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Barriers to Creating Healthier Home Food Environments: Process Evaluation Results from Two Home Food Environment Intervention Studies

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Abstract

Background and Objectives: Few studies have identified barriers to creating a home environment more supportive of healthy eating. We examined barriers faced by participants in a randomized controlled trial and an adaptation study of the Healthy Homes/Healthy Families intervention, which uses health coaches to support low-income families in creating healthier home food environments.

Methods: Coaches maintained logs of participant interactions as part of a process evaluation. We thematically analyzed logs from interactions with participants, mostly lower income African American women (n=114), to identify barriers for each of eight healthy actions that serve as core elements of the intervention.

Results: Difficulty of changing current habits was a barrier for five of the healthy actions. No time/convenience and limited family support each influenced two of the healthy actions, with

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interpersonal barriers also stemming from social situations and visitors, including grandchildren. Cost and economic challenges were barriers for three of the actions. Hunger, cravings and limited access to resources (e.g., transportation, fresh fruits and vegetables) were each noted as barriers for one healthy action.

Conclusions: Overall, these findings provide insight for how to better support families who are trying to improve their home food environments and highlight the need for multi-level interventions.

Keywords

Nutrition; Process Evaluation; Intervention; Qualitative; Barriers

Introduction

Preventing weight gain in adults is an important strategy for reducing the prevalence of obesity and its negative health effects.[1–8] While the home environment is acknowledged as an important setting for diet-related behaviors,[9–13] it is rarely targeted in interventions aimed at adults.[1–4] As a result, little is known about the barriers to creating a home environment more supportive of healthy eating.

In contrast, considerable research focuses on individual and interpersonal barriers to improve diet-related behaviors, including lack of social support from household members,[14–20] limited financial resources,[15, 16, 19–22] and lack of time[16, 18–22] to shop and/or prepare healthier foods. Similarly, significant effort has been expended to understand how community food environments influence eating behaviors.[23–25]

Recent reviews have synthesized studies to identify healthy eating barriers with attention to differences by socioeconomic status.[26–28] Zorbas and colleagues reviewed 39 qualitative studies and organized themes into four categories: individual, social, food environment, and lived environment.[26] Barriers were largely similar between general populations and those with lower socioeconomic status, although affordability of healthy foods and availability of supermarkets were more salient for the latter. Individual-level barriers included knowledge and skills, emotional states, beliefs about food, food preferences, and habits. Social networks influenced healthy eating through social support, food availability in shared settings, food preferences of family and friends, and norms or “social transferability” of food behaviors. The review also documented cultural norms, body size norms, and cultural cooking practices as factors that influence healthy eating.[26] Findings were consistent in a recent scoping review on the meaning of food and barriers to healthy eating among low socioeconomic status populations.[27] Financial considerations were especially salient; other barriers included lack of time due to work schedules, the role of food in social bonding, desire to please family members, and the salience of food in upbringing, tradition and identity. A review by Kelly et al. similarly documented food availability, cost, social environments, identity, lack of time, lack of motivation, competing priorities, and low capability as barriers to a good diet, with access to supermarkets emerging as a barrier for lower SES populations.[28]

While many of these barriers intersect with families and the home environment, past research has rarely focused on barriers encountered during an intervention that explicitly focuses on changing the home food environment of adults. To our knowledge, none of the relatively few intervention studies that target the home food environment of adults have done so.[29,30] Healthy Homes/Healthy Families (HH/HF) is a research-tested intervention that focuses on simple healthy actions to improve the home environment for weight gain prevention. It was shown effective in changing the home environment and improving weight-related dietary behaviors in a controlled trial with overweight and obese patients in three federally qualified health centers (FQHCs).[31] Additionally, results were parallel and promising when the intervention was adapted for telephone delivery in a pilot study with 2–1-1 callers.[32]

The purpose of the current paper is to present barriers to implementing the healthy actions for low-income households based on notes from the coaching process in both studies. Understanding barriers to creating healthier home food environments has the potential to inform future interventions that include a home environment focus.

Methods

Description of the Parent Studies

HH/HF was a randomized controlled trial with baseline, six month and 12-month follow-up.[31] Participants were women recruited from three FQHCs in southwest Georgia (n=349). Eligible women were overweight or obese (BMI ≥ 25), between 35 and 65 years of age, and living with at least one other person and within 30 miles from the referring clinic. Providers screened women during office visits and provided names and contact information to the research team if a patient was interested and eligible. Research staff then confirmed eligibility, obtained informed consent, and collected baseline data; participants were then randomized into the intervention or control arm of the study.

HH/HF 2–1-1 was a single arm pilot study with baseline data collection and four-month follow-up.[32] Participants (n=101) were recruited from the United Way of Greater Atlanta 2–1-1 call center. Eligibility criteria were expanded from HH/HF, to include men, a larger age range (18–75), and individuals with healthy weights (BMI ≥ 20). 2–1-1 community connection specialists screened callers for interest and initial eligibility. If a caller was interested and potentially eligible, 2–1-1 staff provided contact information to the research team. The research team then confirmed eligibility, obtained informed consent, and collected baseline data. All participants were in the intervention group. Both studies were approved by the Emory University Institutional Review Board.

Description of the Intervention

The intervention and its adaptation for telephone delivery have been described elsewhere.[31–33] For the trial, coaches were community residents who had experience in social or customer service and at least a high-school education. For HH/HF 2–1-1, coaches were master's level university staff with experience in counseling. In the trial, intervention participants (n=172) worked with a health coach over five months to improve their home

environment to be more supportive of healthy eating and physical activity. The coaching schedule consisted of three home visits and four phone calls between home visits. Family members were invited to participate in both home visits and calls. In HH/HF 2–1-1 (n=101), the intervention was shortened to three months, and six phone calls and six text messages were delivered in alternative weeks.

A tailored home environment profile was created using baseline survey data. The first coaching session focused on reviewing the profile and selecting a healthy eating action as part of a goal-setting process. Table 1 lists the healthy actions for the home food environment in rank order across the two studies and by study. The healthy actions were based on empirical evidence linking these features of the home environment to healthy eating[34–41] and were designed to be relatively simple to implement in contrast to changing individual eating behaviors, and affordable for lower income households. Coaches and participants documented which healthy actions were chosen on a family contract, which both the coach and the participant signed to indicate commitment to implement the action. Healthy actions were added and strengthened over the course of the intervention.

Coaching Logs

Coaches in both studies used a coaching log booklet specifically designed to document each contact with a participant. The booklet consisted of a cover sheet and log sheets for each contact point. After each contact with a participant, the coaches documented the date, number of family members present, start time and length of the contact. Next, they noted newly chosen healthy actions as well as continuing previously chosen actions. In an unstructured narrative format, the coaches documented discussions with the participants about anticipated and encountered barriers and successes by healthy action. These topics were commonly discussed as the coaching protocol included probes that elicited participant's anticipated barriers when selecting a healthy action, and actual barriers in subsequent discussions focused on overcoming barriers. Coaches in HH/HF transferred the information into RedCap (Research Electronic Data Capture).[42] Coaches in HH/HF 2–1-1 used an online web-based application to store coaching interactions and to document healthy actions.

Sampling of Coaching Logs for Current Study

The current study used process evaluation data from the logs maintained by the coaches to document their interactions with participants. From HH/HF, we selected coaching log data for a subset of women (40 of 151) who had at least one contact with the coach, with an equal number of women who were employed or not employed and either had children under the age of 18 living in their home or not. From HH/HF 2–1-1, we used all available coaching log data, in other words, for all participants who completed at least one coaching call (74 of 101).

Data Analysis

Preliminary analysis differed across the two studies. For HH/HF, qualitative data from the coaching logs were imported into NVivo 10 (QSR International Pty Ltd, Melbourne, Australia) for coding and analysis. Our inquiry approach was pragmatic in nature.[43]

By using a pragmatic approach we sought to identify actionable findings that could be applied to future interventions. The codebook was developed to cover various dimensions of the coaching process, including selected healthy actions, general observations about the household, successes in implementing the healthy actions, suggestions from the coach, anticipated barriers to implementing specific actions, actual barriers encountered in attempting to implement an action, facilitators to implementation, spillover effects (e.g., impact on household members), and general program feedback. Emergent codes were added, including specific barriers, based on initial review of the coaching notes, and definitions of existing codes were refined. Data were coded on paper by two coders, reconciled, and consensus codes were entered into NVivo. In the second phase of analysis, we thematically analyzed the coded transcripts to identify commonly discussed barriers. We used the matrix coding query tool in NVivo to generate a report of barriers by healthy action, and identify which barriers were discussed in relation to which healthy actions.

Analysis of the HH/HF 2–1-1 was much more streamlined and focused only on the barriers to implementing healthy actions. Coaching notes were exported from the online system. We then created a matrix with barriers on one axis and the healthy actions on another, with a participant identifier in the cells, along with a brief description of how the barrier manifested for specific participants.[44,45]

To combine findings from HH/HF and HH/HF 2–1-1, a master matrix was prepared with counts of participants facing each of the barriers across the two studies. Barriers that were mentioned several times for any given healthy action are reported. Original coaching notes were then reviewed again to enrich the themes with a detailed example for each of the barriers. Trustworthiness of the findings was strengthened through member checking with the coaches (several of whom are co-authors on this paper).[43]

Results

Description of Study Participants

Table 1 shows demographic characteristics of study participants for whom coaching data were analyzed. In both studies, the vast majority of participants were lower-income African American women. In HH/HF, mean age was 51 (SD=7.54); in HH/HF 2–1-1 mean age was 45.6 (SD=12). A larger percentage had a high school degree or less in HH/HF (67.5%) compared to 32.5% in HH/HF 2–1-1. Mean BMI was >30 in both studies. Half of the participants in HH/HF were employed and half had children, based on selection criteria for analysis of the coaching logs. More were unemployed in the HH/HF 2–1-1 sample, and fewer had children under age 18 in the home.

Healthy Actions Selected

Table 2 shows the rank order of each healthy action based on the proportion of study participants selecting each. Across the two studies, identifying an unhealthy food and not allowing it in the home was the most popular, followed by rules that limit eating while watching TV. Always having a low-calorie beverage available instead of sugar soda and/or

sweet tea was third most popular. Cutting back on restaurant and fast food was the least popular healthy action across the two studies.

Barriers to Healthy Actions

Table 3 shows barriers across the healthy actions. The most common barrier was difficulty of changing established habits. This barrier affected implementation of five healthy actions: having low calorie beverages available, eliminating an unhealthy item from the home, preparing foods using healthier methods, using portion control practices, and not eating with the TV on. In general, many participants found it challenging to change their grocery shopping patterns and how they prepared and served meals. One participant explained to her coach that cutting back on sugar-sweetened beverages was similar to trying to stop smoking because she has consumed regular sugar, high caffeine drinks daily for years. A mom explained that cutting back on portion sizes was challenging because she resided with five adult children and cooking large quantities of food was the norm. Another participant shared that it was difficult to break old cooking habits, such as frying, in order to use new methods like grilling and baking. Barriers to not eating in front of the TV varied, with some households describing how family members had different eating schedules based on work shifts (i.e. not everyone was home at the same time so when eating alone, they sat in front of the TV out of habit).

Cravings were a challenge for efforts to ban an unhealthy item from the home. For example, one participant described buying turkey bacon in place of regular bacon, but still found themselves craving regular bacon. Others spoke of craving sweets, chips and soda, and crunchy things. One of the participants shared that she and her fiancé had “sweet tooth” and banning ice cream and other sweets was a challenge; getting her fiancé on board with the decision proved to be difficult. Another woman described treating herself to an ice cream cone nightly, after working long hours. Yet another participant reported buying grapes and bananas instead of cookies when she went shopping. She stated that she tried not to think about snack foods and that made it easier, but the cravings were hard to deal with. Hunger was a barrier when participants attempted to limit portion sizes and avoid second helpings.

Lack of time and being too busy were barriers for two of the healthy actions: using healthy food preparation methods and cutting back on restaurant food. Participants noted that fast food was good, fast, and convenient which was appealing when schedules were hectic and there was no time to cook. A recent graduate and full-time employee ate fast food seven days a week out of convenience and lack of free time to cook. Another participant did not have his family’s support in cutting back on eating out because everyone was busy, tired, and did not want to learn how to prepare healthier meals at home.

Challenges with family support were a barrier for making a low-calorie beverage available and banning an unhealthy food or drink from the home. The barrier manifested in two different ways; for some participants, family members refused to participate in the action, whereas for others, family members would participate, but complain or express dislike of the change. For example, one participant started using a low-calorie sweetener, instead of regular sugar, when making sweet tea for the home. However, her family refused to drink the tea stating that they did not like the taste. Another described how her husband loved

sweet tea and since he was retired-he “had to have his tea.” Another participant, who chose not to allow potato chips in the home, stated that her husband continued to purchase potato chips when grocery shopping. The participant explained to the health coach that although her husband was aware of the new house rule, he was “old school” and “stubborn.” When participants discussed family members refusing to participate in an action, it was typically a spouse. However, when participants discussed family members complaining about the action, it was typically children. Several participants explained that it did not matter if their children complained because they had no control over the groceries purchased for the home, or the food and beverages served.

Visitors, especially grandchildren, were described as a barrier to banning an unhealthy food or beverage from the home. Grandparents, in particular, spoke of wanting to have their grandchildren’s favorite foods in the home when they visited. One grandmother described having a hard time eliminating ice cream for her grandchildren during the summer. Social situations, for example, friends who enjoy going out to eat as a social activity, were mentioned by several participants as a barrier to cutting back on restaurant food for family meals. A number of participants reported that most of their social activities revolved around going out to eat with friends and family.

Cost of a healthy lifestyles, including food, was a barrier for three of the healthy actions: getting fresh fruit and vegetables weekly, cutting back on restaurant food for family meals, and putting a scale in a visible location and weighing in weekly. The latter required acquiring a scale for the many households that did not own one at the beginning of the study (54% in the pilot) or figuring out how to access one. Cost of fruit and vegetables was a barrier to getting fresh fruits and vegetables on a weekly basis when budgets were tight. One participant described not having enough money for food and another explained that the produce they obtained with food stamps did not last a whole month. Another participant told her coach she was able to purchase cabbage on a weekly basis, but only able to afford purchasing fruit every other week. Cost of food also influenced use of fast food, as it was seen as relatively inexpensive relative to fresh food. One participant committed to trying two new fresh fruits and two new vegetables and finding recipes online instead of eating out. While she succeeded in obtaining a large variety of new produce early in the intervention, the cost of continuing long-term was prohibitive. One participant who found healthy foods to be too expensive, pooled family money together to make buying healthier foods easier. Another participant expressed fast food as “cheaper and easier.” She resolved this by cooking enough to meal prep for a few days, instead of one meal at a time. Additionally, a number of participants did not have a scale at home, often because of the cost to purchase or replace a broken scale.

Finally, access to different types of resources was a barrier to getting fresh fruits and vegetables at least once a week. A couple participants described that the food pantry does not provide fresh food, and others said lack of transportation made it difficult or the refrigerator was too small to store much produce. Another participant described that the local grocery store did not have a good selection of fresh produce; distance to the nearest grocery store with good fresh produce was a barrier for rural participants.

Discussion

This study highlights the complex and intersecting multi-level influences that lower-income individuals must navigate to improve nutrition for themselves and their household members. Barriers spanned the social ecologic framework and included internal (e.g., habits, craving, hunger) and interpersonal (e.g., family support, social situations) challenges, as well as access, time, cost and other barriers related to economic hardship and structural inequality.

The most common barriers described by the participants across the eight healthy actions were individual-level challenges of changing established habits. Habits have been identified as a barrier to healthy eating in several studies.[18, 26, 46, 47] In the current study, habits emerged as barriers in the context of food preparation, foods available in the home, and TV watching patterns. Cravings and hunger were additional internal barriers, affecting efforts to ban a particular food from the home and portion control efforts. Cravings have been identified in prior qualitative research, often within the context of eating as a coping strategy or a response to negative emotions.[26,48] In our study, hunger was discussed in terms of serving larger portions and second helpings. In the literature, hunger is often associated with financial uncertainty, with families having to decide between paying the bills and purchasing food and/or mothers eating less so children are not hungry. [19, 20, 22] Hunger can also drive fast food consumption through the view that it is more satiating than healthier foods.[26]

Interpersonal influences served as barriers for several of the healthy actions. Challenges stemmed from social situations centering on food, family members expecting certain foods, and a desire to please family members with food, most notably children and grandchildren. For some lower income households, food is one way to fulfill children's desires when parents have to deny other requests that are financially infeasible.[49] Family members who resisted efforts to change the home food environment were also fairly common. Other studies have similarly noted a lack of support for dietary changes by household members.[14–17, 26,27]

Economic barriers, particularly the cost of food, was the second most common barrier, related to maintaining a supply of fresh fruit and vegetables, cutting back on restaurant food for family meals, and having a scale for monitoring body weight. Cost has been noted as a major barrier to healthy eating in many studies, with the cost of fresh produce making it difficult to maintain a household supply when budgets are tight, and fast food providing a relatively inexpensive and convenient alternative.[15, 16, 19–22] Limited access to fresh fruits and vegetables was viewed as an additional barrier. For both rural and lower income urban residents, access can be cost-related and/or due to lack of nearby supermarkets with a good selection of fresh produce.[19, 47] Limited transportation can also contribute to reduced access to fresh produce.[21] Additionally, time can be conceptualized as a limited resource that disproportionately disadvantages certain populations.[50, 51] Lack of time, and the need for convenience, were barriers for the food preparation and fast food restaurant actions.

In the current study, coaches were able to provide suggestions for overcoming some of these barriers and also made an effort to learn from participants who succeeded in making those changes and sharing their strategies with other participants. Examples include buying

fresh fruits and vegetables when in season, rinsing syrup and salty liquid off of canned items, reading nutrition labels more often, keeping bottled or fresh water more accessible, preparing larger quantities to provide for several meals, and involving family members in selecting healthier alternatives. Cutting back on unhealthy foods slowly (e.g., adding less sugar over time), and substituting healthier options were also helpful strategies. In the adaptation study, text messages containing helpful hints were tailored based on challenges that had emerged in coaching sessions. These suggestions were often helpful to participants, but did not ameliorate any of the larger structural barriers participants faced in attempting to change their home food environments.

This study has several limitations. First, data were from coaching logs designed to capture the coaching process with a primary purpose of helping the coach prepare for subsequent coaching sessions. Thus, the data were not collected to systematically document all barriers encountered for each healthy action chosen. Audio-recording and transcribing the coach-participant interactions and/or formally interviewing the participants about barriers may have provided higher quality data. That said, the notes were quite detailed and provided significant depth on barriers, related conversations, efforts to overcome barriers, and results of those efforts. Second, different teams of analysts identified themes in the two studies using different approaches (e.g., thematic analysis with NVivo versus content analysis with no qualitative software). A third analyst then combined the findings into the thematic categories reported here. This may have resulted in loss of some of the sub-themes and/or nuanced findings from each particular intervention study. Additionally, study participants in both samples were primarily lower-income African American women so some of the results may not be generalizable to other racial/ethnic groups and/or higher income households. The generalizability of the findings are strengthened, however, with participants from both urban and rural settings.

It is worth noting that despite the challenges faced by study participants, both the home visit and telephone-delivered interventions were successful, with participants making a notable number of changes to their home food environment and improving diet quality.[31–33] This suggests that with support and encouragement, many barriers to creating a healthier home food environment can be overcome. However, the findings reported here highlight the complexity of changing home food environments and eating behaviors. Both are challenged by barriers at all levels of the social ecologic framework, from individual cravings to family expectations to availability of low cost healthy foods in the community. While addressing all of these barriers with a single intervention may be infeasible, synergistic interventions that collectively target each of these (e.g., frequent reminders or cues to action, a dyadic approach to strengthen social support, improved access to healthy foods, mitigating financial strain) may be necessary to prevent obesity and promote healthy eating at the population-level.

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Table 1.

Demographic Characteristics of Participants with Coaching Data Included in Study

	HH/HF Trial (n=40)		HH/HF 2-1-1 (n=74)	
Demographic Characteristics	**N/Mean**	**SD/%**	**N/Mean**	**SD/%**
Age (Mean/SD)	51.0	7.54	45.6	12.0
Women (N/%)	40	100.0	55	74.3
Race (N/%)				
White	3	7.7	6	9.2
African-American	36	92.3	59	90.8
Education (N/%)				
Less than high school/GED	12	30.0	7	9.5
High school/GED	15	37.5	17	23.0
More than high school/GED	13	32.5	50	67.6
Children under 18 in the home (N/%)				
Yes	20	50.0	28	37.8
No	20	50.0	46	62.2
Employed				
Yes	20	50.0	31	41.9
No	20	50.0	43	58.2
Annual Household Income (N/%)				
<=$10,000	16	42.1	21	30.0
$10,001–$25,000	12	31.6	49	70.0
>=$25,001	10	26.3	0	0
BMI (Mean/SD)	36.2	7.87	33.0	9.66

Table 2.

Rank Order of Selection of Healthy Actions

Healthy Action	Rank Order in Original Trial	Rank Order in HH/HF 2-1-1 Pilot	Average Rank across Studies
Always have low-calorie beverage available instead of sugar soda and/or sweet tea.	1	6	3.5 (3rd)
Bring home fresh fruits and vegetables at least once a week, and make them easy to see and grab.	2	7	4.5 (5th)
Identify one unhealthy food or drink and do not allow it in the home.	3	1	2 (1st)
Establish rules that limit eating while watching TV.	4	2	3 (2nd)
Use healthier methods to cook vegetables, meat, and/or fish.	5	3	4 (4 th)
Place a scale in a visible location to weigh in weekly.	6	5	5.5 (6th)
Reduce portion sizes and avoid second helpings.	7	4	5.5 (6th)
Cut back on how often your family eats fast food or restaurant food.	8	7	7.5 (7th)

Table 3.

Major Barriers by Healthy Action

Barrier	Make low calorie beverages available	Get fresh fruit & vegetables weekly	Ban an unhealthy item	Prepare food using healthy methods	Use portion control practices	Limit eating with the TV on	Cut back on restaurant food for family meals	Place a scale in a visible location and monitor weight*	Total
Habits hard to change	X		X	X	X	X			5
Cravings for unhealthy foods			X						1
Hunger a priority					X				1
No time/too busy/convenience				X			X		2
Lack of family support	X		X						2
Desire to please visitors/grandchildren			X						1
Friends/social situations involve food							X		1
Cost of a healthy lifestyle, healthy food		X					X	X	3
Limited access		X							1
Total types of barriers	2	3	4	2	2	1	3	1	

*HH/HF 2-1-1 only