

Sub-Optimal Fruit and Vegetable Intake Is Associated With Hypertension and Food Insecurity Among SNAP Households: Preliminary Findings From The PROVIDE Study

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INTRODUCTION

- Over 600,000 U.S. deaths were caused by hypertension in 2022¹ and uncontrolled hypertension is more common among those living in households with low incomes.²
- Food-insecure individuals have 1.2 times higher risk of hypertension.³
- Low fruit and vegetable (F/V) intake is associated with an increased risk of hypertension and cardiovascular mortality.⁴
- Supplemental Nutrition Assistance Program (SNAP) and nutrition incentive programs, such as Double Up Oklahoma (DUO), aim to improve access to healthy foods, including fruits and vegetables (F/V), among low-income households.^{5,6}
- Little is known regarding the relationships between hypertension, food insecurity, and F/V intake among the SNAP population.
- The Produce is Vital in Diverse Environments (PROVIDE) Study aims to assess the impact of DUO fresh produce vouchers on nutrition, health outcomes, and food insecurity among those receiving SNAP benefits.

STUDY AIM

These preliminary analyses explored the association between self-reported hypertension, food insecurity, and F/V intake at baseline among SNAP recipients recruited into the PROVIDE study.



METHODS

Study Design: Preliminary cross-sectional analysis of PROVIDE study baseline data collected from April 13, 2024, to January 27, 2025.

Study Population: Adults from SNAP households residing in DUO expansion or matched-control communities in Oklahoma.

Eligibility criteria:

- Age 18 years or older
- Spent at least 25% of their SNAP benefits at participating stores
- Willing to participate in follow-up

Measures:

- Hypertension: self-reported diagnosis.
- Food security: U.S. Adult Food Security Survey Module.
- Fruit and vegetable (F/V) Intake: Estimated using the validated Block Fruit/Vegetable/Fiber screener.

Statistical Analysis: All statistical analyses were performed in SAS v9.4.

RESULTS

- Most participants (n=595) were female (80.6%) and 78.8% had incomes below \$20,000 (**Figure 1**).
- Average age = 39.9 years (range: 19-88 years).

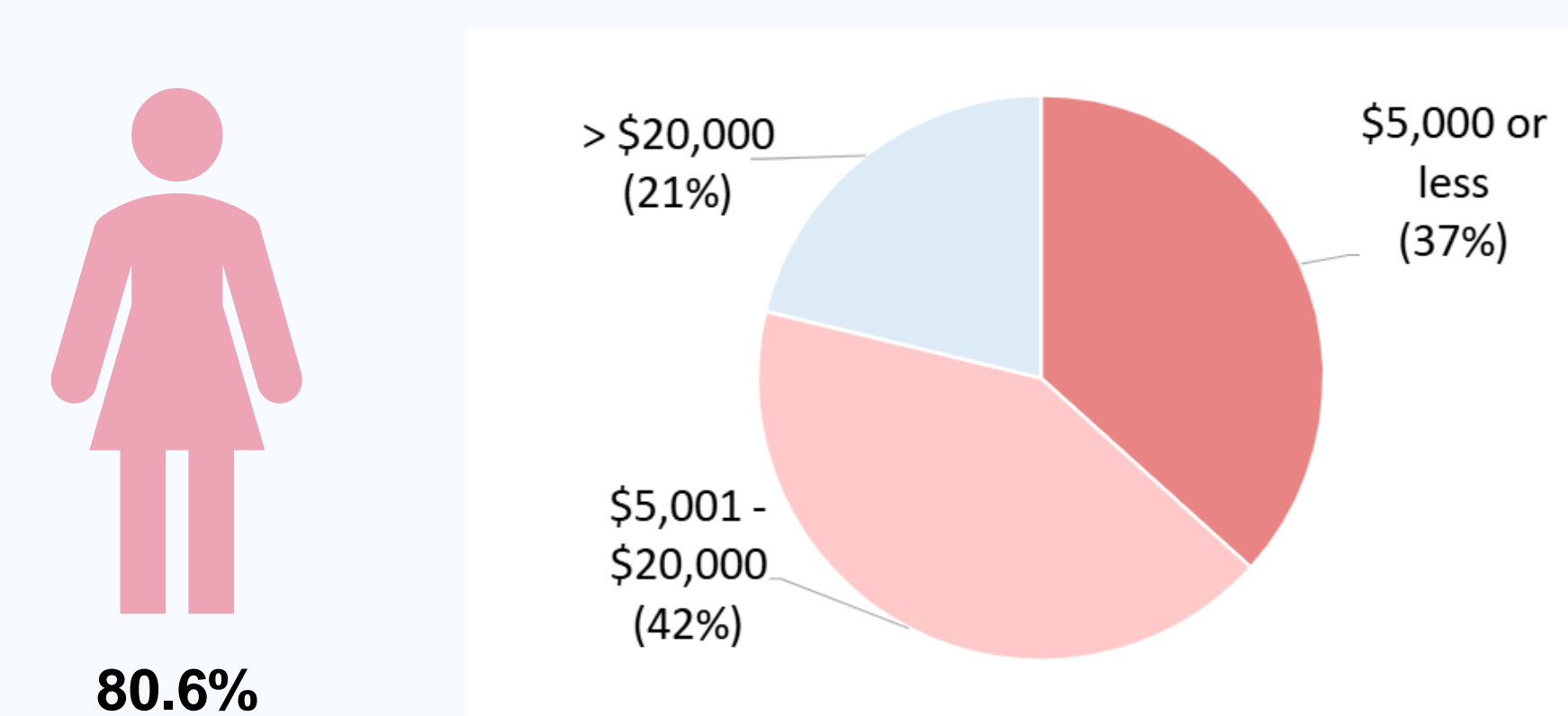


Figure 1. Demographics at baseline of PROVIDE Study participants (n = 594), 04/13/24-01/27/25.

- Even with SNAP assistance, 78.1% of participants reported food insecurity.
- 32.6% had a self-reported diagnosis of hypertension.
- Hypertension was significantly higher among those reporting food insecurity (35.1% vs. 23.9% p = 0.0153) (**Figure 2**).

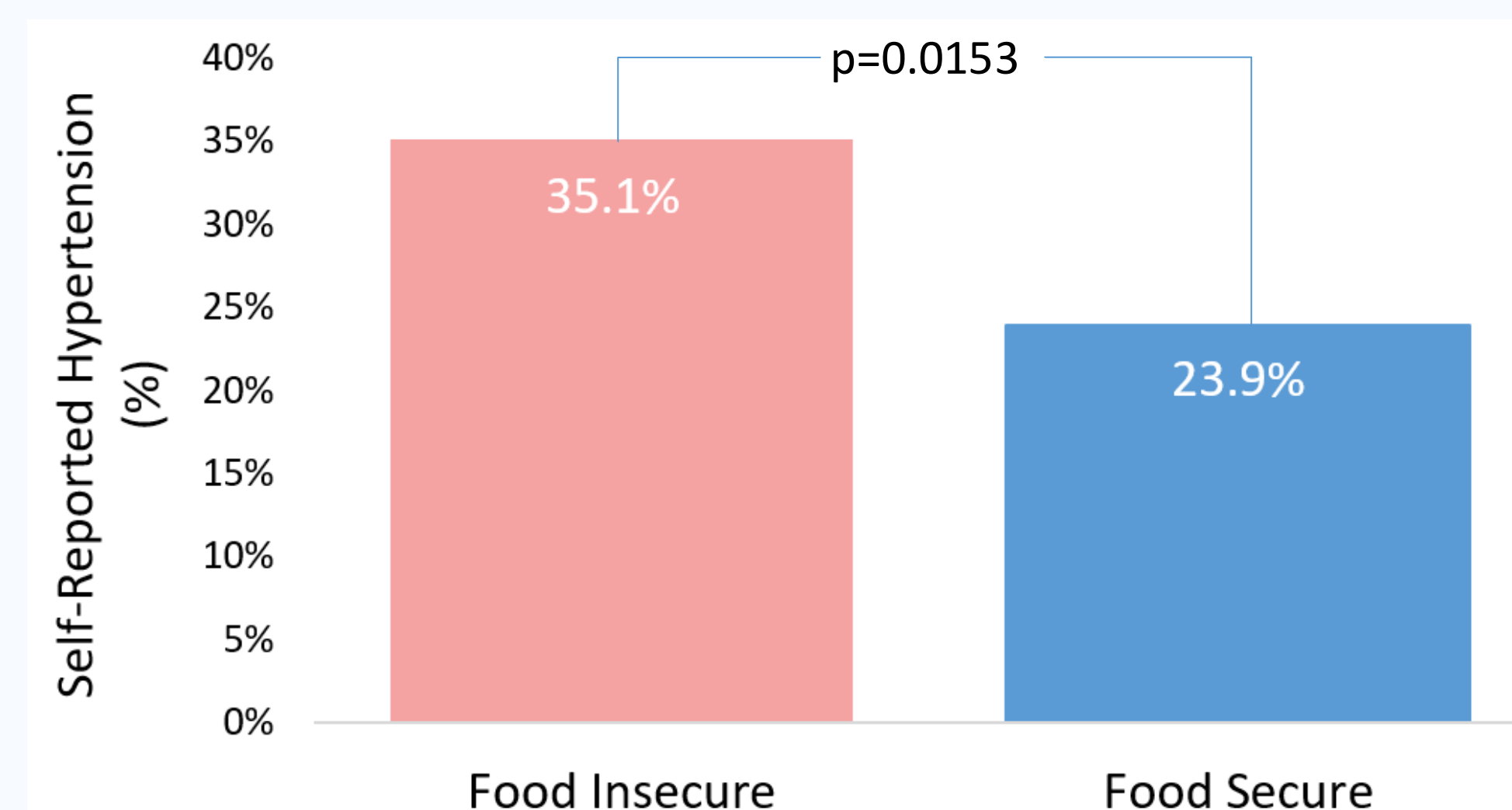


Figure 2. The percentage of food insecure and food secure PROVIDE Study participants with self-reported hypertension (n = 594), 04/13/24-01/27/25.

- Most (71.1%) reported consuming at least one serving of fruit and/or vegetable (F/V) daily.
- On average, participants consumed 3.5 servings of F/V per day.
- Food insecure participants were less likely to consume F/Vs daily compared to food secure participants (68.1% vs 81.5%; p=0.0028) (**Figure 3**).

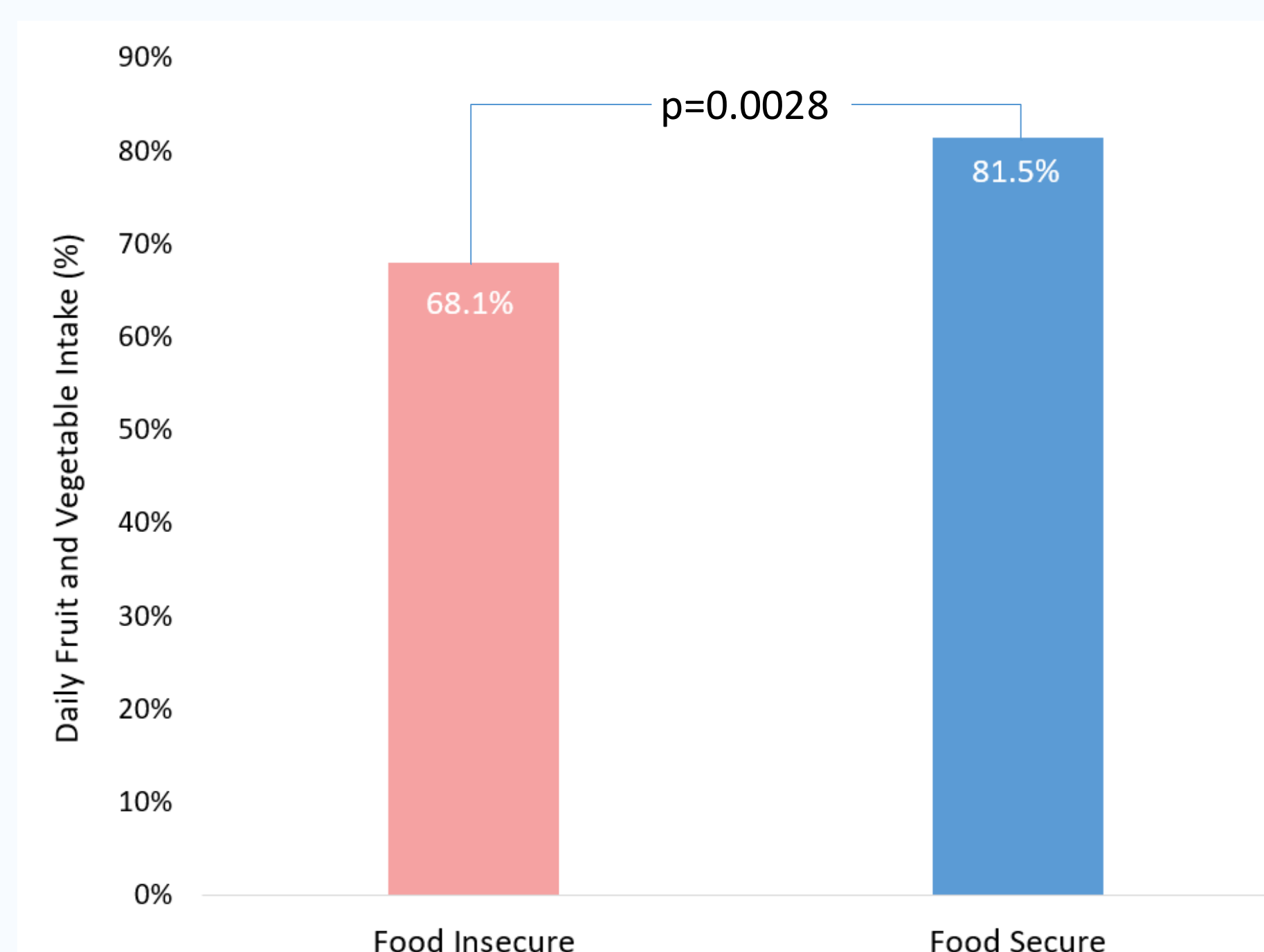


Figure 3. The percentage of food insecure and food secure PROVIDE Study participants with daily intake of fruits and vegetables (n = 594), 04/13/24-01/27/25.

- Those with hypertension reported lower F/V intake compared to those without hypertension (M=3.0 vs M=3.7; p=0.0002) (**Figure 4**).

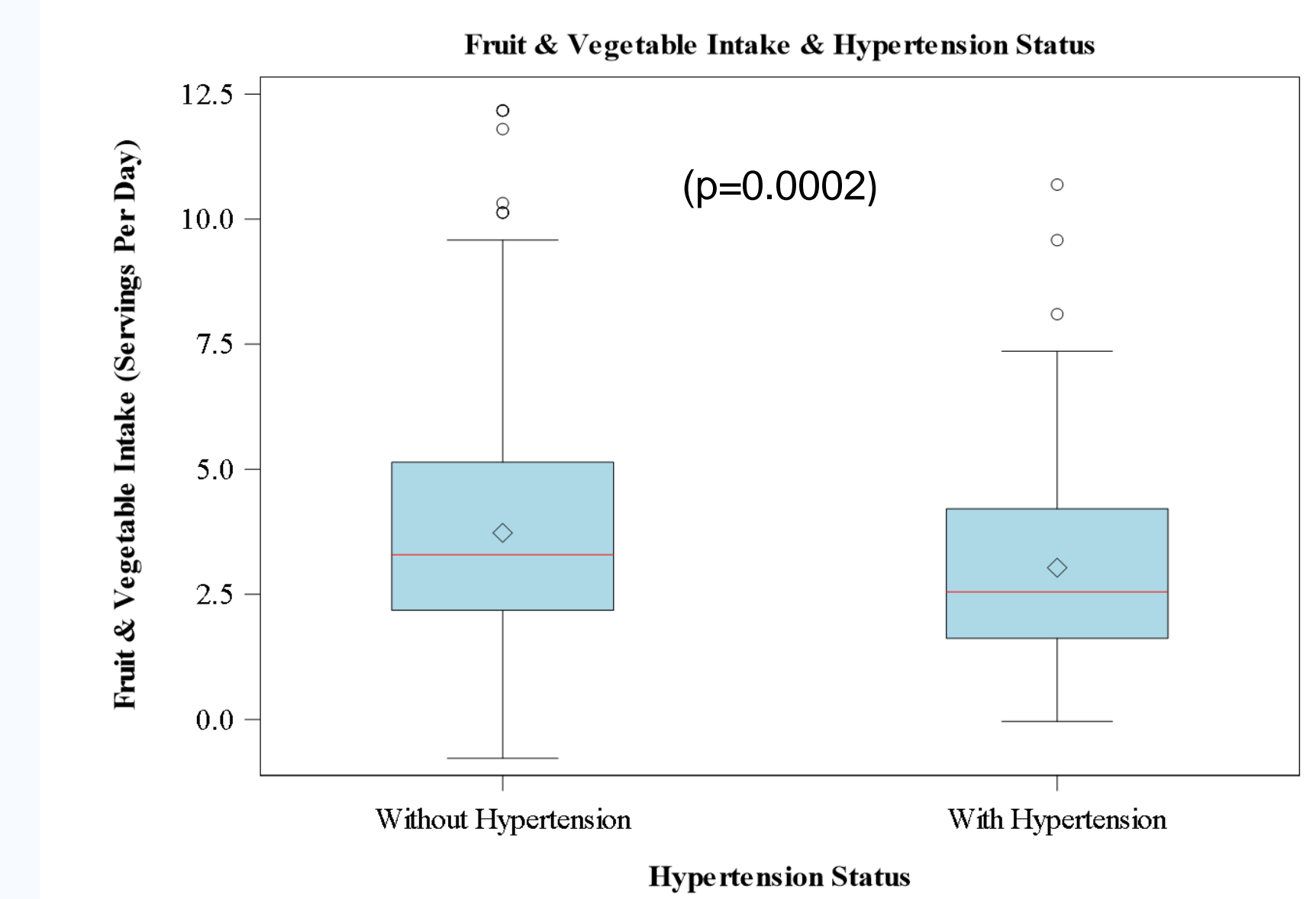


Figure 4. The Mean daily fruit and vegetable intake with self-reported hypertension of PROVIDE Study participants (n = 594), 04/13/24-01/27/25.

DISCUSSION

- Despite receiving SNAP benefits (food assistance), the majority (78%) of PROVIDE study participants reported food insecurity at baseline.
- Similar to other studies of low-income populations, our analyses of SNAP recipients found that adults with hypertension or food insecurity reported lower daily F/V intake.^{3,4}

Study limitation:

- Self-report of hypertension diagnosis may underestimate hypertension due to limited access to healthcare in this population. This underestimate may bias findings toward the null.

CONCLUSION

- These analyses highlight that lower F/V intake is associated with food insecurity and hypertension among adults in SNAP households.
- Future research is needed to determine whether improving F/V access could improve food security and hypertension in this population.

FUNDING ACKNOWLEDGMENT

Double Up Oklahoma is a program of Hunger Free Oklahoma. This work is supported by the Gus Schumacher Nutrition Incentive Program, project award no. 2022-70415-41628, from the U.S. Department of Agriculture's National Institute of Food and Agriculture, as well as support from the Oklahoma Department of Human Services (OKDHS), the Tobacco Settlement Endowment Trust (TSET), Ascension St. John, and other matching funders. Hunger Free Oklahoma is an equal opportunity provider.

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