

# Fruit and Vegetable Intake Among a Sample of Families Attending a WIC Clinic in a Rural North Carolina County: A Quality Improvement Capstone Project

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## Abstract

Despite the nutrition education provided to clients by nutritionists in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) concerning fruit and vegetable intake in clients' children, little is known about whether families implement the advice from the nutritionist and increase their child's intake. This quality improvement project examines children's and family's current fruit and vegetable intake, minutes of physical activity, and perceptions of children's weight status among a population of clients attending a rural WIC clinic. Participants completed a survey regarding current fruit and vegetable intake and other nutrition indicators. Data analysis revealed that non-Hispanic participants consumed significantly more fruit and engaged in significantly more minutes of physical activity than Hispanic participants. The results of data analysis will assist WIC nutritionists design future interventions to increase fruit and vegetable intake among clients' children, and to address other nutrition indicators.

## PLAN

It is well known that the average American does not consume recommended intakes of fruits and vegetables, and this is also true for children under five years old. A study conducted by the Harvard School of Public Health examined the consumption of 100% fruit juice, fruit, and vegetable consumption in children ages 2 - 4 who were enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).<sup>1</sup> The study found that WIC-enrolled children consumed more fruit juice than children who were not participants in the program, but did not consume more fruits or vegetables. The study concluded from its findings that WIC should provide less fruit juice and more vouchers to purchase fruits and vegetables. In another study conducted in an Alabama WIC facility, researchers studied families who redeemed food vouchers on a regular basis and found that they were more likely to buy fruits and vegetables, along with consuming more fruits and vegetables, than those who were not regular voucher redeemers.<sup>2</sup> The Harvard and Alabama studies show that WIC does make a difference in fruit and vegetable intake, but that there are recommended changes to further increase intake. Current WIC policy provides each child aged two to five years with nine dollars per month for fresh fruits and vegetables.<sup>2</sup> This amount is inadequate to last even one week if the child consumes the recommended servings per day.

Despite the nutrition education provided to clients by WIC nutritionists concerning fruit and vegetable intake in clients' children, little is known about whether families implement the advice from the nutritionist and increase their child's intake. In addition, data are lacking regarding the current fruit and vegetable consumption habits of WIC families. The purpose of this project was to conduct a nutrition survey to inform future efforts to increase fruit and vegetable intake among children ages 2 - 5 years and their families attending a WIC clinic in a rural county in North Carolina.

The aims of this project are to:

- Better understand the everyday diets of attending children
- Describe clients' current habits in regards to fruit and vegetable consumption
- Describe clients' current habits in regards to children's physical activity
- Describe parents' perceptions of child weight status
- Provide recommendations for future nutrition education interventions to optimize use of the fruit and vegetable allowance

In this project, fruit and vegetable intake, along with other nutrition indicators in children ages 2 - 5 years, were examined. Data were compiled and analyzed. Results of the project will inform future efforts of the WIC facility in regards to client education on consumption of fruits and vegetables and other nutrition-related topics.

## DO

The WIC facility selected for the project is located in a rural agricultural area of North Carolina. The majority of clients attending the facility are Hispanic with some African-American and White clients. The personnel carrying out this project included the WIC director and the project nutritionist, who collaborated in recruiting participants and gathering data.

The project was conducted over the course of 5 weeks. The first three weeks focused on recruitment of participants. Participating parents completed a questionnaire focused on current habits regarding fruit and vegetable intake. To address the potential obstacle of over- or under-reporting children's fruit and vegetable intake, a multiple-pass method was used to obtain this information. No personal identifying information was collected.

During the survey, participants received educational handouts to use at home as well as recipes that use WIC approved items. During Weeks four and five, the nutritionist compiled survey responses and analyzed the resulting data using SPSS v. 26.0.<sup>3</sup> Because of the small number of non-Hispanic participants, these groups were combined for analysis (n = 7). Descriptive statistics were generated. Pearson correlation tests were used to identify associations among selected respondent characteristics. A Mann-Whitney U test was used to compare participant ethnicity with the amount of daily physical activity reported.

An unanticipated disruption took place in the project timeline at week three, when the WIC facility was closed due to the worldwide COVID-19 pandemic. By week three, it was determined that an adequate number of surveys had been completed, and study personnel made the decision to end data collection and begin data analysis at that point.

## STUDY

Questionnaires were obtained from 30 participating families. Demographics for study participants are provided in **Table 1**. Survey responses are summarized in **Table 2**.

**Table 1: Demographic Characteristics of Children Participating in a WIC Clinic in southeast North Carolina**

Characteristic	n/N (%)
<b>Sex:</b>	
Female	17/30 (57)
Male	13/30 (43)
<b>Ethnicity:</b>	
Hispanic	23/30 (77)
White	4/30 (13)
African-American	3/30 (10)
<b>Age:</b>	
2 years old	15/30 (50)
3 years old	9/30 (30)
4 years old	6/30 (20)



**Table 2: Survey Responses of Parents of Children Participating in a WIC Clinic in southeast North Carolina**

Characteristic	n/N (%)
<b>Do you think your child is overweight:</b>	
Yes	3/30 (10)
No	9/30 (30)
<b>No (but child is overweight)</b>	18/30 (60)
<b>Where do you get fruits and vegetables:</b>	
Grocery Store	28/30 (93)
Farmers Market	1/30 (3)
Grow your Own	1/30 (3)
<b>What type of fruits and vegetables:</b>	
Fresh	23/30 (77)
Frozen	3/30 (10)
Canned	4/30 (13)
<b>How many times a day does your child consume fruit:</b>	
1 time	2/30 (6)
2 times	7/30 (24)
3 times	12/30 (40)
4+ times	9/30 (30)
<b>How many times a day does your child consume vegetables:</b>	
1 time	8/30 (27)
2 times	12/30 (40)
3 times	8/30 (27)
4+ times	2/30 (6)
<b>Any barriers to consuming fruits and vegetables:</b>	
None	15/30 (50)
Not enough time to cook or prepare them	2/30 (6)
Cost	7/30 (24)
Child doesn't like fruits and vegetables	6/30 (20)
<b>How many nights a week does the family eat together for dinner:</b>	
1-2 nights	2/30 (6)
3-4 nights	4/30 (13)
5-6 nights	3/30 (10)
Every night	21/30 (70)
<b>What is the serving size for a 2-5 year old for fruits/vegetables:</b>	
¼ cup	4/30 (13)
1/3 cup	5/30 (17)
½ cup	14/30 (47)
1 cup	7/30 (23)
<b>How much physical activity does your child get a day:</b>	
15 minutes or less	4/30 (13)
15-30 minutes	6/30 (20)
30 minutes-1 hour	2/30 (7)
1+ hour	18/30 (60)
<b>What activities interest you:</b>	
None	6/30 (20)
Recipes	7/30 (23)
Cooking Classes	12/30 (40)
Grocery Store Tours	5/30 (17)

A statistically significant correlation was found between mean fruit intake and ethnicity, with non-Hispanic participants consuming significantly more fruit (2.7 servings/day Hispanic vs. 3.57 servings/day non-Hispanic;  $r = -0.393$ ,  $p = 0.032$ ). The non-Hispanic group engaged in significantly more minutes per day of physical activity than the Hispanic group ( $p = 0.008$ ). No statistically significant difference was found between groups for vegetable intake.

## ACT

Little information is available regarding fruit and vegetable intake in children of Hispanic ethnicity living in rural America. The results of this quality improvement project supported anecdotal observations of clinic attendance on a day-to-day basis. The project findings also supported the investigators' observations that Hispanic populations attending the clinic use traditional cooking methods that do not include much fruit in the diet.

The statistical analysis found that the non-Hispanic participants consumed significantly more fruit, and engaged in more daily minutes of physical activity, than Hispanic participants. Future interventions could be focused on culturally appropriate, community-embedded strategies to address these findings. A large proportion of respondents (80%) indicated an interest in recipes, cooking classes, and/or grocery store tours. The facility should consider implementing such interventions, which, in addition to providing nutrition education, may provide opportunities to address issues such as physical activity and healthful weight. Cooking classes and recipes provided to interested families can teach them how to prepare healthy meals at home and show them what a healthy plate should look like. Cooking classes can also help participating families learn how to cook with fruits and vegetables.

A key finding of this project was the proportion of all parents (60%) who did not perceive their child as overweight, although the child was clinically overweight. Perceptions of child overweight may have cultural roots based on health beliefs, as well as ideals about good parenting practices. The number of young children that are overweight or obese is a serious public health concern. Parent education on division of responsibility and trusting children on intuitive eating may be helpful in improving child weight outcomes.

This project had several limitations. The original study plan was altered due to the COVID-19 pandemic. A larger study sample may have changed the results described here.

## CONCLUSIONS

This quality improvement project supported a strategic direction for the facility toward developing culturally focused nutrition interventions for Hispanic populations, focused on increasing fruit and vegetable intake, increasing physical activity, and addressing child weight perceptions. Such interventions would benefit from the implementation of focus groups among participants to identify interventions most likely to be effective.

## REFERENCES

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