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Use of a Unique Farmers' Market Program Targeting Lower-Income Community Members

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Abstract

We examined use of a farmers' market that leverages community partnerships to provide free produce to lower-income persons. Participants (n=422) were asked to complete a questionnaire and given an ID number, which was used to track market use from 2014 to 2015. Chi square tests were used to examine associations between 2014/2015 market use and reasons for market use, financial support received, and how attendees had learned about the market. Ordinal regression was used to identify household characteristics associated with increased market attendance. Although the proportion of lower-income attendees declined over the study period, a substantial proportion of households in 2014 (69.1%) and 2015 (54.6%) were below the poverty threshold. We identified significant differences in attendees' reasons for market use and ways attendees heard about the market from 2014 to 2015. The most frequently reported reason for 2014 market use was retirement/fixed income (P<0.001) and in 2015 was low-income (P<0.001). Most attendees heard about the market through flyers (P<0.001) and word of mouth (P≤0.001) in 2014 and through local, non-profit services (P<0.001) in 2015. In the ordinal regression, households with an older person registering the household for the market used the market more times per year (P<0.001). Impoverished households (P=0.020) and households receiving more financial support services (P<0.001) used the market fewer times per year. While a substantial proportion of lower-income persons used the free-produce market, frequency of use was still lowest among this group indicating a need to address barriers beyond produce cost.

Keywords Farmers' market · Diet · Low-income · Survey

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Introduction

Improving fruit and vegetable consumption is an important public health priority [1], particularly among low-income persons, who are at an increased risk for diet-related chronic diseases [2, 3]. Increasing fruit and vegetable consumption, however, is significant challenge in the U.S. [4]. As such, recent efforts to increase fruit and vegetable consumption have been re-directed from individual-level interventions with limited efficacy for improving fruit and vegetable consumption [5] to environmental-level interventions which improve access, availability, and affordability of fruits and vegetables. For example, the creation and promotion of farmers' markets might improve access to fruits and vegetables among low-income (i.e., those with incomes less than two times the federal poverty threshold) and historically underrepresented populations who are less likely to have healthy food retailers in their community [6].

Existing evidence suggests that farmers' markets play an important role in increasing fruit and vegetable consumption [7, 8]. For example, the introduction of a farmers market paired with a financial incentive program increased lower-income diabetics' fruit and vegetable consumption by 1.6 servings per day [7]. In addition, Evans and colleagues [8] found that the introduction of two farm stands in a lower income community led to significant increases in the consumption of fruit, fruit juice, tomatoes, green salad, and other vegetables. Thus, establishing farmers' markets in low-income neighborhoods has been recommended as a viable strategy to increase fruit and vegetable consumption among lower income persons [9, 10]. Further, farmers' markets provide a place for social interaction, an avenue for building social capital [11, 12], economic benefits for farmers' market vendors, and reductions in the price of produce sold at grocery stores in proximity to farmers' markets [13, 14].

Despite their potential benefit to low-income populations, farmers' markets are most often used by a narrow segment of the U.S. population: older (i.e., average age over 40 years) [15], white [16], females [15] with above average (i.e., greater than \$50,000/year) income levels [15, 16]. Researchers have examined barriers to farmers' market use among low-income individuals in an attempt to identify opportunities to diversify market patronage. Even though produce is typically cheaper at farmers' markets than grocery stores [17, 18], low-income, food-insecure persons have identified cost as a barrier to farmers' market use [19, 20]. It is possible that even low-priced produce is unaffordable for low-income, food-insecure persons to purchase, especially when federal food assistance benefits are not accepted at farmers' markets [21]. Lack of awareness has also been linked to non-use [19]. Farmers' market locations [20–22] and hours [21, 22] have also been cited as barriers to market use; these barriers emphasize the importance of market accessibility to patrons [21]. A recent review [15] calls for additional research examining the demographic characteristics of low-income market patrons, which could contribute to a better understanding of limited farmers' market use among low-income groups.

This study examined use of a unique farmers' market program that targets low-income community members by providing produce at no cost to market patrons. Specifically, this study addressed three aims: (1) describe an approach to farmers' markets that removes cost as a barrier to use; (2) identify changes in household characteristics of farmers' market patrons from 2014 to 2015; and (3) examine household characteristics and marketing strategies associated with greater market attendance.

Contribution to the Literature

This study addresses a call for more research examining characteristics of low-income farmers' market patrons [15]. To our knowledge this is the first study to examine usage patterns among households using a farmers' market that provides free produce. Thus, we can examine market use among low-income persons without considering cost as a barrier to market use. The study findings are useful for both health professionals and community leaders interested in promoting farmers' market attendance among low-income persons.

Methods

Study Context

Walton County, located in Northeast Georgia, has an approximate population of 88,000 people. Cardiovascular disease (CVD) and diabetes, chronic conditions influenced greatly by diet [23], are the major health risks plaguing Walton County. According to Georgia's Department of Public Health, diabetes and CVD accounted for over 31% of deaths recorded, and 18% of all hospital discharges in Walton County in 2010 [24]. Median household income is approximately \$52,000, and 13.8% of Walton County inhabitants are living below the poverty level [25]. The food insecurity prevalence in Walton is 14% [26].

Study Site: The Faith in Serving Humanity (FISH) Farmers' Market

The Faith in Serving Humanity (FISH) Farmers' Market is a joint venture between Walton Wellness, the FISH organization, and the Walton County Jail. Walton Wellness is a non-profit organization dedicated to the prevention and early detection of non-communicable disease by promoting healthy lifestyle behaviors in Walton County. FISH is a faith-based outreach ministry that serves Walton County.

The FISH market is located in a food desert [1], and targets low-income individuals with limited access to fresh and healthy produce. All market produce is free, eliminating cost as a barrier to market use. Food for the FISH Farmers' Market is sourced by the Garden Project at Walton County Jail. The Garden Project is a joint effort between Walton Wellness, St. Alban's Episcopal Church, and The Walton County Sheriff's Office. The Garden Project is a community garden located on the grounds of the Walton County jail. Inmates work with community

volunteers to plant, maintain, and harvest produce. Once produce is harvested, it is donated by the inmates to the FISH farmers' market.

The project benefits both the inmates and community members. For the community, the garden provides a source of free produce to those who are low-income and gives churches and organizations unique opportunities to feed their community and provide outreach to inmates. For inmates, the garden provides the opportunity to learn a new skill, to feel productive while incarcerated, get fresh air and exercise, and reduce their sentence (i.e., 1 day off their sentence for everyday they volunteer in the garden). In some cases inmates' families have received produce from the garden, which provides inmates with the ability to support their families while incarcerated. From 2010 to 2015, the cost to plant the garden was approximately \$4000 in grants and donations. The garden has provided approximately \$30,000 worth of free produce for the community.

Participants and Data Collection

Approximately 3 weeks prior to the start of the market, market coordinators advertised the FISH market via flyers, word of mouth, and through FISH services. In order to attend the market, patrons were required to: (1) bring a form of identification to verify residency in Walton County; (2) register for the market; and (3) agree to conduct an interview with a market coordinator. All market coordinators were trained prior to conducting the interview. Informed consent was obtained from all participants prior to data collection. The study procedures were reviewed and approved by The University of Georgia Institutional Review Board.

Measures

Market Year and Attendance

Data collection took place during the summers (May to August) of 2014 and 2015. Each year following registration, each participant was given an identification number, which was used to record attendance at each market. In both 2014 and 2015, there were a total of 24 market sessions held from May to August; thus, market patrons could attend between 0 and 24 total market sessions each year.

Household Poverty Thresholds for 2014

During the interview, participants were asked their household's monthly income. The 100% federal poverty level (FPL) for 2014 guidelines were used to analyze the poverty thresholds for households [27]. Based on household income and the number of individuals living in the household,

participants were characterized as living in poverty (<FPL 100%) or not living in poverty (>FPL 100%).

Personal and Household Characteristics

Participants completing the interview on behalf of their household were asked to report their gender (male/female/other) and age (years). Participants were also asked to answer several questions about their household including: if any member of their household experiences chronic conditions (yes/no for diabetes, lung disease, heart disease, cancer, other); how many children aged ≤ 17 and ≥ 18 years live in their household; and their households' primary mode of transportation (car, walking, bike, or carpool). There is no available public transportation within Walton.

Financial Support Received

Participants were asked to report all financial assistance received by members of their households (SNAP/EBT, WIC, Social security retirement, Supplemental security income, Medicare, Medicaid, Emergency Food Assistance, Public housing assistance, FISH assistance, or I do not receive any assistance). Multiple selections could be made, as each option had a yes/no response. Items were summed to create an index of financial support received, with a possible range from 0 to 9.

Reasons for Attending the Market

Participants were asked to indicate why they were seeking food assistance by checking all that apply. The following response options were listed: low-income, fixed income, homeless (staying with relative or friend), employment change, health related issues, decrease in earnings, death in the family, major property damage, permanent disability, temporary disability, retirement, incarceration (jail or prison), loss of employment, military service, or divorce. Items were summed to create a reason for market attendance index, with a possible range of 0 to 15.

How Participants Heard About the Market

Those interviewed were asked to indicate how they first heard about the market, via: flyer, referred by FISH, word of mouth, library, and/or other. Respondents were not asked to specify further if they chose "other." Items were summed to create a marketing strategy index, with a possible range of 0–5.

Statistical Analyses

All analyses were performed in SPSS (version 22). Frequencies and descriptive statistics were calculated for all variables of interest, which were then compared across the dependent variables (i.e., market year, market attendance, and household poverty status). Chi square tests were used to assess the distribution differences for categorical variables. Independent sample *t* tests and one-way ANOVA were used to assess mean differences for continuous and count variables. An ordinal regression model was fitted to assess factors associated with more market attendance (i.e., attending the market 1–6 times served as the referent group).

Results

In total, 442 households used the FISH farmers' market during the 2 years data were collected: 204 households in 2014 and 238 households in 2015.

Characteristics of Households Using the Farmers' Market

The characteristics of households using the farmers' market overall and by year of data collection are shown in Table 1. As shown in Table 1, a significantly smaller proportion of households met the poverty threshold in 2015 compared to 2014 ($\chi^2 = 9.73$, $P = 0.002$). However, households using the market received a greater number of financial support services in 2015 compared to 2014 ($t = -7.51$, $P < 0.001$). Specifically, the proportions of households receiving Medicare ($\chi^2 = 11.03$, $P = 0.001$), Medicaid ($\chi^2 = 9.81$, $P = 0.002$), emergency food assistance ($\chi^2 = 35.01$, $P < 0.001$), public housing ($\chi^2 = 10.36$, $P = 0.001$), and FISH assistance ($\chi^2 = 23.25$, $P < 0.001$) were greater in 2015 than in 2014. Market users most often reported driving to and from the market.

Reported Reasons for Market Use

Reasons provided for why households were using the market overall and by year are reported in Table 2. On average, households reported fewer reasons for using the market in 2015 compared to 2014 ($t = 12.06$, $P < 0.001$). The most frequently reported reason for using the market in 2015 was low-income ($\chi^2 = 173.80$, $P < 0.001$) and in 2014 was retirement or fixed income ($\chi^2 = 46.22$, $P < 0.001$). A greater proportion of households in 2014 than 2015 also reported the following reasons for market use: employment change ($\chi^2 = 11.42$, $P = 0.001$), health related issues ($\chi^2 = 20.04$, $P < 0.001$), decrease in earnings ($\chi^2 = 44.35$, $P < 0.001$), property damage ($\chi^2 = 5.90$, $P = 0.015$),

temporary earning reduction ($\chi^2 = 10.72$, $P = 0.001$), temporary disability ($\chi^2 = 3.38$, $P = 0.066$) and loss of employment ($\chi^2 = 15.77$, $P < 0.001$).

Promotional Sources for the Farmers' Market

Promotional sources identified by participants overall and by year are included in Table 2. Participants reported awareness of a fewer number of promotional sources for the farmers' market in 2015 than in 2014. Distribution of flyers ($\chi^2 = 27.05$, $P < 0.001$), and word of mouth ($\chi^2 = 14.26$, $P < 0.001$) were most successful in soliciting household participation in 2014. In 2015, FISH was the promotional source bringing households to the market ($\chi^2 = 14.77$, $P < 0.001$).

Factors Associated with the Frequency of Market Use

Table 1 includes factors associated with the frequency of market use. Households used markets less frequently, on average, in 2015 than in 2014 ($t = 2.25$, $P = 0.025$). The average age of persons registering households for the market was higher among households that used the market more frequently ($f = 17.20$; $P < 0.001$). Households with a woman rather than a man registering for the market had more frequent market use. ($\chi^2 = 11.31$, $P = 0.010$). Households containing someone receiving social security ($\chi^2 = 20.24$, $P < 0.001$) or Medicare benefits ($\chi^2 = 12.87$, $P = 0.005$) used the market more than households without someone receiving these services. Households with a higher average household income also used the market more often than households with a lower average household income ($f = 4.237$, $P = 0.006$).

Infrequent market use was more common among households at or below the poverty threshold ($\chi^2 = 21.06$; $P < 0.001$) and households using the greatest number of financial support services ($f = 5.95$, $P = 0.001$). Households that received food stamps ($\chi^2 = 24.62$, $P < 0.001$), supplemental security income ($\chi^2 = 7.99$, $P = 0.046$), Medicaid ($\chi^2 = 20.37$, $P < 0.001$), emergency food assistance ($\chi^2 = 11.17$, $P = 0.011$), and FISH assistance ($\chi^2 = 27.22$, $P < 0.001$) also used the market less frequently than households not receiving these services.

We also examined associations between households' frequency of market use and reported reasons for using the market (Table 2). Households that used the market due to a death in the family attended 13 or more markets ($\chi^2 = 8.58$, $P = 0.035$) and households that attended the market due to retirement or fixed income generally attended seven or more markets ($\chi^2 = 18.70$, $P < 0.001$). Households that reported using the market due to low-income ($\chi^2 = 8.12$, $P = 0.044$) used the market less frequently.

Table 1 Characteristics of households using the market overall and by year of data collection and market attendance frequency

	Total (n = 442)		Market year		χ^2	P	Market attendance				χ^2	P			
	%	n	2014 (n = 204)				2015 (n = 238)		1-6 (n = 251)				7-12 (n = 86)		13-18 (n = 62)
			%	n	%	n	%	n	%	n	%	n	%	n	%
Market year															
2014 market	46.2	-	-	-	-	-	-	42.2	51.2	50.0	53.5	3.72	0.293		
2015 market	53.8	-	-	-	-	-	57.8	48.8	50.0	46.5	-	-	-		
Market attendance															
1-6	56.8	52.0	60.9				-	-	-	-	-				
7-12	19.5	21.6	17.6				-	-	-	-	-				
13-18	14.0	15.2	13.0				-	-	-	-	-				
19-24	9.7	11.3	8.4				-	-	-	-	-				
Household poverty status															
No	38.7	30.9	45.4				31.1	39.5	51.6	62.8	21.06	<0.001			
Yes	61.3	69.1	54.6				68.9	60.5	48.4	37.2					
Sex															
Male	15.2	14.7	15.5				13.1	12.8	14.5	32.6	11.31	0.010			
Female	84.8	85.3	84.5				86.9	87.2	85.5	67.4					
Chronic condition type															
None	15.8	22.5	10.1				15.9	18.6	16.1	9.3	9.05	0.875			
Diabetes	3.2	4.9	1.7				2.8	4.7	1.6	4.7					
Lung disease	4.1	2.9	5.0				4.4	4.7	3.2	2.3					
Heart disease	33.5	37.3	30.3				31.5	32.6	40.3	37.2					
Cancer	5.4	2.9	7.6				4.4	7.0	8.1	4.7					
Other	38.0	29.4	45.4				41.0	32.6	30.6	41.9					
Primary transportation															
Car	79.2	76.0	81.9				76.1	81.4	85.5	83.7	9.29	0.158			
Carpool	15.8	17.6	14.3				17.9	15.1	14.5	7.0					
Walking	5.0	6.4	3.8				6.0	3.5	0.0	9.3					
Financial support services received															
Food stamps	46.6	43.6	49.2				54.6	45.3	37.1	16.3	24.62	<0.001			
WIC	2.5	1.5	3.4				3.2	2.3	1.6	0.0	1.81	0.613			
Social security	43.2	38.2	47.5				34.7	47.7	59.7	60.5	20.24	<0.001			

Table 1 (continued)

	Total (n = 442)		Market year		χ^2	P	Market attendance				χ^2	P						
	M (SD)	%	2014 (n = 204)				2015 (n = 238)		1-6 (n = 251)				7-12 (n = 86)		13-18 (n = 62)		19-24 (n = 43)	
			M (SD)	%			M (SD)	%	M (SD)	%			M (SD)	%	M (SD)	%	M (SD)	%
Social supplemental income	26.9	22.5	30.7	31.9	3.68	0.055	31.9	23.3	19.4	16.3	7.99	0.046						
Medicare	47.7	39.2	55.0	43.8	11.03	0.001	43.8	40.7	62.9	62.8	12.87	0.005						
Medicaid	34.6	27.0	41.2	43.0	9.81	0.002	43.0	29.1	17.7	20.9	20.37	<0.001						
Emergency food assistance	16.7	5.4	26.5	21.9	35.01	<0.001	21.9	10.5	9.7	9.3	11.17	0.011						
Public housing	12.9	7.4	17.6	15.5	10.36	0.001	15.5	8.1	11.3	9.3	3.93	0.269						
FISH assistance	34.8	23.0	45.0	45.0	23.25	<0.001	45.0	24.4	17.7	20.9	27.22	<0.001						
	M (SD)	M (SD)	M (SD)	M (SD)	t	P	M (SD)	M (SD)	M (SD)	M (SD)	f	P						
Age of person registering household	59.79 (± 15.16)	58.5 (± 15.50)	60.89 (± 14.82)	60.89 (± 15.44)	-1.65	0.100	60.89 (± 15.44)	61.36 (± 13.34)	65.47 (± 13.86)	70.47 (± 10.08)	17.198	<0.001						
Total number of financial services received	2.66 (± 1.62)	2.08 (± 1.39)	3.16 (± 1.64)	2.94 (± 1.73)	-7.51	<0.001	2.94 (± 1.73)	2.31 (± 1.44)	2.37 (± 1.37)	2.16 (± 1.27)	5.954	0.001						
Total number of people in household	2.11 (± 1.41)	2.18 (± 1.40)	2.05 (± 1.41)	2.26 (± 1.50)	0.94	0.348	2.26 (± 1.50)	1.97 (± 1.22)	1.92 (± 1.44)	1.81 (± 1.01)	2.225	0.085						
Average household income	13410.03 (± 18160.73)	11688.05 (± 7659.48)	14886.00 (± 23637.05)	11648.53 (± 9287.59)	-1.85	0.065	11648.53 (± 9287.59)	13492.98 (± 8102.29)	14384.27 (± 8272.75)	22121.63 (± 51182.68)	4.237	0.006						
Average number of sessions attended	7.28 (± 6.75)	8.05 (± 6.92)	6.61 (± 6.54)	2.23 (± 1.69)	2.25	0.025	2.23 (± 1.69)	9.42 (± 1.89)	15.32 (± 1.86)	20.86 (± 1.63)	2043.693	<0.001						

Table 2 Reasons for attending the market and sources of learning about the market overall and by market year and frequency of market attendance (n = 442)

	Total (n = 442)		Market attendance				χ^2	P				
	Market year		1-6 (n = 251)		7-12 (n = 86)				13-18 (n = 62)		19-24 (n = 43)	
	%	%	%	%	%	%			%	%	f	P
Reasons for attending the market												
Low-income	31.4	0.0	58.4	173.80	< 0.001	36.7	23.3	22.6	30.2	8.12	0.044	
Employment change	3.6	6.9	0.8	11.42	0.001	4.4	3.5	1.6	2.3	1.35	0.718	
Health related issues	6.6	12.3	1.7	20.04	< 0.001	6.8	4.7	8.1	7.0	0.77	0.856	
Decreased earnings	7.9	17.2	0.0	44.35	< 0.001	8.8	9.3	6.5	2.3	2.50	0.475	
Death in the family	0.9	1.5	0.4	1.35	0.245	0.4	0.0	1.6	4.7	8.58	0.035	
Property damage	1.1	2.5	0.0	5.90	0.015	0.0	2.3	3.2	2.3	6.95	0.074	
Temporary earning reduction	2.0	4.4	0.0	10.72	0.001	2.8	2.3	0.0	0.0	2.93	0.402	
Permanent disability	16.3	19.1	13.9	2.22	0.136	19.1	14.0	12.9	9.3	3.88	0.200	
Temporary disability	1.4	2.5	0.4	3.38	0.066	1.2	1.2	3.2	0.0	2.28	0.500	
Retirement or fixed income	34.4	51.0	20.2	46.22	< 0.001	25.9	44.2	46.8	46.5	18.70	< 0.001	
Incarceration	0.5	0.0	0.8	1.72	0.189	0.8	0.0	0.0	0.0	1.53	0.676	
Loss of employment	8.1	13.7	3.4	15.77	< 0.001	9.6	10.5	3.2	2.3	5.24	0.155	
Military service	0.5	1.0	0.0	2.34	0.126	0.4	0.0	1.6	0.0	2.46	0.483	
Divorce	0.5	1.0	0.0	2.34	0.126	0.8	0.0	0.0	0.0	1.53	0.676	
Homeless	0.2	0.0	0.4	0.86	0.354	0.4	0.0	0.0	0.0	0.76	0.858	
Sources of learning about the market												
Flyer	9.7	17.6	2.9	27.05	< 0.001	8.0	9.3	12.9	16.3	3.72	0.294	
FISH	44.1	34.3	52.5	14.77	< 0.001	47.8	34.9	41.9	44.2	4.48	0.214	
Word of mouth	41.0	50.5	32.8	14.26	< 0.001	39.0	50.0	35.5	41.9	4.07	0.254	
Library	0.2	0.0	0.4	0.86	0.354	0.4	0.0	0.0	0.0	0.76	0.858	
Other	12.9	14.2	11.8	0.59	0.443	10.4	14.0	21.0	14.0	5.16	0.160	
	M (SD)	M (SD)	M (SD)	t	P	M (SD)	M (SD)	M (SD)	M (SD)	f	P	
Total number of sources for learning about the market	1.08 (±0.34)	1.17 (±0.49)	1.00 (±0.06)	4.72	< 0.001	1.06 (±0.33)	1.08 (±0.28)	1.11 (±0.45)	1.16 (±0.37)	1.44	0.231	
Total number of reasons for attending the market	0.84 (±0.88)	1.33 (±0.98)	0.42 (±0.50)	12.06	< 0.001	0.81 (±0.88)	0.92 (±1.01)	0.89 (±0.77)	0.77 (±0.78)	0.48	0.694	

Ordinal Regression for Market Use

Table 3 displays findings from the ordinal regression model. Households with an older person registering the household for the market used the market more times in a given year (Beta=0.05, $P < 0.001$). Compared to households not meeting the poverty threshold, households with poverty status used the market fewer times in a given year (Beta = -0.49, $P = 0.020$). Households receiving more financial support services used the market fewer times in a given year (Beta = -0.26, $P < 0.001$).

Discussion

This study adds to the literature by examining characteristics and usage patterns of households using a farmers' market that provides free produce. To our knowledge, this is the first peer-reviewed study to examine use of a farmers' market providing free produce. This approach provides a unique opportunity to identify patterns of farmers' market use without consideration of produce cost. This study also fills a gap in the literature by providing an overview of factors associated with farmers' market use among lower income persons [15]. The study findings are useful for health professionals and community leaders interested in promoting farmers' market attendance among lower-income persons.

Shift in Market Demographics

A shift in market demographics was observed from 2014 to 2015. Specifically, the proportion of market patrons at or below the poverty threshold decreased from 2014 to 2015. However, over half of market patrons were at or below the poverty threshold in both 2014 and 2015. Farmers' market users typically have higher income levels [15, 16]. Thus, the large proportion of lower income persons using a farmers' market is unique to this study [15, 16]. Experimental research is warranted to examine if the free produce is what caused relatively high market use among low-income patrons. Additional research is also needed to examine why farmers' market use decreased among impoverished patrons over the course of the study as this group is at greatest risk for food insecurity and diet-related chronic diseases [2, 3].

Market Use Frequency

Greater frequency of market use was observed in households where older, women with higher incomes were registering the household for the market and among households having a Medicare and/or social security beneficiary. Being female is the demographic characteristic most consistently associated with farmers' market use in prior research [15]. However, in this study, when examining the contribution of multiple characteristics to higher market use frequency, having

Table 3 Ordinal regression: factors associated with attending the market more times in a year (n=442)

	Beta	St. error	P	95% CI	
				Lower	Upper
Market year: 2014	1.00		–	–	–
Market year: 2015	-0.32	0.26	0.207	-0.82	0.18
Age	0.05	0.01	<0.001	0.03	0.06
Household poverty status: no	1.00		–	–	–
Household poverty status: yes	-0.49	0.21	0.020	-0.90	-0.08
Male	1.00		–	–	–
Female	-0.25	0.27	0.345	-0.78	0.27
Chronic condition type: none	1.00		–	–	–
Chronic condition type: diabetes	-0.22	0.59	0.714	-1.38	0.94
Chronic condition type: lung disease	0.34	0.56	0.541	-0.75	1.43
Chronic condition type: heart disease	-0.15	0.31	0.629	-0.76	0.46
Chronic condition type: cancer	0.01	0.48	0.990	-0.94	0.95
Chronic condition type: other	-0.17	0.31	0.593	-0.77	0.44
Primary transportation: car	1.00		–	–	–
Primary transportation: carpool	-0.39	0.29	0.175	-0.95	0.17
Primary transportation: walking	-0.11	0.48	0.815	-1.06	0.84
Number of reasons attended market	-0.05	0.13	0.714	-0.30	0.21
Number of financial support services received	-0.26	0.07	<0.001	-0.40	-0.12
Number of sources heard about market	0.40	0.28	0.150	-0.14	0.93

Referent group: attending the market 1–6 times

-2 Log likelihood = 917.75; Nagelkerke $R^2 = 0.203$

an older person registering the household for the market was the only significant predictor of high-frequency market use. Prior studies have identified positive associations between age and market use [15]. One plausible explanation is that older persons are retired with fewer occupational time constraints enabling them to visit the market more frequently. Additional research is warranted to examine market use among households containing older persons.

Low market use frequency was associated with households at or below the poverty level and households using financial support services such as Medicaid and public housing. When examining the contribution of multiple characteristics to low market use, only poverty status remained significant. While most market patrons reported driving to and from the market, it is possible that the current market location is inconvenient for low-income individuals who walk to the market. Location has previously been identified as a barrier to market use among low-income persons [20–22]. Access to the farmers' market for impoverished persons might be improved through the addition of low-cost public transportation and pedestrian friendly sidewalks. Additional research is needed to identify other possible barriers to market use as lower income persons are at risk of having a low-quality diet [2, 3] which could impact chronic disease risk [2, 3, 23].

Marketing Strategies

Between 2014 and 2015, marketing strategies used to reach households changed. Marketing strategies most recognized by participants in 2014 were word of mouth, through FISH, and flyers. However, in 2015 significantly fewer participants listed flyers and word of mouth as sources of learning about the market. Meanwhile FISH accounted for more than 50% of recognized marketing efforts in 2015. This change in marketing strategies could partially explain the shift in the proportion of low-income individuals who attended the market. Similar to this study, Colasanti and colleagues [21] identified word of mouth as an important marketing strategy for farmers' markets among low-income persons. Identifying optimal marketing strategies is crucial as increased market awareness could lead to increased attendance and fruit and vegetable consumption [28]. For example, there are health-care organizations, churches, and special interest organizations similar to FISH (Action, Inc., Faith Works, Shepherd's Staff Ministries, and other local government offices) that also serve low-income persons in Walton County [29] with whom the farmers' market can advertise. The Project for Public Spaces study on farmers' markets in low-income communities also suggests creating partnerships with government health organizations that can refer economically disadvantaged persons to the market [29].

Limitations

This study has several limitations. First household characteristic data were self-reported, which may introduce cognitive recall and social desirability bias. However, this study used an objective measure of market use frequency. The findings are most relevant to suburban areas with modest household incomes (median annual household income in Walton County is \$53,000) and might not be generalizable to other types of communities. We have provided detail about the study context to enable readers to consider generalizability to their setting. Further, the study fills an important gap in the literature by examining use of a unique farmers' market program located in a food desert, with a particular focus on low-income households using the farmers' market.

Recommendations for Future Research and Practice

The study findings suggest that those interested in promoting farmers' markets to low-income populations might benefit from community partnerships that enable free produce distribution and marketing through word of mouth. A substantial proportion of lower-income persons used the free-produce market; however, frequency of use was still lowest among this group indicating a need to address barriers beyond produce cost. Additional research is needed to identify how to increase the frequency of farmers' market use and sustain market use among low-income households over time.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval This manuscript complies with the ethical standards put forth by this journal.

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