

Abstract

Purpose: The Nutritarian Women's Health Study (NWHS) is a longitudinal hybrid effectiveness-implementation study that seeks to determine the role of a nutrient-dense plant-rich (NDPR) diet on the incidence and progression of chronic diseases. This arm of the study is aimed at investigating the effectiveness of a Nutritarian diet on pregnancy-related health outcomes specifically anxiety, postpartum depression, and pregnancy-induced nausea.

Background: Psychological distress such as depression and anxiety are major health issues among pregnant women. Overweight and obese individuals are more likely to experience elevated antenatal and postpartum depression symptoms during pregnancy. Following a NDPR diet has been associated with weight reduction, decreased risk of hypertensive disorders such as preeclampsia, and maternal mortality.

Methods: Baseline data is collected from the Nutritarian Women's Health Study. Participants are asked to complete five pregnancy specific self-reported questionnaires on their overall pregnancy, Generalized Anxiety Disorder-7, Edinburgh postnatal depression, PUQE, and postpartum along with the general NWHS surveys.

Conclusions: This NDPR dietary longitudinal investigation seeks to combine the elements of clinical effectiveness and implementation which can provide for more effective strategies and rapid translational gains for clinical and public health practice.

Methods and Materials

Inclusionary Criteria:

- ✓ Female
- ✓ 18 years and older
- ✓ United States resident
- ✓ Online access
- ✓ Pregnant
- ✓ Enrolled in the Nutritarian Women's Health Study

Participants: Participants continue to be recruited through social media, direct marketing, and nutrition related events for the general study. The sample size of this arm of the study is 34 participants. Mean participant age is 34.61 years \pm 6.82. 97% of participants identify as not Hispanic or Latino and 94% identify as White. The majority of participants have an average household income of \$70,000 per year or more.

Procedures: The participants are asked to complete five pregnancy specific self-reported questionnaires on their overall pregnancy, Generalized Anxiety Disorder (GAD-7), Edinburgh Postnatal Depression, and the Pregnancy Unique-Quantification of Emesis (PUQE). Once the participant gives birth they will receive a general postpartum questionnaire. Along with these questionnaires, participants are asked to complete general NWHS surveys such as the Nutritarian Health Indicator questionnaire four times per year.

Data Collection: Participants who identify as pregnant in the Nutritarian Health Indicator questionnaire are sent the additional pregnancy specific questionnaires. All data is self-reported and electronically collected using Research Electronic Data Capture (REDCap).



Introduction

Nutrient-dense, plant-rich diets (NDPR), such as the dietary pattern recommended for this study, have been proven to be safe and effective in clinical applications and have been associated with: weight reduction (Sutcliffe et al., 2016; Sarter et al., 2008); lipid management (Fuhrman et al., 2015; Jenkins et al., 2006); glycemic control in diabetes (Yokoyama et al., 2014); inflammation reduction (Sutcliffe et al., 2015); perceptions of hunger (Fuhrman et al., 2010); precautionary approaches for cancer (Gonzales et al., 2014) and overall health and longevity (Hever et al., 2017).

The intent of this pregnancy arm of the Nutritarian Women's Health Study (NWHS) is to assess the pregnant participant's health trends before, during, and after delivery. The questionnaires analyze dietary intake, supplementation, the presence of generalized anxiety disorder, postpartum depression, pregnancy induced nausea, diabetes, and high blood pressure. Psychological distress such as depression and anxiety are health issues among pregnant women and their baby. Overweight and obese individuals are more likely to experience elevated antenatal and postpartum depression symptoms during pregnancy (Molyneux et al., 2014). Following a NDPR diet has been associated with weight reduction, decreased risk of hypertensive disorders such as preeclampsia, and maternal mortality (Piccoli et al., 2015; Pistollato et al., 2015).

Nausea and vomiting, often referred to as morning sickness, are common in early stages of pregnancy. Nutrient-dense diets can ameliorate such these discomforts. Diets high in refined carbohydrates and sugars lead to greater nausea during early gestation than those that are rich in vegetable and whole grain consumption (Huo, Li & Wei, 2017).

Results

For this cohort, pre-pregnancy mean BMI is 23.58 \pm 6.78 kg/m². The pre-pregnancy waist-to-height ratio is 0.48 \pm 0.08. All participants reported this pregnancy was planned and less than half the study participants (38.24%) reported that this is their first pregnancy. Only one participant used fertility treatments. For the participants that have had previous pregnancies; 38% had 1 birth, 24% had 2 births, 24% had 3 births, and 14% had 4 births. Zero participants smoke, nearly 90.91% of participants have never smoked in their lifetime while the remaining participants quit. Prior to pregnancy, 44% of participants never consumed alcohol and 48% consumed < 3 drinks per month. In the three months prior to pregnancy, zero participants reported diabetes, high blood pressure, or depression. Zero participants are currently taking medication to lower high blood pressure.

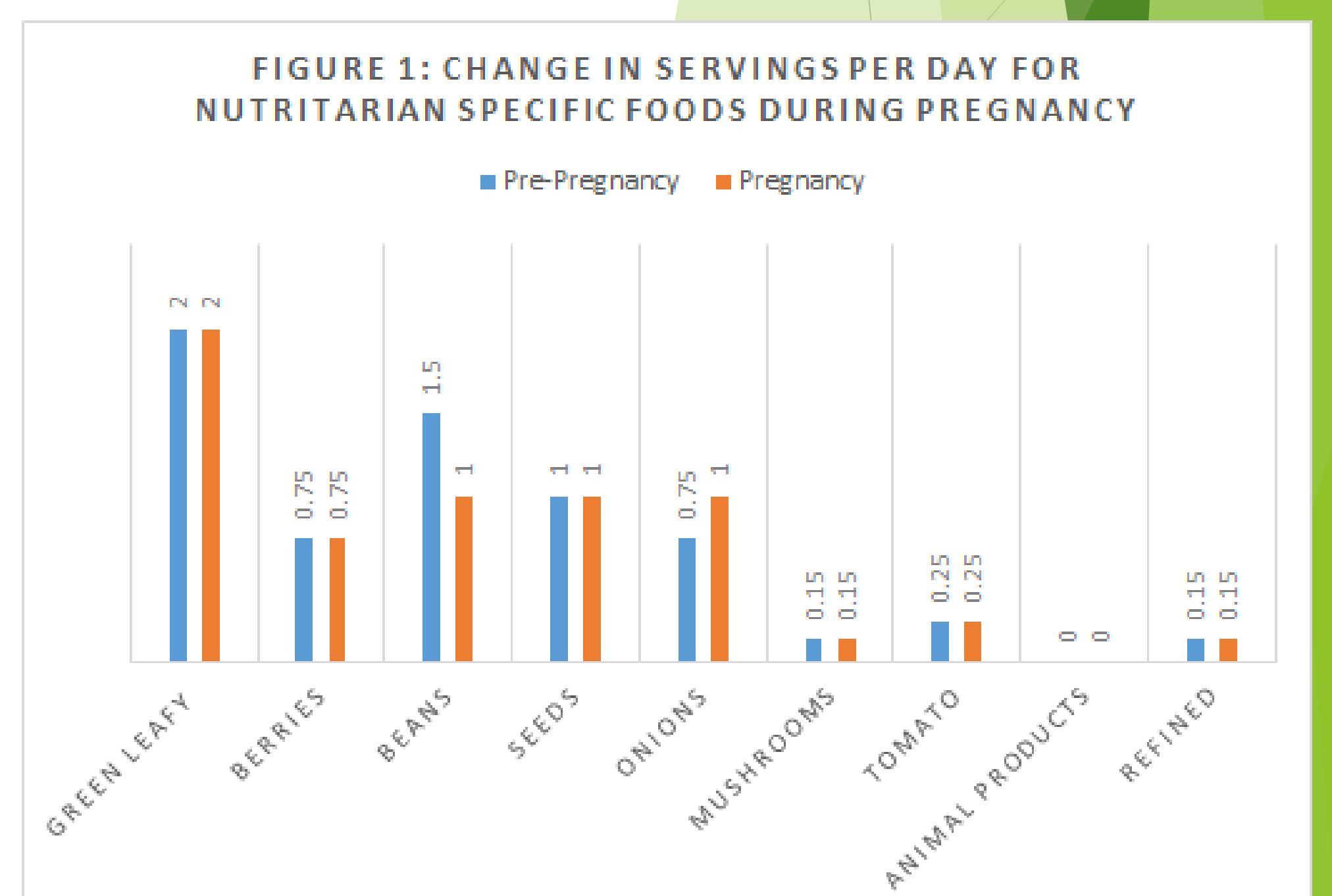
The mean number of weeks of pregnancy is 27.50 \pm 2.43. During pregnancy, over the last 30 days, the majority of participants reported consuming \geq 1-2 servings per day of leafy greens, \geq 4-6 servings per week of berries, \geq 4-6 servings per week of beans, 0 servings of meat or animal products, and 1-3 servings weekly of foods made with sugar and refined flour. Figure 1 shows there are minimal changes in dietary patterns or compliance with the Nutritarian diet pre-pregnancy and during pregnancy.

Pregnant women in this arm of the study report minimal nausea scores, an average score of 3.16 on the PUQE index (mild NVP = \leq 6, moderate NVP = 7-12, severe NVP = \geq 13). In addition, women report minimal generalized anxiety scores with a mean score of 2.33 on the GAD-7 scale, meaning little to no anxiety. Although the Edinburgh Postnatal Depression Scale is used for post-birth, this study is tracking the participants possible depressive symptoms throughout the spectrum of pregnancy. The participants report very minimal (mean 3.5) on EPDS. Overall, this small cohort of women report minimal nausea, anxiety, and depression.

Discussion & Conclusions

This work in-progress report reveals a pre-pregnancy mean BMI that is in the desirable range of 18-24.9 kg/m² with a mean WHtR 0.48 that is in the desirable range of 0.38 to \leq 0.50. This small cohort of women have minimal risk factors for pregnancy complications. Participants are well above the national average income, have a healthy pre-pregnancy BMI, no pre-existing conditions, and receive prenatal care. Furthermore, these participants have minimal lifestyle related risk factors such as smoking or alcohol consumption. As this arm of the study continues to grow, we hope to examine a less homogenous group.

Combining the elements of clinical effectiveness and implementation can provide for more effective implementation strategies and rapid translational gains for clinical and public health practice. In addition, although traditional clinical effectiveness and implementation trials are likely to remain the most common approach to moving a clinical intervention through from efficacy research to public health impact, judicious use of the proposed hybrid design could speed the translation of research findings into routine practice.



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The Nutritarian Women's Health Study is funded by the Nutritional Research Foundation. The pregnancy arm is supported by the Vitamix Foundation.

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