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Acknowledgments
The authors of this article would like to send a special thank you to all of the North Carolina Extension Family and Consumer Sciences (FCS) professionals who participated in the North Carolina FCS Agent Needs Assessment. Furthermore, we would like to thank our colleagues, Isabel Osborne and Kati Jackson, for their role in analyzing the research data.

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Assessing Foods and Nutrition Programming Needs of Family and Consumer Sciences Agents in North Carolina

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North Carolina Extension specialists conducted a needs assessment of Family and Consumer Sciences (FCS) agents to determine their foods and nutrition programming needs. Researchers examined agent and community needs, agent-offered programming, and barriers and facilitators to program implementation. Results will help inform the development of targeted agent trainings, materials, programs, and technical assistance related to foods and nutrition. The study is intended to help maximize the success of FCS foods and nutrition programming by supporting agents in delivering high-quality, evidence-based programs. This paper reviews study implementation, results, and relevant implications for other Extension professionals interested in performing a similar analysis.

Keywords: Family and Consumer Sciences (FCS), needs assessment, nutrition education, foods programming, diet-related disease

Introduction

Diet-related chronic diseases, such as obesity, heart disease, and diabetes, are the leading cause of rising healthcare costs in the United States (National Center for Chronic Disease Prevention and Health Promotion, 2018a). Maintaining a healthy diet and lifestyle can help reduce the risk of these costly diseases (World Health Organization, 2005). Chronic disease prevention strategies have structural and programmatic implications for Cooperative Extension Services as they address their communities' emerging needs. In August 2014, North Carolina State University’s Cooperative Extension Service released a new strategic plan that considered North Carolina’s high rates of diet-related chronic disease (Trust for America’s Health, 2017). The plan focused organizational efforts on nine major goals, including the relationship between healthy weight and reduced risk of chronic disease through healthy eating and physical activity (NC Cooperative Extension, n.d.). In response, North Carolina State University Extension’s Family and Consumer Sciences (FCS) program established foods and nutrition as its core program focus, a concentration comprising the topics of nutrition, health, food safety, food preservation, and local food systems (Kirby, 2018).
Establishing foods and nutrition as the core program focus for North Carolina State University Extension’s FCS Program constituted a programmatic shift for agents previously working in non-foods FCS programming, such as housing, parenting, family resource management, human development, and aging. To determine how to support FCS agents in delivering core foods and nutrition programs, we conducted a needs assessment. The goal of the research was to determine training and programming needs of North Carolina FCS agents related to foods and nutrition.

Methods

We conducted semi-structured telephone interviews with North Carolina Cooperative Extension FCS agents and County Extension Directors (CEDs) with FCS responsibilities. We developed an interview guide, conducted interviews, and analyzed the data using qualitative methods. The study was approved by the North Carolina State University institutional review board.

Interview Guide

We developed an interview guide based on previous studies (Clarkson-Frisbie et al., 2008; Peña-Purcell et al., 2012) to elicit information on training and support needs of county-based FCS agents and CEDs with FCS responsibilities. The interview guide was reviewed by Extension specialists, agents, and CEDs, with edits made based on feedback. The final interview guide (see Appendix) included questions on community needs related to foods and nutrition programming; current foods and nutrition programming offered; kitchen space, equipment, and supplies needed to successfully deliver foods and nutrition programming; and demographic information.

Needs Assessment Interviews

All FCS agents and CEDs with FCS responsibilities in the NC Cooperative Extension system were eligible for the study. Potential participants (N = 69) received an email about the study from a research team member soliciting their participation in a 60-minute telephone-based interview. Participants that showed interest in the study had a study information sheet emailed to them, and an interview date was scheduled. Author Alford conducted all interviews. Verbal consent was obtained, and each interview was recorded and transcribed verbatim.

Data Analysis

We used a qualitative approach for this study. We developed a codebook for this study through an iterative process. In the initial coding phase, authors Alford and Haynes-Maslow independently applied open coding to five transcripts. Alford and Haynes-Maslow compared open codes, reconciled coding discrepancies, and then created a codebook that was applied to an additional five transcripts. Members of two coding pairs, each comprising one author and one research assistant, were trained by the principal investigator (author Haynes-Maslow) regarding the codebook and coding procedures. Each pair independently coded approximately 30
transcripts. Code discrepancies were discussed, and consensus was reached within each coding pair. The researchers used Atlas.ti version 7.0 to analyze the data.

The researchers used thematic content analysis to analyze transcripts. Thematic content analysis allowed the researchers to examine and record patterns, known as themes (Guest et al., 2012). Thematic content analysis is considered an inductive approach to analyzing qualitative data since researchers generate themes based on what they assess to be important issues arising from the data, rather than applying pre-existing themes (Wilbraham, 1995). The researchers calculated the frequency of themes based on the number of times a theme or subtheme was mentioned; this allowed for multiple themes to potentially be coded in one statement. In content analysis, calculating frequencies is important because it reveals which themes are most important to participants. The researchers created six themes based on interviews.

**Results**

The researchers conducted 61 interviews between 2016 and 2017. Forty-seven interviews were conducted with FCS agents, and 14 interviews were with CEDs with FCS responsibilities (Table 1). Most participants were female (96.7%) and White/Caucasian (68.9%).

**Table 1. Interview Participant Demographics, N=61**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Type, # (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FCS Agent</td>
<td>47 (77.0)</td>
<td></td>
</tr>
<tr>
<td>CED</td>
<td>14 (30.0)</td>
<td></td>
</tr>
<tr>
<td>Age (Mean # Years)</td>
<td>44.2</td>
<td></td>
</tr>
<tr>
<td>Sex, # (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>59 (96.7)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2 (3.3)</td>
<td></td>
</tr>
<tr>
<td>Race, # (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>42 (68.9)</td>
<td></td>
</tr>
<tr>
<td>Black or African American</td>
<td>13 (21.3)</td>
<td></td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>3 (4.9)</td>
<td></td>
</tr>
<tr>
<td>Native American</td>
<td>1 (1.6)</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>1 (1.6)</td>
<td></td>
</tr>
<tr>
<td>Prefer not to answer</td>
<td>1 (1.6)</td>
<td></td>
</tr>
<tr>
<td>Number of Years Working for Extension (Mean)</td>
<td>9.4</td>
<td></td>
</tr>
<tr>
<td>Years working as FCS Agent</td>
<td>7.8</td>
<td></td>
</tr>
<tr>
<td>Years working CED</td>
<td>7.0</td>
<td></td>
</tr>
<tr>
<td>Number of Counties Served (Mean)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FCS</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>CED</td>
<td>1.1</td>
<td></td>
</tr>
</tbody>
</table>
Six themes generated from the interviews included agent needs for curriculum and materials, program implementation challenges, program target audiences, collaborations with community partners, agent training needs, and strategies that agents use to learn about foods and nutrition programs (Table 2).

**Table 2. Theme Definitions, Illustrative Quotes, and Code Frequencies**

<table>
<thead>
<tr>
<th>Theme</th>
<th>Theme Definition</th>
<th>Illustrative Quote of Theme</th>
<th>Total Code Frequency #</th>
<th>Percent of Total Codes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agents’ needs for curriculum and materials</td>
<td>Agent needs for curricula on specific topics (i.e., baking, diabetes-friendly recipes) and/or materials such as fact sheets and recipe cards. Could also include updating curriculums and materials. Materials could also include technology.</td>
<td>“I use the Stanford University’s Dining with Diabetes class. I teach that every so often. That is a curriculum, like I said, from Stanford University that has recipes and information about that. I don’t know if that’s the one they’re going to update that one with a new healthy living class or not, but that’s, to me, Extension should have their own.”</td>
<td>246</td>
<td>19.6</td>
</tr>
<tr>
<td>Program implementation challenges</td>
<td>Any current challenge or barriers that reduces the agent’s potential for effectively delivering programming in the community</td>
<td>“None of us ever have a kitchen space that’s great. Well, there’s a few of us in the west that might…there might be one or two, but my kitchen space is…it can be a challenge. You get ten people in there trying to cook.”</td>
<td>243</td>
<td>19.4</td>
</tr>
</tbody>
</table>
| Program target audiences                  | Agent’s target audience for foods and nutrition programming. Includes engaging and reaching audiences for programming. Could include current program audiences and/or audiences that the agent would like to reach. | “We’ve been able to reach African American, but just low-income in general, we’ve struggled with.”  
“Low-income audiences are probably the ones making the worst choices, driven by economics, that is why many programs target this population.” | 224                    | 17.8                      |
<p>| Collaborations with community partners    | Includes collaborations with specific physical                                   | “We have a food pantry over here that I did several classes for their clients. We did a | 188                    | 15.0                      |</p>
<table>
<thead>
<tr>
<th>Theme</th>
<th>Theme Definition</th>
<th>Illustrative Quote of Theme</th>
<th>Total Code Frequency #</th>
<th>Percent of Total Codes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community settings, such as senior centers, schools, farmers' markets, faith-based, etc.</td>
<td>canning class for them. I've done a cooking class, a one-time cooking class for them.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“I’ll get a request, ‘Our church wants this program’ so I’ll say, ‘If you can get 10 to 15 people, then it’s easy for me to go’ because a lot of times, it’s easier if they have an already semi-existing group. A lot of times, they won’t show up if I have something here at the Extension office. It’s also easier to go to a place where I have a programming request, and they have a group already formed.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agent training needs</td>
<td>Training for latest nutrition topics and fads (i.e., gluten-free, GMO, healthy oils), training on specific curriculum, and/or program delivery skills such as cooking and using technology.</td>
<td>“I think it would, I mean what would be really helpful would, as I said, to have some training around like how to set up a kitchen, how to prep and just kind of how to set up the kitchen for a cooking class or to teach cooking. I think also, too, it would be helpful to have any information around like technology that can assist.”</td>
<td>188</td>
<td>15.0</td>
</tr>
<tr>
<td>Strategies that agents use to learn about foods and nutrition programs</td>
<td>Agent describes how and where they find foods and nutrition information, including programming, recipes, etc., Or how they learn (or would like to learn) from other Extension agents.</td>
<td>“If I see something that Extension has from one of the other Extension states, -- Georgia usually has some pretty good stuff. From Utah, I’ve seen stuff online from various places, and if I think it fits, I’ll use it. I’ve actually pulled some stuff out of Cooks Illustrated. That’s, you know, America’s Test Kitchen.”</td>
<td>166</td>
<td>13.2</td>
</tr>
</tbody>
</table>
Agent Needs for Curriculum and Materials

Agents focused on the needs for youth curriculum with an emphasis on nutrition and cooking and for adults with diet-related chronic disease. For the adult curriculums, agents expressed wanting more diabetes-related programming and weight loss management strategies. They wanted to expand current healthy eating and food/nutrition programs by adding new recipes, as well as tips on how to live with chronic illnesses and how to prevent family members from developing them. Some agents described a need for young adults to have an introductory cooking class, since they felt many of them in their community lacked the skills to cook on their own.

Program Implementation Challenges

Common challenges were recruitment and retention of class participants, funding for equipment and materials, and adequate kitchen space. For recruitment and retention, getting people to attend classes weekly or continue to show up for multi-session classes can be difficult with participants’ changing schedules and the need to commute to class locations. This was especially an issue for low-income participants. Funding was another barrier because agents could not afford to buy all of the supplies or equipment they needed for programming or they had to charge participants a sign-up fee to cover costs. The last barrier was not having enough space for classes. Oftentimes, agents traveled to other locations to use kitchens that could hold a larger number of participants for their classes, or they had to limit their class sizes. Even when they limited the class size, there was often not enough room for demonstrations or the participants could not see the agent.

Target Audiences

Agents discussed four main target audiences: low-income, elderly, youth, and parents. Even with the strong focus on low-income participants, many agents said it was a struggle to recruit them due to a lack of transportation and scheduling issues. Some agents liked to focus on elderly audiences because they are at high risk for diet-related diseases, and they comprise a large
percentage of their population. Agents also said the elderly were typically easy to recruit because they can travel to senior centers or congregate nutrition sites, where seniors are already going. They considered seniors as a captive audience. Many agents talked about doing youth programming as a way to instill healthy eating habits early on. Agents typically did not have a hard time getting youth to attend programming because they offered classes in the schools.

Collaborations with Community Partners

Collaborations allowed agents to target programming to specific groups that meet consistently in specific locations and bring classes to groups that may not have transportation to an Extension office. Some agents relied on programming requests from community partners and said they would offer a program if the community partner could recruit enough participants. Places agents collaborated most with included churches, schools, farmers’ markets, senior centers, shelters, food pantries, libraries, and health departments.

Agent Training Needs

The majority of agents asked for training on “hot topics” that were considered “fad diets,” such as gluten-free diets, healthy oils, organic products, and local foods. Agents were aware that peoples’ preferences were continually changing, especially in response to the media, so agents wanted to be trained on new topics that were evidence-based. Several agents also requested more training on basic cooking topics and tips; they wanted to be comfortable teaching cooking classes.

Strategies that Agents used to Learn about Foods and Nutrition Programs

The majority of agents obtained information from various places to add to their curriculum or supplement their own knowledge, including other state Extension program curricula and websites, university courses, guest lectures, and online videos/resources. Agents also tended to collaborate for certain classes to pool expertise and create successful programs. Peer learning was talked about as a very important strategy for learning how to teach various programs.

Discussion

This study examined agent and community needs, agent-offered core programming, and barriers and facilitators to foods and nutrition program implementation in North Carolina communities. Agents conveyed a need for curricula and materials focused on diabetes prevention and weight loss management. Despite this expressed need, all North Carolina State University Extension foods and nutrition programs are focused on improving healthy eating and physical activity, subsequently making them geared toward diet-related chronic disease prevention. This disconnect may reveal that Extension specialists need to better communicate the purpose and goals of programs they develop. Foods and nutrition programs should be marketed as healthy
eating and active living programs that can assist with diet-related chronic disease prevention and control, including diabetes prevention and weight management. Future research could explore this disconnect.

Agents discussed challenges with recruitment and retention of class participants, especially low-income participants. One potential solution for addressing retention is making program locations and times convenient (Haynes-Maslow et al., 2019). Additionally, agents can use social media to recruit participants (Topolovec-Vranic & Natarajan, 2016), and some programs at North Carolina State University offer online nutrition education resources that can be accessed via mobile devices, tablets, or computers. Recruitment and retention could also be addressed by tailoring programs to meet the specific needs of various audiences (based on geography, economic status, age, gender, etc.). Last, Extension should use policy, systems, and environmental (PSE) approaches to address recruitment and retention, since PSE changes are typically meant to “make the healthy choice the easy choice” (Haynes-Maslow et al., 2018). However, PSE was not brought up during the interviews, which reveals a need for more PSE training among agents.

In regard to funding barriers, multiple programs offered by North Carolina State University offer free supplies, training, and curriculum, including the Supplemental Nutrition Assistance Program-Education, which serves low-income participants. Even if agents have to charge a minimal fee to cover costs of additional supplies and/or materials, studies have shown that a small fee (even for lower-income participants) makes them feel invested in a program and more likely to complete it (Ackermann & Marrero, 2007). In terms of having adequate space to do programming, the best short-term solution is to partner with organizations that have adequate kitchen space.

Agents expressed a need for additional training in cooking skills and nutrition/foods “hot topics.” North Carolina State University has been working to enhance trainings in these areas. A comprehensive FCS agent cooking skills training class has been developed and offered to several agents to enhance knowledge, skills, and confidence. Monthly FCS “hot topic” online training is delivered to provide agents with information on new and emerging topics related to foods and nutrition. Increased training opportunities are in accordance with best practices in nutrition education, which require expertise in content and teaching methods, as well as ongoing professional development to ensure educator proficiency (Baker et al., 2014; National Center for Chronic Disease Prevention and Health Promotion, 2018b). Last, since peer learning was a preferred learning strategy for agents, future trainings should consider this technique.

This study has several limitations. First, due to its geographic scope, this study may not be generalizable to other states. Second, some agents knew the interviewer, which could have resulted in interview bias.
Conclusions

Extension specialists should understand the challenges agents face when delivering programming in the field. Conducting qualitative research with agents can help specialists better develop trainings, materials, programs, and technical assistance that meet agents’ needs. Using results in this manner will help maximize the success of FCS foods and nutrition programming by ensuring that all agents are well-prepared to deliver high-quality, evidence-based programs. This is critical when Extension Services are working hard to effectively address growing community needs surrounding diet-related chronic disease. This approach can be utilized by other Extension professionals interested in identifying and addressing FCS agent training and support needs related to foods and nutrition.

References


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Appendix

Needs Assessment Interview Guide

Interview Questions:

Extension Role

1. What is your current role with Extension (i.e., County Extension Director, Family and Consumer Sciences Agent)?
2. What county or counties do you currently work in? If you work in multiple counties, what is your primary or home county?
3. How long in total have you worked with Extension? How long have you been in your current position?
4. If you are a CED, do you currently work in the area of foods and nutrition? Describe.
   a. (Probes: If you do not work in foods and nutrition, do you have staff or are you planning on hiring staff that will work in foods and nutrition programming? Describe.)
5. If you are an FCS agent, how long have you worked in foods and nutrition programming as an FCS agent? Do you currently have other work responsibilities besides foods and nutrition (for example, CED, ECA, etc.)? Describe.

Foods and Nutrition Training and Support Needs

The following questions are to help us determine what type of trainings, materials, and support would be helpful for agents related to foods and nutrition programming. Your responses will help us to identify training needs and develop useful resources.

1. Tell me about your experience with nutrition and nutrition education.
2. Tell me about your experience with cooking and cooking education.
3. How comfortable are you leading programming related to foods, nutrition, and cooking? Describe.
4. What type of support and/or training would help you enhance your foods, nutrition, and cooking programming skills?
5. What specific foods, nutrition, and cooking topics would you like to receive training on? Describe.
6. What types of foods, nutrition, and cooking teaching and program implementation techniques would you like to receive training on (i.e., food demonstrations, hands-on cooking classes, cross-program collaborations, etc.)? Describe.
7. What types of teaching materials and/or curricula (in addition to any you already use) would be useful to you in your nutrition education and foods programming efforts (i.e., handouts, recipes, lesson plans, videos, etc.)? Describe.
8. Is there anything else that you would like to share regarding your foods and nutrition programming, training, and support needs?

Community Needs Related to Nutrition and Foods Programming

1. What foods and nutrition topics do you feel are most relevant to (or in demand by) your community? Why? What do you think would be the best way to address these topics with your community?

2. Which audiences are most important to target for foods and nutrition programming in your community? Why? What do you think would be the best way to engage these audiences in your community?

Nutrition and Foods Programming

1. Do you offer nutrition education and/or foods programming? If yes, describe.
   a. (Probe: What topics does your programming address? What audiences does your programming target? What curricula does your nutrition and/or foods programming utilize? How often does this programming occur? Where does this programming occur? Do you use the kitchen space at the extension office for this programming? Do you use the outdoor cooking space at the extension office for this programming? Do you use portable cooking equipment for this programming?)

2. Does your nutrition education and/or foods programming include cooking instruction, food demonstrations, and/or food tastings? If yes, describe.
   a. (Probe: What cooking skills and foods do you teach, demonstrate, and/or taste? How do you incorporate these topics into your programming? Do participants do any hands-on cooking? Do you do this with all nutrition education and foods programming or just certain classes?)

3. What types of incentives would motivate you to do more cooking and food demonstrations? For example, an award, public recognition, scholarships to conferences, or physical items such as books or cooking equipment.

4. Does your nutrition education and/or foods programming include any collaborations with other agents, county Extension offices, or community partners? Describe.
   a. (Probe: Have you developed or are you using any resources, teaching materials, or curricula to help facilitate this collaborative programming? Describe.)

5. Do you currently evaluate your nutrition and foods programs? If so, how do you evaluate them?
   a. (Probe: What do you evaluate: Participant satisfaction with classes? Changes to knowledge, or behavior change? What tools do you use to evaluate? Are there any programs/classes you are not evaluating? Are there any tools/support that could help you evaluate your programs?)
6. What makes your nutrition education and/or foods programming successful? Describe.
7. Does this programming have any barriers/challenges? Describe.
8. Is there anything you would change or do differently? Why?

**Kitchen Space, Equipment and Supplies**

1. Does your extension office have a kitchen? If so, please share a photo of the kitchen using your phone or a camera with zaalford@ncsu.edu.
2. Briefly describe the kitchen space at your extension office.
   a. (Probe: How big is the kitchen space? Is it a teaching kitchen? How many people can it accommodate? What type of appliances does your kitchen have? What type of cooking equipment and supplies are available in the kitchen? Do you have an outdoor cooking space? Do you have portable cooking equipment? Describe.)