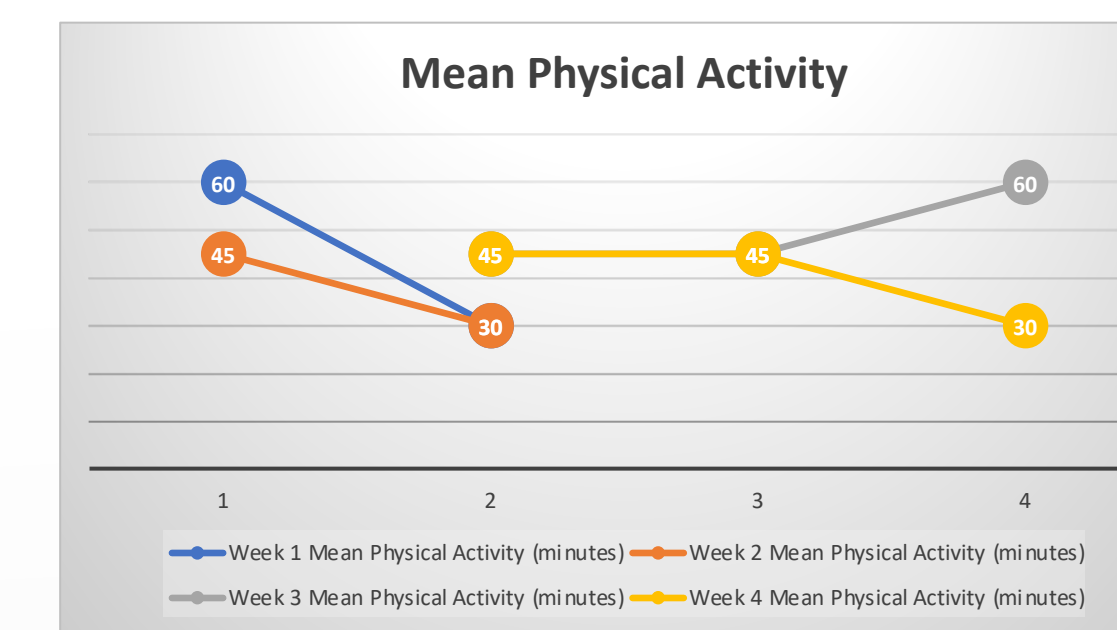
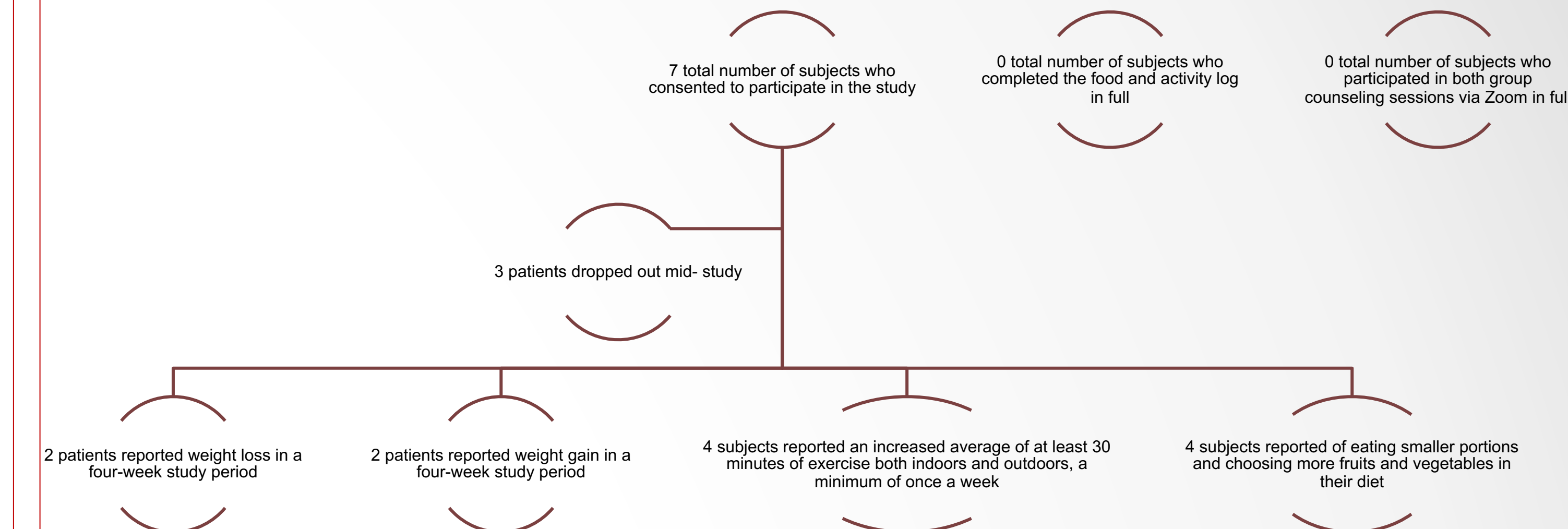


Table 4: Mean Physical Activity



Discussions



Outcomes:

- No statistically significant correlations between Hgb A1c level, pre- and post-intervention weight loss, total weight loss and time spent exercising, $p>.05$.

Limitations:

- Covid-19 restrictions
- Decreased subject compliance

Recommendations:

- Longer study duration
- Increase number of subjects
- Consider a mobile food and activity logging app
- Encourage PCP to continue with Hgb A1c testing and prediabetes screening

Conclusion

Prediabetes is a precursor to diabetes and needs to be taken with serious care. Screening for prediabetes in primary care is a reliable, easy and quick process to start a provider-patient conversation about the importance of evaluation, baseline Hgb A1c level, education, lifestyle changes and follow up. Utilizing an evidence-based screening tools can be effective in recognizing patients who may be at risk for prediabetes. In that manner, referral for Hgb A1c testing, introduction of lifestyle modifications and continuing evaluation and education can help mitigate the progression of prediabetes to diabetes.

Implications

Healthcare Quality:

Increasing awareness and risk stratification of individuals with prediabetes may help physicians understand potential interventions that may help decrease the percentage of patients in their panels in whom diabetes develops. Early intervention may contribute to ongoing efforts to make healthcare more affordable and accessible, avoid disease progression to diabetes and complications such as cardiovascular diseases, neuropathy and amputations and possibly save the patient's life.

Practice:

This is an opportunity for the PCP to initiate early counseling and education about lifestyle changes in all patients regardless of race or ethnicity. With a baseline Hgb A1c level, it is also easy for the PCP to monitor the patients accordingly and manage their care as they are evaluated over time.

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