

# FOOD PHARMACY IMPLEMENTATION TO REDUCE CARDIOVASCULAR RISK THROUGH NUTRITIONAL AWARENESS

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UVA

SCHOOL *of* NURSING

# BACKGROUND: CARDIOVASCULAR DISEASE

## National Statistics (CDC, 2023; AHA, 2024)

- Leading cause of Death
- 127 million US adults

## Estimated Cost (AHA, 2024)

- About \$320 billion in 2022
- 21% National Healthcare Expenditure
- Out-of-pocket expenses exceed \$5,200 per year



# BACKGROUND: WEALTH DETERMINES HEALTH

CVD risk/outcomes strongly associated with income (Frenn & Whitehead, 2021)

- Disproportionately affects low-income populations: Higher incidence (Abdalla et al., 2020)
- Increased morbidity & Mortality (Minhas et al., 2023)
- Reduced life expectancy by 10-15 years (NAS et al., 2017)
- Greater barriers (Althoff et al., 2015)

Fresh produce may lower CVD risk by 28% & risk of premature death by 31% (Harvard Health, 2017)

- Most important behavioral factor (NIH, 2022)
- **Poverty reduces access to healthy foods** (Althoff et al., 2015)



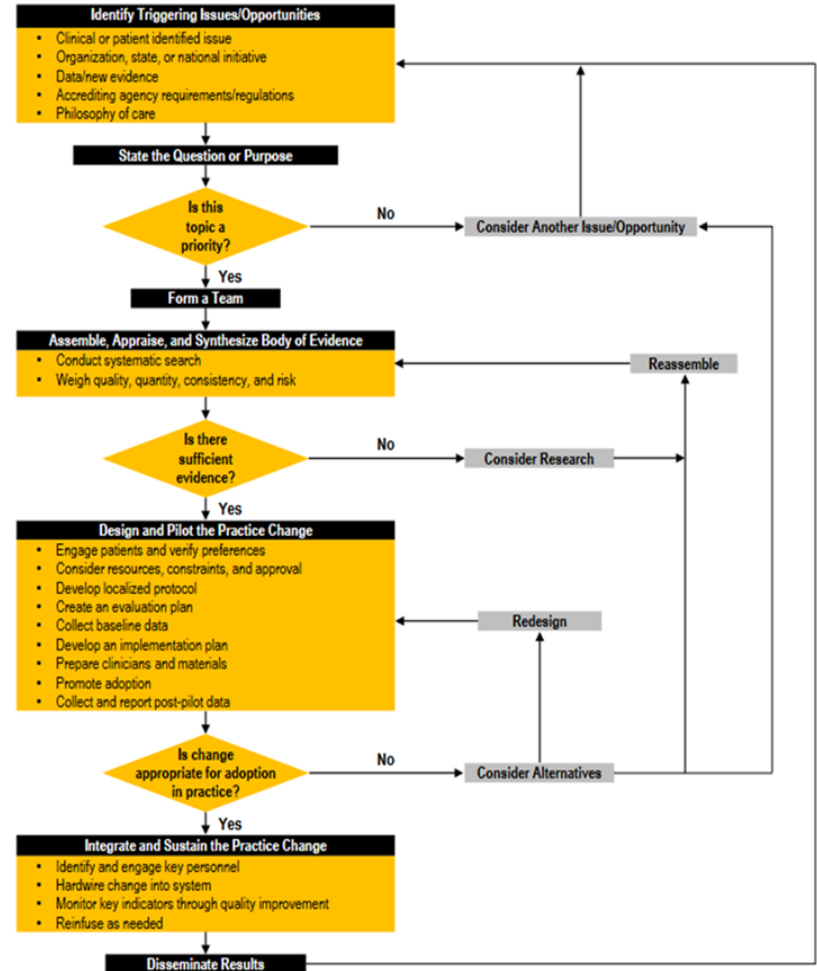
# PURPOSE

To implement a food pharmacy aimed at reducing cardiovascular disease risk by improving nutritional awareness and access for low-income residents. This project attempted to empower the community, allowing residents to identify local resources and invest in their own neighborhood for lasting change.

# EBP Framework: Iowa Model Revised

1. Identify triggering issues & opportunities
2. Form a question
3. Form a team
4. Assemble, appraise, & synthesize
5. Design & pilot the practice change
6. Integrate & sustain the practice change
7. Disseminate results

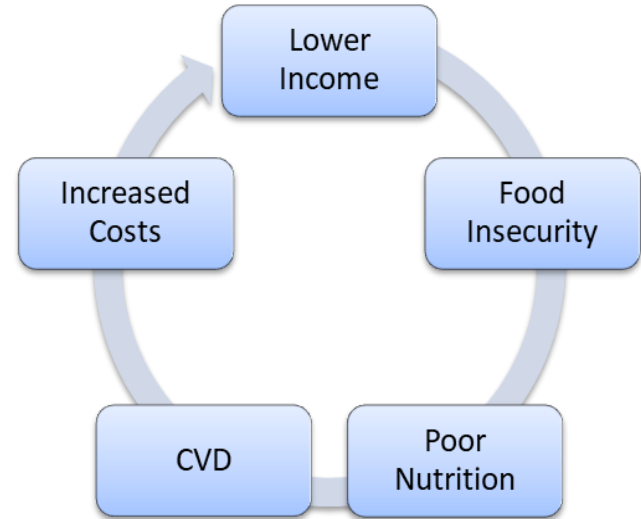
(Iowa Model Collaborative, 2017)



# STEP 1: IDENTIFY TRIGGERING ISSUES

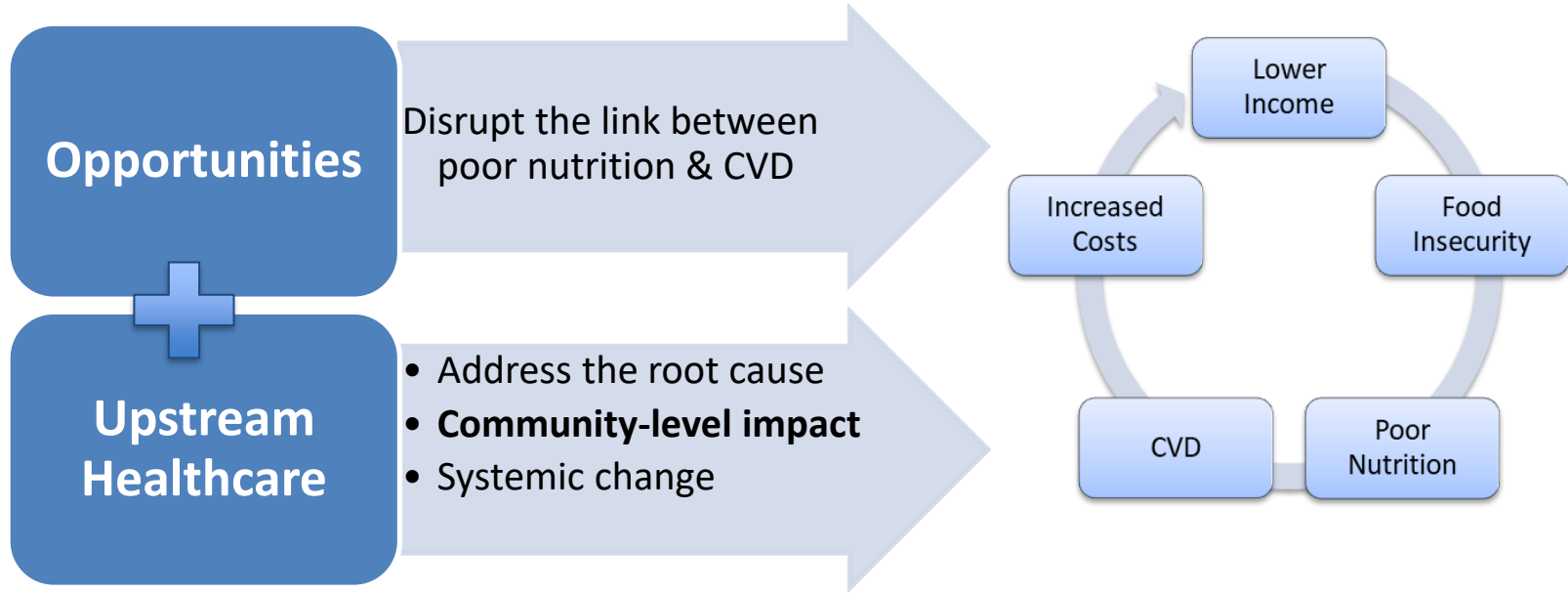
Norfolk VA:

- People die at twice the national average for CVD
- About 20% of Norfolk residents below the poverty line
- Several food deserts in low-income neighborhoods



(City of Norfolk, 2024; Sentara Health, 2022)

# STEP 1: IDENTIFY OPPORTUNITIES



## STEP 2: FORM A QUESTION

What is the effect of community-based nutrition programs in lowering CVD risk in low-income populations?





# STEP 3: FORM A TEAM

## Interdisciplinary Team Collaboration

- Food Bank leadership & Health Equity Manager, Volunteers, & cardiac nurse unit coordinator, local Healthcare Agency, local SON

**Setting:** Underserved, Urban Community Food Hub

- Transformative approach to tackling food insecurity by offering comprehensive community support system



## STEP 4: ASSEMBLE, APPRAISE, AND SYNTHESIZE

- Inclusive Database Search
  - PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science, and Google Scholar
- Search terms for each database
  - nutrition AND ("*heart disease*" OR "*cardiovascular disease*") AND *community-based* AND *income*
- Limitations
  - English, last 20 years, Level A or B only,

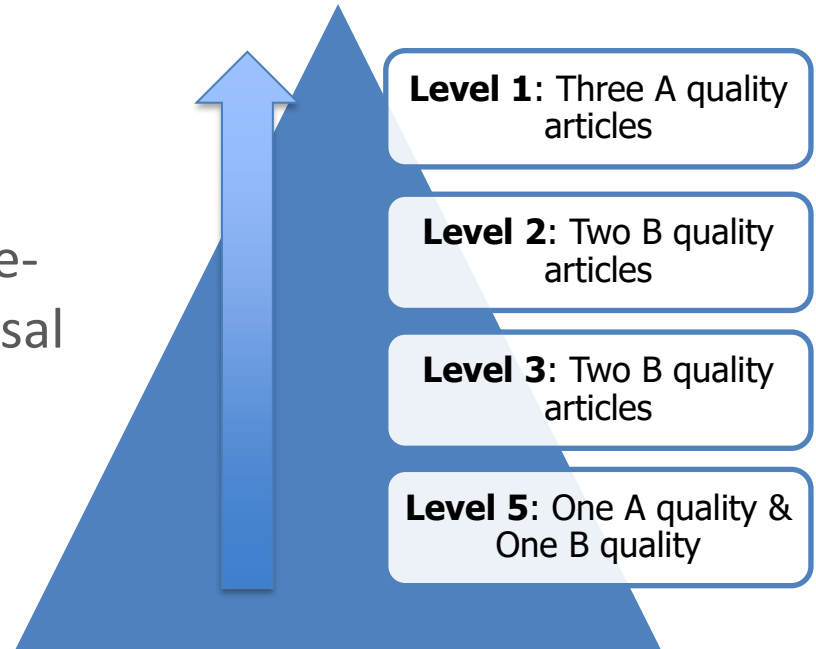
# STEP 4: ASSEMBLE, APPRAISE, AND SYNTHESIZE

**Initial search:** 393 articles

**Appraisal:** 11 articles

- Johns Hopkins Nursing Evidence-Based Practice Evidence Appraisal Tool
- 2 level-C articles excluded

**Synthesis:** 9 Articles



# STEP 4: SYNTHESIS SUMMARY

**Four Themes:** All were effective community-based strategies for reducing CVD risk in low-income groups

## **Behavior Modifications**

Weight management, Promotion of physical activity, Healthy eating through dietary change

## **Education-based Interventions**

Examined the impact of education on nutritional awareness, behavior and lifestyle, and CVD risk through various interventions and outcomes

## **Multicomponent Interventions**

A combination of behavior change, healthy lifestyle promotion, education, medication adherence/optimization, and patient monitoring

## **Manipulating the Food Environment**

Interventions included: Food pantries/hubs, Food Pharmacies, Community Gardens or Kitchens, and Community-supported agriculture

# STEP 4: FOOD PHARMACY CONCEPT

**“Food is a powerful tool for preventing and managing health conditions” (AHA, 2024)**

Programs designed to increase the access to and consumption of healthful foods to help them prevent or manage health conditions

- Multicomponent interventions
- Focus on removing barriers to healthy eating
- Effective in reducing CVD risks in low-income groups

# STEP 5: DESIGN AND PILOT THE PRACTICE CHANGE



**Intervention:** Implement a Food Pharmacy at the Community Hub



**Aim:** to reduce CVD risk by removing barriers to healthy eating, increasing knowledge regarding nutrition, and integrate or coordinate nutrition interventions between the local community and healthcare system

# STEP 5: DESIGN AND PILOT THE PRACTICE CHANGE

## Population

Low-income adults  $\geq 19$  years utilizing the Food Bank.

- Adults aged 19+
- Low-income (within 200% of the federal poverty threshold)
- Supplement diet using the food bank

## Ethical Considerations

- Respect for the Individual
- Justice
- Right to Autonomy

# STEP 5: NEEDS ASSESSMENT

## Local Hospital Agency

- Dec 2021 – March 2022
- 1,871 stakeholder surveys and 17,294 community member surveys

## Food Bank Organization

- Winter 2023
- 47 Food Bank Clients

## Food Pharmacy Team

- Summer 2024
- 15 Food Bank Clients

## Needs Assessment Data

- Greatest gap in services that hinders or impedes health
  - Transportation
  - **Health care access**
  - Livable wages
  - Affordable housing
  - **Nutrition education**
  - Financial literacy
  - Mental health services
- Benefits of collaboration include:
  - **Awareness** of community resources available
  - Streamlining of intake process for **improved accessibility of resources**



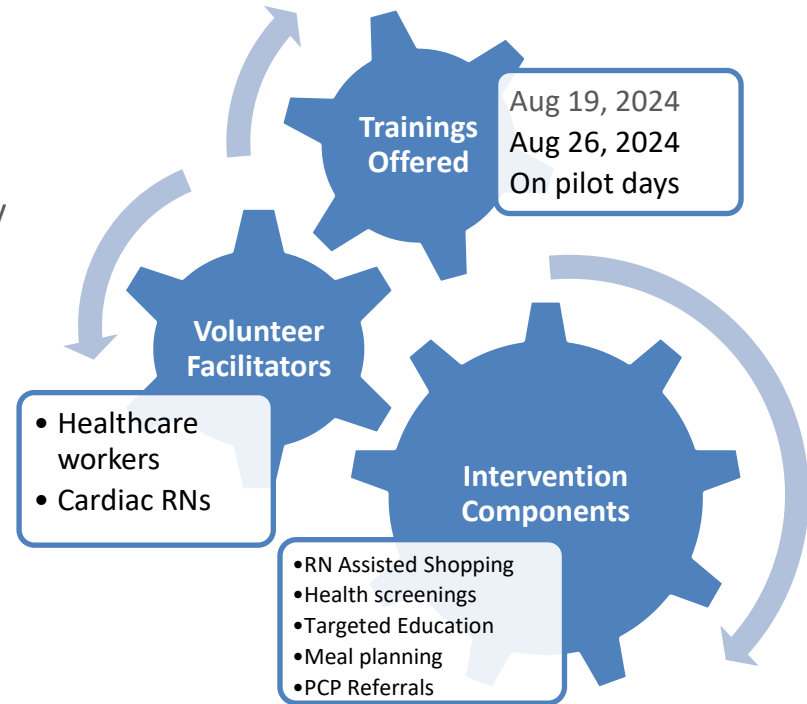
# STEP 5: THE FOOD PHARMACY PLAN

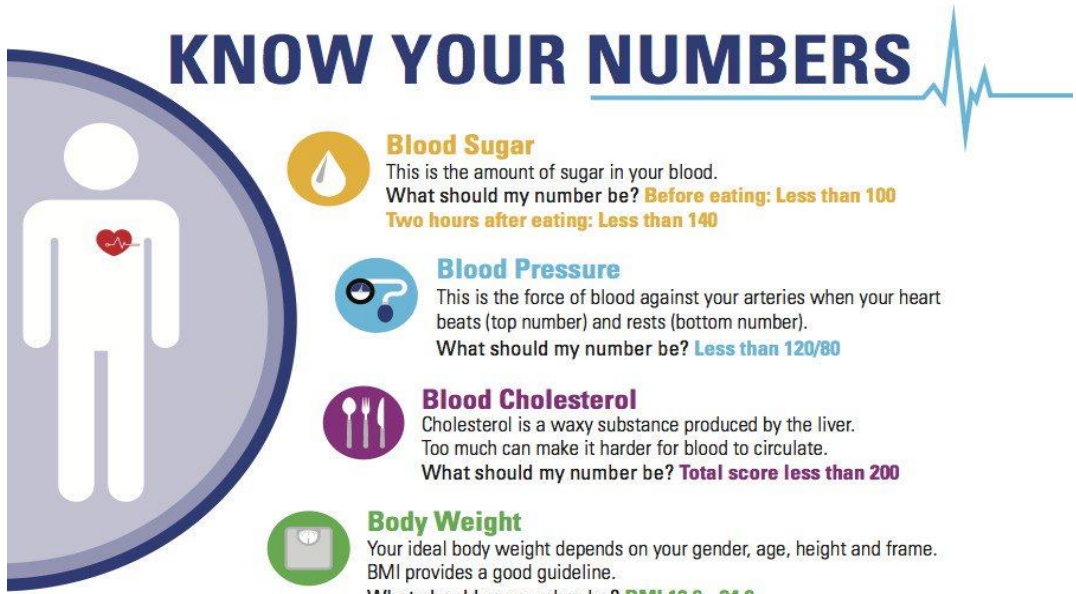




## Station 1: Screenings & Education

- Conducted Health Screenings
- Provided nutrition education
  - Focused on four CVD risks influenced by diet: Hypertension, Diabetes, Obesity, Hyperlipidemia
- Clinic Referrals
- Meal Planning (MyPlate)

## Station 2: Assisted Shopping

- Individualized nutrition & health education
- Meal Planning (MyPlate)
- Recipe Sharing



<div data-bbox="164 158 1246 758">  <h2 data-bbox="330 186 1081 245">KNOW YOUR NUMBERS</h2> <div data-bbox="450 289 531 365">  </div> <div data-bbox="548 289 1064 390"> <p><b>Blood Sugar</b>        This is the amount of sugar in your blood.        What should my number be? <b>Before eating: Less than 100</b>  <b>Two hours after eating: Less than 140</b></p> </div> <div data-bbox="500 414 581 491">  </div> <div data-bbox="598 414 1110 518"> <p><b>Blood Pressure</b>        This is the force of blood against your arteries when your heart beats (top number) and rests (bottom number).        What should my number be? <b>Less than 120/80</b></p> </div> <div data-bbox="486 546 568 622">  </div> <div data-bbox="585 546 1068 644"> <p><b>Blood Cholesterol</b>        Cholesterol is a waxy substance produced by the liver. Too much can make it harder for blood to circulate.        What should my number be? <b>Total score less than 200</b></p> </div> <div data-bbox="430 671 511 748">  </div> <div data-bbox="529 671 1105 769"> <p><b>Body Weight</b>        Your ideal body weight depends on your gender, age, height and frame. BMI provides a good guideline.        What should my number be? <b>BMI 18.6 - 24.9</b></p> </div> </div>	<div data-bbox="1273 128 1796 256"> <p><b>A1C:</b></p> </div> <div data-bbox="1273 256 1796 453"> <p><b>Blood Pressure:</b></p> </div> <div data-bbox="1273 453 1796 649"> <p><b>Cholesterol:</b></p> </div> <div data-bbox="1273 649 1796 843"> <p><b>Weight:</b></p> </div>
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## SCREENING FORM

Provided to all participants screened at the Food Pharmacy

# STEP 5: DESIGN AND PILOT THE PRACTICE CHANGE

## Focused Outcomes: Reducing CVD Risk

- **Short-term Measures**
  - Resource Coordination
  - Dietary Habits
  - Nutrition Literacy & Awareness
- **Long-term Measures**
  - Blood Pressure
  - Weight
  - A1C
  - Total Cholesterol



## STEP 5: DESIGN AND PILOT THE PRACTICE CHANGE

- **Strengths**
  - 10 Questions
  - Inexpensive
  - Reliable
- **Weakness**
  - Memory and perception based
  - Excludes ethnically-centric foods
  - Not as valid as longer tests

# STEP 5: DESIGN AND PILOT THE PRACTICE CHANGE

## Nutrition Literacy Assessment Instrument (NLit)

- Reliable and valid tool for measuring nutrition literacy in adults with nutrition-related chronic disease
- Comprehensive: assesses 6 subscales of nutrition literacy
  - Nutrition & Health
  - Energy Sources in Food
  - Household Food Measurements
  - Food Label & Numeracy
  - Food Groups
  - Consumer Skills

### Subscale: Nutrition and Health

**Directions:** Please read the text below and answer the questions that follow.

...A healthy diet is high in **nutrient-dense** foods, such as fruits, vegetables, and whole grains. A healthy diet is also low in **energy-dense** foods, refined grains, and added sugars. While these foods can provide energy, too much energy can lead to weight gain and chronic disease.

In order to follow a healthy diet, **eat more:**

- ☐ **Nutrient-dense foods:** Fruits and vegetables are examples of *nutrient-dense* foods. Plant foods are *nutrient-dense* because they provide many vitamins, minerals, and other needed nutrients. At the same time, they are low in calories. Eating more of these foods may improve weight control and decrease disease risk....[Excerpt]

**Directions:** Choose the best answer for the questions below. You may go back to the text to choose your answers.

Nutrient dense foods, such as \_\_\_\_\_ should be consumed most often.

- A. regular soda
- B. French fries
- C. an orange
- D. apple juice

### Subscale: Energy Sources in Food

These questions concern carbohydrate, protein and fat, the nutrients that supply energy to the body. **Directions:** Use what you know about nutrition to answer the following questions.

The calories in foods like olive oil and butter come from their high \_\_\_\_\_ content.

- A. vitamin E
- B. carbohydrate
- C. protein
- D. fat

### Subscale: Household Food Measurement

Sometimes we eat food in the right amounts as advised by nutrition experts and sometimes we choose smaller or larger portions than might be best to achieve a healthy diet. For each food in question, choose what you think is the right portion size. This portion may or may not be the amount you usually eat. The portion amounts given in the question are also shown in pictures.



3. Pictured at left is 1 (one) cup of rice. Is this:

- A. more than one (1) portion?
- B. less than one (1) portion?
- C. about right for one (1) portion?

Nutrition Facts	
Amount Per Serving	
Calories 0	
Total Fat 0g	
Sodium 0mg	
Total Carbohydrate 0g	
Protein 0g	
Dietary Fiber 0g	
Sugars 0g	
Saturated Fat 0g	
Trans Fat 0g	
Cholesterol 0mg	
Vitamin D 0mcg	
Calcium 0mg	
Iron 0mg	
Potassium 0mg	
Total 0g	
Percent Daily Values	
Total Fat 0%	
Sodium 0%	
Total Carbohydrate 0%	
Protein 0%	
Dietary Fiber 0%	
Sugars 0%	
Saturated Fat 0%	
Trans Fat 0%	
Cholesterol 0%	
Vitamin D 0%	
Calcium 0%	
Iron 0%	
Potassium 0%	
Total 0%	

### Subscale: Food Label and Numeracy

This Nutrition Facts Panel at right is taken from the back of a container of macaroni and cheese. How many grams of total carbohydrate would you eat in 2 cups of macaroni and cheese?

- A. 31 grams
- B. 45 grams
- C. 62 grams
- D. 75 grams

### Subscale: Food Groups

The next group of questions will give you a type of food and ask you to select the food group in which it belongs according to its nutrition value. For example, bread would be put into the grains group.

In which food group do noodles belong?

- A. Grains
- B. Vegetables
- C. Fruits
- D. Protein
- E. Dairy
- F. Fats & Oils
- G. Added Sugars

### Subscale: Consumer Skills

**Directions:** Choose the best answer for the questions that follow.

If calories are equal for one serving of each food, which provides the most healthful nutrients overall?

- A. Applesauce with no sugar added
- B. Apple
- C. Applesauce with no sugar added is equal to an apple in nutrition.



Applesauce with no sugar added



Apple

# STEP 5: DESIGN AND PILOT THE PRACTICE CHANGE

## Data Collection

- Session Dates
  - September 24, 2024
  - November 12, 2024
  - December 10, 2024
- With each visit:
  - Surveys
  - Screenings
  - Non-identifying Demographic Form

## Outcome Evaluation

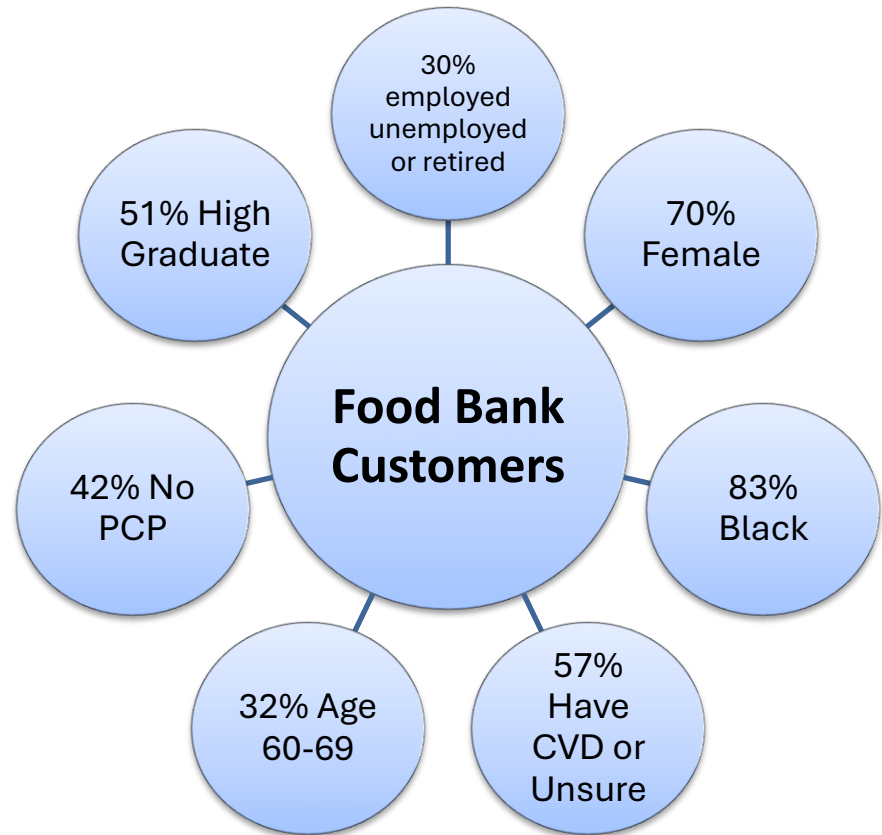
- Aggregate Data
- Compare sessions

## Data Analysis

- Descriptive Statistics
  - Qualtrics
  - Excel

# STEP 5: DATA COLLECTION

## DEMOGRAPHIC DATA

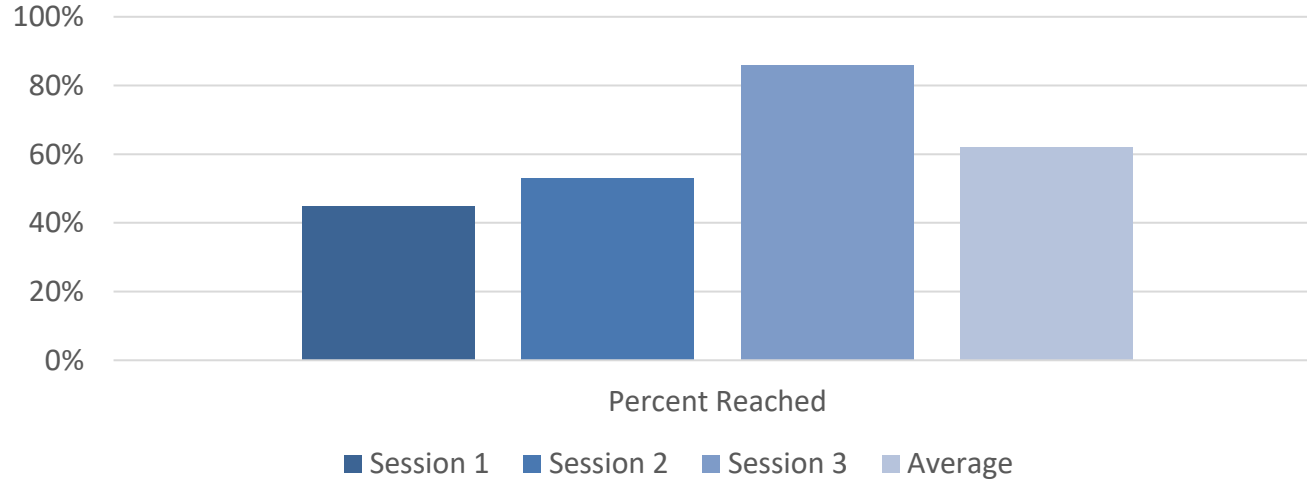


# FOOD PHARMACY VISITATION

Utilization Category	Session 1	Session 2	Session 3	Both EDU & Shopping	Total
Both Education & Shopping	0	12	18	--	30
Education	25	12	11	30	78
Assisted Shopping	0	17	32	30	79
Health Screening	25	37	47	--	109
Total Food Pharmacy Visits	50	78	108		236
PCP Referrals	7	12	9		28
Survey	44	59	45		148

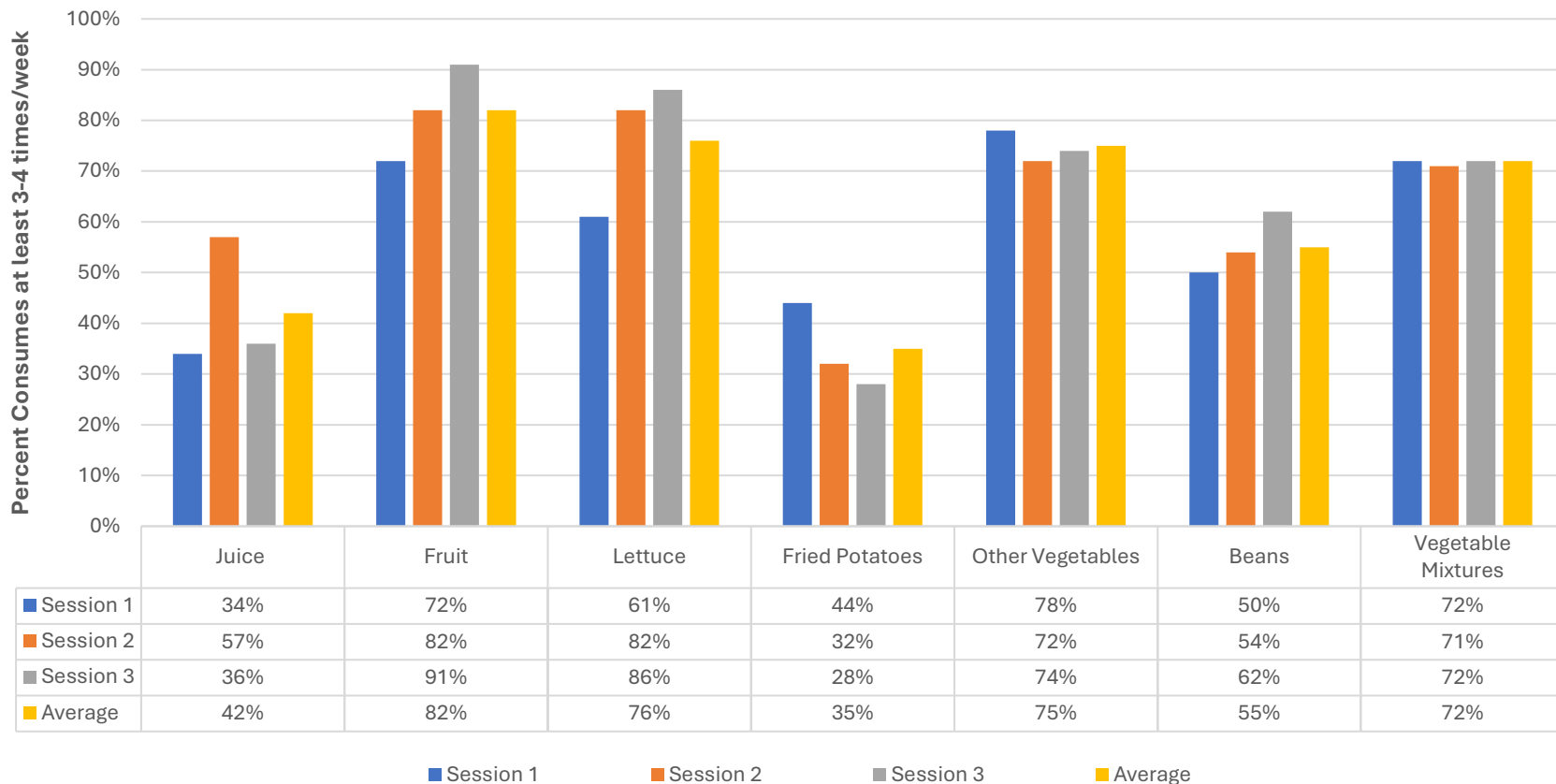


# IMPACT PERCENTAGE

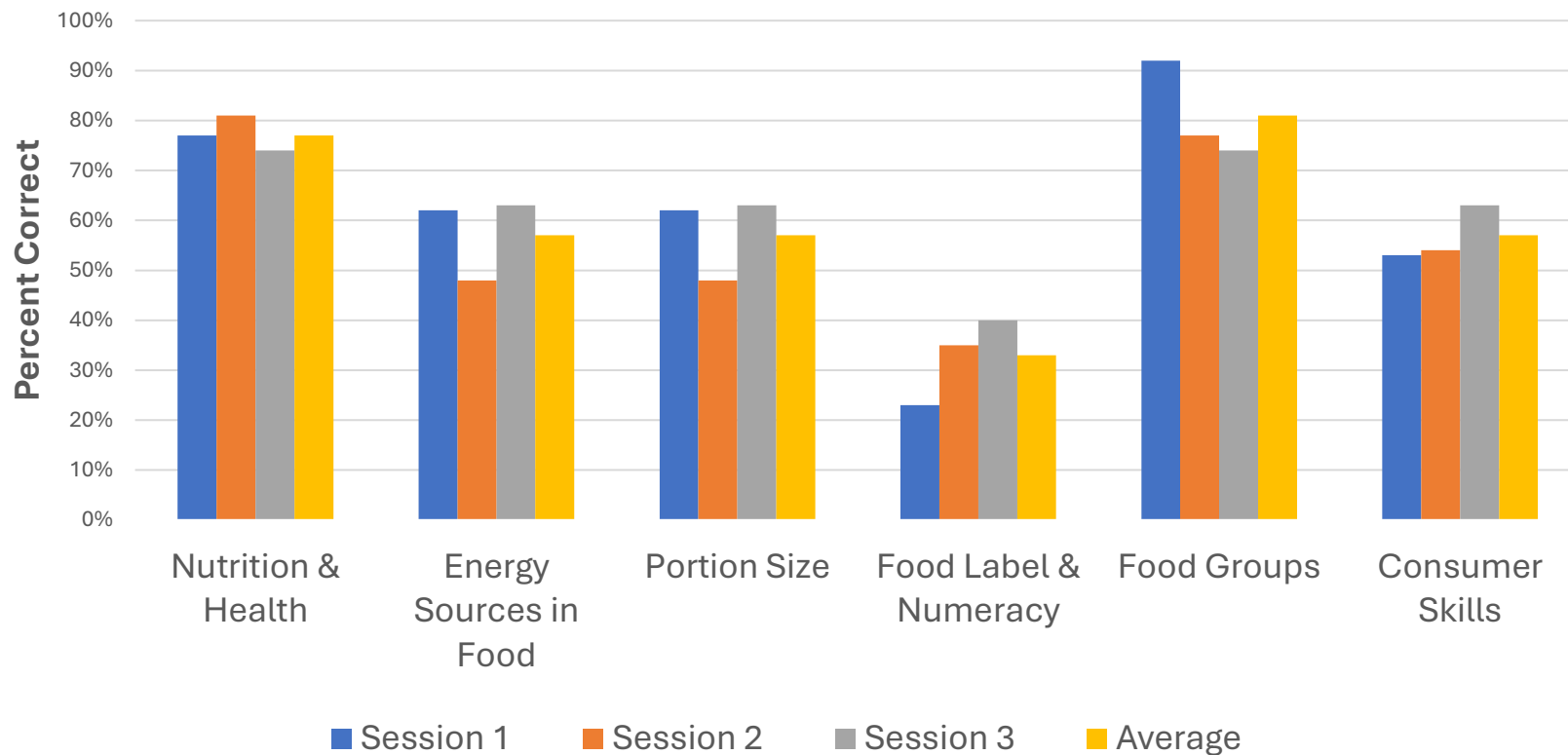


	Session 1	Session 2	Session 3	Total
Total Pharmacy Visits	50	78	108	236
Total Food Bank Clients	110	147	125	382
Impact Percent	45%	53%	86%	62%

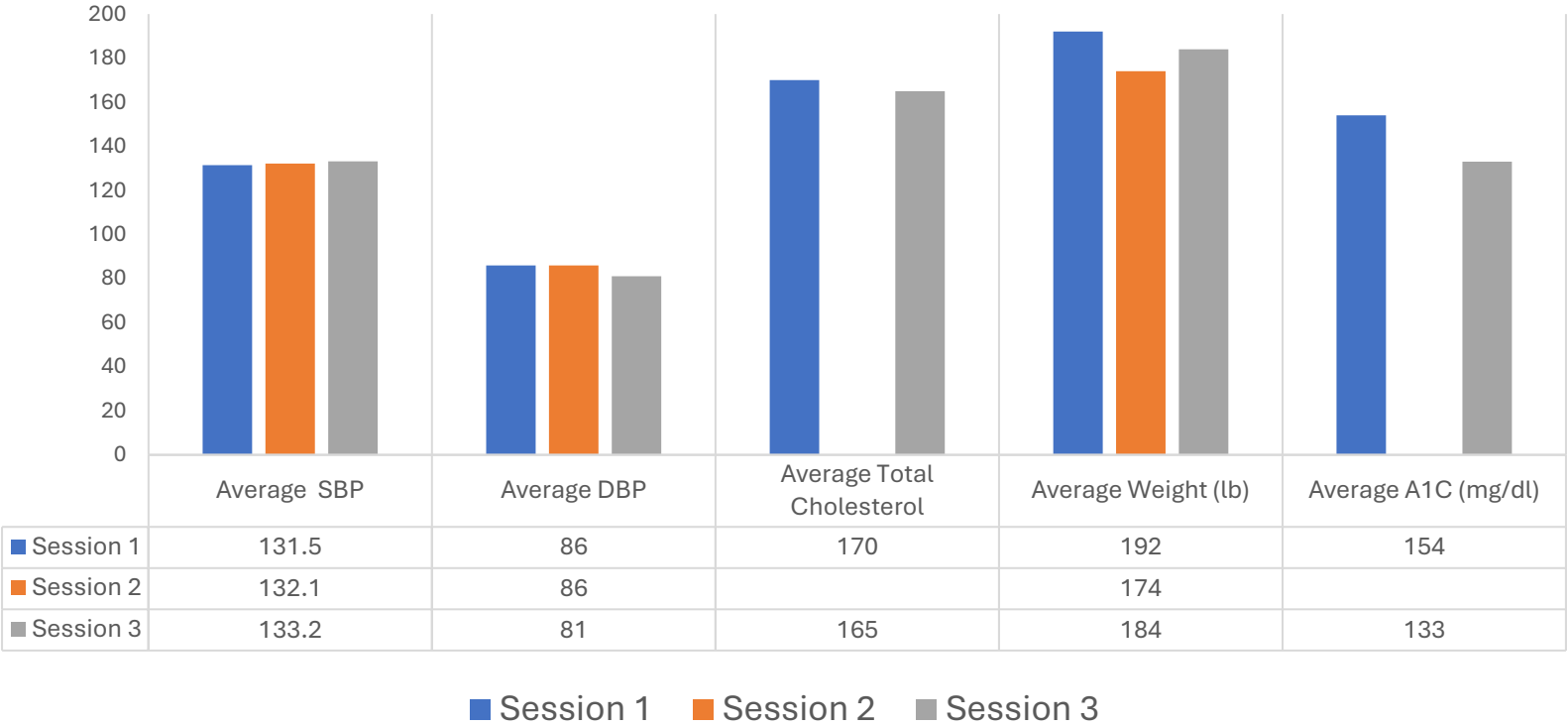
# QUICK FOOD SCAN: DIETARY HABITS



# NUTRITION LITERACY



# HEALTH SCREENING RESULTS



# PRACTICE IMPLICATIONS

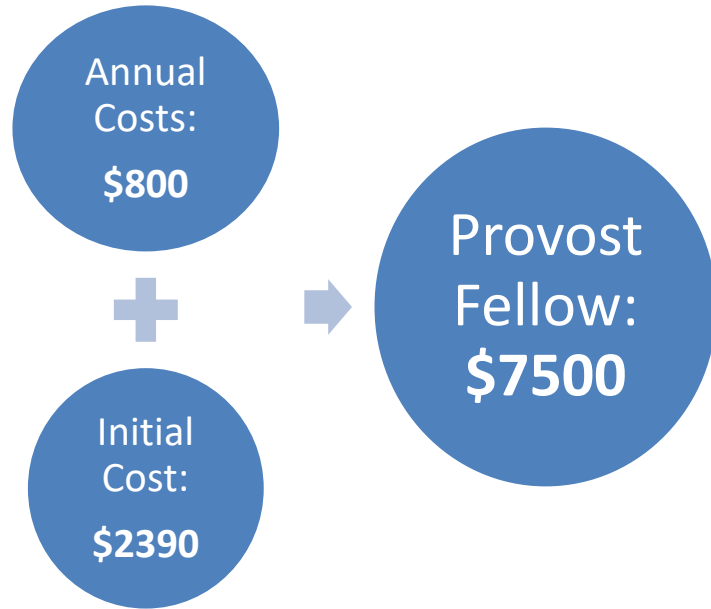
- Critical to utilize multimodal interventions to service diverse learning needs
  - Handouts
  - Group Lecture
  - Demonstrations
  - Posters
  - Individual Education
  - Participatory learning
- Continued engagement among key community stakeholders essential:
  - Resource Allocation
  - Program Expansion
  - Sustainability Opportunities
  - Influence Credibility
- Future implications include a need for resources that increase visitation among underserved food pharmacy groups due to language or cultural barriers, such as refugees & non-English speakers
  - Incorporate language services to include non-English speaking clients
  - Consider surveys with validity outside of the standard American diet
  - Include content to incorporate ethnically-centric foods to broaden relatability

# CLINICAL, CULTURAL, & SOCIAL SIGNIFICANCE

- Nursing – Nurse driven program
- Cardiology – CVD-risk focused
- Dietitians – Nutrition intervention
- Public Health – Community project
- Health Equity – fresh food should be accessible to everyone



## STEP 5: FINANCIAL ANALYSIS



Items	Cost	Unit	Recurring
Standing Scale	\$600	1	N
BP Machine	\$40	2	N
POC Tests:	\$550	1	N
A1C	\$200		
Cholesterol	\$350		
Test Strips:	\$350	1	Y
A1C	\$150		
Cholesterol	\$200		
Office Supplies	\$180	1	N
Volunteer Incentives	\$60	3	N
Printing Fees	\$150	3	Y

## STEP 6: INTEGRATE AND SUSTAIN PRACTICE CHANGE

### Building Community Connections

Hospital Community  
Health Champion

Local University SON  
student nurse  
facilitators

Community Center  
for Sliding Scale Care

### Maintaining Health Engagement

BP Machine Donated  
to Food Bank

Standing Scale  
Donated to Food  
Bank

### Developing Nutritional Competence

Community  
Cookbook

Recipe Cards for  
Meal Planning





## SAMPLE RECIPE

### Heart-Healthy Bean and Vegetable Stew

#### Ingredients:

- 1 can of beans (such as kidney beans, black beans, or chickpeas – low-sodium if possible)
- 1 can of diced tomatoes
- 1 can of mixed vegetables (or fresh or frozen if available)
- 1 small onion, chopped
- 2 cloves of garlic, minced (or garlic powder)
- 1 cup of whole grain rice (or other whole grains from the food bank, like brown rice or oats)
- 2 cups of vegetable or low-sodium chicken broth
- 1 tablespoon of olive oil (if available, for cooking)
- 1 teaspoon dried herbs (such as oregano, thyme, or basil)
- Salt and pepper, to taste

**Tip:** This stew is versatile, so feel free to swap in any other canned vegetables or grains you have from the food bank. It's a simple and nourishing dish that can be enjoyed as a hearty meal, packed with ingredients that support heart health!

#### Directions:

1. Prepare the Grains:
  - If using rice or quinoa, cook it according to the package directions in a separate pot or a rice cooker. Set it aside
2. Sauté the Aromatics:
  - In a large pot, heat 1 tablespoon of olive oil over medium heat. Add the chopped onion and garlic (or garlic powder) and sauté for 2-3 minutes until softened. This step is optional but adds extra flavor
3. Combine the Ingredients:
  - Add the drained and rinsed canned beans and mixed vegetables to the pot
  - Pour in the can of diced tomatoes (with juices) and the vegetable broth
  - Stir in the dried herbs & a pinch of salt and pepper.
4. Simmer the Stew:
  - Bring the stew to a boil, then reduce the heat and simmer for 20-30 minutes. Stir occasionally to prevent sticking, and let the flavors meld together
5. Serve:
  - Serve the stew over the cooked whole grains like rice or quinoa

# PROGRAM EXPANSION THROUGH COMMUNITY CONNECTIONS

Clothing Closet Opened

Partnership with local farmer's Market

- Fresh Food Prescriptions

Community Garden

Partner with a local Dental Hygiene school

- Dental screenings and cleanings

Mentorship Program with local School of Nursing

- Community Health Hours
- Mentorship between student nurses and registered nurses



# STEP 7: DISSEMINATE RESULTS

Public Health  
Nursing  
Brief Report

Journal of  
Community Health  
Nursing  
Systematic Review

University of  
Virginia's Library  
database  
Libra

VCNP Poster  
Presentation  
March 2025

5HH Hospital  
Presentation

Food Bank  
Leadership

“OF ALL FORMS OF INEQUITY,  
INJUSTICE IN HEALTH CARE  
IS THE MOST SHOCKING AND INHUMAN.”

Dr. Martin Luther King Jr  
1966 National Convention of the Medical Committee for Human Rights

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**Community Health Volunteers**



# THANK YOU

Family, Friends, 5 Heart Nursing Unit,  
& All the Community Stakeholders



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# APPENDIX

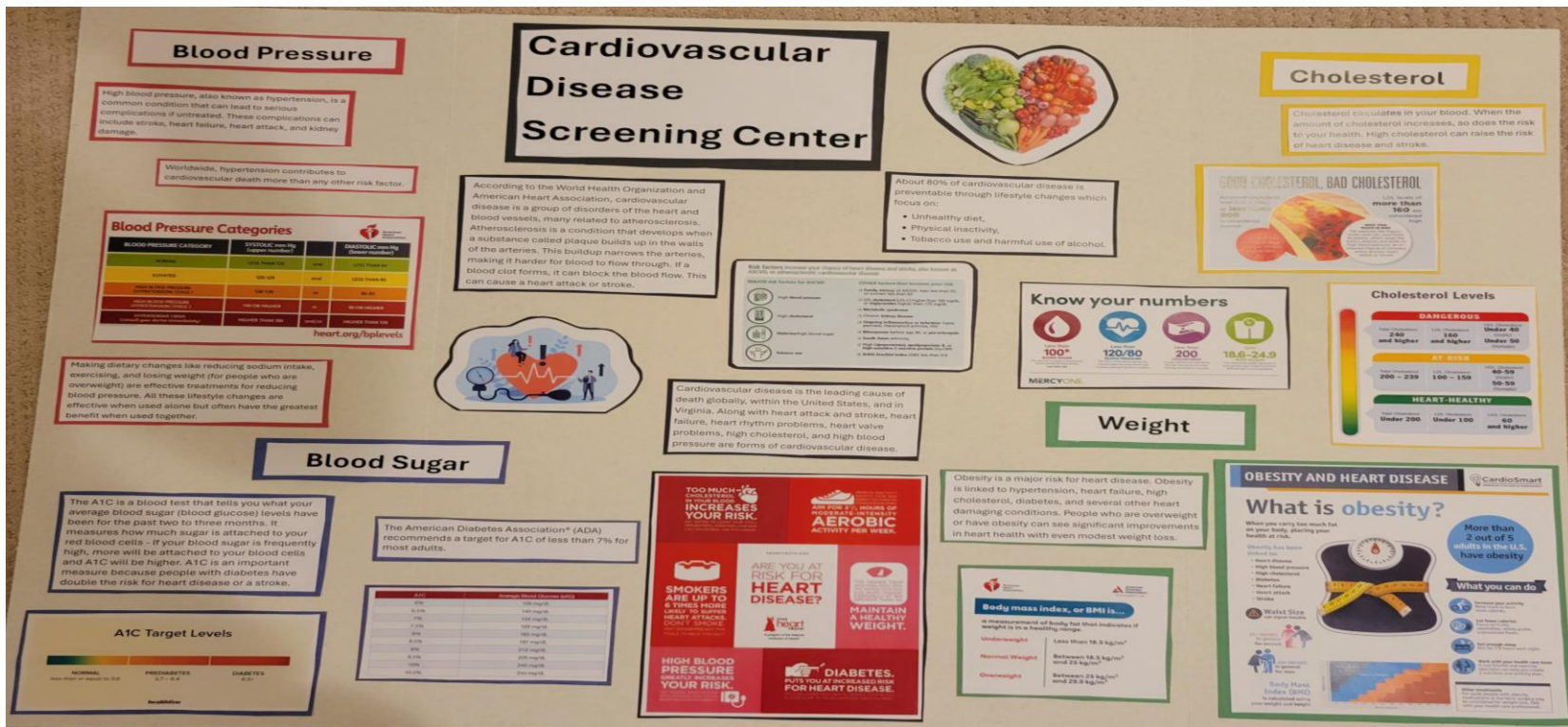
# LOWEST SCORING QUESTION ON NLIT

This Nutrition Facts Panel is taken from the back of a container of macaroni and cheese.

How many grams of total carbohydrates would you eat in 2 cups of macaroni and cheese?

- 31 grams
- 45 grams
- 62 grams
- 75 grams

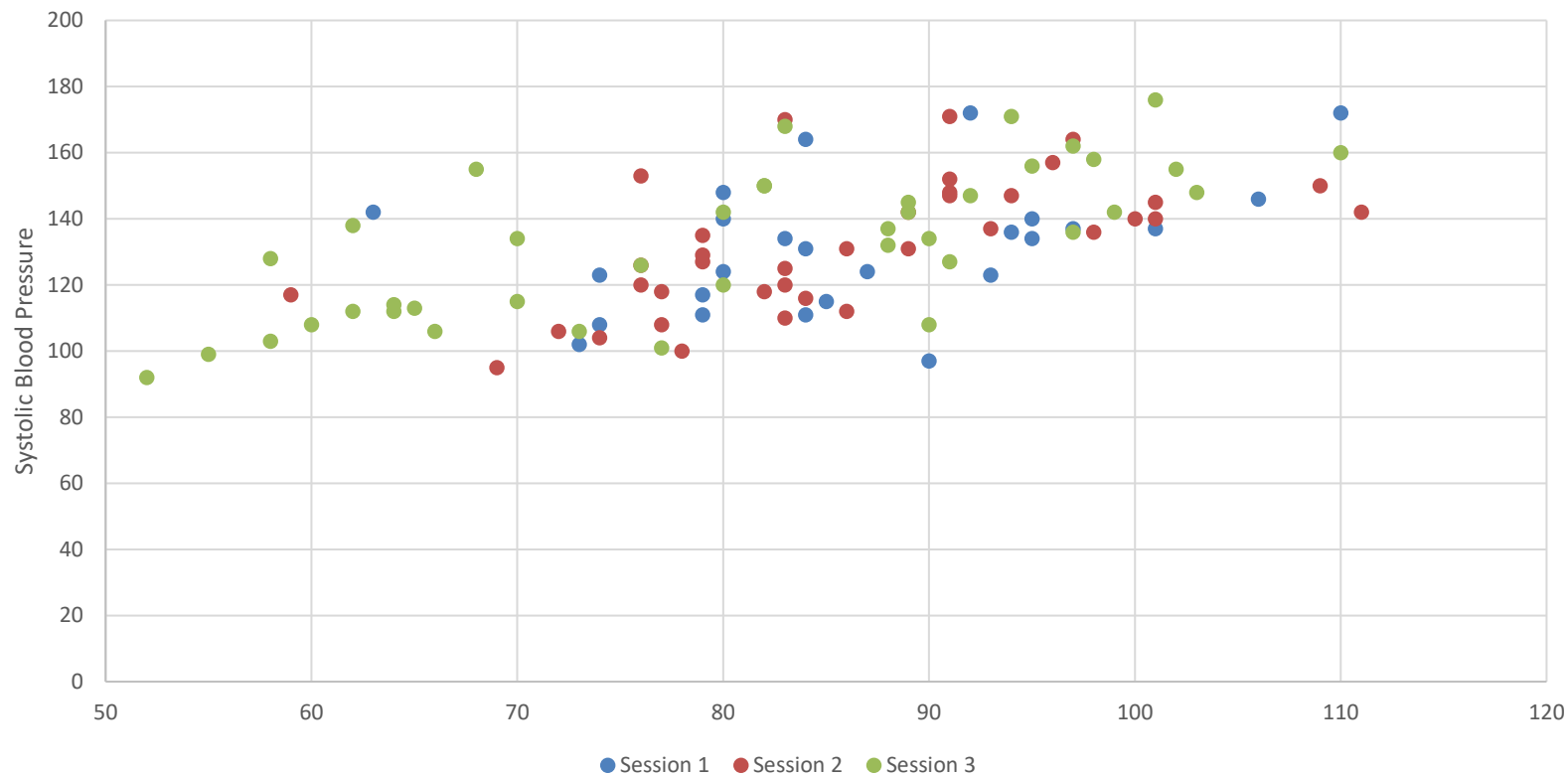
Nutrition Facts		
Serving Size 1 cup (228g)		
Servings Per Container about 2		
Amount Per Serving		
Calories 250	Calories from Fat 110	
% Daily Value*		
Total Fat 12g		18%
Saturated Fat 3g		15%
Trans Fat 3g		
Cholesterol 30mg		10%
Sodium 470mg		20%
Total Carbohydrate 31g		10%
Dietary Fiber 0g		0%
Sugars 5g		
Proteins 5g		
Vitamin A		4%
Vitamin C		2%
Calcium		20%
Iron		4%
* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs:		
	Calories: 2,000	2,500
Total Fat	Less than 65g	80g
Saturated Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g



SAMPLE EDUCATION BOARD

Education focused on four main risk factors for CVD: BP, Wt, BG, & TC

# Blood Pressure from Sessions 1-3



# Average Weight over Session 1 - 3

