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Implementing locally-tailored strategies to promote redemption of Farmers' Market Nutrition Program vouchers among WIC participants in Central Pennsylvania

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Abstract

The Pennsylvania Farmers Market Nutrition Program (FMNP) provides vouchers to participants of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) to purchase locally grown fruits, vegetables (F&V), and herbs every year from June to November. Voucher redemption is suboptimal among WIC participants in Lebanon County, a community with high numbers of low income and Hispanic families. Supported by a Racial and Ethnic Approaches to Community Health (REACH) award, our community-academic coalition partnered with the local WIC provider to implement locally-tailored strategies to promote redemption of FMNP vouchers. In 2019, we surveyed FMNP participants (n=100) to examine opportunities for improved voucher redemption. Increasing sites for voucher use (47%) and a larger variety of F&V (27%) were the most commonly selected improvements participants identified. Participants also supported improvements to increase awareness of available seasonal produce (14%), text/phone reminders to redeem vouchers (13%), and having recipes to cook meals with FMNP-approved F&V (12%). These findings led us to implement a weekly, Farm-to-WIC “grab bag” program in 2020/2021. We partnered with a local farmer to offer a variety of FMNP-approved produce in \$3 and \$6 grab bags at the local WIC office. Each grab bag included healthy recipes using the included produce. In 2021, we launched a text/phone reminder intervention to encourage voucher redemption among FMNP participants (n=57). Our work demonstrates the value of community-academic partnerships to identify and implement feasible strategies that are responsive to local needs as well as supporting existing programs providing greater access to affordable produce.

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Keywords

Special Supplemental Nutrition Program for Women, Infants, and Children; Farmers Market Nutrition Program; Fruits and vegetables; Hispanics; Community-academic partnership

Background

Inadequate consumption of fruits and vegetables (F&V) increases the risk of many chronic diseases such as type 2 diabetes, obesity, and heart disease (Wang et al., 2021). Only 4% of adults in Lebanon County, Pennsylvania report consuming 2 fruits and 3 vegetables daily (Center for Opinion Research, 2015) compared to 7% of adults in Pennsylvania and 8% of U.S. adults (United Health Foundation, 2019). Adults in Lebanon County also experience higher prevalence of type 2 diabetes (9.7%), obesity (33.6%), and heart disease (6.1%) than their fellow Pennsylvanians (diabetes=9.1%, obesity=30.1%, heart disease=5.9%) (Healthiest Communities, 2021). Differences in social determinants of health (SDOH) –or the conditions in which we live, learn, work, and play– contribute to the stark and persistent chronic disease disparities among racial, ethnic, and socioeconomic groups (Centers for Disease Control and Prevention, 2022). For example, low income is a risk factor for inadequate F&V consumption (Kirkpatrick et al., 2012), underscoring the need for programs supporting greater access to affordable produce in socioeconomic-disadvantaged groups (Di Noia et al., 2019). F&V consumption is especially important for low-income pregnant and postpartum women due to the increased need of essential nutrients (e.g., vitamin C, folic acid) to support healthy fetal development and mother’s health.

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) serves low-income pregnant and postpartum women, infants, and children up to age 5 who are at nutritional risk. The program works to improve food security among participants by providing nutritious food and nutrition education, including access to F&V through the Farmers’ Market Nutrition Program (FMNP). In Pennsylvania, FMNP provides four \$6 vouchers annually to WIC participants to purchase locally grown fresh F&V and herbs at approved farmers’ markets every year between June and November (Pennsylvania Department of Agriculture, 2021). Lebanon Family Health Services (LFHS), the local WIC provider in Lebanon County, had a 36.7% redemption rate of FMNP vouchers in 2019; that number dropped to 25.6% in 2020 because of the pandemic. Despite promoting use of FMNP vouchers (e.g., annual event that includes live cooking demonstrations with FMNP-approved produce and farm stand in the parking lot), redemption rates are lower in LFHS compared to neighboring counties. LFHS serves a large number of Hispanic families, accentuating the need of interventions that are responsive to local needs and preferences, and diverse cultural backgrounds.

In 2018, our community-academic coalition Better Together received a Racial and Ethnic Approaches to Community Health (REACH) award to plan and implement culturally-appropriate practice- and evidence-based interventions aimed at addressing preventable risk behaviors leading to chronic diseases, such as poor nutrition. Our funded initiative, Better Together REACH, serves the counties of Lebanon and Berks and focuses on eliminating

chronic disease disparities among Hispanics (Calo et al., 2020). Since the beginning of the REACH award, our coalition recognized the importance of improving access to affordable F&V in these communities while also supporting the WIC FMNP and local farmers. Although a growing literature shows promising opportunities to address structural and educational barriers limiting access to fresh F&V among WIC participants (Ball et al., 2018; Di Noia et al., 2019; Stallings et al., 2016), a knowledge gap remains for best practices for integrating farmers' markets into the WIC setting to address the underuse of FMNP vouchers.

The present study sought to evaluate a series of locally-tailored strategies to promote redemption of FMNP vouchers among WIC participants in Lebanon, including 1) a survey examining FMNP use and opportunities to voucher redemption, 2) a farm-to-WIC program using "grab bags," and 3) a brief text/phone reminder intervention. We aim to provide public health practitioners, including WIC administrators, with the evidence to successfully build upon existing WIC infrastructure and local resources (e.g., farmers, farmers' markets, coalitions) to promote greater redemption rates of FMNP vouchers, especially in predominantly racial/ethnic minority communities. Our study was grounded in principles of community engagement (Scanlon et al., 2017) and Social Cognitive Theory (SCT) (Bandura, 2018). First, our team worked collaboratively with and through groups of people and organizations, part of the Better Together coalition and who share similar interests and catchment area, to define project goals, develop materials (e.g., surveys, reminders), and implement activities that were consistent with community needs and existing resources. Second, the strategies implemented in this study touched on all three SCT determinants, including opportunities to improve self-efficacy (e.g., recipes for cooking meals using FMNP-approved produce), behavioral capability (e.g., reminders to redeem vouchers), and the environment (e.g., greater access to buy F&V).

Methods

FMNP Use Survey.

In 2019, we, the Better Together REACH evaluation team, conducted a brief survey with a convenience sample of 100 WIC participants to examine opportunities to promote FMNP voucher redemption. We recruited adults aged 18 years who received FMNP vouchers at LFHS in 2019. Only one survey was offered per family. The survey was conducted at the annual "Farm to Table" event hosted by LFHS in June 2019 (approximately 600 people attended including minors). Eligible individuals provided informed consent before taking the survey, which was offered in Spanish and English, and in paper format or verbally through a bilingual community health worker (CHW). The survey gauged opportunities to facilitate use of FMNP vouchers with the question, "what would make the FMNP easier to use?" The list of response options (Table 1) was informed by the SCT and studies that have examined strategies to improve FMNP voucher redemption in WIC settings serving large numbers of minority families (Seidel et al., 2018; Di Noia et al., 2019), and included strategies our community-academic coalition was prepared to implement. Participants received a \$10 gift card for their time. The survey study was approved by the Penn State Institutional

Review Board (IRB) (STUDY00012688, approved 6/14/2019). For analysis, we report the percentage of participants who selected any of the options provided in the survey.

Farm-to-WIC Program.

The pandemic created challenges for local farmers' markets as statewide COVID-19 mitigation protocols set occupancy limits for both indoor and outdoor events in 2020 and 2021 and many were closed for months. In 2020, we partnered with a local farmer to offer an innovative program: a variety of FMNP-approved produce was provided in \$3 and \$6 grab bags at the local WIC office. During the summer months, the farmer delivered approximately 80 bags/week and in the fall, approximately 40 bags/week. Bags were delivered on Wednesday mornings, and bags remaining at the end of the day were returned to the farmer by WIC staff (information on the number of bags returned was not collected). The number of bags and price per bag were consistent between 2020 and 2021. Grab bags could be purchased using FMNP vouchers or cash. This Farm-to-WIC program offered the same quality produce people usually find in farmers' markets in a convenient venue where participants could easily purchase after their scheduled WIC appointments. Informed by our initial survey, bilingual healthy recipes for cooking meals with seasonal F&V were included in grab bags. For evaluation, we tracked and reported the number of grab bags sold using FMNP vouchers or cash, and the dollar value of these transactions for each year. This study was approved by the Penn State IRB (STUDY00013944; approved 3/4/2020).

Reminder Intervention.

In 2021, we launched a text/phone reminder intervention to encourage voucher redemption among a random sample of FMNP participants (n=57). Participants were eligible if they were 18 years of age, received FMNP vouchers from LFHS in 2021, and owned a mobile phone that could receive calls or text messages. Participants were recruited at the annual "Farm to Table" and weekly Farm-to-WIC events at LFHS. Eligible participants were given a summary explanation of the study to read, implying consent, followed by the baseline survey. This study was approved by the Penn State IRB (STUDY00017273, approved 9/9/2021), with a waiver of written documentation of consent.

The baseline survey assessed preferred language (Spanish, English), Hispanic ethnicity, number of household members eligible to receive FMNP, whether they received FMNP in prior years, and number of vouchers not yet redeemed. Following survey completion, participants were randomly assigned into two groups; the "FMNP + Reminder" group that received vouchers as usual *plus* a text message or phone call at 30 days, or the "FMNP only" that received vouchers as usual but did not get reminders. Phone reminders were offered by a bilingual CHW or staff, took no longer than ten minutes, and included information about where to find the closest FMNP-approved vendor, what produce was eligible, and dates of Farm-to-WIC events. Text reminders included similar information. All participants, regardless of group assignment, received a follow-up survey two months after enrollment which asked if they had redeemed any FMNP vouchers. Participants who had redeemed FMNP vouchers were asked where they were redeemed (Farm-to-WIC, farmers' markets, other), whether they tried new F&V because of FMNP, use of emergency food services,

and whether they engaged with marketing promoting voucher redemption. Participants in the reminder group were also asked whether they found these calls or messages helpful. Surveys and reminders were offered on the participant's preferred language. Participants received a \$20 gift card for their time. For statistical analyses, we used Chi-square tests to compare categorical variables between groups (FMNP + Reminder and FMNP only). Wilcoxon Rank Sum tests were used to compare counts/continuous variables between the two groups, including the primary outcome, percentage of vouchers redeemed.

Results

FMNP Use Survey.

Among the 100 WIC female participants who completed the survey, 42% were Hispanic. The top two improvements that participants selected that would make FMNP vouchers easier to use was having more places to use vouchers (47%) and a larger variety of F&V to redeem for (27%; Table 1). Participants also supported improvements related to farmers' markets, including having extended hours of operation (24%), additional locations of markets and farm stands (19%), and better transportation to/from markets (14%). Participants also selected improvements to increase awareness of available seasonal produce (14%), text/ phone reminders to redeem vouchers (13%), and having recipes to cook meals with FMNP-approved F&V (12%). These findings guided our community-academic coalition to implement the Farm-to-WIC Program and Reminder Intervention.

Farm-to-WIC Program.

In 2020 and 2021, LFHS issued 4,000 FMNP vouchers/year to qualifying WIC participants. In 2020, 580 vouchers (15% of vouchers issued by LFHS) were used to purchase grab bags with a value of over \$1,740 in produce; in 2021, another 357 vouchers (9% of vouchers issued by LFHS) were redeemed for grab bags with a value of over \$1,071. Separate from the vouchers redeemed, LFHS also sold \$900 of grab bags for cash in 2020, and \$288 in 2021.

Reminder Intervention.

Baseline characteristics between groups did not differ (all $p > .05$; Table 2). Overall, our sample included Hispanics ($n=18$, 32%), people whose preferred language was Spanish ($n=7$, 12%), and prior recipients of FMNP ($n=40$, 70%). Post intervention, both groups reported similar percentages of FMNP vouchers redeemed ($p > .05$). Although not statistically significant (all $p > .05$), more participants in the reminder group reported redeeming vouchers through the Farm-to-WIC program ($n=13$, 33%) and farmers' markets ($n=16$, 41%) and trying new F&V because of vouchers ($n=10$, 26%), when compared to people who did not receive reminders ($n=3$, 17%; $n=5$, 28%; and $n=2$, 11%, respectively). Participants in the reminder group reported higher levels of engagement with materials promoting voucher redemption ($n=23$, 59% vs. $n=4$, 22%; $p=.029$). Ninety-five percent ($n=37$) of participants in the reminder group agreed that the call/text reminder was "helpful."

Discussion

Our three-year, collaborative Farm-to-WIC program, grounded in principles of community engagement and SCT, examined opportunities to encourage FMNP voucher redemption among WIC participants. Farm-to-institution programs facilitate physical and economic access to fresh produce, especially among priority populations like WIC participants (Di Noia et al, 2019). Findings from our initial survey guided our coalition to implement locally-tailored strategies that were responsive to community's needs and preferences. Our resultant Farm-to-WIC program is an innovative, lower cost approach when compared to more resource-intensive and costly offerings such as an on-site farmers' market. Although on-site programs have been successful in other WIC locations (Di Noia et al, 2019; Ball et al., 2018), they were not practical for our WIC partner in Lebanon. For instance, any project had to comply with strict COVID-19 mitigation protocols, including limiting physical contact between WIC participants, staff, and farm vendors. Importantly, our Farm-to-WIC program sought to decrease barriers for participants to redeem vouchers by improving location and convenience, while simultaneously providing a new stream of revenue for the participating farmer and supporting the local economy. Sales from grab bags alone represented \$3,999 for this farmer, an important source of revenue as many farmers' markets were closed or operated at limited capacity during most of 2020.

This study provides a blueprint for implementing strategies that built upon existing WIC and community resources, thereby increasing sustainability, including opportunities for adaptation to other priority populations. For example, our coalition is adapting this approach to connect farmers and seniors who receive FMNP vouchers by expanding the grab bag program to low-income senior housing. To pivot and sustain this expanded program, critical community infrastructure is needed, including having a local farmer deliver the grab bags consistently to senior centers during the FMNP season, easy return of unsold produce, and a selection of FMNP-approved produce that caters to this population. More evidence supporting strategies to increase FMNP redemption are needed since federal funding for this program is often at risk.

Limitations.

All study activities were implemented in a single WIC office. Therefore, we do not know whether these activities could be replicated in other WIC offices, especially those located far from farmers who could bring fresh produce to support a Farm-to-WIC program in a consistent way. Future efforts should consider community gardening programs as evidence suggests these type of projects can effectively reduce food insecurity, improve dietary intake of vegetables, and strengthen family and community relationships (Carney et al., 2012). Also, our reminder intervention was conducted in the late months of autumn, when less produce was available for voucher redemption compared to the peak months of the season. Study findings should also be interpreted with caution in light of the small sample size; therefore, the present work should be considered as a feasibility study. Finally, this study was not designed to assess changes in the consumption of F&V among the population impacted by our work. Prior studies have reported mixed findings regarding the impact of FMNP on the consumption of F&V among WIC participants (Stallings et al., 2016).

In terms of strengths, the present study is among the first to examine the feasibility of a Farm-to-WIC program using grab bags and the delivery of brief reminders to encourage FMNP voucher redemption. Our study also recruited a meaningful number of Hispanics, an understudied minority population in FMNP evaluations.

Implications for policy and practice.

Some states have achieved high rates of FMNP voucher redemption, in some places as high as 85% (Farmers Market Coalition, 2022). For instance, states like Washington, New York, Ohio, and Michigan, have successful programs in part because they have leveraged additional resources for marketing and outreach activities. Also, in Michigan, a study found that combining education about the preparation, storage, and nutritional value of F&V with the use of FMNP vouchers was key to the success of their program (Farmers Market Coalition, 2022). However, budget cuts to the federal program over the past decade and the 30% state funding match requirement to participate in FMNP, have limited WIC offices to offer similar education and outreach activities in many states (Farmers Market Coalition, 2022). Our work highlights the need to foster a positive informational environment through education and outreach, including the collection of hyper-local data to inform the implementation of strategies and adaptations. Results also show that farmers can be motivated to collaborate in novel ways, like offering grab bags, to address access barriers to FMNP in low-income communities, while generating good revenue. Following community engagement principles, collaborations were critical in building a successful partnership between WIC, state FMNP administrators, the university, and farmers.

In conclusion, our work demonstrates the value of community-academic partnerships to identify and implement feasible strategies that are responsive to local needs and promote existing programs supporting greater access to affordable produce. Innovative approaches like the Farm-to-WIC initiative may present important opportunities to improve healthful nutrition for priority populations and support local farmers sell their produce. Our work shows the resilience and creativity of our community partners to implement chronic disease prevention strategies despite the many challenges posed by the pandemic as well as the need to nurture and sustain infrastructure that is essential to advance public health (Lavinghouze et al., 2014).

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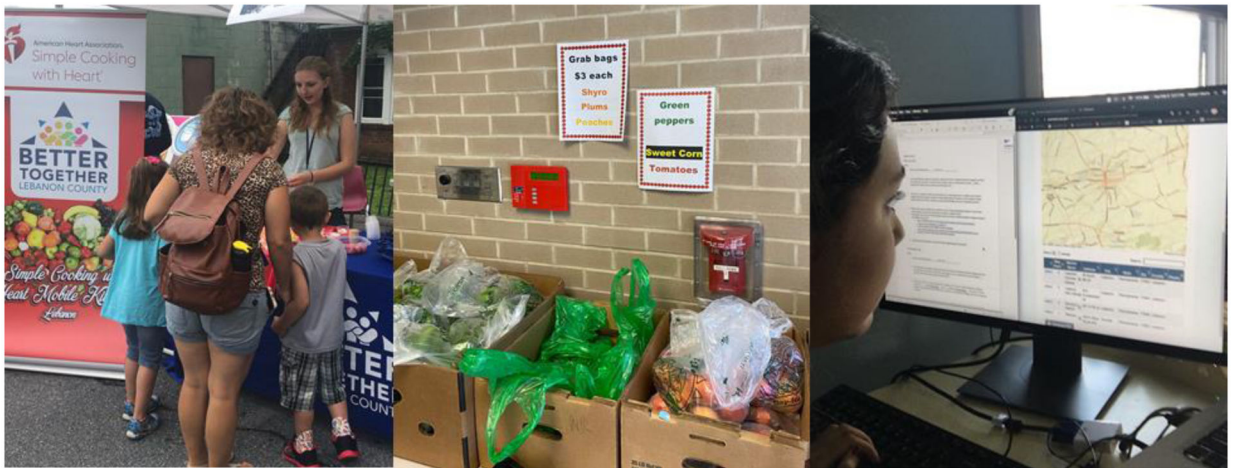


Figure 1.

Farmers Market Nutrition Program (FMNP) participants receiving bilingual nutrition education and taking our FMNP Use Survey at the annual “Farm to Table” event hosted by the local Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) office in June 2019 (left); Farm-to-WIC program featuring “grab bags” with a variety of FMNP-approved produce available for \$3 and \$6 (center); Our bilingual staff conducting a reminder call, using an interactive map developed by our Better Together REACH (Racial and Ethnic Approaches to Community Health) coalition to identify nearby vendors accepting FMNP and a script to educate participants about qualifying produce they can buy with vouchers (right).

Table 1.

Results from FMNP Utilization Survey to promote voucher redemption among WIC participants in Lebanon, Pennsylvania (n=100).

What would make the FMNP easier to use? (FMNP Utilization Survey, 2019)	%	How Better Together REACH and LFHS addressed opportunities
More places to use FMNP vouchers	47	Established Farm-to-WIC program to offer FMNP-approved produce in grab bags at LFHS
Offer variety of F&V	27	Grab bags included a mix of seasonal F&V produced by a local farmer
Extended farmers' market hours	24	n/a
Location of farmers' markets/farm stands	19	n/a
Transportation to/from farmers' markets	14	n/a
Knowledge of seasonal produce	14	Bilingual CHW educated FMNP recipients about seasonal produce
Text/phone reminders to redeem FMNP vouchers	13	Tested brief intervention offering text/phone reminders with a sample of FMNP recipients
How to cook a meal with FMNP-approved F&V	12	Grab bags included healthy recipes for cooking meals with FMNP-approved F&V
Family activities at farmers' markets	11	n/a
Easier way to carry F&V home	10	Grab bags provided convenience to carry F&V home

Note. FMNP = Farmers' Market Nutrition Program; F&V = fruits and vegetables; LFHS = Lebanon Family Health Services; CHW = Community health worker; n/a = Not applicable, due to COVID-19 we were not able to intervene on these issues.

Table 2.

Baseline and 2-month follow-up evaluation of a reminder intervention among FMNP participants who receive WIC services in Lebanon, Pennsylvania (n=57).

	FMNP + Reminder (n=39) n (%)	FMNP only (n=18) n (%)	<i>p</i> value
<i>Baseline characteristics</i>			
Hispanic ethnicity	13 (33)	5 (28)	0.68
Spanish was preferred language	6 (15)	1 (6)	0.42
Received FMNP vouchers in prior years	30 (77)	10 (56)	
Total household members eligible to receive FMNP vouchers, mean (SD)	1.6 (0.78)	1.5 (0.79)	0.72
Total FMNP vouchers available, mean (SD)	3.8 (3.36)	3.8 (2.75)	0.59
<i>Post-intervention variables</i>			
Percentage of FMNP vouchers redeemed, %	60	59	0.78
Redeemed FMNP vouchers through...			
Farm-to-WIC events at LFHS	13 (33)	3 (17)	0.19
Farmers' markets	16 (41)	5 (28)	0.33
Other	0 (0)	2 (11)	0.09
Tried new F&V because of FMNP vouchers	10 (26)	2 (11)	0.68
Used emergency food services	11 (28)	3 (17)	0.52
Engaged with marketing materials promoting use of FMNP vouchers	23 (59)	4 (22)	0.029
The reminder was helpful	37 (95)	n/a	n/a

Note. FMNP = Farmers' Market Nutrition Program; SD = Standard deviation; % = Percentage; F&V = fruits and vegetables; LFHS = Lebanon Family Health Services; n/a = Not applicable, only participants in the FMNP + Reminder group were asked this question.