Research Article

Equity-Promoting Strategies in Online Grocery Shopping: Recommendations Provided by Households of Low Income

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ABSTRACT

Objective: To explore barriers and facilitators of online grocery shopping and identify community-driven strategies to promote equity in online food access.

Design: This qualitative study used a purposive recruitment strategy to conduct 11 focus groups and 5 in-depth interviews between November 2020 and March 2021.

Setting: Data collection was conducted virtually with participants residing in diverse (majority urban) regions of Maryland.

Paricipants: 44 primary household food purchasers with young children (aged < 8 years) eligible for the *Supplemental Nutrition Assistance Program* (SNAP).

Phenomenon of Interest: Barriers and facilitators of online grocery shopping and strategies elicited by the community to leverage SNAP and online food retailer services to reduce inequities in healthy food access.

Analysis: We coded and analyzed transcripts on the basis of the Socioecological Model, Theory of Planned Behavior, and an Equity-Oriented Framework.

Results: Overall, we identified 10 themes across all socioecological levels, all of which reflected both barriers and facilitators to online shopping: (1) individual: trust of shoppers, technology, (2) interpersonal: spousal/children needs, (3) community: safety and security, (4) organizational: retail experience and food quality, and (5) policy: SNAP and structural inequities. Participant recommendations included improving food access and communication with hired shoppers, implementing more payment/cost-saving options, and offering educational programming for SNAP participants on using benefits online.

Conclusions and Implications: Households of low-income identified barriers and facilitators of online grocery shopping across the socioecological levels, emphasizing the need for a multilevel approach to equity promotion. We recommend future work to explore the suggested actionable pathways, which involve delivery providers, grocery stores, nutrition educators, and policymakers leveraging online grocery features (ie, meal planning support) and policies (ie, expansion of the SNAP Online Purchasing Pilot to more retailers) to reducing deterrents (ie, delivery fees waived) for an equity-promoting online grocery environment.

Key Words: online grocery shopping, food insecurity, low income, health disparities, SNAP (*J Nutr Educ Behav.* 2022;54:998−1010.)

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INTRODUCTION

Food insecurity and poor diet quality have multiple predictors across the levels of the Socioecological Model (SEM),[1] ranging from individual-level awareness and attitudes toward healthy eating to household-level financial constraints, to the lack of physical and financial access to safe, affordable, and nutritious food at the community level.[2,3] These conditions often leave the household food purchasers to rely on inexpensive, energy-dense, nutrient-poor foods.[4]

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Nationwide, 10.5% of Americans experience food insecurity, with a higher prevalence among households with children (13.6%).[5,6] Households with children deserve special attention as growing up in a food insecure home poses risks for young children beyond poverty, negatively affecting their physical and mental health and development.[7]

Physical, social, and financial barriers prevent individuals living in households of low income from equitable access to sufficient, safe, and nutritious food. Food assistance programs, such as the *Supplemental Nutrition Assistance Program* (SNAP) and the *Special Supplemental Nutrition Program for Women, Infants, and Children* (WIC), are intended to alleviate food insecurity that leads to poorer health outcomes.[8] To provide families living in households of low income with equal access to healthy foods, especially in light of the social and economic impacts of the coronavirus disease 2019 (COVID-19) pandemic, the US Department of Agriculture launched and rapidly expanded an online purchasing pilot (OPP) program to allow the use of SNAP benefits as a payment method for online grocery orders.[9] However, although WIC benefits are currently unredeemable online, researchers have partnered with retailers to evaluate the feasibility of a click & collect model for WIC online, in which customers place their orders online and complete the payment at pick-up.[10]

The popularity of online grocery services has increased in the US, accounting for 10% of the overall current grocery market in 2020, and is projected to double in the next 5 years.[11] During the COVID-19 pandemic, online grocery shopping experienced a sharp increase in popularity, with 78% of the US adult population reporting shopping for groceries online since March 2020.[12] Current changes in supply and demand within the food system shaped this growth, initially triggered by social distancing policies promoting health and safety of shoppers. On the demand side, consumers who have shifted to online grocery shopping value the convenience and time-saving aspects of the service and safety concerns related to health.[13] On the supply side, the increased availability of online grocery services across large and small retailers, paired with the expansion of home delivery and curbside pick-up services, have facilitated increased service use.[14,15]

However, inequitable access to online grocery services remains a concern partly because of structural barriers related to technology access or reliable internet.[16] The technological barrier and the low availability of grocery stores offering online services in underserved areas such as rural environments [17] form a digital food desert.[16] Moreover, even when online grocery services are available, healthy food options, such as fresh produce, may be unavailable at the retailer or not purchased by consumers online because of mistrust of hired online shoppers in selecting high-quality items.[16,18,19] Families living in digital food deserts may be at a greater risk for food and nutrition insecurity and diet-related chronic disease, underpinning why food insecurity is a significant contributor to the US obesity epidemic.[20]

Prior research has applied Ecological Systems Theory (EST) to understand inequities in healthy food access.[1] The premise of the EST, first developed by Bronfenbrenner (1979), is that one's life is affected by interconnected, nested environmental factors that encompass prevalent social and cultural values (macrosystem), interactions within and between social environments (mesosystem and ecosystem), and immediate environment (microsystem).[21] The EST forms the foundation of the SEM, which further disaggregates these ecological forces into individual, interpersonal, organizational, community, and policy level factors.[1] In disentangling individual-level contributors to nutrition-related inequities, the Theory of Planned Behavior (TPB) provides an additional lens to connect healthy eating with relevant attitudes toward the behavior (eg, beliefs on the importance of healthy eating), subjective norms in relation to the behavior (eg, perceptions on family support to eat healthy foods), and perceived behavioral control (eg, one's ability to enact healthy food behaviors).[22,23]

To identify pathways to address these inequities, the Equity-Oriented Framework (EOF) developed by Kumanyika (2019) outlines 4 overarching strategies for obesity prevention and can be applied to inform interventions to improve equity in the online grocery retail environment by (1) improving access to healthy foods, (2) reducing deterrents to healthy food purchasing, (3) improving social and economic resources, and (4) and building on community capacities.[24,25] Qualitative research is important to foster co-learning and equitable collaborations among community partners while incorporating local relevance to health problems.[26] The application of qualitative methods informed by the EOF, SEM, and TPB allows researchers to identify determinants of online grocery shopping behaviors with specific pathways to enhance policies (eg, SNAP OPP) while centering the agency of consumers on disentangling these determinants and identifying solutions that work for them.

Therefore, the SEM, EOF, and TPB guided this qualitative study to identify perceived strategies to reduce inequities in healthy food access and purchasing behaviors related to online grocery services by SNAP-eligible households with young children.[1,24] This study aimed to assess perceived barriers and facilitators to online grocery shopping among children living in households of low income and identify strategies to promote equity in healthy food access and purchasing behaviors.

METHODS

Design

We used a qualitative methodology for this study, given its aim to explore experiences, meanings, and perspectives from community members to inductively reveal areas for more targeted, explanatory quantitative research and policy prioritization.[27] The ideas presented by participants developed iteratively through interactions within focus groups, which provided more nuanced and comprehensive insights than an individualized survey-based approach. The research team

involved in the study development, implementation, and analysis included male and female, White and non-White researchers with graduate-level training and experience in qualitative methods, food security, public health nutrition, food policy, and health of underserved communities in the Northeast region of the US. No research team members had preexisting shared connections or relationships with any of the study participants.

Recruitment

Details on data collection methods and study design of the larger mixed-methods study, from which data of this study are sourced, have been described elsewhere.[19] Briefly, qualitative data was collected between January and March 2021 as part of a study exploring online grocery shopping behaviors among SNAP-eligible households with young children in Maryland. Adults living with a child aged ≤ 8 years, self-identifying as their primary household grocery shopper (shopping ≥ once/month), and having a low income (self-reported annual household income of ≤ 130% of the federal poverty level and/or enrolled in SNAP) were invited to participate in online focus group discussions. We primarily recruited participants to complete an initial quantitative survey via social media advertising (80%) (specifically Facebook and Instagram), given the demonstrated effectiveness of the platform in recruiting for health research during the COVID-19 pandemic.[28] We conducted additional recruitment in a pediatric nutrition clinic for underserved families (12%), online via ResearchMatch.org (2%), and Maryland-based school and community listservs (6%). There was no difference in recruitment sources between the quantitative and qualitative samples.

Data Collection

A total of 310 households participated in the quantitative phase of the parent mixed-methods study, and in parallel, we invited a subsample for the qualitative phase of the study reported in this paper. During mid-data collection (Jan 2021), we stratified participants of the initial survey (n = 241) into 5 groups on the basis of SNAP status and previous online grocery shopping experience. We planned a sample of 10 participants in each of the 5 focus groups (n = 50) on the basis of previous literature, feasibility, and funds available.[29] We contacted and invited a random sample of up to 20 participants from each stratified group a maximum of 3 times. If at least 5 people did not respond to contact attempts in a particular group, we contacted and invited additional random samples of 10 participants. Through this process, of the 241 survey respondents, 215 received an invitation for the qualitative study: (1) SNAP, shopped online (n = 60); (2) non-SNAP, shopped online (n = 36); (3) SNAP, never shopped online (n = 61); (4) non-SNAP, never shopped online (n = 18); and (5) mixed (n = 40). Based on past research and the TPB, we decided to stratify participants into homogenous groups on the basis of SNAP and online grocery shopping experience to facilitate group interaction and dynamics.[22,29] We included a heterogenous group (ie, mixed) to evoke debates of different experiences and viewpoints in relation to SNAP participation and past online grocery experience.

If < 3 participants attended a scheduled focus group, we conducted individual in-depth interviews. Because of the fewer participants in each online session, we scheduled more focus group discussions to ensure the representation of viewpoints of the diverse study population until data saturation was achieved. Because of the small initial sample of non-SNAP who never shopped online (n = 18), we could not hold a homogenous focus group; however, their views were represented in mixed focus groups. We also conducted 2 mixed focus groups during the last week of data collection for invited participants unable to attend earlier stratified sessions.

We provided all invited participants with an additional survey that included questions on household food security, measured using the 6-item validated US Department of Agriculture screening tool[30] to assess food insecurity within the past 12 months, along with information on technology use (including comfort with Zoom video conferencing software). In addition, participants self-reported their race and ethnicity from a list: White or Caucasian, African American or Black, Hispanic or Latino, Asian, Middle Eastern, American Indian, or Native Hawaiian. Participants could select multiple categories, which we grouped as multiracial.

A facilitator and a notetaker conducted each focus group or interview, which typically lasted about 60 minutes. We used a predeveloped discussion guide informed by principles of the TPB[31] to gather attitudes toward experiences with, barriers to, and facilitators of online and in-store grocery shopping, SNAP participation, and strategies to improve online grocery shopping experiences (Table 1). The drafting of the predeveloped guide was informed by themes identified in past research on online grocery shopping among SNAP participants,[29] and then revised using input from community partners (Maryland *Supplemental Nutrition Assistance Program Education* [SNAP-Ed], Baltimore City Department of Planning, and a local nonprofit organization promoting food security). Facilitating researchers conducted debrief sessions after every focus group or interview to identify signs of data saturation.[32,33] Specifically, during each debrief session, the facilitator and notetaker discussed what they identified as the salient themes from the interview, the emergence of new themes, and recurrent themes, which were documented in a debrief form. The consistent recurrence of similar themes and lack of new emergent themes were considered signs of data saturation. Researchers iteratively adapted interview guides to incorporate emergent themes learned from previous interviews and preliminary findings from quantitative analyses of the survey data being conducted in parallel (eg, differences in attitudes toward online grocery shopping or types of food purchased online), following the grounded theory approach.[34]

Table 1. Summary of Key Questions Asked to Households of Low Income With Children Who Participated in Focus Groups or In-depth Interviews

Topic of Discussion	Example Questions
Attitudes and perceptions about buying groceries online	• What are your thoughts about online grocery shopping? • Have you thought of getting your groceries online? • What are some of the reasons that influenced your decision to (or not to) order your groceries online?
Experiences with shopping online and in person	• How does your experience grocery shopping with your kids compare when buying in-store vs online? • Where have you bought groceries online? • What are the foods/beverages that you usually buy in-store but not online? • How would you compare the money (or time) you usually spend when buying groceries online vs in-store?
Barriers to buying online	• What do you think are some of the drawbacks of buying groceries online? • How easy or difficult is it to pay for groceries online? • How do you feel about someone else selecting certain items at the store for you?
Reflections on inequities	• Can you think of any challenges certain groups of people may have in getting to grocery stores and affording healthy foods like fresh fruits and vegetables? • Can anyone think of ways online grocery services would make it harder for some people to buy healthy foods? • How do programs like food stamps help people get healthy foods?
SNAP related	• How does the ability to use your food stamps card online change where you usually buy your groceries? • What, if anything, do you want to see added or changed in the SNAP/food stamps program?
Strategies to enhance online grocery shopping	• What would motivate you to buy groceries online more often? • What online grocery shopping features would make you more likely to use it?

SNAP indicates *Supplemental Nutrition Assistance Program*.

We emailed participants a guide to assist in setting up Zoom (Zoom Video Communications, Inc, version 5.11.6) on their computers/mobile devices and instructions on how to join their scheduled focus group. In addition, we provided guidelines before commencing the focus group discussion encouraging (although not requiring) them to turn their video camera on during the call to improve engagement in the discussion. All participants consented to the interview terms through online consent (via Qualtrics [Qualtrics International Inc, 2021]) and oral consent before the focus group. After the focus groups, participants received a $25 e-gift card to appreciate their time. All focus groups were audio-recorded and transcribed. Study procedures were reviewed and deemed exempted by the University of Maryland School of Medicine Institutional Review Board.

Analysis

Three of the 4 members of the analysis team were involved in the qualitative data collection; the team held a debrief session for the fourth member before analysis to share data collection experiences. First, we developed a preliminary codebook informed by barriers and facilitators identified from notes taken during interviews and constructs of the TPB (ie, attitudes, social norms, and perceived behavioral control). For the current analysis, we used the SEM as the primary framework to analyze and categorize the identified barriers and facilitators, although principles of the TPB informed the conceptualization of individual-level barriers and facilitators (eg, attitudes toward online grocery shopping and social norms from family or friends). We also identified strategies suggested by participants to reduce barriers and inequities in healthy food access online and categorized them under ≥1 of the 4 domains of the EOF.[24] We generated codes from the collective analysis of focus groups and interviews across SNAP use and online grocery shopping experience, although we evaluated key intergroup differences in themes.

Next, 2 coders independently applied the codebook to a transcript to refine existing codes and identify emerging codes. On double analysis of the first transcript, the coders met to discuss and consolidate the codebook. Coding disputes were resolved by a third researcher who would determine which codes were most appropriate for the segment or if a new code needed to be developed. The codebook was refined and included examples from the transcripts of when to use or not to use the codes. Using the refined codebook, the same pair of researchers independently recoded the initial transcript and double-coded another transcript until intercoder reliability of > 80% was reached.[35] Then,

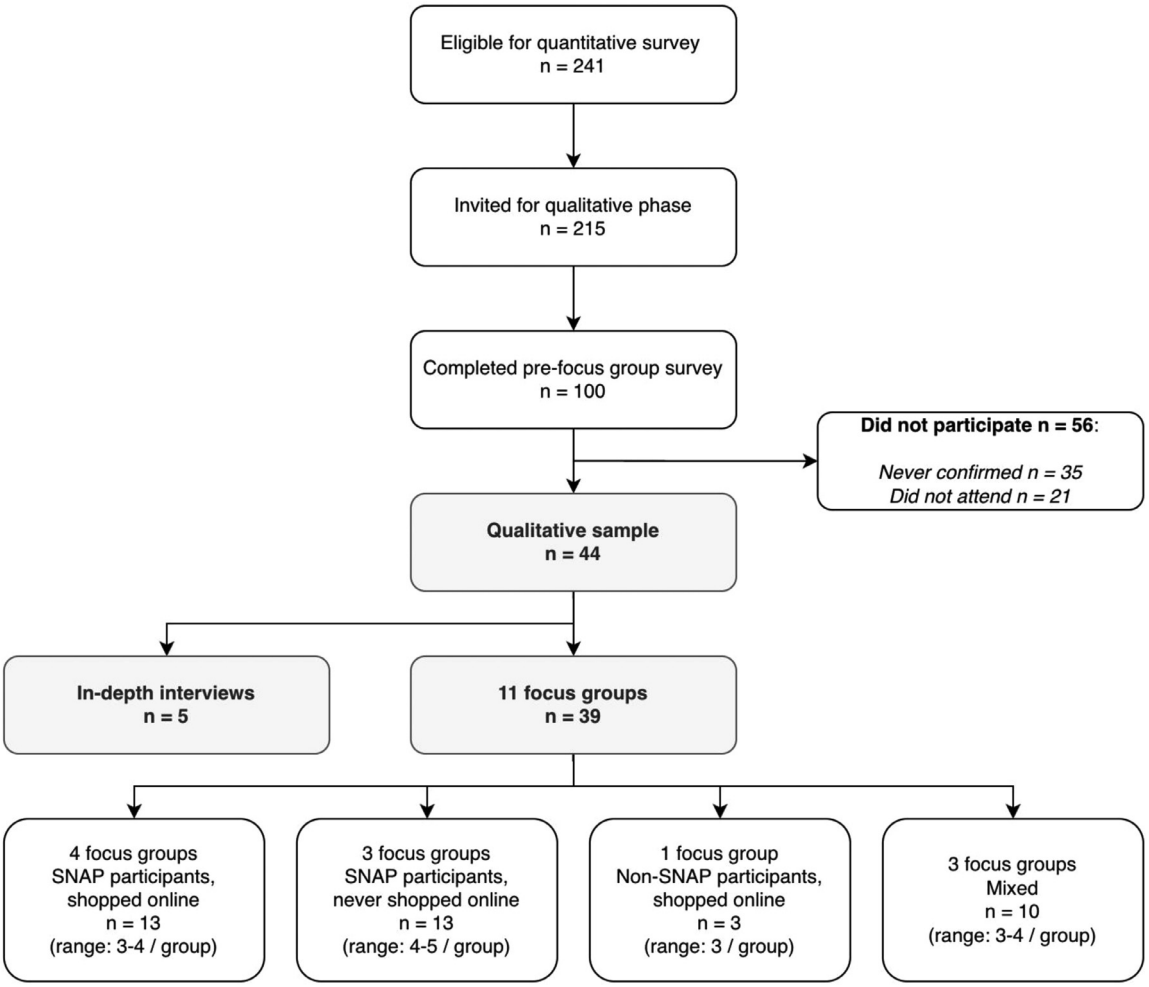

Figure 1. Recruitment of households of low income with children participating in focus groups or interviews (n = 44). SNAP indicates *Supplemental Nutrition Assistance Program*.

researchers independently coded the remaining 14 transcripts. We conducted the qualitative analysis in MAXQDA software (VERBI Software, 2020), using separate, offline versions of the platform to maintain confidentiality in coding before consolidation.

RESULTS

We invited 215 individuals to the qualitative phase, of whom 100 expressed interest in participating in focus group discussions. Forty-four individuals attended either a focus group (n = 39) or an in-depth interview (n = 5) (Figure 1).

Table 2 displays participant demographics and grocery shopping experiences gathered from the online survey conducted before the focus group discussions. Most participants in the qualitative study were female (91%), identified as either Non-Hispanic Black (48%) or Non-Hispanic White (41%), lived in an urban area (88%), lived at or below 130% of the Federal Poverty Line (91%), and reported low or very low household food security (63%). Half of the qualitative participants had experience using online grocery services. Of those who had ordered groceries online and received either SNAP or the Pandemic EBT (n = 18), 33% never tried to use government benefits as an online payment method.

Barriers to and Facilitators of Online Grocery Shopping

Table 3 organizes the 10 themes that emerged during the qualitative analysis related to the barriers and facilitators of online grocery shopping perceived by participants across all the levels of the SEM. Importantly, the themes identified were salient across SNAP participation and online grocery shopping experience (evidenced by the representative quotes highlighted in Table 3). However, the foundation behind the perspectives provided differed. For example, those who had previously shopped for groceries online used personal experiences to inform their opinions about

Table 2. Characteristics of Primary Food Purchasers of Households of Low Income With Children Who Participated in Focus Groups or Interviews (n = 44)

Characteristics	n (%) or mean ± SD
Age, y	
18-29	12 (27)
30-39	13 (29)
40-49	16 (36)
≥ 50	3 (7)
Sex (Female)	40 (91)
Race[a,b]	
African American or Black	21 (48)
White or Caucasian	18 (41)
Other	3 (7)
Multiracial	2 (4)
< 130% federal poverty line (yes)	40 (91)
Locale[c] (urban)	39 (89)
Household size	4.43 ± 1
Comfort using Zoom	
Very/somewhat comfortable	39 (89)
Not-very/not-at-all comfortable	5 (11)
Food security[d]	
High food security	16 (36)
Low/very-low food security	28 (64)
SNAP in the past 12 mo	37 (84)
Grocery shopping frequency	
≥ 1 mo	9 (20)
Every 2 wk	7 (16)
1 wk	28 (64)
Availability of grocery delivery[e]	
I don't have the option to	4 (9)
I'm not sure if I have the option to	9 (21)
I know I have the option to	30 (70)
Availability of in-store or curbside pick-up	
I don't have the option to	2 (4)
I'm not sure if I have the option to	8 (18)
I know I have the option to	34 (77)
Ever shopped for groceries online (yes)	22 (50)
Started shopping online[f]	
< 1 mo	3 (16)
1-6 mo	12 (63)
> 6 mo	4 (21)
Shop online using SNAP[g]	
No, online stores didn't accept EBT card	1 (6)
No, never tried to use EBT card online	6 (33)
Yes	11 (61)

EBT indicates Electronic Benefit Transfer; SNAP, *Supplemental Nutrition Assistance Program*.

[a]Other include Hispanic or Latino, Asian, Middle Eastern, American Indian, or Native Hawaiian; [b]Participants who selected multiple of the provided racial groups were categorized as multiracial; [c]Locale defined according to the 2010 Rural-Urban Commuting Area codes: Urban (metropolitan area), rural (micropolitan, small town, or rural area); [d]US Department of Agriculture 6-item Household Food Security Survey; [e]One respondent did not answer (n = 43). [f]Among those who have purchased online at least once in the 6 mo (n = 19) referencing the time participants took the survey (Nov-March 2021); [g]Among those who have purchased online and have received SNAP or the Pandemic Electronic Benefit Transfer (P-EBT) (n = 18).

trust in shoppers and food quality. Conversely, those who had not shopped online relied on second-hand experiences from family members or community networks. Similarly, SNAP participants could provide more insights on the role of SNAP as either a barrier or facilitator to online grocery shopping than non-SNAP participants.

Strategies to Improve Online Food Access: EOF

Specific strategies from households of low income to improve online food access within the 4 components of the EOF are described in Table 4. Participants identified delivery service providers, grocery stores, nutrition educators, and policymakers at the local, state, and federal levels as important stakeholders to help build community capacity for online grocery shopping (Figure 2). To improve the availability of healthy food options online, participants suggested increasing the inventory of foods available (including international foods and dietary restrictions), allowing more retail stores to provide online grocery services, and adding more time slots for pick-up and delivery. Participants placed the responsibility for improving the availability of healthy food options and reducing deterrents on the grocery stores, delivery providers, and policymakers and suggested these entities improve the supply of healthy foods and implement cost-saving options. Participants also suggested improving access to services and foods through outreach efforts by nutrition educators (eg, SNAP-Ed) focused on meal planning or purchasing healthy foods online, and policymaker efforts to expand the number and types of grocery stores that accept SNAP online.

DISCUSSION

Through a community-centered approach to data collection and analysis, this qualitative study identified barriers and facilitators of online grocery shopping for households of low income with children across the socioecological levels.[1] The SNAP OPP and structural inequities (ie,

Table 3. Key Barriers and Facilitators of Online Grocery Shopping Services Across the Socioecological Model Identified by Households of Low Income With Children

Theme	Components	Barrier	Facilitator
Individual			
Demographics	Age/disability	Difficulties using technology to access online services "As technology gets more advanced, the older generation is left behind. Like my dad is 83, my mom is almost 70. They barely can work their computer, let alone trying to figure out how to shop online." (NS+E focus group)	Ability to have groceries delivered and avoid issues of physically going to a grocery store "I mean it's really good for me, because I can't carry these bags and wheel this chair, I am in a wheelchair, so you know it is excellent, I love it." (S+E focus group)
	Occupation	In-person preferable because of the proximity of grocery stores to work, specific foods required for work "I literally work right by a grocery store, so it's been so simple to just stop there when I'm leaving work, grab the groceries that I need." (Mixed focus group, S+NE participant)	Convenient when demanding jobs constrain time available to travel to grocery stores "I work in a hospital setting, so sometimes it's hard for me to get to a grocery store. And if I do, it has to be in and out real quick. Whereas now . . . I can find more time when I'm shopping online." (NS+E interview)
Attitudes	Food preferences	Difficulties in finding specific items (eg, health or religious needs, flavor preferences) "They really don't have everything. . . most of the time it's better to go into the store to get what you want, especially if you're looking for non-preservatives, organic things, it's better to go in." (S+E focus group)	Important food staples are easier to regularly order online "It's really good for quick things. Like, if you're out of milk or bread or you want to make a cake and you don't have any baking soda."(S+NE focus group)
	Trust of shoppers	Less trust on shoppers for online grocery services to put the effort into the selection, practice good hygiene "I am scared that somebody is going to pick up something and send me something that's rotten... when you're shopping online, ultimately, you're leaving your grocery decisions to someone else's hands." (Mixed focus group, S+NE participant)	Quality of prior experience contributed to greater trust, awareness of features "When somebody is shopping for you on [name of service], you're live chatting with them, so they can sit there and say hey they don't have this, and they'll take a picture of what they do have available." (NS+E interview)
Priorities	Time/Effort	Unpredictability in when groceries will be received with online services "I'm never sure [when groceries will arrive]. Even though they give you that time frame, it doesn't come during that time frame, so I never know for sure when everything has arrived." (S+E focus group)	Ability to minimize effort, and time involved with grocery shopping when using online services "I don't have to sit there and clip all these little paper coupons and, you know, worry about the expiration date. Online it's right there, plain as day and all I have to do is click the button." (S+E interview)
	Experiential	Inability to see, touch, and personally select groceries before purchasing with online services "I guess I'm old fashioned that way like if I'm buying produce, I need to see it myself, see how they look, feel it... which is [why] I don't do as much of my shopping online." (Mixed focus group, NS+NE participant)	Ability to avoid crowded spaces, long lines, and other social inconveniences of in-store shopping "I don't mind online, it is nice, it is a convenience. . . you don't have to deal with the people you don't have to deal with long lines." (S+E focus group)
Capacities	Technology Skills	Difficulties with connecting payment options in online services "In the online shopping part for [name of service] there is a label where it says payment options and there's a way to add it, but once I started typing in the numbers it kept on saying card not registered." (S+NE focus group)	Experienced online shoppers expressed ease in navigating different features on platforms "I've had good experiences with [name of service], learning how to use the pin pad or the keypad in the beginning was a little bit challenging, but once I figured that out, it's smooth sailing." (S+E focus group)
	Knowledge of features	Lack of awareness of retailer features (eg, contacting/rating shoppers, tracking order) Participant 1: "One thing you can do with [name of service] is you can track the driver." Participant 2: "Oh wow, I did not know that." (S+E focus group)	Awareness of cost-saving features (eg, online coupons, membership fees waived with SNAP card) "My daughter does a lot of coupons too electronically she shows me a whole lot of stuff... click the electronic coupons and save it... [you can] use it on your phone, scan the barcode on your phone yourself." (Mixed focus group, NS+NE participant)
Interpersonal			
Family	Interpersonal experiences	Discouraging experiences from social networks (eg, poor food quality, long timing of delivery) "I know one of my family members said she didn't even get her [online] order until the next day when she paid for it to be delivered at 3 o'clock in the afternoon, so that means she still had to go to the grocery store to get things for dinner that night, it is not necessarily always reliable." (Mixed focus group, S+NE participant)	Encouraging experiences from social networks (eg, convenience, time-saving) "Some of my friends have used [name of service] and they love it. They love the fact that somebody does their work for them. . . it saves time for them. I think that's why they like it." (S+NE focus group)
	Spouse / Partner	Spouse/partner makes specific food requests which are not available on online platforms "My boyfriend is extremely picky. . . so sometimes [when] ordering online I'm like oh, they don't have it." (Mixed focus group, NS+E participant)	More agency in food selection online compared with instances when spouse/partner shops for household "With shopping online, it was easy for me to pick out exactly what I want. . . I don't trust my husband in the grocery store (laughs). It was just very convenient, and to this day I still use it." (Mixed focus group, S+E participant)
Children	Children needs	Difficulties in finding specific food for their children in online services "My two-year-old likes fruit pouches and a lot of the times the ones he likes are out of stock when we try to do online grocery shopping." (S+E focus group)	Online grocery services efficient for routines related to children's meals "Baby food comes in bulk on [name of service] so I am stacked up on the baby food and I am absolutely in love with it, because I don't have to go anywhere to go get it." (S+E focus group)
	Children as stressor	Less agency for children to choose what they want, frustrations when items are replaced or not in stock "Even with the kids, if [the store] doesn't have [name of brand] then they just throw something in the cart. When I	Avoiding the stress of having to bring and care for children in-store, less pester power "It's kind of hard to get [the kids] out to the store, and hope that they're not yelling and screaming throughout

(continued)

Table 3. (*Continued*)

Theme	Components	Barrier	Facilitator
		say [name of brand], I want [name of brand]. [The children say] I'm not going to eat them. I want what I want." (Mixed focus group, S+E participant)	the store. So online shopping eliminates a whole lot of fuss." (S+E interview)
Community Perceptions	Community experiences	Social media comments about bad food selection, issues with foods delivered "I see people post on Facebook how they order one thing and then instead of [the shoppers] just not giving anything they kind of pick whatever replacement they want." (Mixed focus group, S+NE participant)	Learn from social media about different features, payment methods, and cost-saving options "I saw on Facebook that a few people [were] tagged in [in a post] about how great [online grocery shopping] was if you want to save money. So that intrigued me." (Mixed focus group, S+NE participant)
	Safety and Security	Apprehension of delivery services because of concerns of neighborhood robberies/violence "My area is like, I guess they consider it a semi-bad neighborhood. I'm sure some people in the neighborhood are cautious about that kind of thing, you know, getting food delivered to their home if you're not home. It's a possibility your items could be stolen." (S+E interview)	Flexibility in services (eg, curbside, scheduling delivery) to adapt to perceived community safety "[Theft] has never happened to me because I usually try to make sure that I schedule my deliveries for times and days when I know I'm going to be in the house." (Mixed focus group, S+E participant)
Food access	Community food environment	Less attractive when larger retailers are far and don't deliver "I'm in a very small area, I cannot get anything fresh and when it comes to shopping online, all I can really find that we use is mostly junk. I mean [name of store] has tons of snacks and drinks, but as far as anything fresh, I cannot get any of that." (NS+E focus group)	The proximity of large retailers to urban residents, accessing diverse foods with online services "[Name of service] are very reasonably priced and they still have a large variety of items, and very fresh food delivered to [your] home." (S+E focus group)
	Accessibility of grocery services	Affordability of services, neighborhood remoteness, limited access to some services (eg, delivery) "Where I live, I don't have the option for delivery. I get told that I'm too far away from stores. Granted I'm 20-30 minutes from the nearest grocery store." (NS+E focus group)	Ability to avoid personal/public transportation-related difficulties and expenses "To get to the one I want to get to it's like $10 going and $10 coming back. You've got to take a bus and that takes time. So, it is expensive, the travelling costs involved in getting to the market." (S+E focus group)
Organization Store-level	Retail experience	Limited shopper engagement and payment options (eg, coupons, cash), outdated online inventory "A lot of times it is hard to use coupons online because the system isn't set up to take coupons like if you went to the store and the cashier scanned it." (S+E focus group)	Different ways of selecting (eg, recent purchase list), receiving grocery (eg, delivery vs. curbside) "[name of service], I find it frustrating trying to do their online order. And [name of service] was missing like 10 of 30 items last week. So, I find it like I'm not getting what I need. But when I go the grocery store, I don't have that problem." (S+E focus group)
	Food quality/safety	Awareness of store-specific food safety or quality which drove distrust of online grocery options "[It] depends on the grocery store because you have some grocery stores that just put out whatever - bad stuff. So, some of these [shoppers] could just be shopping off of what the store put up." (S+NE focus group)	Confidence in food safety practices in certain large retailers, driving trust of online services "A lot of grocery stores are different. [name of service]'s produce and fruits are. . . they're just great. And that's what one reason I do like [online] shopping at [name of service]." (NS+E interview)
Policy State/federal-level	SNAP/WIC related policies	SNAP OPP not widely implemented, inability to use WIC/SNAP for online shopping fees (eg, delivery) "It is a lot easier for me just to do it online, but I still have to go to the store for the baby's WIC." (S+E focus group)	Ability to connect EBT card with popular, large online grocery retailers "Not a problem. I simply added the card number into my account and when I go to check out, I select my EBT card and it gives me plenty of options." (S+E interview)
	Structural inequities	Lack of access to supermarkets in racially diverse areas or of low-income "I technically live in a food desert because they shut down the [store name]. That was the main market I could go to get everything I needed. And that was just a mile away from my house." (S+E interview)	Policies expanding online service access during the COVID-19 pandemic "They had the pandemic EBT, so if your kids were receiving free, reduced lunch, they would [pay] the difference. . . so that did help stretch everything, because you got a nice allotment." (S+E interview)

COVID-19 indicates coronavirus disease 2019; E, experience shopping online; EBT, Electronic Benefit Transfer; NE, No experience shopping online; NS, non-SNAP participant; OPP, online purchasing pilot; S, SNAP participant; SNAP, *Supplemental Nutrition Assistance Program*; WIC, *Special Supplemental Nutrition Program for Women, Infants, and Children*.

underinvestment in communities from low-income and rural environments) formed the foundation of the US food policy environment that influenced online grocery shopping behaviors.[2,3,9] In turn, the current policy environment shaped food inventory and retailers' online presence, which, together with community-level perceptions of online grocery services, influenced the uptake of online grocery services in the context of household needs, dynamics, and priorities.

> Online grocery shopping interventions should involve delivery providers, grocery stores, nutrition educators, and policymakers.

Retail Partnerships: Increasing Healthy Options and Reducing Deterrents

Prior research conducted among consumers of low income in the US and globally reported that perceived difficulty in meeting personal food quality standards and long delivery time windows were common barriers to online grocery services.[29,36,37] In this study, differing beliefs about food

Table 4. Recommendations Provided by Participants From Households of Low Income With Children on How to Enhance Online Grocery Shopping Access and Experiences

	Intervention Stakeholders by Relevant Component of Equity-Oriented Framework			
Category and Specific Recommendations	**Increase Healthy Options**	**Reduce Deterrents**	**Improve Social and Economic Resources**	**Build on Community Capacity**
Improve access to services, foods				
Community outreach about the online grocery services available			G, N	
More retail stores to provide online grocery services (including smaller grocery stores)	G, P			
Cater to international foods and dietary restrictions	D, G, P			
More ready-made, nutritious cooked foods available online	D, G			
Meal planning support				
Provide recipe ideas that automatically build the online shopping cart with the ingredients you need				G
Automated reminders for when to purchase items				G
Suggestions on ways to select healthier foods				G, N
More payment and cost-saving options				
Allowance of in-store coupon redemption online		G		
More sales/discounts online		G		
Implement incentives/points systems		G		
Lower spending minimum required for discounted or free delivery		G		
Lower or remove fees for delivery/membership		G		
Expand acceptance of SNAP to more stores and allow use of WIC benefits online			G, P	
Reduce the cost of foods in general		P		
Facilitate better shopper interactions				
Real-time photograph/video features to connect with online grocery shoppers		D, G		
Train/monitor shoppers on proper practices (eg, protocols for communication, substitutions, and hygiene)		D, G		
Implement or enhance feedback mechanisms, connect with customer support		D, G		
Better job security for hired online grocery shoppers (eg, better pay and benefits) to incentivize high-quality service		D, G, P		
Control of food selection				
More visual options for each item online		G		
More up-to-date inventory/stock data		G		
More efficient shopping-cart builders or favorites list				G
Provide more substitution/replacement options				D, G
More specific, detailed labeling of items		G		
Quality assessment of food items (especially fresh) before placing an order online		D, G		
Flexible methods for receiving groceries				
Increase availability of online grocery delivery options (ie, home delivery and click and collect)	D, G, P			
Ability to monitor the route of the shopping bags once they leave the store		D, G		
More options for shorter pick-up or delivery times	D, G			
Flexible return/refund policies		D, G		
Enhance SNAP services				
Education for SNAP recipients on how to use benefits online, including the logistics/paperwork to enroll in SNAP				N, P
Revise the SNAP policy to serve those with slightly above threshold incomes, large families			P	
Consistent and frequent SNAP benefits distribution			P	

D indicates delivery service providers; EBT, Electronic Benefit Transfer; G, Grocery stores; N, Nutrition educator; P, Policymakers.
SNAP, *Supplemental Nutrition Assistance Program*.

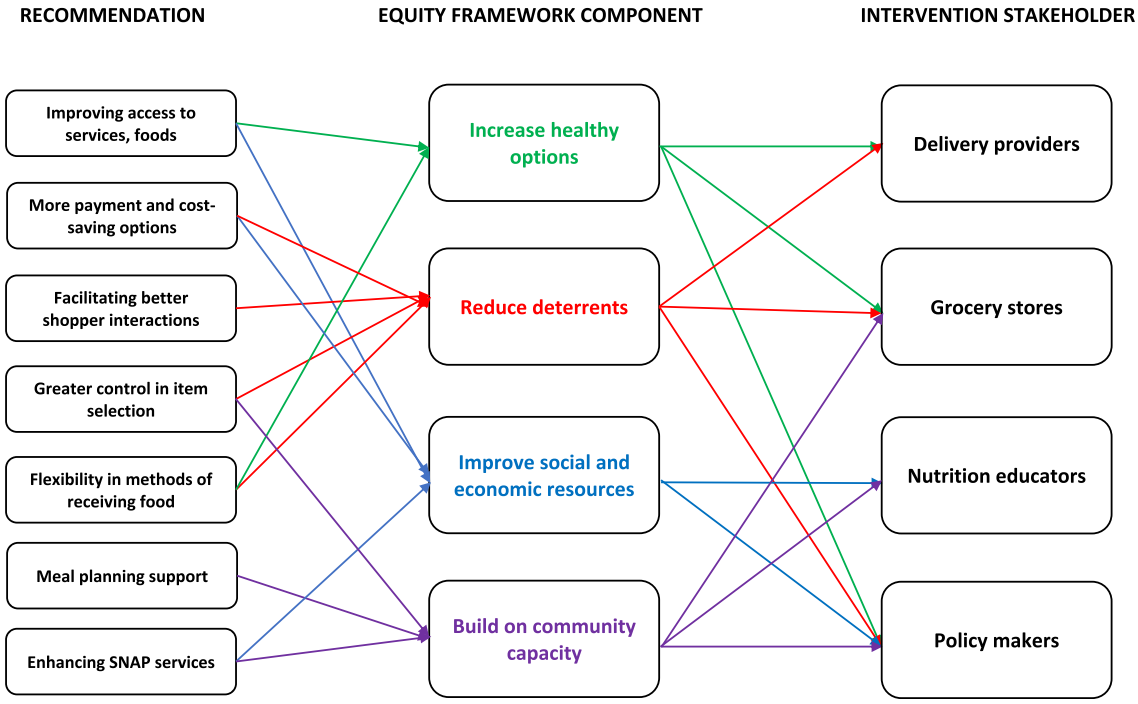

Figure 2. Contextualizing community-identified strategies to enhance online grocery shopping with components of equity-oriented obesity prevention and key stakeholders to partner with in intervention efforts. SNAP indicates *Supplemental Nutrition Assistance Program*.

quality at the retailer-level and perceived ease of use of online grocery shopping platforms acted as facilitators to some participants and barriers for others, corroborating findings from a systematic review on online grocery as a double-edge sword[18] and in line with the TPB.[31] When contextualized with suggestions presented by participants, we identified online grocery retailers (including delivery services) as key stakeholders to improve service provision to households of low income and ultimately enhance equitable, healthy food access. Nonetheless, it is important to consider that retail partners have competing financial interests in dietary health interventions,[38] which may supersede goals of improving healthy food access through online grocery services. Despite these potential barriers, strategic collaborations with retailers may play a critical role in addressing inequities in food access. For example, the Centers for Disease Control and Prevention provides an action guide for practitioners to develop effective partnerships with food retailers by including them in developing and evaluating programs and ensuring sustainability and collaboration momentum.[39]

> Mistrust in hired shoppers, concerns with food quality, and inaccessibility of services are barriers to online grocery shopping in communities of low income.

Opportunities for Nutrition Educators: Building Awareness and Community Capacity

Participants expressed desires for capacity building regarding meal planning and healthy eating strategies, emphasizing the role nutrition educators could play in enhancing online grocery shopping for equity-oriented obesity prevention efforts, building on evidence-based strategies implemented in physical stores. For instance, the *Cooking Matters* program, which involves hands-on meal preparation and interactive grocery store tours, improved healthy food choices and boosted participants' self-efficacy for purchasing and preparing healthy foods on a budget.[40,41] Moreover, Burrington et al[42] conducted a pilot study of in-person nutrition and cooking classes in combination with a fruit and vegetable prescription program with online produce delivery and observed increased fruit and vegetable access and consumption among children living in rural areas community. Therefore, future studies are needed to evaluate whether hybrid classes or online grocery tours can improve self-efficacy related to online grocery shopping and if this would translate into healthier purchases.

Supplemental Nutrition Assistance Program Policymakers and Structural Reforms: Pathways to Improve Resources

There is a growing concern in the literature about how the digital food environment may contribute to food insecurity and poor nutrition, as it is most accessible to urban, high-resource communities,

and may increase access to packaged, processed foods rather than healthy food items such as fresh produce.[16] The reliance of US households of low income on government food assistance programs (ie, SNAP and WIC) emphasizes the important role of safety net programs in shaping food purchasing behaviors within the traditional food environment. Food policy advocates and researchers have highlighted the need to ensure government benefits are widely accessible within the digital food environment,[43] following the lead of the SNAP OPP. However, although programs like the SNAP OPP have the potential to improve food availability in urban food deserts, access to online services and delivery continues to be limited in rural areas,[17] which was similarly highlighted by the small sample of rural households reflected in the current study. A case study of the SNAP OPP program in Alabama found that most online grocery purchasers were non-SNAP participants, with older rural populations using SNAP for groceries online less frequently than younger urban customers.[44] Given the higher prevalence of poverty observed in many rural regions of the US compared with urban areas,[45] the inability to use SNAP benefits in the digital food retail environment coupled with inaccessibility of online services in rural or under-resourced areas may significantly widen existent nutrition-related inequities. Furthermore, state agency communication about the SNAP OPP has largely ignored nutrition and health knowledge, which is a potential missed opportunity for health education.[46] Our findings support promoting the use of the SNAP EBT card for online grocery shopping and ensuring that, beyond logistical support, efforts also include promoting strategies for shopping online on a budget.

We acknowledge several limitations. First, although efforts were made to purposefully sample diverse participants with different SNAP statuses and online grocery shopping utilization experiences, we recruited participants from a convenience sample of English-speaking individuals in Maryland who agreed to participate in an online survey. We primarily recruited participants through online platforms such as Facebook who may have different attitudes and experiences relevant to online grocery shopping than those not recruited online. Therefore, possible selection bias exists toward those who were available during the interview and had access to and were comfortable with the internet. Similarly, although Zoom-based qualitative research has demonstrated a strong ability to collect rich qualitative data in past health research despite the lack of in-person engagement,[47] with the added benefit of greater time and locational flexibility to participate, it may limit participation to those with low access to the internet or unfamiliarity with technology.

In addition, participants were self-selected to participate in this study, and their views and experiences may differ from those who did not volunteer, including perspectives from those without internet or phone access (likely facing a unique set of barriers relevant to online grocery shopping) who were unable to be represented. As such, although data saturation was achieved for key themes, results may not be generalizable to other households of low income nationally. Moreover, a systematic member check protocol was not used during the analysis. However, we conducted debrief sessions to identify emergent themes which were immediately included in subsequent focus groups' discussion guides.[32] This allowed us to assess reactions toward emerging themes and validate interpretations that affirmed or disaffirmed synthesized themes.[33] Furthermore, online grocery services may have unintended consequences relevant to the socioemotional health of families (eg, child socialization and development implications) that have not been investigated.[48] Finally, given the dramatic and continued impact of the COVID-19 pandemic on the retail food environment, there is a need for longitudinal assessments of online grocery shopping attitudes and experiences to account for evolving social changes in a post-COVID world.

> Nutritional equity in online grocery shopping is needed through reduced cost barriers, tailored nutrition promotion, and *Supplemental Nutrition Assistance Program* expansion.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Based on our findings, online grocery retailers or third-party vendors could implement structured training for hired shoppers to improve service quality and reduce delivery fees and other cost-related barriers to households of low income. Furthermore, grocery services could explore personalized, interactive, health-promoting forms of engagement in online grocery platforms and implement cost-saving strategies for the consumer by reducing the cost of food or delivery. Moreover, programmatic efforts led by SNAP-Ed educators, alongside other nutrition educators working with universities, schools, or localities, may consider developing and testing nutrition education curricula focused on the unique challenges and opportunities for healthy food choices within the online grocery environment. Retailers and nutrition educators could also ensure that online grocery shopping tutorials and related resources are available to the public, especially to households of low income, considering digital literacy, language barriers, and limited budget. Finally, although the updated SNAP benefits coupled with the SNAP OPP indicate progress toward addressing structural inequalities,[49] expanding subsidization of healthier food options in online services coupled with increased accessibility of these services in communities of low income may be warranted.

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