



A qualitative study to inform the development of a subsidized community-supported agriculture program for Chinese Americans in Brooklyn, New York, U.S

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ABSTRACT

The objective of this study was to inform the development of a subsidized, culturally adapted Community-Supported Agriculture (CSA) program for the Chinese American (CA) community in Brooklyn, New York (NY), USA. We conducted interviews with CA adults to understand their eating and shopping behaviors, interests in CSAs, and recommendations for educational content to inform the development of a subsidized and culturally adapted CSA. We then conducted thematic analysis of those interviews and identified major themes. CA adult participants shared interest in a CSA primarily to support their own health, interact socially with farmers and other participants, and gain access to fresh, culturally appropriate produce. Major concerns for participation, especially among older adults, included language barriers, transportation, and mobility. The unique needs and motivations of CAs should be centered in the development of alternative food access interventions for this population. CA adult participants living in Brooklyn, NY may be interested in a subsidized culturally adapted CSA that includes health information about the produce and provides in-language support. Engaging communities in the development of a health program may be important to ensure accessibility and acceptability for CA populations.

1. Introduction

Structural inequity revealed by the COVID-19 pandemic, coupled with inequitable implementation of nutrition-focused policy and interventions have widened cardio-metabolic health disparities across racial/ethnic minority groups. (Zhang et al., 2018; McGill et al., 2015; Rehm et al., 2016; Trends in Dietary Quality Among Adults in the United States, 1999) Asian Americans (AA) have been historically underrepresented and aggregated in health studies, which can mask meaningful differences in behaviors, health risks, and health outcomes among different ethnic subgroups and communities. (Gordon et al., 2019; Holland and Palaniappan, 2012; Islam et al., 2010) Aggregation of AA health data also reinforces racial stereotypes, while excluding AA from public health policies, (Yi et al., 2022) and the model minority and healthy immigrant effect stereotypes impact the understanding of AA health. (Yi et al., 2022) Limited English proficiency among AA

immigrants can also lead to under-sampling in research. (Holland and Palaniappan, 2012) AA broadly show longer-term vulnerability to diet-related diseases; they have an elevated risk of hypertension, diabetes and non-alcoholic fatty liver disease in the United States (Anderson et al., 2015; Schwimmer et al., 2006; Tabibian et al., 2011; Zou et al., 2020; Fei et al., 2017; The Office of Minority Health, 2023).

Several factors make AAs particularly susceptible to diet-related disease. Immigration can shift diet due to factors such as convenience and availability of foods; many AAs increase their consumption of fat, sweets, and sodium while decreasing their consumption of their traditional foods and vegetables after immigrating to the U.S. and Canada. (Firestone et al.; Lv and Cason, 2004) Interestingly, while immigration is associated with this diet shift, Chinese immigrants tend to keep many cultural beliefs about health and food that focus on fresh fruits and vegetables to prevent disease. (Wang-Chen et al., 2022; Harrison et al., 2005) Thus, social and environmental factors may be mediating these

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inconsistencies between health beliefs and poor diet and health outcomes.

Lower English proficiency and social isolation make it difficult for immigrants to seek information about and use food and nutrition resources. (Zou, 2019; Vu et al., 2020) Transportation, mobility and health issues, especially during the COVID-19 pandemic, all serve as further barriers to accessing food and health resources among AA ethnic groups. (Rummo et al., 2021; Morales et al., 2021) In a needs assessment of New York City (NYC) AA adults during the COVID-19 pandemic, access to food was cited as the number one challenge (Đoàn et al., 2022).

There is an important gap in the health literature focusing on the Chinese American (CA) population. There are approximately 5.4 million CAs living in the U.S., which is the largest group among Asian origin groups in the country (Budiman and Ruiz, 2022). However, few health studies have focused on understanding this population's specific challenges and needs to access affordable and culturally appropriate food and health information. For the CA community in the NYC metropolitan area (NYCMA), economic hardship may further limit access to healthy food options; data from the American Community Survey demonstrated that 18 % of the overall NYC Chinese population and 30 % of CA older adults (65+ years) live in poverty. (Chinese in NYC: A Profile. Asian American Federation. Accessed April 8, 2023) A survey of CA adults in the NYCMA described traveling further to access culturally-specific foods and interacting with products and cashiers using their native languages; this was particularly true for those with lower incomes, less education and who were less acculturated. (Yi et al., 2021) Many nutrition and food interventions occur in settings that don't reach immigrant populations who primarily shop at ethnic grocery stores or have lower English proficiency. (Oronce et al., 2021; George et al., 2014) CA households in the NYCMA often speak different languages or have limited English proficiency, shop at non-western grocery stores, and exhibit varying levels of acculturation and food consumption behaviors. (NYC Mayor's Office of Immigrant Affairs. A Demographic Snapshot: NYC's Asian and Pacific Islander (API) Immigrant Population. Accessed July 23, 2023; Kirshner et al., 2020; Yi et al., 2021) Thus, interventions aimed at addressing food access in this community must be able to support a wide variety of food and language needs.

One approach for improving healthy food access and health outcomes is the Community Supported Agriculture (CSA) model. Here, an individual purchases a share from a farm before the growing season and then receives allotments of the harvest at set time points throughout the season. (Vasquez et al., 2017; Basu et al., 2020) CSA is a well-tested model among individuals of higher socioeconomic status and White populations. (Vasquez et al., 2017; Berkowitz et al., 2019; Feuerstein-Simon et al., 2020) Several studies have indicated that CSAs can increase the amount and variety of produce consumed, increase the quality of food consumed, and decrease opportunities to purchase and consume unhealthy food. (Berkowitz et al., 2019; Izumi et al., 2018; Izumi et al., 2020) Despite these encouraging findings, results are somewhat inconsistent and limited in applicability, particularly in low-income, immigrant communities. While some studies reached Black and Latine/x populations, (Basu et al., 2020; Izumi et al., 2020; Quandt et al., 2013) there is little to no adaptation or evaluation of CSAs for other diverse ethnic groups. However, adaptations of CSAs for other low-income populations, such as providing subsidized payment plans, show promise for low-income, AA communities. (Izumi et al., 2018; Izumi et al., 2020; Quandt et al., 2013; Seguin et al., 2017) Furthermore, CA adults often hold Eastern beliefs regarding food and health that emphasize consuming fresh produce. (Satia et al., 2000; Adekunle et al., 2013) A CSA model may support these beliefs by providing access to locally grown and seasonal produce. CSAs that incorporate social and educational components also provide participants with a sense of community and social support through meal sharing and learning opportunities. (Cotter et al., 2017; Lu et al., 2021; Chen, 2013) A program that incorporates the produce preferences, cultural beliefs, and language needs of low-income CAs may be a promising intervention to reach this

understudied population.

BASIS (Building Access to Food through Systems and Solidarity) or Harvest Share (community-facing name) is a multi-sector, equity-driven community-partnered initiative that addresses food access, nutrition education, policy change and hands-on learning incorporating culturally appropriate values throughout the activities. BASIS is designed for English, Mandarin Chinese, Spanish and Bangla-speaking individuals, including older adults, adults, and families, in Sunset Park, Brooklyn, New York and adjacent neighborhoods. The food access arm of BASIS is a subsidized CSA featuring culturally specific vegetables. Sunset Park is a neighborhood in Brooklyn, where half of the population are born in countries other than the U.S. (Profile and October 2022) A higher percentage of its residents experience poverty and rent burden and have limited English proficiency, compared to New York City (Hinterland et al., 2018).

Our research aims are to (1) explore priorities and interest in CSA membership among the CA community in Sunset Park, Brooklyn, (2) elicit recommendations for paired nutrition education and hands-on learning components, and (3) understand potential barriers and accommodations for participation. Our findings helped to inform the development of a pilot program of a subsidized, culturally adapted CSA for this community.

By directly engaging low-income CA community members through interviews, we can inform more effective evidence-based interventions to improve diet quality and address disparities.

2. Materials and methods

2.1. Basis

This study is part of a larger initiative called BASIS (described above). The interviews described here helped inform the development of a subsidized CSA that was piloted in Summer 2022. The program's development required extensive input from community partners and population of interest before it was piloted, including input on food preferences, cost, and interest in a paired educational component. Other formative research included input from a Community Advisory Board, quantitative surveys on food preferences among community members, including a comprehensive needs assessment, (Đoàn et al., 2022) participatory group model building workshops, (Chebli et al., 2023) neighborhood audits of the food retail environment, (Ali et al., 2021; Yi et al., 2022; Russo et al., 2022) and consultation with partner organizations. Four organizations were selected as partners for this program based on their status as trusted community leaders and experience with nutrition-related work: 1) Glynwood Center for Regional Food and Farming, a non-profit organization with extensive experience with CSAs and efforts related to increasing access to CSAs among low-income and limited English proficiency communities; 2) Chinese American Planning Council (CPC), a key community-based organization partner with experience advising on adaptation and implementation activities in the Chinese community; 3) The Table at NYU Langone Brooklyn Family Health Centers (The Table), a client-choice food pantry, and 4) Brooklyn Grange, a farming organization that has done extensive work with CSAs.

Brooklyn Grange has offered sliding-scale CSAs that run over the Spring, Summer, and Fall. Weekly produce boxes cost between \$16.50 to \$36.50 depending on household income, with flexible payment options. The organization can grow and distribute a variety of produce that our partners believed is enjoyed by CA households, including bok choy, pea shoots and cucumbers. We elicited feedback from partners and our target population to determine appropriate prices, logistics, and educational engagement. Ultimately, our research grants reduced CSA boxes from \$20 to \$5 per weekly box (75 % subsidy) for BASIS pilot participants.

2.2. Data collection

Between December 2021 and April 2022, 18 interviews were conducted with CA residents of Brooklyn, New York, U.S. We included individuals born abroad in China or Taiwan and immigrated to the U.S., and second- and third-generation CAs who were born and raised in the U.S. Eligibility criteria included being 18 years of age or older, self-identifying as Chinese, currently living in Brooklyn, and speaking either English, Cantonese, or Mandarin.

We recruited a purposeful sample through local community organizations that served low-income communities in Sunset Park, including CPC, The Table, and an elementary school. While we did not ask about income, many participants said they used SNAP benefits, indicating we were reaching our intended population. These participants brought expertise on their community traditions, values, barriers, and common practices to help our team understand how people with similar backgrounds and experiences would respond to a CSA.

The organizations shared Chinese and English flyers and information about the program with potential participants, and interested individuals contacted the study team in their preferred language (Mandarin, Cantonese, English). Verbal informed consent and eligibility were confirmed and obtained prior to each interview. Interviews were conducted over Webex and audio recorded.

Interviews lasted 30–60 min and were conducted in participants’ preferred language (Cantonese, Mandarin, English) by trained community health workers and members of the research team. Semi-structured interview guides were used, and included questions related to 1) current shopping and cooking behaviors, 2) awareness and interest in CSAs, 3) program components (cost, logistics, education and social components, and produce type), and 4) interest in future leadership opportunities (see supplemental material 1 and 2). Interview scripts (Supplements 1 and 2) were developed by members of the research team and then reviewed by community partners and community health workers who were familiar with the target population.

English interviews were transcribed verbatim. Interviews conducted in Cantonese and Mandarin were translated and transcribed into English. Each interview participant received a \$40 Target gift card. This study was approved by the Institutional Review Board at NYU Grossman School of Medicine.

2.3. Analysis

After reviewing 15 interview transcripts, the research team determined that responses were approaching saturation with regard to answering our research questions and gathering peripheral information. (Morse, 2015) The team conducted four more interviews to increase confidence that no new major themes were being introduced. Thematic analysis was conducted on interview transcripts using Dedoose software 9.0.46 (Los Angeles, CA: SocioCultural Research Consultants, LLC). (Socio 0000) A preliminary codebook was developed based on research questions and by reviewing the interview guide and transcripts. A team of five research staff coded the first three transcripts and met to reconcile coding discrepancies and finalize the codebook. A team of three coders double-coded the remaining 16 transcripts blind and met to resolve differences in coding until consensus was reached. The three coders developed matrices to compare findings across codes and participants. From these comparisons, the coders sorted codes into themes that captured the range of experiences and responses by interviewees.

3. Results

3.1. Participant characteristics

The 18 participant and household characteristics are summarized in Table 1. Most participants identified as female and were born outside of the U.S. Participants came from China, Hong Kong, the U.S., and

Table 1

Individual and Household Characteristics of Chinese American Adults (18) Interviewed Between December 2021 and April 2022 to Inform the BASIS Pilot Study in Brooklyn, New York.

Characteristic (n)	Full sample Mean or n	%
Participant Age (18)		
Mean (SD)	54.5 (21.4)	(range: 22 to 81)
Gender (18)		
Female	12	66.7
Male	6	33.3
Country born in (18)		
China	13	72.2
Hong Kong	2	11.1
Taiwan	1	5.6
USA	2	11.1
Household size (18)		
Mean (SD)	2.9 (1.4)	(range: 1 to 6)
Household size (18)		
1	2	11.1
2	6	33.3
3	5	27.8
4	3	16.7
5	0	0.0
6	2	11.1
Number of children living in the household (18)		
0	10	55.6
1	2	11.1
2	3	16.7
3	3	16.7
Language spoken at home (18)		
Cantonese	10	55.6
Mandarin	7	38.9
Fuzhou dialect	5	27.8
English	3	16.7
Shanghaiese	1	5.6

Taiwan. The average age was 54 years (range: 22 to 81 years). All participants spoke at least one non-English language at home, with Cantonese and Mandarin being the most popular. Three participants, two of whom were born in the U.S., spoke English at home in addition to a Chinese dialect. Seven major themes that would inform the development of the CSA emerged from the data: (1) cooking & food shopping behaviors, (2) interest in CSAs, (3) CSA produce, (4) cost & payment options, (5) recommendations for paired education, (6) language and mobility support, and (7) engagement and recruitment strategies.

3.2. Cooking & food shopping behaviors

7 participants reported that they could find all the cultural produce they were looking for in their local neighborhood. Nine participants said they would not swap out cultural produce for other produce if specific cultural produce was not available, but four said that they would swap. Produce swaps included substituting choy miao (white stem bok choy) for hairy gourd in the summer and swapping Chinese seasonal vegetables that are not in stock with varieties of broccoli or celery commonly available in US grocery stores. Two participants would just make the dish without the missing produce. When discussing cooking behaviors, six participants, most of them older adults, shared that they typically do not use recipes when cooking.

Common cooking methods identified by participants included boiling, stir-frying, steaming, and sauteing (Table 2, 3.2.1). Participants shared that they shop for produce at farmers’ markets, Chinese markets, and U.S. grocery stores (3.2.2, 3.2.3, 3.2.4). Participants who shared that they could not find cultural produce shopped at local farmers’ markets, and U.S. chain grocery stores. A 34-year-old Cantonese-speaking female shared that she is unfamiliar with the produce at an American market but has interest in learning how to prepare them

Table 2
Quotes Illustrating Seven Themes Around Developing a CSA for the Chinese Am Community.

Quote #	Quote	Participant
3.2 Cooking & Shopping Behavior		
3.2.1	"The big oven in the kitchen – I don't know how to use. One reason is because the children don't like to eat baked. They are used to the Chinese methods of cooking like steaming, boiling, stir frying."	71-year-old Cantonese-speaking female
3.2.2	"The Chinese supermarket can satisfy me most of the time, but the price is a little bit higher than China for the normal vegetables. And the quality is not that, is not as well as."	34-year-old mandarin-speaking male
3.2.3	"Weekends my wife and I frequent those farmers market coz convenient to us like this one by 4th Ave. while I look they all appear not well arranged neatly. Not like in supermarket things are arranged fairly well. Farmers market tend to present things messy spreading over everywhere."	75-year-old Mandarin-speaking male
3.2.4	"I go to Whole Foods and I purchase my meat there because I know it's better quality."	33-year-old Mandarin-speaking female
3.2.5	"When I go to the American supermarket, I am not familiar with most of the fresh produce, but I have interest to learn most of the American fresh produce in the supermarket and also wanted to learn how to cook them in general."	34-year-old Cantonese-speaking female
3.3 General Interest in CSAs		
3.3.1	"It's appealing to be able to get fresh produce in general and get it in a way that's regular. [The supermarkets I prefer] are relatively far from my neighborhood..... And if there was a way to get something regular and make it in some way that makes it more convenient for me, I think that that would be cool."	28-year-old Cantonese-speaking male
3.3.2	"Yes, I am very interested in participating because of health concerns and also the quality of produce from local farms is better and healthier."	34-year-old Cantonese-speaking female
3.3.3	"I'm interested in helping people to get healthy food, and how to improve their knowledge and attitudes towards healthy dieting."	34-year-old mandarin-speaking male
3.3.4	Mainly is the produce quality, to receive organic fresh produces and to support the local farmers as well...It's a clever idea if I can interact or check out the farm with the farmers together. I am willing to take part."	73-year-old Cantonese-speaking female
3.4 CSA Produce		
3.4.1	"I would say a variety of them, so it would be like, you know, not too many of each kind, but, like, the variety could be more. I could have 2 or 3 cucumber, 2 or 3 carrots, not like 10 carrots."	33-year-old Mandarin-speaking female
3.5 Program Cost & Payment Options		
3.5.1	"If it's subsidized, that means it's cheaper, then it might beat the cost of me going out to the grocery store or supermarket, so it would definitely improve the chances that I take part in such a program."	28-year-old Cantonese-speaking male
3.5.2	"If SNAP benefits can be used to participate, I will definitely join the program."	74-year-old Cantonese-speaking male
3.5.3	"Sometimes I might not be able to finish the whole basket each time. If I keep getting the basket and can't use all the produce in time, then all the produce will go to waste. I'm thinking if I have the possibility to order a basket as needed and I can pay for the basket each time I order whenever I need it, it would be better."	68-year-old Fuzhou dialect-speaking female
3.6 Recommendations for Paired Education		
3.6.1	"I would like to see the recipe of the fresh produce that comes in the basket, the nutritional value and other health info."	33-year-old Mandarin-speaking female
3.6.2	"Yes, that would be great. The things that you teach are actually helpful to older adults. Every older adult – they can sometimes cook for their grandchildren, sometimes cook for themselves. It is useful information, because a lot of older adults just cook and they don't know what the nutrition	71-year-old Cantonese-speaking female

Table 2 (continued)

Quote #	Quote	Participant
3.6.3	value of each food. They just know that it tastes good and they eat it. But the nutrition value – they don't know about it. Once you inform then they would be more knowledgeable." "I feel like that would be great [to involve children in classes] because it would also teach children how to cook at a very young age and this is a very important life skill later on. Developing an interest at a young age is nice. I guess it also depends on the parent's comfort level. If the recipe is very complicated and has knives and heat, then it probably is not the best idea. But if it very simple, like making a salad, that would probably be more convenient for a child to be involved and be excited for eating vegetables."	22-year-old English-speaking female
3.7 Language and Mobility Support for Chinese CSA Participants		
3.7.1	"As long as you can solve the language barrier and there is a translator [for social events], then this should not be an issue. I'm only afraid that there will be no translator for us older adults who do not understand English at all... I am kind of interested in interacting with the farmers. The issue would be language barrier"	74-year-old Cantonese-speaking male
3.7.2	"I would prefer somewhere near my house. So, I don't have to walk that far, especially during inclement weather such as rain or snow due to my mobility issues. It would be best to have a home delivery service offer to older adults, especially over 70 due to their declined mobility issues."	73-year-old Cantonese-speaking female
3.8 Engagement and Recruitment Strategies		
3.8.1	"I think [having Chinese-speaking staff to help explain the program is important] because many [older adults] do not know English just like me"	70-year-old Cantonese-speaking female
3.8.2	"I feel like a lot of people are really comfortable with WeChat even if they do not know how to make an email. My grandmother herself, she is like almost 80, she can use WeChat perfectly fine but she cannot email or go on a website. But WeChat...I don't know...they are really good at it."	22-year-old English-speaking female
3.8.3	"If it is a trusted organization, then I will of course join. But if it is not a trusted organization, then I will not... Even though I can't see your face. I think you should be an honest person and won't trick us [because we were referred by CPC]."	74-year-old Cantonese-speaking male
3.8.4	"I only go to CPC. I never participate in other organizations... If I know it's good, of course I will join... This society has a lot [organizations] that trick and lie to older adults."	70-year-old Cantonese-speaking female

(3.2.5).

When it came to paying for food, seven participants, all 65 years old or older, were enrolled in the Supplemental Nutrition Assistance Program (SNAP) and used their SNAP benefits to purchase food.

3.3. Interest in CSAs

While seven participants had prior experience in a discounted produce program organized by CPC, no participants had previously participated in a CSA. However, after interviewers described a CSA model to each participant, all 18 participants expressed interest in participating for different reasons. The most cited reasons for interest were access to fresh produce, health-related reasons, the inclusion of a social component (with other CSA participants, their families, and farmers), and the subsidized model.

Over half shared an interest in CSA to access fresh produce (3.3.1). Furthermore, many participants believed a CSA could positively contribute to their overall health by consuming more fresh produce and promoting a healthy lifestyle (3.3.2, 3.3.3).

Participants were also interested in social interactions; 10 were interested in interacting with farmers, and 14 were interested in interacting with other CSA participants. A 73-year-old Cantonese-speaking female expressed her interest in both receiving fresh produce and in interacting with the farmers who would provide the produce (3.3.4).

3.4. CSA produce

When discussing specific produce that would be included in the CSA boxes, there was a strong interest in receiving a variety of Asian produce, including Chinese broccoli, choy sum, gai lan (early jade broccoli), and bok choy. Most participants expressed interest in receiving a variety of produce in each box. Three participants stated that it is important to receive a variety of produce in each box to avoid eating the same produce each week, including a 33-year-old Mandarin-speaking female (3.4.1). Responses on the quantity of produce per box and frequency of box distribution varied and there were no trends identified across age group or household size.

3.5. Cost & payment options

Participants repeatedly brought up four payment-related ideas to get people interested in joining CSAs, including (1) discounts and subsidies, (2) flexible payment plans, (3) SNAP as a payment option, and (4) providing important information on the basket before participants place orders.

10 participants said they would consider cost before joining; they were interested in joining if the CSA cost matched approximately what they currently paid for groceries, and several were willing to pay \$20 or less per box. 13 participants favored a subsidy to try out the program, ranging from 10 to 50 percent off. Subsidies were also a recruitment factor to attract more people to the program (3.5.1). Using SNAP benefits as a payment option would increase interest and potentially attract others into the program (3.5.2). Eight participants wanted the flexibility to stop and start payments according to their interests and needs for the produce (3.5.3).

Additionally, participants were interested in receiving information about the amount and types of produce in each basket prior to purchasing. Seven participants brought up that the amount of produce they would receive in each basket was important to consider before signing on to a CSA, especially in the context of getting a good price for each basket.

3.6. Recommendations for paired education

To complement the CSA, we proposed to include educational materials on cooking and nutrition in the CSA boxes and virtual or in-person instructional classes. Participants shared great interest in these educational resources; 11 were interested in recipes or resources teaching them how to cook the produce in each CSA box, and 10 were interested in information about the nutritional benefits of the produce. Interestingly, of the seven participants who do not usually follow strict recipes, five still had interest in receiving recipes and cooking ideas for the CSA produce. 11 participants were interested in receiving health and nutrition information about the CSA vegetables (3.6.1).

Classes were also offered as an educational option to pair with the CSA. Most participants (12) favored a virtual format for classes; reasons included concerns about COVID-19 safety, convenience, and being homebound. All five participants who were interested in in-person classes wanted the location to be convenient (ie. close to their homes, at a local trusted organization they visit frequently, or in Brooklyn in general).

Nine participants were interested in interacting with the farmers who grow the CSA produce; six wanted to learn how to grow their own produce, 2 were interested in gleaning events (collecting leftover crops from a farm that are no longer economically profitable), and one wanted

to participate in activities on the farm with kids.

3.7. Language and mobility support

Language barriers were the most common concern among participants. Both Cantonese and Mandarin were noted as languages that should have verbal and written language support in all aspects of the CSA, from recruitment efforts, pick up or delivery protocols, education materials and classes, as well as farmer and social interactions. Furthermore, most participants who were interested in interacting with farmers said that language support was necessary for this interaction (3.7.1).

Older adults were also concerned about CSA pick-ups. Fifteen participants shared a preference for delivering CSA baskets to their homes rather than picking them up due to convenience, mobility concerns (3.7.2), and not wanting to use public transportation during the COVID-19 pandemic.

3.8. Engagement and recruitment strategies

To increase engagement with the Chinese community in Brooklyn, participants identified three main recruitment strategies: (1) ensuring in-language support, (2) offering different avenues of communications, and (3) partnering with trusted community partners. Participants interviewed in Mandarin or Cantonese brought up the need for ensuring recruitment staff and materials could accommodate Chinese (3.8.1).

Participants also suggested different avenues of communication could reach different demographics. These suggestions included signing up through in-person events, a website, WeChat, a popular social networking phone application among Chinese communities (3.8.2), or by phone.

Most participants stressed the importance of partnering with organizations they were familiar with, including CPC, senior centers, general community centers, and health clinics. Participants shared that CPC has established trust in the community, especially among the older adults (3.8.3). A 70-year-old Cantonese-speaking female mentioned that some organizations have been known to trick older people, highlighting the importance of partnering with an institution that is trusted in the community (3.8.4).

4. Discussion

To our knowledge, this is the first study examining the perceptions of CA on the creation of a CSA specifically tailored to meet their needs. Participants shared their current food-related behaviors and gaps in their local food environment that may be addressed by our subsidized CSA. Most notably, despite no prior experience with, and little prior knowledge of CSAs, all participants were interested in enrolling, specifically to support their health, interact socially with other participants and farmers, and access to fresh produce. The literature shows that currently most CSA participants have higher incomes, have completed more education, and are White. (Vasquez et al., 2017; Brehm and Eisenhauer, 2008; Russell and Zepeda, 2008) CSAs that are specifically targeted and tailored for low-income and diverse communities have been successful (Izumi et al., 2018; Seguin-Fowler et al., 2021); however, none have been specifically created for CAs with community input. Our participants shared unique motivations for enrolling, which can be used to tailor a CSA to fit the needs of this population. The absence of these findings in prior research on food access programs demonstrates the importance of outreach to communities of diverse ethnic and socioeconomic backgrounds.

Our participants were interested in receiving fresh produce and learning about the nutritional benefits of the produce. Similarly, Satia-Abouta et al. showed that CA and Chinese Canadian women generally believe in a relationship between their health and a diet high in fruits and vegetables. (Satia-Abouta et al., 2002) However, some women

reported that healthy foods were more expensive in North America compared to their home country. These findings, along with our results, show that resources increasing access to, and information about, fruits and vegetables could support values among CAs of different generations. Our team plans to incorporate nutritional information and emphasize produce freshness in the CSA program.

Participants were also interested in cooking and growing the produce. Interestingly, while many participants said that they did not usually follow recipes at home, many also wanted recipes using CSA produce. We interpreted these findings as participants wanting cooking ideas on how to use produce that were unusual to them, rather than in-depth recipes. While participants were excited to receive a variety of both Chinese and American produce, they were concerned about produce being more expensive compared to what they normally purchase, that produce would spoil if they received more than their household could eat, and about not knowing how to cook unfamiliar produce. To this end, our team will develop cards sharing how to use produce in simple preparations that are familiar to the participants, such as swapping out kale for bok choy in a stir-fry. Most participants were interested in interacting with the farmers who grow the CSA produce, including learning how to grow produce. Community-based gardening education and CSAs paired with nutrition and cooking education have separately been associated with increased fruit and vegetable intake. (Lu et al., 2021; Tharrey and Darmon, 2021; Litt et al., 2011) We plan to work with Brooklyn Grange to develop educational resources to correspond to when produce is being distributed to participants.

There was little consensus on the format of educational classes for different reasons, including safety, convenience, and mobility. Given the discrepancy in responses, our team may provide hybrid options to attend classes, where participants can join in-person at a convenient location with a virtual option for those who are unable to travel.

Mobility and language were both barriers, particularly for older adults concerned about transportation and their mobility being barriers to picking up CSA produce and visiting the farm. Mobility among older adults has been previously reported as a barrier to food access, (Bishop and Wang, 2018) as well as transportation to CSA pick-up sites in another study (Quandt et al., 2013). When it came to communication and outreach, our participants emphasized the importance of utilizing both Cantonese and Mandarin languages. Many of the older adults we interviewed have limited verbal and written proficiency in English, or do not speak it at all, and were worried that they could not fully participate in a CSA. Moreover, food insecurity has been associated with speaking a language other than English at home, social isolation, transportation and low acculturation. (Rummo et al., 2021; Morales et al., 2021; Becerra et al., 2018) Although the connection between acculturation and food security is complex, higher levels of acculturation are associated with improved access to foods and food services. (Nosratabadi et al., 2020; Whitley, 2013) Conversely, a lack of language support in food access programs and limited access to culturally-relevant foods may be barriers for low-income CA from accessing food. (Yi et al., 2021) Future programs should work with their partners to provide delivery options to participants who have limited mobility, safety concerns, or other significant circumstances. Additionally, it is essential that staff is able to support participants' preferred languages. Our team plans to create Mandarin, Cantonese, and English versions of all forms of communication, including recruitment and education.

Finally, the variety of responses we got based on age and language proficiency reiterates the importance of flexibility, especially in community-engaged work. For instance, younger, more mobile participants may prefer in-person classes and weekly CSA box pick-up, while older adults with limited mobility need virtual and delivery options. Future studies may also consider narrowing their target audience to ensure their program and mode of delivery addresses participants' needs.

Participants reiterated the importance of social networks and partnership with trusted community organizations. As one participant

noted, organizations tend to trick and scam older adults; so, often the best way to reach folks is to have community-based organizations. CPC was the most popular organization mentioned. Participants mentioned the staff at CPC, and how they would help them with signing up for benefits and entitlements and help them with registration if needed. Because CSAs are a new concept to most of our target audience, our team will take the time to explain how CSAs are designed for the community. Their acceptance of CSAs is also aided by CPC vouching for the BASIS program. These findings emphasize the significance of understanding the needs of a community and developing trust and partnerships with individuals when attempting to provide a resource.

Our study has a few limitations. First, the participants and our community partners have shared that there are a number of Asian grocery stores, Chinese community organizations, and other resources that support CA food security and ethnic identity in this neighborhood. However, the history of CA populations in Sunset Park is much longer and more established compared to other regions of America. Thus, there may be more structural and communal support here that may impact the experiences of participants and receptivity to our proposed CSA. Additionally, while we coordinated with trusted community partners to recruit participants because of their integration in the Chinese community in Brooklyn, there are likely many Chinese individuals in Sunset Park who do not actively engage with these organizations and may have unique barriers and needs for food access programs that we could not capture.

Our study also has several strengths. Recognizing the barriers for minority and immigrant populations to participate in research, (George et al., 2014) we took steps to build trust and engagement of our target community. Instead of aggregating AAs broadly, we focused our sample on a particular under-researched ethnic community to tailor our program to their needs and circumstances. We conducted interviews in the participants' language of choice which helped reduce barriers to participating in research for non-English speaking CAs. Lastly, we were able to interview a wide range of ages. This enabled us to better understand the potential differences and similarities between the preferences of older and young adults. This allowed us to consider multiple perspectives pertaining to physical access, language support, and cultural practices in the formative stages of our program design.

5. Conclusions

To our knowledge, no study has directly engaged the CA population in the development of a culturally tailored nutrition-focused program. Many participants, especially older adults, had concerns related to language barriers, transportation, and mobility. In-language support throughout the program was emphasized by almost all interviewees. Future programming engaging with a wide range of age groups and English proficiency levels must prioritize the accessibility of a program or intervention. Partnerships with trusted community organizations is also important, especially when engaging with populations that have been under-represented in health research. Many of these lessons learned have been incorporated into current programming (Yi, 2022).

Based on the high levels of interest among participants, a CSA can be a method to improve healthy food access and diet-related health outcomes among the CA population in Brooklyn, NY. These findings provide a pathway for future research among other diverse immigrant and ethnic groups that are particularly susceptible to diet-related disease.

CRedit authorship contribution statement

Isabel Lu: Methodology, Visualization, Supervision, Data curation, Writing – original draft, Writing – review & editing. **Rachel Suss:** Methodology, Investigation, Data curation, Writing – original draft, Writing – review & editing, Supervision, Project administration. **Dalila Victoria Lanza:** Investigation, Visualization, Writing – original draft. **Sarah Cohen:** Investigation, Visualization, Writing – original draft.

Yousra Yusuf: Methodology, Visualization, Writing – original draft, Project administration. **Stella S. Yi:** Conceptualization, Writing – review & editing, Supervision, Project administration, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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Appendix A. Supplementary data

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