



Juggling the five dimensions of food access: Perceptions of rural low income residents



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ABSTRACT

Using focus groups (n = 6) from six West Virginia counties we assessed how low income, rural women (n = 30) enrolled in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) program perceived the food environment and the ability to access healthy food.

For WIC clients who are at risk for nutrition problems and live at or below 185% of poverty, challenges with food access threaten the positive aspects and impacts of the WIC program.

We undertook a qualitative analysis by coding the focus group data on rural food access, into three themes. Our analysis demonstrated how the three major themes interact with five dimensions of food access and underscores the issues with food access that decrease the effectiveness of the food packages and nutrition education that low income WIC participants receive. To increase food access we recommend creating a formal structure where vendors and low income clients may discuss concerns; encouraging greater investment in rural communities through state issued incentives to build full service grocery stores or informal transportation networks; and additional research on the status of low income clients as social change agents capable of addressing issues that act as barriers to their shopping experiences. However, even with the data and prior literature, the pathways by which these environmental factors shape nutrition remain unclear-entangled - much like the issues that low income, rural residents must juggle when they make grocery shopping and nutrition decisions.

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1. Introduction

It is widely recognized that residence in a rural community means limited access to food resources due to the food system infrastructure available in that region (Liese, Weis, Pluto, Smith, & Lawson, 2007; Pitts, Whetstone, Wilkerson, Smith, & Ammerman, 2012; Smith & Morton, 2009). Well-designed interventions intended to improve the overall health and wellbeing of rural residents must examine the individual, structural, and community characteristics that may facilitate or impede healthful eating (Caspi, Sorensen, Subramanian, & Kawachi, 2012; McGee et al., 2008; McKinnon, Reedy, Morrisette, Lytle, & Yaroch, 2009). Problems with access to food based on the social and structural conditions of

a geographic location can undermine and lessen the effects of important benefits delivered by the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). For WIC clients who are already at risk for nutrition problems and live at or below 185% of poverty, problems with food access threaten the nutrition education and subsidized food packages delivered by the WIC program. As such, the aim of this study was to explore how low income, rural residents enrolled in the WIC program perceived the food environment and the ability to access healthy food using a framework based on five dimensions of food access (Caspi et al., 2012).

1.1. Dimensions of food access

The conceptualization of the food environment including the different features of food access have evolved over time to now include factors related to the availability, accessibility, affordability, accommodation and acceptability of food (Caspi et al., 2012). Briefly (Table 1), *availability* is conceived as the adequacy of the supply of

Abbreviations: WIC, Special Supplemental Nutrition Program for Women, Infants and Children.

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Table 1
Dimensions of food access.

Dimensions of food Access	Definitions
Availability Are there sources for food?	The adequacy of the supply of healthy food (e.g. presence of certain types of restaurants near people's homes, or the number of places to buy produce).
Accessibility Can individuals get to or make use of the food that is available?	The geographic location of the food supply and ease of getting to that location.
Affordability Are individuals able to pay for the food that is available?	Food prices and people's perceptions of worth relative to food cost.
Accommodation Do food sources respond to needs?	How well local food sources accept and adapt to local residents' needs (i.e. store hours or types of payment accepted).
Acceptability Does the food available meet community standards?	An individual's attitude regarding the attributes of their local food environment and whether or not the given supply of products meets their personal standards.

healthy food (e.g. presence of certain types of restaurants near people's homes, or the number of places to buy produce). *Accessibility* refers to the geographic location of the food supply and ease of getting to that location.

Affordability refers to food prices and people's perceptions of worth relative to food cost. *Acceptability* is about an individual's attitude regarding the attributes of their local food environment and whether or not the given supply of products meets their personal standards. Lastly, *accommodation* refers to how well local food sources accept and adapt to local residents' needs (i.e. store hours or types of payment accepted).

2. Methods

2.1. Study design, location and procedures

This research was approved by West Virginia University IRB Protocol 1405301733. In Spring 2014, the West Virginia Helping Appalachian Parents and Infants (HAPI) project assisted in recruiting participants for the study. Funded by Health Resources and Services Administration (HRSA), HAPI is one of 96 Healthy Start Projects in the United States established to improve maternal well-being during pregnancy, postpartum and the interconceptional period. HAPI recruited participants using a flyer at the sites where they met with clients in six West Virginia counties (i.e. Marion, Harrison, Preston, Taylor, Doddridge and, Monongalia). Eligibility criteria for this study included being female, a current WIC beneficiary, age 21 years of age or older, living in one of the six counties, and not currently pregnant. During the recruitment process participants were informed that childcare services and a snack would be provided in addition to a \$50 gift card incentive.

The moderator's guide used in the focus groups was developed based on a literature review of similar research and was evaluated by the West Virginia WIC program (Christaldi & Cuy Castellanos, 2014; Jilcott, Hurwitz, Moore, & Blake, 2010; Jilcott, Laraia, Evenson, Lowenstein, & Ammerman, 2007; Johnson et al., 2014; Lucan, Gustafson, & Jilcott Pitts, 2012). Topic areas included grocery shopping habits, travel time and distance, food sources in the community, influences on eating and shopping behavior, physical activity, cooking habits, use of food assistance programs, and perceptions of healthful food.

In late summer and fall of 2014, teams of three individuals, one public health researcher and an inter-professional pair of students in public health and human nutrition conducted the focus groups. All 6 sessions were audiotaped and transcribed by professional transcriptionists. Each session averaged 4–6 women for a total of 30 participants.

2.2. Qualitative data analysis

Three research staff members independently read through the

transcripts to identify common themes. They reviewed their findings and came to an agreement on a set of themes listed as topical categories to use to code the data. Next, using the themes, the researchers independently coded the transcripts. Interview transcripts were broken down as quote segments that were as small as possible while still remaining meaningful (Miles & Huberman, 1994; Tesch, 1990). After coding, the researchers worked as a group with the coded data to identify commonalities, reconcile differences, and determine whether subcategories were needed for a theme (e.g., interactions with store staff and/or other customers). Finally, analysis of quote segments and the major themes from the transcripts was undertaken using the five dimensions of food access based on the principles of directed content analysis which are appropriate if a concept or theory could benefit from further description leading to validation or an extension of that theoretical framework (Hsieh & Shannon, 2005; Krippendorff, 2012).

3. Results

Overall three dominant themes with an impact on the five dimensions of food access were identified based on the analysis of focus group data representing perceptions of low income, rural WIC participants: (1) Structure of place, external food environment; (2) Personal household determinants of food; and (3) Social cultural environment.

Table 2 summarizes how the three key themes on food access interacted with the five dimensions of food access.

3.1. Theme 1: Structure of place, external food environment

Focus group data demonstrated that the topography and rural features of the region compromised the accessibility of food sources creating problems with getting to locations where food was available. Participants frequently mentioned how the geography of place created barriers getting to and from grocery stores and other sources of food. Because many participants did not own cars or lived where there was no public transportation they were forced to confront the geography of where they lived.

- *Preston County Participant*: "It's [grocery store] probably what, 45 min? About a half an hour, 45 min just one way."
- *Marion County*: "You've got to run over there [to the grocery store] and get it and come back out so you can catch that bus back."
- *Doddridge County*: "I had to walk. I lived down at Central Station and I had to walk to town and get my groceries and put it in a backpack."

Not all communities had sidewalks and the quality varied between communities that did have sidewalks. Some participants expressed the fear of being a victim of a crime due to nearby illicit

Table 2
Interaction between themes and dimensions of food access.

Key themes	Dimensions				
	Availability	Accessibility	Affordability	Accommodation	Acceptability
Structure, place; external food environment	Available food sources are far away.	Long distances, no transportation compromised ability to get to food sources.			
Personal household determinants of food			Compromised ability to buy food due to income.		Budget forced to concede food preferences.
Social cultural environment				Vendors do not meet needs or recognize preferences.	Available food fails to meet standards.

drug activity.

- *Marion County*: “That’s what I wish ... they need to provide more sidewalks.”
- *Taylor County*: The sidewalks are “cracked and the cement is uneven. In a stroller – you’ve got to break the stroller to get over and rocks and – a couple manholes that are not always covered. And you really can’t let the kidson the sidewalks. A lot of cars park on the sidewalks.”
- *Marion and Preston County*: Drug use is also an issue. “I have a lot of people around me. There’s a lot of drug activity.”

We asked what the participants did if they ran out of a food product or needed something quickly. We found that participants sometimes had to exceed their budget due to geography. They would buy from a more expensive place because it was closer than where they would normally go.

- *Monongalia County*: “If I need something quickly, I usually go to Walgreens or CVS because it’s a 20 min walk from my house.”

3.2. Theme 2: Personal and household determinants of food

Income and the regular household budget meant that the food access dimensions of accessibility, acceptability, and affordability were compromised. Many participants could not afford personal transportation which hindered the ability to get to sources of food that was acceptable, affordable, and nutritious. Little or no income meant that the majority of the participants relied heavily for long periods of time on the both WIC and the Supplemental Nutrition Assistance Program (SNAP) to purchase healthy food options. Grocery store trips were often planned around the times of the month when participants received food assistance benefits. However, participants often ran out of WIC benefits and found themselves having to choose between paying a bill and buying food.

- *Marion County*: “ I try to make complete meals and it’s hard to do that especially at the end because I’m always running out of something.”

Participants were cost conscious despite not having the option to select shopping locations with acceptable and affordable prices. Participants were aware of price differences between stores and would report going to multiple stores to buy the cheapest products.

- *Monongalia County*: “I go where I can get the best prices on certain things. Like – if I can get milk, eggs, and bread at a good price at Kroger, I’ll go there. And then I’ll go to Save-A-Lot to get

my canned goods and side dishes and then I’ll go up to Shop ‘n Save to get my meats.”

3.3. Theme 3: The social and cultural environment

The social and cultural environment in stores compromised the food access dimension of accommodation because WIC participants observed how stores did not meet their needs. Participants frequently mentioned problems associated with using state assistance such as vendor issues with incorrect food labeling, unexplained changes in approved WIC products, and employees displaying visible resistance to working with WIC customers.

One study participant reported that difficulties with cashiers affected other customers. She reported feeling “bad” because her problem with the cashier made people behind her “get mad.”

- *Preston County*: “Usually you can go to Walmart and you don’t have any problems. And if you do, they’ll straighten it out. But, like – Shop ‘n Save? No.”

Across the six counties, data from participants demonstrated agreement that shopping outlets and products were unacceptable. There was agreement that stores failed to accommodate the needs of the WIC participants by stocking poor quality food including fruits and vegetables (FV) and other products.

- *Taylor County*: “This guy’s [store] is awful I’ve had to return spoiled milk at least five times and it’s not even outdated. But, I don’t know if he’s just not getting it in the cooler or what his deal is. He buys stocked items from bigger departments that are — on sale and he’ll bring in what’s on sale with ice cream. His vegetables and stuff aren’t like homegrown, but [he] leaves them out too long — three days of expiring for a bag of lettuce, two days sometimes and it already looks watery and kind of — brown before you even take it home.”
- *Marion County*: “Then, some of them [cashiers], they go ahead and start ringing up and they swipe it [WIC ecard]. Some things might not swipe. And you’ve got to figure out well, it swiped last week. But, they changed their orange juice.”

4. Discussion and conclusions

Analysis of focus group data representing perceptions of low income, rural WIC participants identified three major themes: (1) Structure of place, external food environment; (2) Personal household determinants of food; and (3) Social cultural environment. The results demonstrated that interactions between these themes compromised the five dimensions of food access that

include the availability, accessibility, affordability, accommodation and acceptability of food (Caspi et al., 2012).

The theme on structure of place and external food environment interacted with two of the dimensions of food access on availability and accessibility. Consistent with previous studies, the perceptions of study participants described low income individuals living in rural areas as having available food sources but experiencing longer commute times to grocery stores and having to visit multiple grocery stores to meet needs (Bitto, Morton, Oakland, & Sand, 2003; Dean & Sharkey, 2011; Jilcott et al., 2010; Seguin, Connor, Nelson, LaCroix, & Eldridge, 2014).

In relation to the theme of place and the dimension of accessibility, referring to location and ease of getting to that location, the WIC participants reproduced findings showing that rural populations are especially burdened by a greater variation in spatial access to grocery stores which weighs against the opportunity of low income, rural populations to affordably access the means to eat balanced meals (Bitto et al., 2003; Pheley, Holben, Graham, & Simpson, 2002). The data made it clear that individuals without their own transportation have a significantly harder time grocery shopping. Some counties did not have a public transportation system causing the residents of that county to depend heavily on walking under less than ideal circumstances, or obtaining rides from other people.

Similar to other research, the theme of personal household determinants of food indicated that income and costs were major factors in deciding which foods to buy (Morris, Neuhauser, & Campbell, 1992; Smith & Morton, 2009; Yousefian, Leighton, Fox, & Hartley, 2011). In particular, the perceptions of low income WIC participants on household determinants interacted with the food access dimensions of affordability and acceptability. Often grocery store trips were planned around many factors including times of the month when participants received food assistance benefits, pay checks, and when access to a vehicle was available. The shopping pattern of a monthly shopping trip to a large grocery store, supplemented with smaller purchases, is in keeping with several other studies that have examined rural food access (Jilcott et al., 2010; Yousefian et al., 2011). This might be problematic because studies have indicated that fewer trips to the grocery store might mean lower produce consumption (Jilcott et al., 2010).

Participants made efforts to find the absolute lowest price for products, even if that meant going to multiple stores (Seguin et al., 2014; Yousefian et al., 2011), and were willing to travel greater distances for fresher and better food at reasonable prices. However, such behaviors were based on the availability of transportation, time of the month and benefits, and other sources of income. Often participants had to concede their food preferences due to personal household determinants related to money and their monthly budget.

The last theme, reflecting participant's perceptions on the social and cultural environment, interacted with the food access dimensions of acceptability and accommodation. People's attitudes about features of their local food environment and how well local food sources accept and adapt to local residents' needs are factors not well studied in rural environments (Smith & Morton, 2009). Our findings on the food access dimensions of accommodation and acceptability highlighted several issues perceived as problematic by WIC clients. Participants reported that food vendors did not respond to their needs. Further, the data from the focus groups indicated a strong sense that both the food environment and vendor treatment of WIC participants were substandard. We found barriers associated with the use of WIC benefits such as feelings of stigma from cashiers linked with using state assistance; problems with vendors' incorrectly labeling products; and a sense of confusion over frequent changes to the food basket brands that could be

bought. Last, across all counties there was agreement on the poor quality of food available in some stores including FV and other produce.

There are some limitations to our study. Some might assert a limitation due to the use of convenience sampling which can increase the likelihood of sampling bias where the sample is not representative of the entire population of West Virginia. However, we do not find this to be a problem in our study because of the compact size of the state, small number of counties in West Virginia (55), and a largely homogenous population with very few minorities (Crouch & McKenzie, 2006; Explorable.com, 2015). One limitation may be low external validity due to the inability to generalize the study results to other parts of the United States. However, regardless of this limitation, our study is unique in that it was able to apply the five dimensions of food access to the perceptions of WIC clients a rural setting in West Virginia.

4.1. Implications for research and practice

The WIC program is a supplemental nutrition program as well as one of several nutrition education programs for low-income audiences. It is critical that nutrition educators understand the barriers that supplemental nutrition program participants face in accessing healthy food. From this study one can see that the issues identified by rural, low income WIC clients turn what should be a simple shopping trip into an arduous experience.

Educators can help participants develop strategies for food resource management and meal planning that takes into consideration the role that place, social and cultural factors, and personal household determinants play in shaping food access.

Our analysis highlights the importance of vendor interactions with low-income clients, which may be addressed by carrying out the following: creating a space, formal structure or group where vendors and WIC clients may discuss concerns and mutual interests; encouraging greater investment in rural communities through state issued incentives (tax credits) to developers to build full service grocery stores; or creating alternatives such as state supported incentives for informal transportation networks.

We also recommend additional research on the status of WIC clients as social change agents capable of addressing issues that act as barriers to their shopping experiences which may ultimately result in a more food-secure environment for this vulnerable group. Additional research is needed to disentangle interactions between the social, cultural, and physical environments and their impact on low income, rural food access and nutrition. In the future we hope to initiate studies using WIC retail shop-along interviews and listening sessions in coordination with the State of West Virginia WIC program. These efforts are meant to provide a clearer picture of the importance of vendor-client relations for WIC clients in their juggling act as they make food decisions, help to rank the previously identified barriers to food access relative to each other based on the perceptions of WIC clients and explore the presence of change agents among the WIC clients.

Conflict of interest

The authors have no conflict of interests to declare.

Role of the funding source

The Claude Worthington Benedum Foundation played no role in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication.

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