ABSTRACT

WILLIAMS, LATASHA DUBOISE. Healthy Foods Access: An Assessment of Registered Dietitian Nutritionists' Perceptions and Readiness to Help Mothers Gain Sustainable Access to Healthy Foods (Under the direction of L. Suzanne Goodell).

The United States Department of Agriculture defines food security as a condition in which people, at all times, have physical, social, and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Levels of food security range from high food security to very low food security. Approximately 38.3 million people in the United States lived in low to very low food secure households in 2020. Rates of low to very low food security were highest among households with children headed by a single woman. Mothers with young children living in low to very low food secure homes exhibit increased risks of adverse outcomes in their children as mediated through stress and depression, which may hinder the purchase and preparation of healthy food. Young children living in low to very low food secure households are more likely to exhibit aggressive maladaptive behaviors. They are at a greater risk of developing a poor health status overall. According to the Academy of Nutrition and Dietetics, Registered Dietitian/Nutritionists play an integral role in achieving consistent food security in households at risk in the US through sustainable and systematic actions.

The purpose of this dissertation is to understand and describe the experiences of RDNs as they work with mothers encountering various levels of household food security. In study 1, researchers examined RDN perceptions of helping mothers gain sustainable access to healthy foods through an online survey. In this study, we found that most RDNs perceive helping mothers experiencing food insecurity as important and part of their scope of practice; however, some RDNs were not aware of the programs, activities, and services available to support

mothers. This study indicated that RDNs could benefit from access to continuing education courses focusing on assisting mothers experiencing limited access to healthy foods.

The second study explored RDN readiness to help mothers gain sustainable access to healthy foods. Investigators employed the Community Readiness Model (CRM), a mixed-methods approach to determining the readiness of a community to tackle a specific issue. The CRM includes an assessment comprised of an adaptable semi-structured interview guide that produces a readiness score and qualitative data that supports the score. RDNs received a readiness score of four, placing them in the preplanning stage of readiness. In the preplanning stage, key informants characterize RDNs as having heard about local efforts to help mothers but knowing very little about them. This score also indicates that RDNs have limited knowledge about mothers experiencing food insecurity and the resources available to support mothers even though they acknowledge that helping mothers gain sustainable access to healthy foods is important. The results of this study identify a need for further education of RDNs regarding how to support people experiencing food insecurity.

The final study of this dissertation was built on the knowledge and data acquired in the second study. As outlined in the CRM, researchers analyzed the strengths, weaknesses, opportunities, and threats (SWOT analysis) that emerged from the key informant interviews. From the SWOT analysis, three dominant themes relevant to RDN readiness to help mothers emerged across interviews: (1) Barriers influencing the ability to help mothers; (2) Opportunities available to help mothers; and (3) Perceived needs of RDNs. Combined with the readiness score, future investigators could use this analysis to frame targeted goals and objectives RDNs can employ to move them to the next stage of readiness.

The findings from this dissertation filled a gap in the literature related to RDN perceptions of helping mothers gain sustainable access to healthy foods. Additionally, the results from the CRM provide a baseline readiness score that RDNs can use to develop an action plan to move them to the next stage of readiness. These outcomes can also inform future curricula modifications that include experiential learning associated with helping mothers experiencing food insecurity.

Healthy Foods Access: An Assessment of Registered Dietitian Nutritionists' Perceptions and Readiness to Help Mothers Gain Sustainable Access to Healthy Foods

by
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DEDICATION

For we are the product of His hand, heaven's poetry etched on lives,
created in the Anointed, Jesus, to accomplish the good works
God arranged long ago. – Ephesians 2:10 (The Voice)

I dedicate this dissertation first to God for filling me with the courage, strength, wisdom, and resilience I needed to finish this part of my journey. To my mother in heaven, who taught me the meaning of being a lifelong learner early in life - thank you for the countless community college classes you took me to where I spent hours mimicking your detailed notetaking style. To my grandmother, who gave me more books to read than answers – thank you for raising me to be a researcher. To my Aunts, Remonia, Bernice, Willie B., Faye, Dorothy, Joyce, and Uncle Bill, you have made lasting impressions on me that I take everywhere I go. To my Aunt Regina – thank you for teaching me how to take up space without ever saying a word and always having my back. To my Uncle Dennis – I am grateful for you. To my sister, Latonya, and brother-in-love Lamont – thank you for always praying for me and your constant reminders that I can do anything through Christ that strengthens me. Also, thank you for giving me the gift of being an aunt to Destinee, Imani, Myu, and Majesty – they bring me joy and laughter when I need it the most. To my best friend and diva dog Jada – thank you for sitting through countless readings of this work and PowerPoint presentations – Your presence meant more to me than I realized and I will miss you. And last but not least, this dissertation is dedicated to the entire Buddy and Eliza Williams family and legacy – Thank you for always believing in me.

BIOGRAPHY

Latasha Williams completed the NCCU dietetic internship on May 15, 2008, and passed the registration exam to become a registered dietitian a few months later. Ms. Williams started her career as a traveling dietitian with Sodexho. Several months later, she transitioned to a permanent position at Doctor's Hospital in Augusta, GA, where she led the nutrition program development in the bariatric surgery center. After living in Augusta for a year, Ms. Williams returned to NC to finish her Master's degree at Meredith College while working at UNC-Chapel Hill as their first dietitian/liaison in the foodservice department with Aramark. When Ms. Williams decided to leave UNC-Chapel Hill, it was for a position as an RDN for a Patient-Centered Medical Home (PCMH). Working at the PCMH presented many new and exciting opportunities that led Ms. Williams to develop a passion for ensuring people had access to the food they needed to follow dietary recommendations. As the practice evolved and changed, Ms. Williams decided it was a good time to try something new.

In 2016, Ms. Williams began her doctoral studies at North Carolina State University in the College of Agriculture and Life Science in the Department of Food, Bioprocessing, and Nutrition Sciences under the direction of Dr. L. Suzzanne Goodell. In addition to her dissertation studies, Ms. Williams also coordinated and managed the Nutrition Understanding Through Service (NUTS) student organization Dr. Goodell started. As a research assistant (RA) for Dr. Goodell, Ms. Williams assisted with developing food safety training modules for the College of Design's Natural Learning Initiative. As a RA for *Voices into Action: The Families, Food, and Health Project*, a community-based research project led by Drs. Sarah Bowen, Sinikka Elliot, and Annie Hardison-Moody, Ms. Williams conducted participant interviews and analyzed nutrition data.

As her time at NC State was coming to a close, Ms. Williams earned the Teaching and Communication Certificate from The Graduate school. She also submitted an abstract and presented a poster at the Society for Nutrition Education and Behavior (SNEB) conference, where she received the Ph.D. student research award. In the future, Ms. Williams plans to pursue a career that allows her to collaborate with students and colleagues to ensure that everyone has access to healthy foods.

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I sincerely thank all the Registered Dietitian Nutritionists (RDNs) who took time out of their busy lives and schedules to complete my survey and volunteered to sit through one more Zoom meeting. I hope that your valuable insights will provide the basis for future research related to RDNs supporting people experiencing food insecurity.

Finally, I want to thank my family and friends for your endless support and belief in my ability to finish what I started.

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CHAPTER 1: LITERATURE REVIEW

Food Security: Definitions, prevalence, implications, and contributors

Food security is a nutrition challenge that encompasses the physical, social, and economic access to enough nutritious food to sustain an active and healthy life by all people at all times.[1] In 1989, the Life Sciences Research Office (LSRO) assembled an expert panel to define food insecurity.[2] Based on previous ethnographic studies, the LSRO reported that people who are food insecure (1) are not sure when or if there will be food available in the future and if they will have access to it, (2) are not able to secure the types of foods required to live a healthy lifestyle, or (3) obtain food by scavenging, stealing, or relying on emergency and charitable food programs.[2] Ultimately, the panel determined that food insecurity "exists whenever the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain." [3] This concept was to be distinct from hunger which is assessed at the level of the individual and is generally evident through physiological symptoms versus the household level.[4]

Following the expert panel meeting, the National Nutrition Monitoring and Related Research Act of 1990 (NNMRR) mandated the development of a standardized instrument to measure the prevalence of food insecurity and food insufficiency.[2] In response to this recommendation, the U.S. Food Security Measurement Project developed a survey tool to measure household food insecurity.[4] Each year in December, the U.S. Census Bureau administers this survey, the Core Food Security Module (CFSM),[3] as part of the Current Population Survey (CPS).[5] The CFSM includes 18 questions intended to determine if a household faced difficulties procuring foods due to a lack of money over the previous year and within 30 days of completing the survey.[4] Included in the questionnaire are items designed to

detect the severest forms of food insecurity in households with or without children.[6] Some questions include: 1) In the last 12 months, did you ever eat less because there wasn't enough money for food?; 2) In the last 12 months, did any of the children ever not eat for a whole day because there wasn't enough money for food?[7]

After establishing a definition and standardized measurement for food insecurity, the United States Department of Agriculture (USDA) found people experiencing food security on a continuum from high food security to very low food security.[1] The existing food security continuum includes the following household characteristics: [1]

1. High food secure households do not have any problems securing enough food consistently.
2. Marginally food secure households sometimes experience problems accessing enough food without substantially reducing the food quality, quantity, and intake.
3. Low food secure households experience problems accessing food, decreasing their diets' quality, variety, and desirability without substantially interrupting eating patterns.
4. Very low food secure households experience disrupted eating patterns several times during the year due to a lack of money or other resources for food.

Even though the USDA introduced new labels to characterize food security, the previously-established methods to measure household food security did not change.[8] However, in 2015, marginal food security was deemed to pose similar health risks as food insecurity.[9]

More recently, the COVID-19 pandemic impacted data collection in December 2020, and overall responses to the Food Security Supplement (FSS) of CPS were significantly lower in 2020 (24.2%) than in 2019 (30.3%).[10] These differences prompted a non-response bias analysis using FSS data from 2015. The analysis revealed some differences in the demographic characteristics between responders and non-responders; however, the Bureau of the Census did not find a non-response bias issue.[11]

Statistical data from 2020 indicate that food insecurity rates did not differ significantly from 2019.[10] Nevertheless, food insecurity rates increased significantly for some population subgroups, including all households with children, Black, non-Hispanic householders, and households located in Southern states.[10] Conversely, food insecurity rates declined for households with no children, White, non-Hispanic householders, and households located in Midwestern states.[10]

In 2020, 26.6 million adults and 11.7 million children lived in food insecure households in the U.S.[12] While food insecurity is not ideal at any age, it is particularly injurious in early childhood when children tend to be more vulnerable.[13] During the first 1000 days of a child's life, food security is crucial for healthy growth and normal development.[14] Children living in households impacted by food insecurity are more likely to experience stomach aches, iron deficiency anemia, and hospitalizations than those living in food secure homes.[4,15] Additionally, a reduction in diet quality and the unpredictable nature of food insecurity may lead to overeating and thus obesity among children living in food insecure households.[16]

The CDC recognizes living in a food insecure household as an adverse childhood experience (ACE) that impacts children's future opportunities by putting them at risk for chronic health conditions and mental illness.[17] For example, children enrolled in preschool programs experiencing hunger and anxiety about their next meal tend to be less focused and struggle to stay awake in class.[13] Even intermittent experiences of living in food insecure households can lead to an increased risk of behavioral and emotional problems in children, negatively impacting school readiness.[13] In some households, children are less likely to experience food insecurity at the same rate as the adults in the same household.[15] Adults and caregivers often reduce the

quality of foods they consume before allowing the children living in their households to experience food insecurity.[15]

For many households experiencing food insecurity, maternal health is a contributing factor.[4] Even intermittent experiences of living in food insecure homes can lead to depression and anxiety among mothers.[18,19] Chronic depression and anxiety negatively impact the ability of an adult to care for the children in their households by limiting their ability to engage in healthy interactions to ensure food security.[13] Interviews with parents and caregivers of 14,000 children found that moderate to severe depression in mothers may increase the risks of childhood food insecurity by 50 to 80 percent.[20] Thus, children living in households with adults with mental or physical disabilities are more likely to have very low food security than children not living with a disabled adult.[21]

Several systemic structural factors contributing to household food insecurity in the U.S. include racism, income inequality, and job discrimination. These factors can lead to households living at or below the poverty level.[4] However, poverty is not always the main contributor to household food insecurity.[4] Approximately sixty percent of children living in households bordering poverty do not experience food insecurity.[4] Thus, other contributing factors to household food insecurity include exorbitant housing costs, inadequate access to affordable health care, sudden unemployment, lack of access to emergency food programs, living in food deserts, lack of access to free/reduced lunch in the summer, and decreased access to child-care for single mothers.[4,22] For example, during the beginning of the COVID 19 pandemic in 2020, 27.7 percent of households headed by single women experienced food insecurity, more than twice the likelihood of children living in married-couple households (9.5 percent).[10]

Nutrition Assistance Programs

To end food insecurity in the United States, the USDA works through the Food and Nutrition Service (FNS) to research, develop, and implement nutrition assistance programs.[23] FNS administers 15 federal nutrition assistance programs to increase food access for people experiencing shocks to their livelihood caused by illness, unemployment or underemployment, job displacement[24], or increased housing costs.[25] Eight of the existing nutrition assistance programs serve mothers and children by providing them with access to nutritious foods.[26] These programs include the Supplemental Nutrition Assistance Program (SNAP), Food Distribution Program on Indian Reservations (FDPIR), Supplemental Nutrition Program for Women, Infants, and Children (WIC), Child and Adult Care Feeding Program (CACFP), National School Lunch Program (NSLP), School Breakfast Program (SBP), The Emergency Food Assistance Program (TEFAP), and Summer Food Service Program (SFSP).[23,27]

The Supplemental Nutrition Assistance Program

The Food Stamp Program (FSP), a commodity-based program created to relieve farmers from a volatile market during the Great Depression, gave rise to the Supplemental Nutrition Assistance Program (SNAP).[28] FSP was made permanent in 1964 with the passage of the Food Stamp Act.[28] By the 1980s, political support for FSP declined, and legislation passed in 1981 and 1982 drastically decreased the benefits of FSP.[28] An untimely review of benefits to match inflation rates, the use of gross income, the imposition of stricter income requirements, and the prohibition of certain people, such as strikers and boarders, from being eligible to apply upheld these cuts and stringent eligibility requirements.[28]

Before the COVID-19 pandemic, SNAP beneficiaries could purchase food at over 250,000 authorized food outlets nationwide.[4] At the onset of the COVID-19 pandemic, SNAP

was modified to include emergency benefit allotments, pandemic electronic benefits, online food purchasing, and waivers allowing states to adjust program requirements independent of FNS.[29] While SNAP eligibility requirements vary from state to state, the Thrifty Food Plan (TFP) determines the maximum amount of SNAP benefits individuals and families receive.[30]

The TFP is one of four food plans the USDA developed to provide Americans with guidance on healthful eating at a minimal cost.[30] The TFP replaced the Economy Food Plan, a short-term food plan recommended for emergency use, in 1975 as a long-term solution.[30] The basis of the TFP is up-to-date dietary recommendations, food composition data, consumer eating patterns, and existing food prices.[30,31] Prior to 2020, the TFP received its last update in 2006.[30,31] However, as the pandemic continued, Congress responded to recommendations to re-evaluate the TFP according to four critical factors identified in the 2018 Farm Bill.[32] The four key factors include up-to-date food prices, the typical American diet, the dietary guidelines, and the nutrients in food.[32] Based on this re-evaluation, SNAP benefits increased by 21 percent.[31,32] Additionally, as mandated by the 2018 Farm Bill, the USDA committed to updating the TFP every five years.[32]

National School Lunch Program

Following SNAP, the National School Lunch Program (NSLP) is the second-largest nutrition assistance program administered by the USDA.[33,34] From 1939 to 1945, the U.S. military deemed approximately 40 percent of potential draftees unqualified to enlist due to malnutrition.[28] Many citizens viewed this as a risk to national security, prompting Congress to pass the National School Lunch Act in 1946 to establish the NSLP.[35] [36] The NSLP operates in over 100,000 public and non-profit private schools in the United States.[4] Operating in over 100,000 public and non-profit private schools in the U.S., the NSLP aims to provide free or

reduced lunches to eligible students.[4] In its first year, 7.1 billion children participated in the NSLP.[37] More recently, one year prior to the pandemic, an average of 28.6 million students participated in the NSLP.[34]

In March 2020, the COVID-19 pandemic forced schools to transition to remote learning, decreasing the number of meals served to eligible students.[34] In response, schools implemented "grab and go" meals and other off-site meal options to continue serving children and their families.[34] By the 2020-2021 school year, programs continued to operate on various hybrid or remote learning schedules, and an average of 19.8 million children participated in the NSLP.[34] To strengthen the NSLP going forward, the USDA allotted $1.5 billion to reimburse states for emergency operating costs incurred at the pandemic's beginning.[38] The USDA also granted state waivers allowing schools to provide free lunch to all students through the 2021-2022 school year.[34] Further provisions in the American Rescue Plan and the Build Back Better Act address the need for permanent changes to expand and create better access to nutritious foods for children through the NSLP.[34,38]

School Breakfast Program

Alongside the NSLP, the School Breakfast Program (SBP) operates in over 90,000 public schools, non-profit private schools, and public and non-profit private residential child-care facilities.[39] The SBP functions much like the NSLP offering free and reduced options for eligible participants.[4] Since its pilot in 1966, participation in the SBP continues to lag behind the NSLP but shows growth each year.[40] In the last full school year prior to the pandemic, an average of 14.6 million children participated in the SBP.[34]

Participation in the SBP rose by 3.5 million students between 2009 and 2019.[41] Similar to student participation in the NSLP, the pandemic resulted in a drastic decrease in students

receiving breakfast from school.[34] In March, April, and May 2020, the SBP served 61 million fewer meals when compared to the same period in 2019.[42] To address the widening nutrition gap caused by the pandemic, the USDA issued waivers allowing states to serve breakfast at no charge to all students to increase participation in the SBP.[34,42]

Supplemental Nutrition Program for Women, Infants, and Children

In 1964, the Committee on Nutrition of the American Academy of Pediatrics (AAP) brought attention to the need for research on the nutritional status of preschool children in America.[43] AAP posited that adequate diet and nutrition education could help solve the problem of iron deficiency anemia in low-income American children.[43] As a result, between 1968 and 1970, three studies found that children living in low-income situations experienced anemia and inadequate growth at high rates.[44–46] Additionally, these studies found that low iron, vitamin A, riboflavin, and protein levels existed among low-income pregnant and lactating women.[44–46] Upon learning about nutritional deficiencies that could negatively impact a child's normal growth and development, a Senator sponsored a bill for the Supplemental Nutrition Program for Women, Infants, and Children (WIC) in 1972.[45,47,48]

Congress initially funded WIC for two years, and an amendment to the 1966 Child Nutrition Act established WIC as a permanent national health and nutrition program in 1974.[49] Women living below 185 percent of the poverty line, pregnant, post-partum, and breastfeeding women are eligible to participate in WIC.[49,50] WIC also includes infants and children up to age five who are at nutritional risk.[49,50] Eligible participants can access WIC in all 50 states, 32 Indian Tribal Organizations, American Samoa, the District of Columbia, Guam, the Commonwealth of the Northern Mariana Islands, Puerto Rico, and the Virgin Islands.[51] WIC also provides access to health screenings, nutrition and breastfeeding counseling, immunization

screening and referral, and substance abuse referral.[49,50,52] Similar to SNAP and the NSLP, WIC participation declined in the early months of the pandemic.[53] However, also like SNAP and the NSLP, state WIC programs received government waivers and additional funding in 2020 and 2021.[29,42,54,55] The American Rescue Plan Act allotted $390 million through 2024 to continue to expand WIC participation and benefit redemption.[55]

The Child and Adult Care Food Program

The smallest scaled federal food assistance program with the broadest scope is the Child and Adult Care Food Program CACFP.[4,56] Authorized in 1968 as the Special Food Service Program for Children (SFSPFC), CACFP reimburses child and adult care organizations and family or group home care centers for providing healthy foods to participants.[4,57] In its infancy, SFSPFC covered two components – the Child Care Food Program (CCFP) and the Summer Food Service Program (SFSP).[57,58] The USDA separated CCFP and SFSP, making CCFP permanent in 1975.[57] After experiencing exponential growth between 1979 and 1981, the Older Americans Act of 1987 amended CCFP to include eligible adults resulting in what is now known as the CACFP.[57,58]

In 2020, CACFP served nutritious meals and snacks to more than 4.2 million child and adult participants daily.[59,60] Overall, CACFP served 23 percent fewer meals than in 2019 due to the COVID-19 pandemic as millions of child care centers closed.[60,61] To increase participation and reach more people, CACFP state agencies received program waivers similar to those of SNAP and the NSLP after the pandemic began.[61] However, as part of the American Rescue Plan Act, the program also expanded to include the provision of healthy meals to individuals under 25 experiencing hunger.[62]

Food Distribution Program on Indian Reservations

Congress authorized the Food Distribution Program on Indian Reservations (FDPIR) in 1973 under the Agriculture and Consumer Protection Act.[63,64] The FDPIR is an alternative to SNAP for eligible households living on Indian Reservations or approved areas near reservations and Oklahoma.[63,64] Households cannot participate in FDPIR and SNAP simultaneously.[63–65] Many times, the participants of FDPIR cannot easily access SNAP offices or authorized venues.[63]

To facilitate FDPIR, the USDA buys food from a list of approved items and sends them to participants through their state agency or Indian Tribal Organization (ITO).[63,64] Eligible households can choose from a variety of over 100 foods based on their assigned food package.[63–65] In addition to food, the USDA also provides agencies with funds for nutrition education through individual nutrition counseling, cooking demonstrations, nutrition classes, and product information sheets.[63]

At the beginning of 2020, 276 tribes received in-kind food commodities from the FDPIR.[63,65] In March 2020, FDPIR received $100 million when the President signed the Coronavirus Aid, Relief, and Economic Security (CARES) Act into law.[66] The CARES Act also provided program waivers allowing ITOs and state agencies more autonomy to determine income guidelines and food distribution procedures.[67] For example, participants could select a trusted individual to pick up their food packages from distribution sites.[67]

Summer Food Service Program

When the 3-year pilot for the Special Food Service Program for Children ended in 1975, the Summer Food Service Program (SFSP) emerged.[60,61,68] The USDA authorized this program to serve nutritious meals to children and teens in low resource areas when school is not in

session.[68,69] Originally, SFSP operated in areas where at least one-third of the school children qualified for free or reduced lunch and residential summer camps.[68] SFSP underwent several significant programmatic changes between its inception and 1981 to prevent abuse and inefficiencies.[68] For example, in 1981, the Omnibus Budget Reconciliation Act (OBRA) eliminated sponsorships from non-profit organizations except schools and camps.[68] OBRA also redesignated areas of poor economic conditions to mean areas where fifty percent of the children would be eligible for free or reduced lunch.[68] Since OBRA, many other acts including the Child Nutrition Reauthorization Acts of 1989 and 2004, the Healthy Meals for Healthy Americans Act, the Personal Responsibility and Work Opportunity Reconciliation Act, and the Healthy, Hunger-Free Kids Act shaped SFSP into its pre-pandemic form.[68]

Prior to the pandemic, the USDA authorized state-approved sponsors to offer free meals to groups of children up to 17 years old at approved sites during the summer.[68,69] In early 2020, the USDA waived several restrictions, including the income requirements, allowing agencies to distribute free meals in all areas.[70] Additionally, the program no longer requires participants to eat meals onsite. Participants can choose grab-and-go meals, prepackaged groceries for several days, and meal deliveries to easily accessible centralized locations.[26]

The Emergency Food Assistance Program

In 1983 the Temporary Emergency Food Assistance Act was established by Congress to create a more permanent relationship between food pantries and the U.S. government.[1] The Temporary Emergency Food Assistance Program (TEFAP) designated the government as a regular source of commodity goods to the private food assistance network to distribute food through food banks, food pantries, and soup kitchens.[72] Prior to TEFAP, food pantries relied on irregular donations from individuals and businesses.[28] Even though TEFAP increased the

responsibilities of food pantries, it also increased the regular supply of nutritious food and the quantity of food available to those in need.[28]

To support TEFAP, the USDA created the Commodities Credit Corporation (CCC) to pay the increased costs of administering the program.[28] No longer could food pantries freely hand out food because the CCC required hunger relief agencies to report demographic and household income data to the state agencies.[28] During the first several years of the program, the USDA supplied surplus food to state agencies for distribution.[28] By the late 1980s, food supplies started to dwindle, and Congress approved the Hunger and Prevention Act of 1988 with provisions requiring the USDA to purchase commodities for the TEFAP.[73]

The USDA also instituted the Soup Kitchens/Food Banks program during this time, requiring the food being purchased for TEFAP to be given only to soup kitchens and food banks.[28] TEFAP became more permanent in 1990.[28] The name changed from Temporary Emergency Food Assistance Program to The Emergency Food Assistance Program.[28] The purchase of commodities for distribution by the private food assistance network demonstrated government support for private charities and began the institutionalization of the private food assistance network.[28] Thus, to support food banks through the COVID-19 pandemic, the USDA is using funding from the American Rescue Plan Act to purchase foods through the Agricultural research service and increase administrative support to states.[62]

Effects of federal food safety nets

In the past, research studies completed to learn the effects of federal food assistance programs on food insecurity have proven difficult. These difficulties are due to problems determining the food insecurity status of non-recipients who are eligible for benefits and the status of recipients if they did not receive benefits.[4] Dishonest survey responses also contribute

to problems associated with conducting research studies on federal nutrition assistance programs. Even when researchers control for readily observed factors, the problem remains because many people do not report their participation in food assistance or under-report it.[4]

A dose-response model was used to examine how increases in the dollar amount given to SNAP participants affect food insecurity.[74] The findings were consistent with the theory that receiving SNAP benefits should lead to a lower probability of food insecurity among participants.[74] Additionally, research to estimate the causal effect of WIC on food security shows that overall, WIC decreases incidences of child food insecurity by one-third.[74] To determine the impact of CACFP participation, researchers analyzed data from the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B). They determined that overall, participation in CACFP is not associated with household or child food insecurity.[56]

Private food assistance networks

Initially, the USDA required families to purchase food stamps; however, eliminating the purchase requirement for food stamps in 1977 presented an unintended consequence.[28] Since households were no longer required to purchase food stamps, the incentive to budget for monthly food allowances ceased. This change essentially increased the amount of food needed for a household above and beyond that provided by the FSP.[28] Having food needs above FSP benefit provisions, households began to seek low-cost and free food to supplement monthly allotments of food stamps.[28] Thus, the elimination of the purchase requirement ultimately led to an increased chronic reliance on food banks, food pantries, emergency kitchens, and other charitable organizations which provide free food.[28]

By 1980, political support for leadership and agencies to decrease hunger declined, resulting in substantial cuts to FSP and stricter eligibility requirements.[28] In response to these

changes, the anti-hunger community protested, insisting that OBRA incorporate language geared towards reducing hunger in America.[28] OBRA allowed the USDA to distribute commodities to soup kitchens and other groups, providing free food to people experiencing poverty.[36] With its inclusion of anti-hunger legislation, OBRA reinstituted commodities distribution to emergency feeding organizations and the private food assistance network.[28]

The private food assistance network comprises individual entities that come together when their relationship is beneficial.[28] Even though the private food assistance network initially used government resources, food pantries existed before OBRA.[28] TEFAP provided scaffolding for the private food assistance network.[25,75] However, John Hengel established the first food bank in Phoenix, Arizona, at St. Mary's Church in 1967 by soliciting food from agriculture and food companies.[25] The agriculture and food companies viewed donating as beneficial to reducing the costs associated with handling and disposing of unsalable food.[28]

Another incentive for businesses donating food came in the 1976 Tax Reform Act, which allowed corporate tax deductions for donated food plus 50% of its depreciated value.[28] As donations grew, so did the number of food banks.[28] With consistent donations and growth, Hengel started a non-profit organization called Second Harvest in 1979.[28,75] The incorporation of Second Harvest coincided with eliminating the purchase requirement for food stamps.[28] After several years of operating in Arizona, Second Harvest moved its base to Chicago, changing its name to America's Second Harvest.[28,75] The evolution of America's Second Harvest brought together and organized a network of food pantries, soup kitchens, and emergency shelters, formally institutionalizing the private response to hunger.[28] Over time, America's Second Harvest changed its name to Feeding America and is (at the time of this publication) the nation's

largest domestic hunger-relief organization with a network of over 200 food banks across the US.[75]

Over the years, Feeding America has grown to secure donations from partner organizations, including national food and grocery manufacturers, retailers, and government agencies.[76] Feeding American supports and certifies food banks through training programs and equipment grants.[76] The Feeding America Network consists of more than 200 food banks and 60,000 food pantries and meal programs serving 1 in 7 Americans.[77] In 2021, Feeding America provided meals to more than 6.6 billion meals, an increase of 26.6 percent over meals served in 2020.[77]

Currently, there are no national baseline data documenting food banks, food pantries, soup kitchens, and other charitable hunger-relief agencies before 1980. However, they did exist before the organization of Feeding America.[25] Additionally, at this time, there is no national database of emergency hunger-relief agencies existing outside of the Feeding America network. Thus, in this review, all references to food banks, food pantries, soup kitchens, and charitable hunger-relief agencies will focus on those that belong to the Feeding America network.

Feeding America partners with local state governments and agencies, family advocates, employers, and community and faith-based organizations to help families apply for SNAP.[78] To supplement hunger in school-aged children, Feeding America sponsors the Kids Café, BackPack program, School Pantry, Mobile Pantry, Disaster Food Assistance, Summer Child Nutrition Programs, The School Pantry Program, and SNAP outreach.[79] The Kids Café focuses on providing children from low-resource homes with free and nutritious meals after school.[80] The Kids Café serves children under 18 years of age, allowing local food banks and other non-profit organizations to partner with CACFP for funding to support the program.[80] The BackPack

program has been operating for over 15 years. It seeks to send children home with enough nutritious and easy-to-prepare food to last over a weekend.[79] The Mobile Food Pantry Program consists of a truck delivering rescued food and grocery products directly to participants, allowing them to choose what they need.[79] Emergency food and disaster relief are also provided to families of need all over America following catastrophic events. Lastly, summer feeding programs provide nutritious meals and snacks to children served by NSLP during the summer months.[79] Feeding America's programs seek to break down barriers, including resource limitations and low access to meal sites that are not typically present during the school year.[79]

Beyond safety nets

Beyond public assistance and the private food network, families often resort to other strategies to increase their chances of food security.[81] Households often have to choose between food and competing necessities such as utilities, transportation, medical care, and housing throughout the year.[82] Some families resort to selling or pawning personal property, dumpster diving, eating food past the sell-by-date, and decreasing medications, heating, and cooling expenditures.[81] In a qualitative study that randomly selected 90 SNAP households, findings indicate that towards the end of the month, most SNAP recipients face financial shortfalls.[83] When families run out of money and benefits, they improvise by paying bills late, moving in with other family members, or working extra jobs.[83] The least food secure are less likely to have access to family and social networks for support but are most likely to share food with ineligible household members.[84] Furthermore, the least food secure is also described as the least skilled at finding bargains and using other budgeting strategies to make ends meet until the end of the month.[85]

Food Insecurity: Policy and national goals

In 2020, government spending on food and nutrition assistance programs reached an all-time high of $122.1 billion, yet rates of food insecurity remain high.[86] A misunderstanding of the causes of food insecurity and how food assistance and other programs operate to decrease incidences of food insecurity contribute to the remaining high rates of food insecurity.[4] There have been many research studies conducted on food insecurity. However, only a small number focus on the causes of food insecurity or how public policy affects those experiencing the most severe forms of food insecurity.[4] With the existing gaps in research and high expenditures on food and nutrition assistance programs, food insecurity remains a policy challenge as many people continue to be food insecure.[4]

Since 2000, the USDA has made a concentrated effort to increase outreach to SNAP-eligible participants to increase participation.[4] Prior to the COVID-19 pandemic, access remained restrictive due to office hours occurring during prime working hours, resulting in parents choosing between applying for benefits or going to work.[4] In 2020, the USDA granted waivers to all states giving them the ability to apply and recertify online.[62]

While SNAP benefits have increased over the years due to inflation, the calculation formula has remained unchanged since 1977.[4] In 2013, the Institute of Medicine (IOM) outlined several other limitations of SNAP.[4] Some of their concerns include: 1) Fixed SNAP benefits across the U.S. that do not account for the varying food cost across the country; 2) Earned income credits do not account for travel to and from work or other work-related costs that may decrease the amount of money that could be available for food; 3) The expectation that families should be able to contribute approximately one-third of their income to food, which was a guideline established in the 1950s, while families today often spend closer to one-seventh of

their budgets on food; and 4) The low benefit levels often discourage families from dealing with the paperwork and trouble of applying even though they are food insecure.[87]

Program accessibility is also a common barrier among participants of school nutrition programs.[88] Prior to the COVID-19 pandemic, the USDA did not offer the NSLP nor SBP during the summer or extended school breaks and holidays.[88] In 2011-2013, the USDA conducted a dose-response experiment in which they increased SNAP benefits for children over the summer. Results showed that very low food security decreased by one-third compared to children who did not receive increased benefits.[88] In addition to increasing SNAP benefits, other outreach measures may prove beneficial over the summer and during extended school breaks.[4] One such suggestion is to assist with the expansion of backpack programs.[4] Typically, backpack programs are sponsored by local food banks that provide backpacks full of enough food usually to last throughout a weekend.[4] While these suggestions will come at a higher cost, it is hopeful that these measures will decrease food insecurity and the health problems that may arise.[89]

Food security as a Social Determinant of Health

Every ten years, the U.S. Department of Health and Human Services (HHS) releases an iteration of the Healthy People Initiative (HPI).[90,91] The goals of HPI are to develop targeted, science-based objectives to help Americans live healthy lives.[90,91] In 2020, HHS added Social Determinants of Health (SDoH) as a focus area warranting attention if Americans are to achieve the goals of HPI.[92] A SDoH is an economic, social, or physical condition influenced by policies, systems, and environments.[93] SDoH affects communities and individuals' health and daily living status.[94] HHS recognized food security as an SDoH that impacts health outcomes and health disparities in HPI for 2020 and 2030.[94] The HPI 2030 national objectives also recognize household food insecurity and hunger as a Leading Health Indicator (LHI).[95] LHIs highlight HPI

core objectives posing public health problems impacting the health and well-being of people at all life stages.[90,96]

The evolution of food security as a clinically and socially relevant health determinant calls for healthcare professionals to integrate relevant practices into the framework of patient-centered care. [2,3,25,97,98] Recent data suggests that social care can be integrated into healthcare by increasing awareness, adjusting practices, assisting people with resources, aligning healthcare activities with community assets, and advocating for policies promoting changes to healthcare infrastructure.[99] In response to the inclusion of food insecurity in broader conversations as a preventable public health concern, the Commission on Dietetic Registration (CDR) regards registered dietitian nutritionists (RDNs) across all areas of practice as having a primary role in addressing food security.[100]

Registered Dietitian Nutritionists and Food Security

Dietetics was established over 100 years ago to assist the government with food conservation and promote improvements in public health during World War I. [97,101] More recently, RDNs work in hospitals, food service management positions, education and research institutions, and community and private practice environments.[97,101] RDNs also contribute to helping the world face its most significant nutrition challenges through research, advocacy, and education.[101] The Academy of Nutrition and Dietetics (AND) is the most prominent organization representing RDNs. In position papers, AND identifies food insecurity as a public health concern RDNs can address by leading, designing, and implementing strategies to improve food insecurity.[100]

In their first position paper addressing food and nutrition security, CDR asserts that RDNs understand food security in the United States, allowing them to assume leadership roles to

eliminate food insecurity.[100,102,103] Based on their education and training, RDNs in all settings requiring the translation of nutrition science into practical solutions for individuals and families can provide education, referrals, and empowerment to food insecure populations.[100,104,105] However, telephone interviews with 487 Canadian dietitians from several practice areas revealed a wide range of understanding of food security.[106] The differences were so vast that researchers concluded that until dietitians reach a resolution on the definition of food insecurity, efforts to work with food insecure populations would remain unclear and complicated.[106] When researchers assessed RDNs in Ohio for their food security practices, they recommended RDNs learn how to include food security issues in nutrition assessments and professional development portfolios.[107] A more recent survey of food bank managers suggests better preparation for entry-level RDNs intending to work with populations experiencing food insecurity.[104] Foodbank managers also felt that RDNs are helpful but do not disseminate relevant information to people experiencing food insecurity.[104]

There is only a small body of literature documenting RDN knowledge, practices, and understanding of food security in the United States.[104,106,107] Accordingly, many RDNs exhibit little knowledge about incorporating food security issues into their daily practices.[104,106,107] Throughout their undergraduate education and internship, RDN required core knowledge and educational competencies do not directly address working with people experiencing food insecurity.[108] Instead, competencies emphasize working with diverse populations, planning menus that are accessible and affordable, and developing culturally appropriate education materials.[109]

Summary and Conclusions

Food insecurity has emerged from the politics of hunger as an ACE and SDoH, which affected 13.8 million households in 2020.[10,17,110,111] Food insecurity is associated with negative nutrition-related health outcomes in adults and children. Many food and nutrition programs exist to mitigate the negative effects associated with food insecurity. Due to food insecurity's dietary and health consequences, RDNs maintain a critical and distinctive position that allows them to develop, lead, and support strategies to improve food security.[100,104] At this time, there are appears to be very little literature assessing the readiness of RDNs to work with people experiencing difficulty accessing healthy foods. Readiness is "the quality or state of being ready; a state of preparation; and a prompt willingness."[112]

In light of the emphasis CDR places on the position of RDNs as leaders in the fight against food insecurity[100], measuring readiness is a necessary step to understanding the current state of this nutrition practice area. The overall goal of this dissertation research was to conduct an exploratory study assessing the readiness of RDNs to work with mothers experiencing food insecurity. We employed the Community Readiness Model (CRM) to assess RDN readiness. The CRM is a theoretical model that assesses a community's readiness along five dimensions – knowledge of the issue, knowledge of the efforts, the community climate, leadership, and resources.[113] The goal of the CRM is to assess community readiness by defining attitudes, efforts and activities, knowledge, and resources of community members. Because readiness determinations by this model are community-specific, the CRM delineates communities by geographic location, a subgroup of a geographic location, occupation or group of professionals, a system, or an organization or department. The CRM is based in part on the Transtheoretical Model of Behavior Change and ultimately helps a community identify unambiguous ways to

move towards taking action on a specific issue.[113] Using this model will indicate the current level of readiness of RDNs to work with mothers experiencing difficulty accessing healthy foods.

The CRM follows a mixed methods research approach to determine community readiness among a specific group of people.[113] Mixed methods research integrates quantitative and qualitative data to understand research questions.[114] At its core, mixed methods is a rigorous collection and analysis of quantitative and qualitative data used to incorporate multiple ways of seeing and hearing information in the world.[115] While there are several ways quantitative and qualitative research can be combined to form a mixed-methods study, we used a multiphase mixed methods design.[113,116] The multiphase mixed methods design combines concurrent and sequential research strands over time.

The CRM comprises nine steps conducted over three distinct research phases (Figure 1.1). We collected and analyzed quantitative data using an online survey in the first phase. The quantitative phase informed the recruitment strategies for the second phase. In the second phase, we collected and analyzed quantitative and qualitative data using a semi-structured interview guide and anchored rating scales provided by the CRM. We performed a strengths, weaknesses, opportunities, and threats (SWOT) analysis using the qualitative data from the second phase for the third phase. The rationale for this approach is that the quantitative data from the first phase provides a general understanding of the perceptions of RDNs helping mothers experiencing food insecurity. This phase also informs the recruitment for the second research phase by identifying whom RDNs consider key informants among RDNs working to help mothers. In the second and third phases, the qualitative data and their analysis distill and elucidate the readiness scores by examining more in-depth views of the participants.

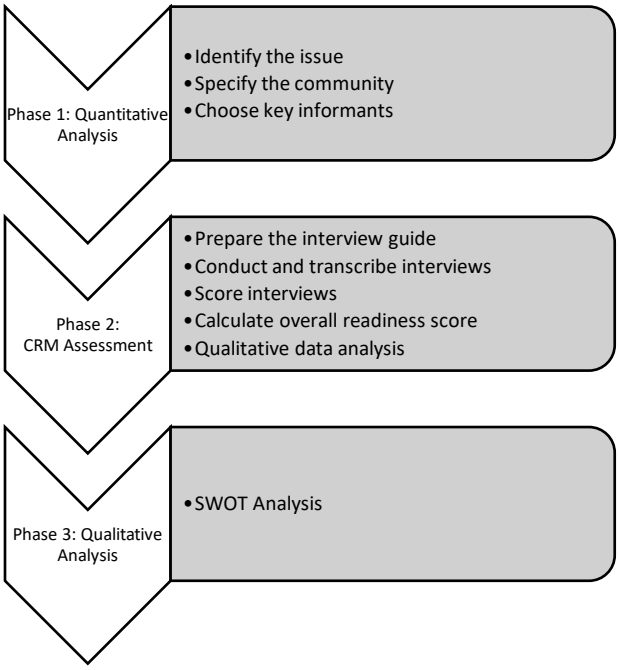


Figure 1.1. Mixed Methods Multiphase Community Readiness Model – adapted from the Community Readiness Model Handbook (2014)

When it comes to making changes, communities are like individuals and present at different levels of readiness. As with individual change, community change must be met with appropriate actions to move a community forward.[113] Examining the perceptions and readiness of RDNs to help mothers experiencing food insecurity may lead to an overall understanding of the preparation and education that will allow for work within the community culture of RDNs. Considering that RDNs work with people in various settings, from healthcare to food service, it is inevitable that they will face the challenge of acknowledging and addressing food security.[97] Therefore, the findings from this research may lead to an increase in RDN awareness of food insecurity among mothers and assist them with identifying ways to participate in local efforts to help mothers achieve food security through evidence-based practices. Assessing the readiness of RDNs to work with mothers experiencing food insecurity will reveal the current status of RDNs'

practice in this area, determine if this work can be improved, and identify how to prepare RDNs better.

Overview of Dissertation Chapters

This dissertation includes five chapters exploring RDN readiness to help mothers gain sustainable access to healthy foods. Chapter 1 presents an overview and background of food insecurity, nutrition assistance programs, and what is known about RDN readiness. In the following chapters, we focus on assessing RDN readiness using CRM. Chapter 2 conducted a quantitative exploratory study to assess RDNs' perceptions of helping mothers gain sustainable access to healthy foods. We also used the first study to inform the recruitment of key informants for the second study. Based on the findings from the first study, we employed the CRM to assess RDN readiness to help mothers with uncertain access to healthy foods. This study produced readiness scores and qualitative interview data. Then using the qualitative interview data from the second study, we continued to the next phase of the CRM and performed a strengths, weaknesses, opportunities, and threats (SWOT) analysis. Lastly, Chapter 5 summarizes the significant conclusions that can be used to determine a plan of action for RDNs to move forward with working with mothers experiencing food insecurity.

CHAPTER 2: REGISTERED DIETITIAN NUTRITIONISTS' PERCEPTIONS OF HELPING MOTHERS GAIN SUSTAINABLE ACCESS TO HEALTHY FOODS

Abstract

Background: Food insecurity disproportionately affects mothers with children living in their households. As nutrition experts, Registered Dietitian Nutritionists (RDNs) hold a unique position based on their education and training to help mothers experiencing food insecurity.

Objective: This study examines RDN perceptions of the importance of helping mothers gain sustainable access to healthy foods, assesses RDN awareness of nutrition assistance programs, and identifies whom RDNs perceive as leaders among RDNs helping mothers.

Design: Researchers conducted a cross-sectional study using an online survey.

Participants: A convenience sample of 533 RDNs licensed to practice nutrition in North Carolina.

Main Outcome Measures: RDNs rated their perceptions of the importance of helping mothers with limited or uncertain access to healthy foods and RDN leaders. Participants also reported their awareness of nutrition assistance programs available to help mothers.

Statistical Analysis: Descriptive statistics provided demographic details about the sample. Kruskal-Wallis H testing compared RDN areas of practice and geographic locations for differences. To account for type I error, post hoc comparisons for differences were assessed using Dunn's (1964) Procedure with Bonferroni correction.

Results: Ninety-eight percent of RDNs perceived helping mothers gain sustainable access to healthy foods as important. Nineteen percent of RDNs reported not being aware of efforts in NC available to mothers experiencing food insecurity.

Conclusions: Irrespective of their area of practice, most RDNs agreed that helping mothers with food access is important. Many RDNs reported being aware of efforts in NC providing nutrition assistance; however, some RDNs reported no awareness. These findings suggest that some RDNs could benefit from continuing education courses designed to increase RDN awareness of the efforts in NC to help mothers gain sustainable access to healthy foods.

Introduction

Nothing about a healthy diet makes sense except in light of sustainable access to nutritious foods. When people are not able to sustainably secure adequate and nutritious foods in socially acceptable ways, they experience food insecurity.[117] Overall, the highest rates of food insecurity are found among households with children, households at or below the poverty level, women and men living alone, and Black- and Hispanic-headed households.[10] Low and very low food security affect each household member differently, and some (especially young children) may only experience mild effects compared to the adults living in the same household. [10]

Parents and caregivers of food insecure households often spend less money on food, decreasing their fruit, vegetables, and dairy intake to protect children from disrupted eating patterns.[118,119] Women, especially mothers, who are food insecure experience obesity at higher rates than men and children living in food insecure households.[120–123] Rates of type 2 diabetes and hyperlipidemia also tend to be higher among women living in food insecure households than women living in food secure households.[124–127] In addition to the harmful physical effects of food insecurity, mothers in food insecure households are more likely to be depressed than mothers living in food secure households.[128,129] For mothers experiencing food insecurity, depression could increase nutrition-related negative health behaviors.[130] For example, mothers experiencing depression and food insecurity are more likely to provide low-cost, energy-dense foods to the children living in the household.[16] This behavior often compromises the health status of the mothers and their children.[16,130,131]

Food insecurity is measured each year by the United States Department of Agriculture (USDA) through a survey that assesses household food access during the 12 months or 30 days preceding the survey.[132] In 2020, the United States Census Bureau began measuring food

insufficiency, a seven-day measure of whether or not a household has enough food to eat, to determine the impact of the COVID-19 pandemic on food security.[133] Food insufficiency measures reveal the number of households experiencing very low food security – the most severe category of food insecurity.[134] In North Carolina, food insufficiency rates reached their peak in week 11 (July 9 – 14, 2020) of the pandemic at 980,034 households.[135] The most recent USDA data ranks North Carolina (NC) as having the 10th highest rate of people who are food insecure in the United States, and 530,827 households report experiencing food insecurity during 2020.[10,136]

The Commission on Dietetic Registration (CDR) for registered dietitian nutritionists (RDNs) posits that RDNs hold a unique position to create systematic and sustainable solutions to ensure food security is attainable for everyone.[137–139] In their inaugural position paper addressing food and nutrition security, CDR positions RDNs as nutrition experts knowledgeable about food security. This knowledge allows RDNs to assume leadership roles integral to eradicating food insecurity.[137–139] However, interviews with 487 Canadian RDNs reveal a wide range of definitions of food security exists among RDNs.[140] The vast differences in defining food insecurity led the authors to conclude that until RDNs resolve the disparities, coordinating efforts to assist food insecure populations will remain unclear and complicated.[140] Additionally, after assessing food security knowledge and practices of RDNs in Ohio, researchers recommend RDNs include food security issues in their nutrition assessments and professional development portfolio.[141] This idea is underscored in a later survey of food bank managers, which reveals that RDNs intending to work with populations with limited or uncertain access to food need better preparation to build the skills necessary to provide people experiencing food insecurity with realistic guidance.[142]

Therefore, research demonstrates a need for RDNs to share their experiences to create substantiative improvements in practices, develop policy, and curate professional development opportunities related to food insecurity.[139–143] Using the ecological approach, research suggests that improving nutrition and dietetics practices will require attention to policy and professional education to address the challenges of everyday practice effectively.[139] Thus, a focus on RDN perceptions of their experiences may reveal the underlying assumptions used to guide practice. These insights could improve the quality of services offered by RDNs.[140] Additionally, administrators in charge of developing curriculum and continuing education could design more effective and targeted training to improve practices.[141]

RDNs are an integral component of helping eradicate food insecurity; however, research regarding RDN perceptions about food security is limited.[139] Taken together – the deleterious effects of food insecurity on mothers, calls for changes in the ways RDNs work with food insecure populations, and the need for sharing experiences to guide practice outcomes – these ideas inform this investigation to examine the perceptions of RDNs. Specifically, this study examines how RDNs perceive the importance of helping mothers gain sustainable access to healthy foods and elicits their perceptions of leaders among RDNs working to help mothers with food security.

Methods

Study Participants

A convenience sample of RDNs (n=533) participated in an online survey assessing their perception of the importance of helping mothers gain sustainable access to healthy foods. RDNs were eligible if they were licensed to practice nutrition in North Carolina. We sent an email containing a brief overview of the study linked to an electronic consent form and survey to 3,235

practitioners on a public mailing list of RDNs provided by the North Carolina Board of Dietetics and Nutrition (NCBDN). Additional recruitment materials were sent to the North Carolina Academy of Nutrition and Dietetics (NCAND) to disseminate among its members. A follow-up email was sent one week later to any participants who had not already completed the survey. Researchers donated $1 to the NCAND Capital Campaign fund for the first 500 completed surveys to encourage RDN participation as an incentive. The Institutional Review Board at North Carolina State University approved all phases of this research study protocol prior to data collection.

Data Collection

Survey Instrument Development and Design

The development of the online survey used to assess the perceptions of RDNs in this study follows the analytical framework of The Community Readiness Model (CRM).[144] Similar to the CRM, the survey questions were divided into sections to elicit RDN perceptions about their knowledge of the resources, efforts, and leadership priorities related to helping mothers gain sustainable access to healthy foods. Unlike the CRM, which employs semi-structured interviews to gather information, this online survey used Likert-type response scales in addition to closed- and open-ended questions.

During Phase 1 of survey development, content validity of the initial collection of items was assessed by four content experts. The survey instrument was refined based on expert reviewer feedback to improve content coverage, item relevance and intention, and question format and clarity. In Phase 2, as another check of content validity, the revised survey was piloted with one-on-one cognitive interviews. We conducted cognitive interviews over Zoom with 5 RDNs recruited from NC and other states. RDNs were asked to (1) explain the meaning of

the instructions, (2) describe their thought processes, (3) define keywords and phrases, and (4) make recommendations for how they might change the survey. Feedback from the cognitive interviews resulted in revisions to the order of the questions and modifications to the wording to reduce response bias. Lastly, the revised survey was reviewed for face validity by a content expert who found no remaining issues with clarity or interpretation of items.

The final survey consisted of 31 items divided over seven sections. This first section included demographic questions. Next, the survey questions asked participants how they perceive mothers who have uncertain access to healthy foods. The survey also included other topics related to helping mothers gain sustainable access to healthy foods, including knowledge of efforts, RDN practices, and RDN perceptions of leaders. The number of questions each participant viewed and responded to varied based on previous questions; therefore, the number of questions respondents could answer ranged from 27 to 31. Likert scales of evaluation (1 = not important to 6 = very important), agreement (1 = strongly agree to 6 = strongly disagree), and frequency (1 = never to 5 = always) were used to assess RDN perceptions of helping mothers.[145] Five closed-ended questions and one optional open-ended question assessed RDN knowledge of the programs, services, and activities available to help mothers gain sustainable access to healthy foods in North Carolina. In the last two sections of the survey, respondents ranked a list of dietetics practice areas in ascending order as leading the charge among RDNs helping mothers gain sustainable access to healthy foods before rating their level of perception of leaders.

Statistical Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS).[146] Descriptive statistics were presented as means and standard deviations for continuous variables and frequencies and percentages for categorical variables. Likert scale data were analyzed using

the Kruskal-Wallis H test to determine differences in RDN area of practice and geographic location.[147] Post hoc pairwise comparisons included Dunn's (1964) procedure with Bonferroni correction to decrease Type 1 error.[148] A *P*-value of 0.05 or less was considered statistically significant for all tests. We used nonparametric analyses because data did not meet the assumptions necessary for the use of parametric statistics.[149]

A priori power analyses were performed using SAS 9.4, and the final sample size met the requirements for at least 90% power to detect a difference of 0.05 in Likert scale responses.[150]

Results

We emailed surveys to 3,235 RDNs, and 654 participants began the survey online. Incomplete surveys were not included in the data analysis, resulting in a final sample of 533 usable responses—most RDNs who completed the survey identified as white (93%). Females accounted for 97% of the participants, while 3% were male. Years of experience reported ranged from less than one year to more than 15 years. The most significant proportion of RDNs (43%) had more than 15 years of experience. RDNs reported practicing in various settings, including 41% in a clinical setting, 18% in a community setting, and 3% in foodservice management. Thirty-four percent of RDN practices were geographically located in suburban communities, 31% in urban communities, and 20% in rural communities. Almost all (n = 524, 98%) RDNs perceived helping mothers gain sustainable access to healthy foods as an important issue.

We used Kruskal-Wallis testing to determine differences in mean ranks for each area of practice identified by RDNs – clinical dietetics (n = 213), community dietetics (n=95), foodservice dietetics (n = 17), and other (n = 199). Researchers used Dunn's (1964) procedure with Bonferroni correction for multiple comparisons when we found statistically significant

differences. The level of agreement of importance among RDNs ($H(3)=12.5$; p=.006) and post hoc testing revealed that community RDNs (mean rank = 288.8) were more likely than food service RDNs (mean rank = 197.8; p=.025) to perceive helping mothers as very important. Community RDNs (mean rank = 305.6) were also more likely than clinical RDNs (mean rank = 248.4; p=.009) to strongly disagree that the number of mothers in NC lacking sustainable access to healthy foods is lower in NC than in most other states ($H(3)=12.5$; p=.006). Additionally, community RDNs' (mean rank = 292.8) perception of how a mothers' food insecurity affects other people differed from both clinical (mean rank = 250.7; p=.034) and food service RDNs (mean rank = 267.3; p=.004) ($H(3)=15.1$; p=.002). Lastly, statistically significant differences in how RDNs view helping mothers gain sustainable access to healthy foods in their scope of practice as an RDN ($H(3)=26.1$; p<.001) were evident. RDNs in food service (mean rank = 353.4) were more likely than community RDNs (mean rank = 206.5; p<.001) to view helping as always outside their scope of practice, while community RDNs were more likely than clinical RDNs (mean rank = 280.7; p<.001) to view helping as always within their scope of practice.

Nineteen percent of RDNs were unfamiliar with any programs, activities, or services in North Carolina that address helping mothers gain sustainable access to healthy foods. We saw differences in responses across practice areas ($H(3)=14.4$; p=.002), and community RDNs (mean rank = 271.9) were more likely than clinical (mean rank = 249; p=.019) and food service (mean rank = 195.8; p=.031) RDNs to be familiar with the efforts in NC addressing food insecurity. When examining geographic location ($H(3)=9.9$; p=.019), RDNs working in rural areas (mean rank = 227.6) were more likely to strongly agree that Federal Nutrition Assistance Programs provide adequate support for mothers experiencing food insecurity than RDNs working in urban areas (mean rank = 282.3; p=.021).

Dietitians practicing in community nutrition were ranked as number one by 51% of the respondents as leaders among RDNs who help mothers gain sustainable access to healthy foods. Participants rated RDNs working as dietetics educators as leaders in fifth place behind RDNs working as food bank managers, RDNs in charge of local nutrition organizations, and RDNs in food service management. Even though participants did not rank dietetics educators as leaders among the top three practice areas, 74% reported learning about helping mothers with uncertain access to healthy foods during their undergraduate or graduate education. Other reported sources of information about helping mothers gain sustainable access to healthy foods include other RDNs (30%), other healthcare professionals (31%), and people living in the community (37%). Fourteen percent of RDNs reported misconceptions or incorrect information among dietitians about helping mothers gain sustainable access to healthy foods.

Discussion

This study indicates that helping mothers gain sustainable access to healthy foods is an important issue among RDNs practicing in various settings. Data analysis revealed statistically significant differences among RDN practice areas regarding how many mothers in North Carolina are affected by limited access to food compared to other states. Additionally, results indicated statistical differences related to how a mother's food insecurity affects others and the degree to which helping mothers falls into the scope of practice of RDNs. These differences affirm the wide breadth of the scope of practice of RDNs, which is grounded in their individual experiences, education, state regulations governing RDN practices, current and previous employment, and the Academy of Nutrition and Dietetics' Standards of Practice.[151,152] For example, many RDNs work in clinical nutrition settings, which encompasses positions in acute patient care at hospitals where RDNs may come into contact with mothers with limited access to

healthy foods.[153] Conversely, RDNs hold positions in long-term care facilities where RDNs manage the diets of the facility's residents and may not be in regular contact with mothers experiencing food insecurity.[151–153] Accordingly, the results show RDN perceptions vary based on their primary area of practice.

The majority of the survey participants acknowledge being familiar with food and nutrition efforts that help mothers; however, 19% report not being familiar with any programs, activities, or services helping mothers in North Carolina with food insecurity. At the time of this writing, a minimum of eight federally funded nutrition assistance programs are available, directly and indirectly, to help mothers gain sustainable access to healthy foods.[27,154] Several local charitable and private sector organizations sponsoring programs, services, and activities in North Carolina helping mothers with food insecurity also exist to assist.[27,155] Among the respondents, RDNs working in a community nutrition setting are more likely than other RDN practice areas to be familiar with the efforts to help mothers. These results are consistent with the scope of practice for community RDNs which acknowledges their role in facilitating federally funded and community nutrition programs supporting people who do not have sustainable access to healthy foods.[151]

Geographically, a difference in the perception of the adequacy of federal nutrition programs between RDNs working in rural areas versus urban areas is evident. Even though disparities exist between rural and urban areas, with rural areas (16.1%) experiencing higher rates of food insecurity than urban areas (14.6%), federal nutrition programs do not allocate funds based on county location in a state.[10,156] One of the most utilized federal nutrition assistance programs, the Supplemental Nutrition Assistance Program (SNAP), is based on the Thrifty Food Plan (TFP).[10,32] The TFP is a mathematical determination of the lowest amount of

money families can spend to feed a family of four a nutritionally adequate diet in the United States.[32] Prior to 2020, over half of SNAP participants ran out of benefits within two weeks, increasing the likelihood that the household experienced food insecurity by the end of the month.[157,158] However, people dwelling in rural areas tend to use federal nutrition programs such as SNAP and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) at higher rates than those living in urban areas, thereby increasing program visibility.[159,160] Witnessing several residents in rural areas using federal nutrition assistance programs may influence RDNs working in those areas to perceive federal nutrition assistance as adequately providing people with the food they need to last throughout the month.

To determine the practice area that participants most associate with helping mothers gain sustainable access to healthy foods, we provided RDNs with a list of 8 RDN practice areas to rank from highest perceived leadership to lowest. Practice areas included in this research were chosen based on the primary work settings reported in the 2016 CDR needs satisfaction survey.[161] At least half of the respondents identified RDNs specializing in community nutrition as leading the profession in issues related to food insecurity. Again, this is consistent with the prescribed scope of practice of community RDNs; however, mothers experiencing limited or uncertain access to healthy foods may be admitted to the hospital where they are under the care of clinical RDNs.[139,151] Additionally, food insecure mothers may be the recipients of food rescue and distribution programs led by RDNs working as food service managers.[139] RDNs also work as researchers leading studies that influence public policy changes to eradicate food insecurity.[139] Furthermore, 74% of participants reported learning about helping mothers through undergraduate and graduate studies. This finding points to RDN dietetic educators who facilitate experiential learning that allow students to go into communities to provide supervised nutrition education

classes to mothers experiencing food insecurity.[151] Thus, while participants perceive RDNs practicing in community nutrition as leaders in helping mothers, the responsibility is not limited to RDNs working in a community setting.[139,151]

When analyzing the conclusions drawn from this study, investigators must consider the limitations associated with research. Results from this study may not be generalizable to all RDNs because eligibility requirements excluded RDNs not governed by the licensure laws in North Carolina. Additionally, the overall response rate (16.5%) may bias the data collected because of the unknown differences between RDNs who chose to respond and those who did not respond. RDNs choosing to complete the survey may have had strong feelings about helping mothers with limited or uncertain access to healthy foods. To increase overall participation and minimize this bias, researchers committed to donating $1 to the NCAND Capital Campaign, a fund designed to support the nutrition professionals in North Carolina, for the first 500 completed surveys. Social desirability bias could have also impacted the results because we based RDN perceptions with no observations or measurement of actual knowledge and behavior. Researchers validated the survey instrument as a pilot survey with cognitive interviews and content experts before administration to limit this type of response. The clarity of the questions was improved based on the feedback received. We also ensured participants that their responses would be kept anonymous. The knowledge that researchers would not share their answers or disclose their identity may have helped reduce this bias.

Conclusions and Future Research Implications

Current research on the perceptions of RDNs does not address their perceptions of helping mothers gain sustainable access to healthy foods. This research study fills that gap by assessing the perceptions of helping mothers experiencing uncertain access to healthy foods

among RDNs in North Carolina. Many of the RDNs responding to this survey about their perceptions of helping mothers gain sustainable access to healthy foods agree that this is a critical issue irrespective of their area of practice. Participants perceived RDNs working in community nutrition as leaders among RDNs helping mothers gain sustainable access to healthy foods. Moreover, most RDNs are aware of programs, activities, and services available to help mothers in North Carolina; however, some RDNs are not familiar with the efforts administered at the local and federal levels. Of the RDNs aware of the efforts designed to facilitate helping mothers experiencing food insecurity, most report learning about them through their undergraduate and graduate education in dietetics.

In light of the results of this study identifying helping mothers gain sustainable access to healthy foods is perceived as a critical issue to RDNs, future research in this area could explore the readiness of RDNs to work with mothers who may have limited or uncertain access to healthy foods. Identifying the readiness level of RDNs to work with food insecure populations may help facilitate the development of targeted educational activities designed to prepare RDNs across practice areas to work with food insecure populations. Future research could also include assessing the current didactic curriculum and its ability to provide RDNs with experiential learning designed to develop the skills necessary to translate nutrition science into information relevant and practical for mothers who may have limited or uncertain access to healthy foods. Lastly, accredited education providers could curate continuing education opportunities addressing food insecurity and the programs, activities, and services available to help mothers for RDNs wanting to increase their competence beyond the traditional dietetics education.

Table 2.1 Distribution of demographic characteristics of the 533 RDNs in North Carolina who completed the online survey on healthy food access.

Characteristic	n	%[a]
Gender		
Female	516	97
Male	16	3
Prefer not to answer	1	<1
Race/Ethnicity		
Hispanic, Latino, Spanish	15	3
American Indian/Alaska Native	4	1
Asian	13	2
Black/African American	20	4
Native Hawaiian/Other Pacific Islander	2	<1
White	493	93
Other	7	1
Prefer not to answer	5	1
Years of Experience		
<1 year	16	3
1-5 years	142	27
6-10 years	79	15

Table 1.1 (continued)		
11-15 years	65	12
>15 years	231	43
Area of Practice		
Clinical Nutrition	218	41
Food Service Management	17	3
Community Nutrition	95	18
Education	35	7
Research	21	4
Administration	14	3
Retired	18	3
Other	115	22
Setting of Practice		
Rural	104	20
Suburban	180	34
Urban	164	31
Other	85	16

[a] Percent respondents rounded to the nearest whole number

CHAPTER 3: A MIXED-METHODS STUDY USING THE COMMUNITY READINESS MODEL TO ASSESS REGISTERED DIETITIAN NUTRITIONISTS' READINESS TO HELP MOTHERS GAIN SUSTAINABLE ACCESS TO HEALTHY FOODS

Abstract

In 2020, the COVID-19 pandemic exacerbated food insecurity, and the rates among households with children headed by single mothers remained high. Registered Dietitian Nutritionists (RDNs) are trained to assist people experiencing food insecurity. Using a mixed-methods approach, researchers employed the Community Readiness Model to assess RDN readiness to help mothers gain sustainable access to healthy foods. Data analysis produced a readiness score corresponding to the pre-planning stage, and seven themes emerged from the interviews. The findings suggest that RDNs are aware and concerned about helping mothers experiencing food insecurity, but efforts among RDNs are not comprehensive or coordinated.

Key Words: food security, food insecurity, Registered Dietitian Nutritionists, Mixed Methods, Community Readiness Model, readiness

Introduction

The Academy of Nutrition and Dietetics (the Academy) routinely publishes position papers to convey a stance on specific issues and inform its members of current research in nutrition to impact public health.[162] In their first position paper on domestic hunger and inadequate access to food, the Academy contends that nutrition professionals must address hunger and food and nutrition security immediately and aggressively.[163] The most recent position paper from the Academy about food insecurity describes it as a limited or uncertain ability to access healthy foods safely and in socially acceptable ways. Moreover, the Academy cites RDNs as food and nutrition experts uniquely situated to facilitate and lead efforts designed to help end food insecurity.[139]

In 2012, the president of the Academy declared food insecurity a priority in the organization's strategic plan through 2025.[164] The strategic plan underscores that the Academy would address food insecurity by advocating for equitable food access to decrease nutrition disparities throughout the lifecycle.[165] Thus, the Food and Nutrition Security Task Force convened in 2013 to create a framework to prioritize resources and outline actionable steps RDNs can take to address food insecurity across several specialty areas within dietetics, from public health settings to clinical practice settings.[139,166]

Despite the efforts of the Academy alongside other organizations, millions of Americans continue to experience food insecurity each year.[10,167,168] In 2020, 13.8 million households reported experiencing food insecurity at some time throughout the year.[10] While there were no statistically significant differences in household food insecurity rates from 2019 to 2020, the United States Department of Agriculture (USDA) found increases in food insecurity in households with children and households where adults were unemployed due to the coronavirus

pandemic.[10] Throughout the pandemic, households headed by single mothers have experienced food insecurity and hunger at higher rates than the rest of the population.[169] Single mothers living in food insecure households tend to have poorer health outcomes than mothers living in food secure households.[119,123,124,126–128,170]

Even though screening for food insecurity is a necessary first step in helping mothers at risk, no research exists detailing the prevalence of RDNs who screen mothers for food insecurity.[171,172] To help mothers with uncertain access to healthy foods, RDNs need to follow evidence-based practices to screen for food insecurity and prepare to intervene.[166,171] The Hunger Vital Sign has been validated for use in clinical and community settings to assess food insecurity among adults.[173,174] By considering the effects of food insecurity on nutrition-related health outcomes and behaviors, RDNs can intervene by delivering patient-centered, practical nutrition interventions that could help decrease health disparities experienced by mothers with uncertain access to healthy foods.[171]

Unfortunately, food insecurity exacerbated by economic downturns tends to persist years after the economy has recovered.[10] Thus, it is imperative that RDNs are prepared to use their nutrition expertise to help mothers gain sustainable access to healthy foods in this economic climate and beyond. However, previous research exploring RDN self-reported knowledge, practices, and understanding of food insecurity suggests that areas of practice determine how RDNs respond to screening and intervening in the lives of people experiencing food insecurity.[140,141] Overall, RDNs working in education, community nutrition, and public health settings report greater involvement and a broader understanding of food insecurity than RDNs working in clinical settings.[140,141]

The Academy Compensation and Benefits Survey of 2021 reports that 53% of RDNs work primarily in clinical settings (acute care and ambulatory care), 10% work in community nutrition and public health settings, and 6% work in education settings.[153] Despite their area of practice, all RDNs need to be ready to help mothers gain sustainable access to healthy foods because food insecure mothers are often present in acute care settings, community settings,[6] and college campuses.[175,176]

Little research exists investigating RDN readiness to help mothers gain sustainable access to healthy foods. To explore this phenomenon, we employed a community readiness tool grounded in the theoretical underpinnings of the Community Readiness Model (CRM).[144] Development of the CRM began with researchers adopting the tenets of the Transtheoretical Model of Behavior Change and the social action process to describe the intricacies of community change.[177,178] The CRM acknowledges that communities are like individuals and similarly move through stages before they are ready to take action to address a problem.[144] Therefore, the CRM tool focuses on helping communities identify unambiguous ways it can move towards implementing, developing, and delivering interventions that match its level of readiness.[144]

The CRM starts with a community readiness assessment consisting of seven steps (Figure 3.1) designed to define a specific issue, delineate the community, and measure the community's attitudes, knowledge, and beliefs.[144] The assessment uses key informant interviews to evaluate a community's readiness to address a problem based on five dimensions (Table 3.1) - community knowledge of the issue, community knowledge of efforts, community climate, leadership, and resources.[144] Key informants are chosen based on their perceived understanding of the problem and the efforts of the community to address them.[179] After key informant interviews, dimensions

are scored on a nine-point anchored rating scale using descriptive statements to determine the community's readiness score.[144] Each point on the scale corresponds to a stage of readiness (Figure 3.2), starting with no awareness and moving through denial/resistance, vague awareness, pre-planning, preparation, initiation, stabilization, expansion/confirmation, and community ownership.[144,180] Scores for each dimension are averaged across interviews and rounded down to the nearest whole number corresponding to the anchored rating scale to produce a final readiness score for the community.[144] The community's readiness score determines stage-specific goals and strategies designed to move the community towards meaningful actions appropriate for the community.[144,181]

The semi-structured interview guide consists of 21 anchored questions relevant to each dimension and 15 non-anchored optional questions.[144] The non-anchored questions are adaptable and modifiable by researchers to address other facets of the problem. Following the calculation of the readiness score, the information gleaned from all questions asked during the interviews provides qualitative information that is analyzed for major themes by dimension and used to provide a descriptive analysis of each dimension.[144]

While the Academy affirms national strategies to integrate RDNs into the fight against food insecurity, there is little data available about RDNs working together as a community of professionals to help mothers gain sustainable access to healthy foods at a local level.[182] Obtaining information on local RDN efforts is essential because even though the Academy owns the RDN credential, licensure laws vary from state to state.[151] Considering that state-to-state variations impact how RDNs help mothers and what resources are available, it is necessary to develop appropriate actions and techniques to help RDNs address food insecurity in each state. Thus, this research study aims to use the CRM to pursue the following research questions:

(1) What is the stage of readiness of RDNs in regards to helping mothers gain sustainable access to healthy foods in North Carolina and (2) What level of awareness do RDNs have concerning the efforts available in North Carolina to help mothers gain sustainable access to healthy foods. The information gathered from the community readiness assessment will establish a baseline of readiness which will inform the next steps towards action that can be applied locally by RDNs to help mothers gain sustainable access to healthy foods.

Methods

Participants and Recruitment

In a previous study, researchers identified key informants by asking survey respondents to rank RDN practice areas according to whom they perceive as leaders of dietitians helping mothers gain sustainable access to healthy foods. RDNs working in community nutrition settings were ranked the highest as leaders, which informed our recruitment of a purposive sample of RDNs licensed in North Carolina (Williams, unpublished data, 2021). Guided by the public records of the North Carolina Board of Dietetics and Nutrition, we emailed all RDNs identified as working in community nutrition a recruitment email briefly describing the study and a link to an eligibility screening and consent forms. A week later, we sent follow-up emails to encourage participation. We also sent recruitment flyers to four Member Interest Groups of the Academy - Asian Americans and Pacific Islanders, Indians in Nutrition and Dietetics, Latinos and Hispanics in Dietetics and Nutrition, and The National Organization of Blacks in Dietetics and Nutrition.

Initially, we sent recruitment materials to 368 RDNs who self-identified their practice area as community nutrition and dietetics. Twenty-eight RDNs started the eligibility screening; however, nine respondents did not finish, and one respondent did not consent to participate. Based on previous studies using key informant interviews and the CRM, 6-12 interviews are

sufficient to assess readiness.[144,179] The initial sample included 12 key informants. After reaching saturation, we conducted three additional interviews to ensure no new themes would emerge. Also, to increase the diversity of the sample, we conducted two additional interviews for maximum sampling variation (n=17).

Study Design

The principles of the CRM theoretical framework guided data collection and data analysis of the present study.[144] Researchers adapted the semi-structured interview guide developed by the Tri-Ethnic Center for Prevention Research Center to interview key informants in NC about RDN readiness to help mothers gain sustainable access to healthy foods. The interview guide consisted of the 21 anchored questions mandatory for scoring community readiness, probing questions, and one optional non-anchored question. Content experts reviewed the adapted interview guide for relevance, clarity, and question formatting. Edits and revisions were made based on expert reviewer comments and feedback. Interviewer training took place following the modification of the interview guide according to a five-phase interviewer training protocol to increase trustworthiness and decrease bias throughout data collection.[183] Trained interviewers piloted the revised version during mock interviews with two nutrition professionals not involved in the study. Feedback from mock interviews resulted in modifications to the wording of probing questions to encourage open communication from participants. The final interview guide was reviewed and approved by the research team and an expert in qualitative research. The Institutional Review Board at North Carolina State University approved all research procedures employed in this study.

Data Collection

Investigators conducted interviews remotely using Zoom technology after obtaining informed and broad consent from each participant through an online eligibility survey. Interviewers recorded each interview and used Zoom's interview transcripts to facilitate verbatim transcription of each interview.

Data Analysis

The research team met weekly to discuss the interviews and the initial analysis data to determine dominant emerging themes. We used direct content analysis to determine when saturation was reached.[184,185] The CRM handbook of information and materials created by the Tri-Ethnic Center for Prevention Research guided data analysis.[144]

The CRM handbook advises first scoring the interviews based on the anchored rating scales provided for each dimension.[144] Scores for the anchored rating scale range from one to nine, and each number corresponds to a level of readiness and a descriptive statement. For example, in the dimension of community climate, level one corresponds to "Community members believe that the issue is not a concern." In contrast, level nine corresponds to "The majority of the community are highly supportive of efforts to address the issue. Community members demand accountability."[144]

Two reviewers were trained to score interviews and practiced the protocol outlined in the CRM handbook together, using the first interview as a guide before moving on to scoring all interviews. Reviewers scored each interview independently by dimension and held weekly discussions to compare scores. Reviewers settled differences in scores by having each reviewer first explain how the score was reached and discuss the differences until we reached consensus on the final scores. After reaching consensus, we created a consensus scores table to record the

final scores from each interview. Next, we added the scores for each dimension and divided them by 17 (the number of key informants) to calculate the average dimension score. Finally, to calculate the overall community readiness score, we added the mean score of each dimension and divided it by five (the number of dimensions).[144]

Secondly, the CRM handbook recommends identifying the major themes within each dimension through qualitative analysis. Thus, the first author developed a coding manual using the five dimensions and their CRM descriptions as a provisional start list of codes.[185] Next, two authors independently coded each interview line-by-line using open coding and identifying quotes relevant to each dimension.[185,186] Through weekly meetings, we compared codes, created sub-codes, and reached 100% consensus for each dimension. The final coding manual consisted of five main coding categories and 33 subcodes. The primary author used NVivo 12 qualitative analysis software to create a code map and categorize the coded data by dimension.[187]

Lastly, the first two authors independently analyzed relevant quotes to determine dominant emergent themes across interviews. Through weekly meetings, we came to consensus on the significant dominant emergent themes. An expert not involved with data collection reviewed the final results to provide an outside opinion on the relevance of the themes.

Results

Key informants included dietitians who self-identified as working in community nutrition in North Carolina. In addition to working in community nutrition, four key informants reported practicing clinical nutrition, three in education, one in food service management, and one RDN reported not currently working. All participants identified as female, and the majority of the key informants were white (n = 16). Many of the informants reported working in a combination of rural, urban, and suburban settings (n = 9) across North Carolina. In contrast, others reported

working in rural settings (n = 6) or urban settings (n =2). Informant years of experience ranged from 2 to 47 years (mean = 14.03; SD ± 11.91) and ages ranged from 27 to 71 years (mean = 40.12; SD ± 12.03).

The distribution of scores across the seventeen interviews illustrated a wide range of perceived readiness by key informants. The overall community readiness score was determined to be a four, consistent with the 'pre-planning' stage of readiness. The 'pre-planning' stage is an indication that RDNs and leaders recognize the need for action, and there may be people, including RDNs, working to help mothers gain sustainable access to healthy foods. However, informants implied that many efforts among RDNs may not be coordinated or comprehensive.

Additionally, key informants revealed a general sense that most RDNs are concerned about mothers with uncertain access to healthy foods throughout the interviews. Key informants acknowledged that while RDNs may be motivated to act, they may not know where to begin to identify available local resources to support their efforts. Furthermore, the responses from key informants provided in-depth insight into the factors contributing to the current readiness level of RDNs to help mothers gain sustainable access to healthy foods in North Carolina. From informant responses, seven dominant themes emerged across interviews within the dimensions: (1) Driving forces, (2) Competing priorities, (3) Concern versus priority, (4) Knowledge gaps, (5) Hidden food insecurity, (6) Deficits in detailed knowledge (7) Limited capacity. Themes for each dimension provide in-depth insight into the factors contributing to the current readiness level of RDNs to help mothers gain sustainable access to healthy foods in North Carolina.

Leadership

Driving Forces

This domain focuses on the key informants' perceptions of leadership's attitude among RDNs toward helping mothers gain sustainable access to healthy foods. Overall, informants felt that at least some leaders who are RDNs consider food insecurity to be a critical issue. However, key informants thought few RDNs serve as driving forces leading efforts to address helping mothers with uncertain access to healthy foods. One informant remarked, *"You know, most of the decisions are not made by dietitians when it comes to that. They get input, but most of the leaders, you know, the leadership isn't dietitians – they [leadership] are nurses, they are doctors."* Another informant elaborated,

> *"I think of a lot of the work I've done around grants with community access, and I think that there's a lot like, there's usually a dietitian involved in it. But when you look at the team as a whole, there's a lot of people involved that aren't dietitians that are drivers in creating that change."*

Competing Priorities

Several informants recognized that leaders of organizations at both the local and national levels face several competing priorities that often overshadow helping mothers gain sustainable access to healthy foods. For example, one informant said,

> *"I think there's a lot of other levels of concern, and you know, like this is all during COVID too when there's a lot of other like reimbursements and access and all the public health and school nutrition things. So I would say right now ... there's probably a lot of, I hate to say it, but a lot of like competing priorities in terms of all the ones I just listed too."*

Other informants cited licensure laws, obesity/weight management, and order writing privileges in hospitals for RDNs as additional examples of competing priorities that leadership may prioritize above helping mothers gain sustainable access to healthy foods.

Community Climate

Concern versus Priority

The community climate domain addresses the motivation of the community members as a whole, rather than leaders' motivation alone to address helping mothers gain sustainable access to healthy foods.[168] According to key informants, most RDNs have at least heard about the efforts in North Carolina that address helping mothers gain sustainable access to healthy foods and are concerned about food insecurity. However, key informants perceived that the prioritization of helping mothers with uncertain access depends on the RDN's area of practice. Informants described RDNs working in public health nutrition and community nutrition as prioritizing helping mothers with uncertain access to healthy foods higher than RDNs working in clinical nutrition. One informant said,

> *"I'm just thinking of different roles that dietitians play. So, if someone is more clinical focused, they may not be as, I call it, food security focused but more public health focused, more WIC focused, or like WIC folks would be focused more on that, so that would be more of a priority for them."*

Furthermore, informants noted that RDNs often prioritize what mothers eat or feed their children, not food access.

When discussing the level of support of the efforts to address helping mothers gain sustainable access to healthy foods, most informants agreed that many RDNs would be most likely to support food insecurity initiatives passively. Some informants noted that few are

"actually doing the work" to support helping mothers with uncertain access to healthy foods. Informants suggested that RDNs reportedly show this support by signing legislative action alerts from the Academy, organizing local food drives, and joining community health coalitions. *"A lot of it has been people like myself ... People like my colleagues who have taken some leadership and said, you know if anybody's going to stand up and do this, we need to,"* an informant stated when describing how RDNs are actively supporting implementing a food insecurity screening in an area hospital system.

Community Knowledge of Food Insecurity

Knowledge Gaps

Key informants perceived that RDNs have some knowledge about helping mothers gain sustainable access to healthy foods, but not many are aware of how much it occurs in North Carolina. When describing their perception of RDNs' knowledge about helping mothers, one informant stated,

> *"I definitely don't feel like there's no knowledge at all, but I don't think it's at a detailed pillar of knowledge, I think it's kind of not like in passing, like you're aware of it, but not enough that it's like one of their priorities under like let's say, increasing the amount of fruits and vegetables people eat or, like weight management or things that are, tend to be more on the forefront when you think of nutrition in dietetics."*

Other informants agreed and expanded the idea by suggesting that RDNs *"don't see the whole picture"* when assessing a mother's ability to gain sustainable access to healthy foods. For example, one informant cited barriers mothers may face that RDNs might not consider, *"But you know, expecting that these moms, who are likely working you know, can drop everything and go into a WIC appointment at 10 am. [An] appointment on a Thursday and do that every month,*

and they may not have reliable transportation." Regarding COVID, one informant lauded the efforts that some programs have made during the pandemic to accommodate mothers; however, the informant also illuminated structural barriers that remain in place for mothers who do not have consistent access to telephone and reliable internet services.

Hidden Food Insecurity

Key informants also reported that RDNs might not be aware of the number of mothers experiencing uncertain access to healthy foods because mothers often hide this information from RDNs. Some informants believed mothers do not share their food security status because of the expectations placed on them by society to care for their children. As one informant shared,

> "*...but still, in relation to food access is that, in general, I think society views mothers as being able to take care of a lot, and do a lot, and not need as much support and not need much at all. So I think, in that sense, is what I mean is that they're not considered as needing support or needing different types of things, particularly when it comes to child-raising or child-rearing, or doing anything that's providing for your kids. I think that it can be very challenging for mothers to get [the] support that they need in a lot of ways, and food access would be one of those as well."*

One informant simply stated, *"... it's often hidden,"* when asked about the number of mothers experiencing uncertain access to healthy foods in North Carolina.

Community Knowledge of Efforts

Deficits in detailed knowledge

All key informants believed that many RDNs have heard of the efforts to help mothers gain sustainable access to healthy foods. In particular, many RDNs were familiar with the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). However, informants

acknowledged that most RDNs do not have detailed knowledge of the efforts, and few would know how to help a mother who does not qualify for WIC. One informant said, *"Most dietitians outside of WIC are going to say go to WIC, and WIC is great, but we have so many more resources available."* Other informants expressed similar sentiments about RDNs' knowledge of the Supplemental Nutrition Assistance Program (SNAP), SNAP-Ed, the Child and Adult Care Food Program (CACFP), the Expanded Food and Nutrition Education Program (EFNEP), and local efforts such as food banks and food pantries. Another key informant explained, *"In my experience, I think that a lot of dietitians know of some of these programs, but they may not know about them and have much knowledge of the detail of what [the] program's intent is and who they serve."*

Community Resources

Limited Capacity

Informants named federal funding through state-administered programs such as WIC, SNAP, EFNEP, and CACFP as resources they expect some RDNs to be knowledgeable about to help mothers gain sustainable access to healthy foods. Contrarily, many informants did not sense that most RDNs have as much experience applying for grant funding or soliciting donations from private entities unless it is part of their work requirements. For example, one informant stated, *"not too many people do activities other than their own jobs."* Another informant shared,

> *"[I] just think there's like so much that we could be doing, you know, as dietitians, but I think that like funding is an issue for sure ... It's just probably more than some people want to take on, probably more than most people want to take on even if they really care."*

Informants estimated that there are many RDNs in North Carolina; however, they did not feel there were many places available for mothers seeking physical locations to see RDNs for help with food access. Beyond the health department and WIC offices located in most counties, one informant expressed,

> *"...other than, again, the social services programs that I know of and I'm aware of, I don't think that there are places where a dietitian is available or many programs that a mother who's interested in increasing her access to those foods would even know where to go.*"

However, some key informants who work in WIC offices and health departments conveyed issues with the understaffing of RDNs, especially in rural areas with little to no recruitment efforts underway to employ RDNs. Many informants agreed that more RDNs are needed to serve this population, and one informant asserted, *"So do we need more dietitians, yes. We need more dietitians in that category that will serve the people who have health issues and are food insecure and don't have access."*

Discussion

Key informants perceived leaders among RDNs in local and national organizations as absent when others, such as government officials, hospital administrators, and stakeholders, make decisions about the efforts to help mothers gain sustainable access to healthy foods. For example, when discussing the leaders, informants described circumstances in which RDN leaders do not typically interject their expertise to guide the allocation of time, money, and locations for efforts. This finding is consistent with the overall readiness score and suggests that leadership is concerned and agrees that they should act, but little effort to engage is evident.[144,188] Key informants also acknowledged that the leaders among RDNs prioritize other dietetics issues above food insecurity which may be contributing to the inaction described during the

interviews. While there is no evidence available to determine how RDN leaders in North Carolina prioritize food insecurity, a past president of the Academy declared food security as one of its highest priorities through 2025.[164]

Key informants also revealed that RDNs are concerned about food insecurity among mothers but predominantly offer passive support for efforts, activities, and services. Informants reported that RDNs working in WIC offices or other public health settings prioritize ensuring mothers can access the foods necessary to meet dietary recommendations they are encouraged to follow, more so than RDNs working in clinical nutrition settings. These sentiments align with distinctions made by Academy, which delineates dietitian practice areas, services, and activities.[151] According to the Academy, the scope of practice for RDNs in clinical practice asserts that RDNs should follow the Nutrition Care Process (NCP) and the Standards of Practice (SOP) for RDNs.[151,152] Both the NCP and SOP establish an evaluation of food security and social determinants of health (SDoH) as a part of the nutrition assessment to be performed by RDNs.[152] Several key informants related previous experiences working in clinical settings where they never assessed food insecurity. Thus, the absence of assessing for food insecurity in clinical settings may be contributing to the perception that RDNs do not know the prevalence of mothers having difficulty gaining sustainable food access alongside the key informants' perceptions and previous research affirming that mothers are not always forthcoming about their food security status.[189–191]

The knowledge of resources dimension received the lowest score, indicating that informants perceive RDNs as vaguely aware of the resources available to help mothers gain sustainable access to healthy foods. When speaking about funding sources available to RDNs, many key informants disclosed that they are not very knowledgeable about resources outside of

federal and state funding. Therefore, some informants deduced that other RDNs would not know about funding, especially from grants and private organizations. The argument made by informants aligned with the previous response about dietetic practice areas, meaning that informants designated RDNs practicing in research as leaders of securing grant funding because it is usually in their job description. Even though the scope of practice for RDNs involved in research reinforces this perception, RDNs in other practice areas should become more knowledgeable about funding sources and resources.[151] Increasing knowledge about funding and resources will allow RDNs to contribute their expertise to emerging projects and research. For example, RDNs could solicit funding or apply for grants to contribute to and lead projects such as hospital and medical-center-based food pantries.[192–195] Leading projects like this could provide additional services and locations for mothers experiencing uncertain access to healthy foods, which may also require Medical Nutrition Therapy.[139]

The overall community readiness score suggests a need to raise RDNs' awareness of food insecurity among mothers. For communities at this stage, the CRM creators recommend reviewing the efforts available in North Carolina and convening focus groups with local RDNs and community leaders to discuss and develop strategies to help mothers experiencing food insecurity gain access to healthy foods.[144]

Key informants perceived RDNs to have some knowledge and awareness about mothers experiencing uncertain access to foods; however, tackling food insecurity among mothers is not recognized as a priority for intervention, except to RDNs working in specific practice areas. Strategies to increase awareness and education could include developing educational materials to present to RDNs at local events (e.g., NCAND regional meetings) showing national and local statistics about mothers who experience food insecurity. Increasing awareness could

lead to the cultivation of centralized online resources that RDNs can access to get comprehensive information about the efforts to help mothers gain sustainable access to healthy foods. Once RDNs are more knowledgeable, they could solicit support from key stakeholders such as politicians, hospital medical directors, and community leaders to help develop additional strategies benefiting mothers in North Carolina with uncertain access to healthy foods.

RDN leaders who develop curricula for nutrition and dietetics programs could aim to create focused educational strategies to raise awareness that food insecurity can impact many practice areas in dietetics, from clinical settings to community and public health settings.[171] Additionally, the standards that every accredited undergraduate program in dietetics is mandated to follow could include a required element that delineates knowing the role of food insecurity in managing chronic diseases and promoting health as a component necessary for entry-level RDNs.[196]

Increasing awareness about mothers experiencing food insecurity could begin during the undergraduate education years with curriculums highlighting and examining the underlying causes, consequences, prevalence, and intervention strategies associated with helping mothers who have uncertain access to healthy foods. Dietetic internships could be required to expose students to evidence-based screening tools such as the "Hunger Vital Sign" in areas requiring direct patient care.[171,174] For RDNs already practicing, the Academy could develop and prioritize continuing education courses for members and non-members that align with their strategic plan to expand equitable access to healthy foods.[165]

Furthermore, because food insecurity is not always easily detected,[189–191] RDNs could lead efforts in their workplace to ensure food insecurity screening systems[174] are in place alongside current information about the efforts and resources available to people experiencing food insecurity.[171] Screening mothers for food insecurity will help RDNs identify and tailor

nutrition recommendations according to food access. Screening could also be a way to engage social workers, physicians, hospital administrators, and key stakeholders who may assist in increasing funding for the efforts in North Carolina to help mothers gain sustainable access to healthy foods. Resources developed with collaborative efforts could include medically-tailored food distributions at local food pantries, healthcare facilities, and hospitals or mobile markets that deliver free fresh produce to people in need.

Strengths and Limitations

This study was not without limitations. First, the key informants were all from North Carolina, limiting the generalizability of the results to other states because each state issues different licensure laws for RDNs to follow. Secondly, this study relied on key informants who self-selected into the study. While a small number of key informant interviews were employed to produce thick-rich descriptions of what is happening among RDNs in North Carolina, their views may only represent a vocal few and not the community at large. Researchers recruited key informants to mitigate this bias using data from a previous study. In that study, RDNs ranked whom they perceived as leaders helping mothers gain sustainable access to healthy foods. Lastly, social desirability bias may have impacted the results as key informants' responses may have been skewed based on their desire to align their views favorably with those of the interviewer or other RDNs. To limit this bias, trained interviewers used a semi-structured interview guide. Interviewers reminded participants that we sought their perceptions and not right or wrong answers throughout each interview. Additionally, we assured key informants that their answers and data would remain confidential, potentially reducing social desirability bias. Despite these limitations, the CRM provided an efficient method for assessing RDN readiness to address helping mothers gain sustainable access to healthy foods.

Future Research

Although the low readiness score revealed that 'pre-planning' strategies to increase awareness were most appropriate, responses from the interviews also suggested that RDNs were ready to help mothers gain sustainable access to healthy foods under the right conditions. Through examples, key informants stated directly and indirectly that if RDNs were made aware of the prevalence of mothers experiencing food insecurity in North Carolina and practical strategies to help mothers, they would be ready to engage with developing and supporting efforts.

Therefore, future research could continue to the next phase of the CRM. That is, researchers could perform an environmental scan to identify strengths and weaknesses among RDNs in North Carolina alongside opportunities and threats outside the profession that may impact RDN efforts to help mothers gain sustainable access to healthy foods.[144] The strengths, weaknesses, threats, and opportunities (SWOT) analysis could begin with researchers using the key informant interviews and other data sources relevant to helping mothers. After completing the SWOT analysis, key informants, RDN leaders, and community stakeholders could be brought together in focus groups to expand on the SWOT analysis. Researchers could then use this information to plan interventions that increase awareness and efforts among RDNs to help mothers experiencing food insecurity.

Conclusion

The present study contributes to the literature by providing new insights into the readiness of RDNs to help mothers gain sustainable access to healthy foods. The community readiness score and qualitative analysis identify how RDNs could integrate the practices necessary to decrease the prevalence of mothers experiencing food insecurity in North Carolina. Finally,

given the detrimental effects of food insecurity, the CRM highlights the need for RDNs to develop practical strategies to coordinate comprehensive efforts to maximize the use of the available resources and minimize frustration and failure due to a lack of readiness.

Figure 3.1. Process for conducting a community readiness assessment. Source: Adapted from Tri-Ethnic Center Community Readiness Handbook (2nd ed. 2014)

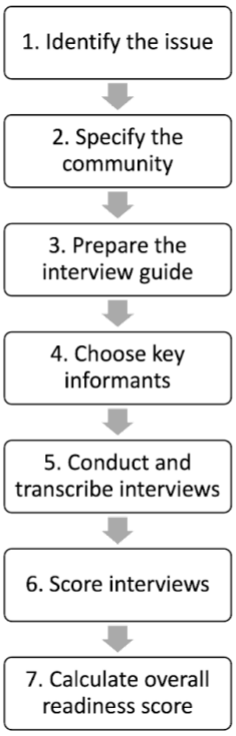


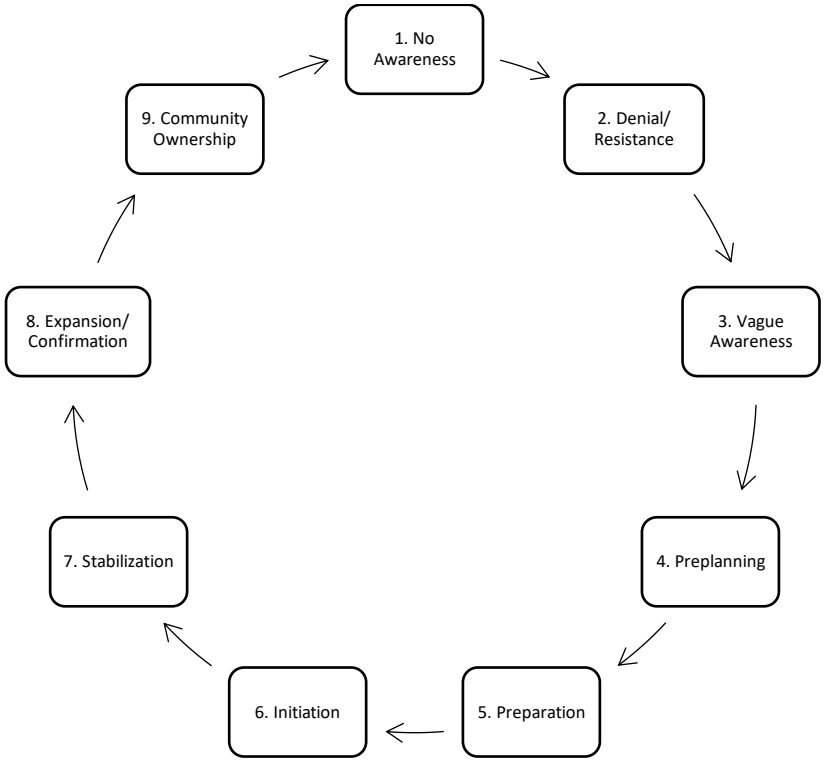
Table 3.1. Five dimensions of readiness influencing a community's readiness level. Source: Adapted from Tri-Ethnic Center Community Readiness Handbook (1st ed. 2006 and 2nd ed. 2014)

Dimension of Readiness	Description
Community Knowledge of Efforts	Describes how much the community members know about local efforts, their effectiveness, and whether they are accessible to all segments of the community.
Leadership	Describes whether or not appointed leaders and influential community members are supportive of the issue.
Community Climate	Describes the prevailing attitude of the community toward the issue.

Table 3.1 (continued)

Community Knowledge of the Issue	Describes what community members know about the causes of the problem, consequences, and how it impacts their community
Resources	Describes the availability of local resources – people, time, money, and space – to support efforts

Figure 3.2. The nine stages of the Community Readiness Model. Source: Adapted from Tri-Ethnic Center Community Readiness Handbook (1st ed. 2006 and 2nd ed. 2014)



CHAPTER 4: A QUALITATIVE EXPLORATION OF THE BARRIERS, OPPORTUNITIES, AND NEEDS OF RDNS TO HELPING MOTHERS GAIN SUSTAINABLE ACCESS TO HEALTHY FOODS

Abstract

Objective: Examination of perceived strengths, weaknesses, opportunities, and threats related to Registered Dietitian Nutritionists (RDNs) readiness to help mothers gain sustainable access to healthy foods.

Design: Qualitative study conducted virtually using a semi-structured interview guide.

Setting: North Carolina

Participants: Purposive sample of 17 key informants credentialed as RDNs.

Phenomenon of Interest: Key informant perceptions of RDNs' readiness to help mothers experiencing food insecurity**.**

Analysis: Qualitative thematic analysis

Results: This study revealed 3 key themes relating to RDNs helping mothers gain sustainable access to healthy foods: (1) Barriers influencing the ability to help mothers; (2) Opportunities available to help mothers; and (3) Perceived needs of RDNs. Key informants described the formal education, misconceptions, and policies as barriers. Opportunities for RDNs to support mothers included collaborating and advocating. Needs expressed included support from leadership, communication between practice areas, and more information about the resources available to support their efforts.

Conclusions and Implications: This research provides insight into the external and internal factors associated with RDNs helping mothers experiencing food insecurity. In the future, these findings could be combined with community readiness scores to help RDNs plan targeted

interventions that will better prepare them to help mothers gain sustainable access to healthy foods.

Introduction

In 2020, 13.8 million households experienced food insecurity in the United States.[10] More than 38 million people, including 12 million children, often did not have sustainable access to safe and nutritious food to support normal development and a healthy lifestyle.[197–199] Food insecurity may be acute or chronic, and depending on the severity, it can lead to hunger and adverse health outcomes, including malnutrition.[199,200] Experiences of food insecurity can also negatively impact mental health[128,201] In children, food insecurity is associated with cognitive development,[202] aggression, anxiety,[128] behavioral problems at school,[203,204] and depression.[201] For adults, the impact parallels that of children as research shows that they too suffer from higher rates of depression and anxiety than their food secure peers.[128,205–210]

Furthermore, mothers experiencing food insecurity are twice as likely to report mental health issues when compared to their food secure counterparts.[128] Mothers reportedly shield the children living in their households from food insecurity by decreasing their intake of preferred foods, selling assets to purchase food, and limiting household spending on other necessities such as medicine or electricity.[211,212] Unfortunately, food insecurity rates among households headed by mothers continue to be higher than any other group and almost three times higher than the national average.[10] Since the coronavirus pandemic began, households headed by single mothers have faced higher food insecurity rates when compared to other household types.[169,213]

Even though the federal government spent over 122 billion dollars on food and nutrition assistance programs in 2020, food insecurity persists, suggesting that government spending alone is not an adequate solution to decreasing food insecurity.[214] Collaborative approaches that include community leaders, nonprofit organizations, health care providers, and researchers are critical to investigating and establishing viable interventions to reduce food insecurity rates.[215]

Among qualified health care providers, the Academy of Nutrition and Dietetics (the Academy) recognizes registered dietitian nutritionists (RDNs) as nutrition experts who receive the education and training to work across sectors to lead, support, develop, implement, and evaluate efforts to improve food security.[139] However, RDNs' understanding and definitions of food insecurity vary based on their practice area.[140,141] For example, RDNs in clinical and administrative positions are less likely to be involved in food security activities or to be involved in local food security efforts than RDNs working in public health and education.[140,141] Clinical and administrative RDNs are also less likely to include affordability and access to food when defining food insecurity.[140]

Additionally, a survey of food bank managers suggests that RDNs need better preparation to work with people experiencing food insecurity.[142] These findings prompted the Academy of Nutrition and Dietetics Foundation (Academy Foundation) to collaborate with Feeding America, the largest hunger-relief organization in the United States, to establish the Future of Food initiative.[142] Through this partnership, the Academy Foundation developed various food insecurity related educational resources for use by members of the Academy.[142]

In 2013, the Academy Foundation commissioned the Food and Nutrition Security Task Force (the Task Force) to increase the awareness of the prevalence and consequences of food insecurity among RDNs.[139] Following their initial meeting, the Task Force presented a plan for complete implementation of specific strategies by May 31, 2016.[216] To date, the Task Force has not published an update on the implementation or evaluation of their plan.[217]

Due to previous research about RDN knowledge and understanding of food insecurity and the limited data available from the Task Force, researchers employed the Community Readiness Model (CRM). The CRM is a theoretical model designed to determine a community's

readiness to address an issue. The CRM uses information from key informant interviews to calculate a community readiness score based on five dimensions – community knowledge of the issue (e.g., prevalence, signs, consequences), community knowledge of the efforts (e.g., campaigns, programs, services), community climate (e.g., attitudes, beliefs, knowledge), leadership (e.g., the extent of support of efforts), and resources (e.g., funding, volunteers, locations).[144,180] Readiness scores establish a baseline readiness level for the community and range from one (no awareness) to nine (community ownership).[144] The readiness score also influences the actions recommended to move the community forward to the next level.[144] One benefit of using the community readiness model for community change is the ability to tailor strategies to reflect the community's level of readiness, which may improve the support received from the community[144] Alongside the community readiness scores, a qualitative analysis of the dimensions across interviews provides a detailed examination of how the dimension scores contribute to the overall community readiness score. The qualitative analysis also underscores the community's specific needs and reveals the differences within the community.[218]

In an earlier study, researchers found that the community readiness score for RDNs to help mothers gain sustainable access to healthy foods in North Carolina matched the 'preplanning' stage. According to the 'preplanning'' stage, informant interviews indicated that some RDNs are aware that local efforts exist to help mothers with uncertain access to healthy foods. However, they do not know about the efforts in detail. Furthermore, at the 'preplanning' stage, informants recognized that RDNs are concerned about helping mothers but have limited knowledge about the prevalence, consequences, and resources available to further the efforts to address helping mothers gain sustainable access to healthy foods (Williams, unpublished data, 2021).

After establishing the baseline readiness score of a community, the creators of the CRM recommend conducting an analysis using the readiness score and the key informant interview data to categorize strengths, weaknesses, opportunities, and threats (SWOT analysis) that may impact the ability of the community to move forward.[144] Additionally, they conclude that conducting a SWOT analysis provides another source integral for developing targeted strategies to initiate change in the community. Thus, the SWOT analysis presented in this paper builds on the previous finding that the readiness score of RDNs to help mothers gain sustainable access to healthy foods in North Carolina matches the 'preplanning' stage of community readiness. By analyzing the four quadrants of the SWOT analysis grid in conjunction with the readiness score and interview data, we investigate the barriers, opportunities, and needs impacting RDN readiness to help mothers gain sustainable access to healthy foods.

Methods

Participants and Recruitment

This qualitative study used purposive sampling to interview 17 RDNs working in community nutrition. Results from a previous study examining RDN perceptions informed the eligibility criteria for the recruitment of participants by recognizing RDNs working in community nutrition as leaders in helping mothers gain sustainable access to healthy foods (Williams, unpublished data, 2021). To identify eligible RDNs, researchers obtained a public listing of all RDNs licensed by the North Carolina Board of Dietetics and Nutrition (NCBDN). Researchers emailed all RDNs listed as working in community nutrition in North Carolina a description of the study with links to an online eligibility screening and consent forms. For maximum variation[10,197] and to increase the diversity of the participants, researchers emailed flyers with details of the study to four Member Interest Groups (MIGs) of the Academy. One

week after the initial email, researchers sent a follow-up email to non-responders to encourage participation. The Institutional Review Board at North Carolina State University approved the research protocol, and all participants provided verbal informed consent.

Data Collection

Prior to data collection, researchers adapted the semi-structured interview guide (Table 1) developed by the Tri-Ethnic Center for Research Prevention to assess community readiness. To ensure content validity of the adapted interview questions, experts in qualitative research design reviewed the interview guide, providing comments and suggestions. Expert feedback guided revisions of the order and wording of the interview questions to make them concise and conversational. To improve trustworthiness and decrease potential interviewer bias, interviewers completed a 5-step interviewer training protocol consisting of online modules and mock interviews.[199] Interviewers pilot tested the interview guide with two nutrition professionals not interviewed for the study. Feedback from the pilot test and mock interviews resulted in modifications to the probing questions to encourage open communication from participants.

Before each interview, interviewers reviewed the consent form, allowed time for questions, and gained verbal consent from each participant. Interviews lasted 30-100 minutes and were recorded and transcribed verbatim using Zoom technology. The research team reviewed all transcripts for accuracy and made corrections as needed before data analysis.

Data Analysis

Interviewers completed an initial analysis form after interviews to document the overall impression of the interview, emerging themes, and any pertinent information from the interviews to share during weekly team meetings. Investigators reached saturation after 12 interviews;

however, interviewers conducted three additional interviews to ensure no new themes would emerge and two additional interviews to increase the sample's diversity.[198,201]

The first author created an initial coding manual using the five domains of the CRM to inform *a priori* main coding categories.[198] Two of the authors independently coded each transcript line-by-line using open coding and annotations to create a coding manual consisting of the five main coding categories developed *a priori* and 33 sub-codes. Next, using the coding manual, two authors individually coded each transcript by dimension and met once a week to compare codes, discuss annotations and notes, and reach consensus on the core themes for each dimension. After the two authors reached consensus on all codes, the first author entered all categories, codes, sub-codes, and annotations into NVivo 12 to organize them for further data analysis. Lastly, the authors analyzed relevant quotes to determine the dominant emergent themes across interviews and, through weekly meetings, reached 100% consensus on the significant dominant emergent themes.

To start the next phase of the community readiness assessment, the first author independently analyzed the core themes, participant interviews, and readiness scores from the community readiness assessment to identify strengths, weaknesses, opportunities, and threats (SWOT) using Nvivo12 to code and organize the data. During weekly meetings, the first and second authors developed a final coding manual for this phase by reviewing the initial codes, discussing themes, and analyzing relevant quotes. The first two authors used the final coding manual to individually analyze quotes, determine dominant emergent themes across each SWOT analysis category, and reach consensus. After reaching consensus on the significant dominant emergent themes, an expert not involved in data collection or analysis reviewed the final SWOT data table and provided insight on the relevance of the themes.

Results

In total, we identified six strengths, seven weaknesses, two opportunities, and three threats (Table 2). Three dominant themes emerged across categories that were relevant to RDN readiness to help mothers gain sustainable access to healthy foods: (1) Barriers influencing the ability to help mothers; (2) Opportunities available to help mothers; and (3) Perceived needs of RDNs. The first theme examines different obstacles that impact how RDNs can help mothers gain sustainable access to healthy foods. The second theme discusses opportunities RDNs have to facilitate helping mothers with limited access to healthy foods. The third theme proposes elements that could assist RDNs in their efforts to help mothers and increase their level of readiness.

Barriers Influencing the Ability to Help Mothers

Education and Training Barriers

Many of the RDNs interviewed for this study held advanced degrees in nutrition and dietetics. However, despite the length of years in practice, most RDNs reported that their undergraduate education focused heavily on the clinical aspects of nutrition and less on the social interactions required to interpret nutrition science in an impactful and practical way. One RDN said,

> *"... there's this idea [that] there's a scientific rigor in nutrition and if you can show that you can use your biochem you can show all this, it's valued higher versus there's that softer social science with access for mothers. And I think because of that, it can get easily overlooked even though it is a very complex issue and ties into a lot of those other topics."*

Additionally, when asked about knowledge of food insecurity in general, one RDN said,

"... you're taught in school, obviously the outcomes, if you don't have healthy food access...but you're not really taught what to do about it, or maybe all the different ways that they [mothers] can get it, you know, and you're certainly not taught what it could do to their [the mother's] friends and family."

Misconceptions as Barriers

Not understanding how programs work and who is eligible for those programs were cited as misconceptions colleagues express about the efforts in North Carolina to help mothers. Key informants perceived that many RDNs misaligned the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and its nutrition education components with other federal nutrition programs. The participants working in WIC offices discussed hearing RDNs describe WIC as a program that emphasizes infant formula, milk, and juice. One RDN stated, *"...we hear lots of things like we push juice or what else ... We push a lot of milk, or you know, they don't realize the scope of the WIC program,"* and another RDN added, *"We do provide formula to infants, but we're mainly breastfeeding forward."* Many participants recognized the term *"handout"* as being used by RDNs to discuss efforts to help mothers gain sustainable access to healthy foods. For example, one RDN explained,

"...but even among community dietitians, there are still people who would assume that our moms would rather get government assistance than physically go work. Disregarding how expensive childcare is ... just completely disregarding what's going on in their household at all."

Many respondents also suggested that because of the commonly heard misconceptions about the prevalence of food insecurity in North Carolina among mothers, many RDNs are unlikely to

associate the impact of food insecurity with other chronic medical conditions, such as obesity and diabetes.

Other misconceptions reported directly related to the mothers seeking help. One RDN stated,

> *"I think a lot of it [misconceptions] tends to be in relation to the mother herself, like blame as far as either choice or just lifestyle, or any of those things, I think a lot of blame goes more individually when it should be more systematically, why are they even in this type of predicament to be in with."*

Other RDNs discussed the stigmatization of mothers who need help gaining sustainable access to healthy foods and noted,

> *"...people have misconceptions about people, you know "She can't keep a job" or "She doesn't apply herself" or "She has too many children" You know, there's all these stigmas around women who, you know, may not have access to healthy foods in a sustainable way."*

Expanding on the stigmatization of food insecurity, another RDN said, *"But the mothers themselves said to the nurses, "I don't want you to think I'm poor. I don't want you to think I'm a bad person." So somewhere they've been treated badly about their food insecurity."* RDNs recognized that these misconceptions about mothers could be contributing to the lack of help mothers receive from some RDNs in North Carolina.

Policy and Political Barriers

Many RDNs reported their employment as governed by entities that do not always include or consider them when making decisions. Participants expressed that managers and supervisors

who are RDNs regularly endorse their nutrition expertise; however, state or other local politics and policies often overshadow their voices. One RDN provided this example,

> *"And so at a county local level, you know some of our WIC offices are answering to a board of commissioners that are elected officials and have no experience in public health or WIC or just public health in general. And so the decision-making is kind of flawed in there sometimes. And people are making decisions based on reelection."*

In addition to highlighting state and local politics, several RDNs expressed concerns about federal policies governing the food and nutrition assistance programs such as WIC and the Supplemental Nutrition Assistance Program (SNAP). Even though RDNs thought eliminating federal food and nutrition assistance programs was unlikely, they acknowledged how funds for different programs were allocated based on federal government administrations. One RDN explained her experience with the federal government at the beginning of the COVID 19,

> *"A big thing for us during the beginning of this pandemic was eggs and how do we ensure we have access to eggs because we had a requirement prior that eggs were only. I think eggs had to be white and large eggs, and so can we get them extended to brown eggs and working with the Federal Government to allow that."*

Working within local and federal systems to help mothers was cited as a barrier for many RDNs because of the challenges they have to overcome to follow the guidelines.

Opportunities Available to Help Mothers

Opportunities to Collaborate

Recognizing that helping mothers gain sustainable access to healthy foods is a complex issue requiring collaborations from many healthcare disciplines, RDNs discussed these partnerships as ways they can offer mothers more support. One RDN said, *"So working on the*

partnerships is something that I think is really important, and the partnerships with maternity clinic, but also like daycare centers and ... all these different places." Establishing relationships with other practitioners outside of dietetics is viewed as one way to reach more mothers experiencing limited access to healthy foods and help them connect to resources. Highlighting a medical food pantry where she works, one RDN said,

> *"It's a joint project of the hospital and school of medicine. It takes constant education and encouragement for them to continue that. So the only way that'll continue is a dietitian continues ... advocating for it and probably showing some outcomes. You know the best opportunities for these things to happen, like most of the things in community nutrition, is to convince non-dietitians that it's important."*

RDNs explained that having relationships with social workers, nurses, doctors, and health department administrators afford them more significant opportunities beyond their scope of practice to assist mothers needing help gaining sustainable access to healthy foods.

Another opportunity to help discussed frequently by RDNs is training community members to act as peer educators. Some RDNs suggested that using community peer coaching or community health ambassadors could extend the nutrition education component of nutrition programs. Regarding this proposal, one RDN remarked, *"I mean that could be a great way to share information too."* Other opportunities to collaborate RDNs discussed include volunteering and donating at the food banks, helping mothers get to farmer's markets, expanding the reach of mobile pantries, developing mobile WIC offices, and speaking with the community about the far-reaching effects of food insecurity. One RDN expounded on this idea by explaining,

"*They [RDNs] may ... spread the word to other professional organizations about how an expansion of a certain program may have positive unintended consequences for that other organization ... this is a win for this group of people that we both work with."*

Opportunities to Advocate

Almost all RDNs mentioned advocacy for programs and program expansion as an opportunity to help mothers. Endeavoring to be a part of the solution to help mothers, many RDNs reported writing letters to policymakers and supporting action alerts sent out by the Academy. One RDN said,

"*One of the ways is advocacy, whether you're educating your organization that you work in, whether you're collecting data and presenting it to a health department or policy advocacy. There are policy alerts that go out through the Academy of Dietetics; there's policy alerts that go out through your specific work organization,"*

to explain advocating for increased access to healthy foods.

Perceived Needs of RDNs

Need for Support from Leaders

RDNs professed that leaders in the profession supported efforts to make sure RDNs are recognized nutrition experts by advocating for the placement of RDNs in various settings such as hospitals, schools, and primary care offices. One RDN said,

"I do think the Academy of Nutrition and Dietetics, even at our state level, does a good job of trying to carve out roles for dietitians ... I think that they absolutely look at ways for where can we expand this career and show the benefits of a dietitian in all of these [food bank, hospitals, food service domains] settings."

RDNs also felt leaders support ideas to expand existing efforts helping mothers gain sustainable access to healthy foods. However, many RDNs also explained that they often do not receive support from leadership to participate in these activities because, as one RDN noted, *"...productivity is a big thing and we don't do lots of things outside of patient care."*

Many other participants also discussed how employers often do not encourage RDNs to join committees helping mothers with uncertain access to food because it is not direct patient care. One RDN provided this example of volunteering at a food bank,

> *"I know I did work with a couple [of] dietitians at the food pantry ... I know it was a process for them to just get into that food pantry ... They had to go through all these systems and get approval from all these people ... being on a community health coalition would be great, but can you take that time to step away and do that?"*

Additionally, another RDN said,

> *"I think most dietitians are in a place where they could have a role in improving their patients' or clients' access to healthy foods. I think often it would need to come from their leadership to be able to spend their efforts that way with their time with their patients."*

Without support from leadership, some RDNs commented that the only way to help mothers was to volunteer outside work; as one RDN noted,

> *"They [RDNs] are volunteers in the effort if their workplace doesn't support it. I don't mean emotionally doesn't support it but doesn't allocate any time for it. We like to talk about a lot of things that we do off the side of our desk*,"

and another said, *"you do a lot of projects, without necessarily funding behind it, you just - it's just - personal time."* Several other RDNs shared the sentiment that having support from leaders

to incorporate food insecurity activities into their daily workflow would allow them more time to follow through to help mothers gain sustainable access to healthy foods.

Need for Communication Between Practice Areas

Almost all participants described a chasm between RDN practice areas that interferes with communication. Most participants implied that increased communication between RDN practice areas could eliminate this gap. For example, one RDN working in WIC conveyed that community RDNs and RDNs working in pediatric units and maternity wards at local hospitals could form referral relationships to increase the help RDNs can provide to mothers with limited access to healthy foods. One RDN said,

> *"I think that even if they're not in a public health role, if they're in a clinical role, they still have the ability to plan a program at their office, again whether it's having better needs assessments, making sure their clinicians are screening for food access and have resources for proper referrals for those who need it."*

Participants perceived RDNs in community nutrition as leaders at the forefront of helping mothers gain sustainable access to healthy foods. Nevertheless, many felt that RDNs in all practice areas need to be knowledgeable about referring mothers with limited access to healthy foods to providers and services that can help with sustainable food access.

Need of Awareness of Resources

The community readiness assessment score indicated that RDNs are vague about resources to help mothers gain sustainable access to healthy foods. Outside of federal funds available for the WIC program, participants reported that RDNs are not knowledgeable about obtaining funding sources for other efforts or writing grants to help mothers with limited access to healthy foods. When discussing awareness of funding among RDNs, one participant said, *"I mean, you*

have a glimpse but not like a good understanding of ... where the funds come from, how they're distributed." Statements from other participants underscored vague awareness and added that obtaining resources was complex and most often cumbersome. One RDN stated that *"... it takes persistence to be able to find funding,"* and another RDN involved with writing grants noted that among RDNs, *"... as far as grant writing ... I don't want to say that there's no effort, but I can't say there's a great effort either."* According to the CRM, a vague awareness about resources is an indication that RDNs need to know more about this domain to help mothers gain sustainable access to healthy foods.

Discussion

To date, there are three pathways available for students to pursue a career as an RDN.[32] Students can choose to complete a didactic program in dietetics plus a dietetic internship, a coordinated program in dietetics, or the future education model in graduate programs.[219] Current standards for each pathway include required elements related to the physical sciences, life sciences, and social sciences. While none of the key informants discussed the pathway taken to become an RDN, many felt that the education and training RDNs receive emphasize the physical and life sciences and minimize the importance of the social sciences. Many informants perceived food insecurity as an underrecognized social issue that educators should spread throughout the dietetics curriculum. Given that dietetics program directors incorporate few food insecurity concepts throughout the didactic program, internship, and coordinated program, it is possible that RDNs do not believe it is meaningful to prioritize incorporating food insecurity into their daily practices.[220] To increase RDN prioritization of food insecurity, educators could begin to incorporate additional learning activities centered around food insecurity into each pathway to becoming an RDN[220] Educators could use the food

insecurity/food banking supervised practice concentration preceptor guide to introduce the learning activities into the curriculum.[142]

Key informants perceived that misconceptions about the details of programs and efforts could prevent some RDNs from being able to help mothers. Some informants acknowledged that misconceptions about the details might reflect the constant changes being made to programs to accommodate changes in society. For example, as the coronavirus pandemic has continued, many federal nutrition programs are changing their eligibility requirements and policies to accommodate more people.[29] If RDNs are not aware of program changes and instead believe information that is not true, they may miss the opportunity to refer a mother to a program that could help with access to healthy foods.

Additionally, informants described misconceptions among RDNs stigmatizing mothers with uncertain access to foods. These misconceptions may be related to societal views that people experiencing food insecurity are lazy, uneducated, and uninformed about taking care of their health.[221] Misconceptions that result in negative characterizations of mothers experiencing food insecurity may alienate mothers who need help gaining sustainable access to healthy foods.[131,221] This alienation can lead to underreporting of food security status or mothers avoiding medical care altogether to avoid the shame and embarrassment of being unable to follow dietary recommendations made by RDNs[131,221] Thus, to reduce the shame and embarrassment mothers may experience, RDNs could seek to understand the structural and systemic causes at the root of food insecurity.[221] Furthermore, engaging in activities designed to increase empathy, such as the food insecurity experience – living on a limited budget for five days – may motivate RDNs to look for ways to change food systems to decrease food insecurity among mothers[222]

From the passage of the first Agricultural Adjustment Act (also known as the Farm Bill) in 1933[223] to the passage of the most recent American Rescue Plan in 2021,[29] federal nutrition policy and politics continue to inform the response of state government officials to food insecurity.[224] While key informants expressed appreciation that federal nutrition assistance program policies continue to allocate funding to help mothers experiencing food insecurity, they also voiced frustrations related to the influence of the personal political ambitions of some government officials. Informants felt that often elected officials make decisions about state food and nutrition guidelines without input from food and nutrition experts. Many informants conveyed the challenges of working with federal, state, and local policies that do not always reflect the nutrition needs of the people they serve. Informants also expressed frustrations about government funding fluctuations directly impacting RDN services to mothers experiencing food insecurity. For example, many discussed positive changes to nutrition policies introduced in the American Rescue Plan, but remained skeptical about the longevity of such changes.[29]

Despite the barriers key informants described that RDNs face, they also discussed the opportunities they feel positively impact RDNs' ability to help mothers gain sustainable access to healthy foods. Informants believed collaborating with healthcare and non-healthcare professionals afforded RDNs opportunities they would overlook if they only worked with other RDNs.[171] According to the Academy, external collaborations are integral to combating food insecurity and help RDNs successfully develop, lead, and implement strategies to decrease food insecurity among mothers.[139] Additionally, informants voiced the importance of collaborating with members of the communities they aimed to engage by training peer educators. The success of the Expanded Food and Nutrition Education Program (EFNEP) is an example illustrating the

benefits of community collaborations that RDNs can look to for opportunities to work within the community.[225]

Another opportunity described by informants was the ability of RDNs to advocate for programs and services designed to help mothers gain sustainable access to healthy foods. Many informants discussed the convenience of receiving action alerts from the Academy, prompting RDNs to contact local government officials.[226,227] For RDNs desiring an active means of advocating, the North Carolina Academy of Nutrition and Dietetics plans legislative days when RDNs collectively go to state officials to discuss issues and advocate for food policies to ensure mothers have access to healthy foods.[228] Presenting advocacy opportunities to RDNs may empower them to take part in decisions impacting their ability to create sustainable changes for the food security of mothers in North Carolina.

In conjunction with taking advantage of opportunities the Academy provides, informants expressed the need for support from leadership that would allow RDNs to incorporate food insecurity practices into the daily workflow. Informants recognized that instituting evidence-based strategies, such as food insecurity screenings, would take time away from other assigned duties.[171] Therefore, RDNs would need support from leaders to show how implementing these changes could lead to improved health outcomes for mothers with limited access to healthy foods.[171,229]

Key informants reported that many RDNs work as the sole nutrition provider in many healthcare settings. These working conditions naturally create silos that could contribute to the knowledge gap in food insecurity between practice areas[140,141] Food insecurity among mothers presents itself in various practice areas. Thus informants pointed to the need for RDNs to communicate best practices to foster sustainable efforts that help mothers gain sustainable access

to healthy foods.[139] Additionally, increasing communication between practice areas about food insecurity and how to screen for it may help RDNs become more confident in their ability to assess and help mothers with uncertain access to healthy food.[171]

Informants highlighted the need for RDNs to learn more about the resources available to help mothers beyond the funding for federal nutrition assistance programs. Knowing how to secure additional resources to help mothers with uncertain access to healthy food can set precedents that impact legislation. The Food Insecurity Nutrition Incentive (FINI) Grant Program, an incentive program sponsored by the federal government to increase the purchase of fruit and vegetables among SNAP participants, provides an example of how grant funding leads to legislative change.[230,231] As a result of this grant, FINI was included in the 2018 Farm Bill as an entitlement program, guaranteeing its funding through 2023.[230,231] To increase RDN knowledge of the resources available, the Academy could offer a course teaching basic skills related to finding and applying for funding.

Strengths and Limitations

This study provides insight into the barriers, opportunities, and needs of RDNs to help mothers gain sustainable access to healthy foods; however, there are significant limitations to consider. First, we recruited a purposeful sample of RDNs licensed to practice in North Carolina as key informants, limiting the generalizability of the results. Moreover, while key informant interviews are known to yield in-depth perspectives about a specific topic or community, they may not represent the views of the entire community. In order to overcome this shortcoming, we informed recruitment by asking RDNs in a previous study (Williams, unpublished data, 2021) to identify leaders in their professional community that could provide the most information about RDNs helping mothers gain sustainable access to healthy foods. We also sent recruitment

materials to all RDNs in North Carolina who identified as working in community nutrition and encouraged participation by offering a gift card raffle ticket as an incentive. Secondly, informants may have been reluctant to express beliefs they felt differed from the views of other RDNs resulting in social desirability bias. To mitigate biased responses, interviewers reminded informants that interview data would be confidential and that we were not looking for right or wrong answers.

Implications and Future Research

This SWOT analysis provides foundational information that could be useful in the future to plan targeted interventions to increase RDN readiness to help mothers gain sustainable access to healthy foods. Alongside the community readiness score, researchers could use this analysis to initiate conversations among key stakeholders in the RDN community to develop an action plan reflective of the community's readiness to engage. Researchers could convene focus groups and use the SWOT analysis as a tool to combine the readiness analysis data with ideas from the community. Together, this information could inform strategies that are compatible with the needs of RDNs to help mothers with uncertain access to healthy foods in North Carolina. Additionally, conducting follow-up interviews after implementing interventions using the CRM assessment tool could help researchers evaluate the effectiveness of the targeted efforts employed to move the RDNs to the next level of readiness.

Table 4.1. Major interview questions and probes asked of RDNs (n=17) during qualitative interviews.

Dimension	**Major Questions and Probes**
Knowledge of Efforts	1. How many dietitians are aware of the aspects of the efforts to address helping mothers? You may answer none, a few, some, many, or most. • Thinking about what you just said regarding how many dietitians are aware of the aspects of the efforts to address helping mothers, why do you think dietitians have this amount of knowledge of the efforts? 2. Are there misconceptions or incorrect information among dietitians about the current efforts? • What are these misconceptions?
Leadership	1. How much of a priority is helping mothers gain sustainable access to healthy foods to dietetic leadership? • Can you explain why you say this? 2. Does the leadership support expanding efforts among dietitians to address helping mothers gain sustainable access to healthy foods? • If yes: How do they show this support?
Community Climate	1. How much of a concern is helping mothers gain sustainable access to healthy foods among RDNs in NC, with 1 being "not a concern at all" and 10 being "a very great concern"? • Can you tell me why you think it's at that level?
Knowledge of the Issue	1. On a scale of 1 to 10, where a 1 is no knowledge and a 10 is detailed knowledge, how much do dietitians know about helping mothers who may have limited or uncertain access to healthy foods gain sustainable access to healthy foods? • Why do you say it's a <insert number>? 2. What are some misconceptions among dietitians about helping mothers gain sustainable access to healthy foods?
Resources	1. How are current efforts and resources funded? 2. How much effort are dietitians putting into writing grant proposals to obtain funding to address helping mothers gain sustainable access to healthy foods. 3. Are you aware of any proposals or action plans that have been submitted for funding to address helping mothers gain sustainable access to healthy foods?

Table 4.2. Strengths, Weaknesses, Opportunities, and Threats of RDN readiness to help mothers gain sustainable access to healthy foods

Strengths/Assets within RDN Community	**Weaknesses within RDN Community**
1. RDNs are nutrition science experts/more focus on the clinical aspects 2. RDNs are "helpers" 3. A variety of information available on food insecurity 4. High levels of passive support to fund and expand efforts 5. Some active support by leaders to fund and expand efforts 6. Existing efforts available to support mothers	1. Dietetics education/training does not emphasize food access equally with nutrition science/making dietary recommendations 2. RDNs work in silos - don't seek to do things beyond their current scope of practice; little communication between practice areas 3. Available information RDNs can use to help mothers with food insecurity is not always easy to find 4.RDNs do not typically screen for food insecurity - especially in a clinical setting 5.Misconceptions among RDNs about: • the efforts to help • mothers who need help • working in community nutrition 6.Little knowledge about funding and funding acquisition 7. Lack of diversity in profession
Opportunities outside RDN Community	**Threats outside RDN Community**
1. Collaborations with other professionals (not RDNs) working to help mothers 2. Advocacy • Introduce/Support legislation • For RDN positions/positioning within organizations	1. State and Federal policies/funding policies 2. Policymakers (who are not RDNs) 3. Human Resource Policies: • Underpaid positions potentially lead to understaffing

CHAPTER 5: SUMMARY, FUTURE WORK, RESEARCH SIGNIFICANCE, AND CONCLUSIONS

Registered Dietitian Nutritionists' perceptions of helping mothers gain sustainable access to healthy foods

Summary

This study assessed RDN perceptions of helping mothers gain sustainable access to healthy foods and informed participant recruitment for the second study. The results revealed that most RDNs perceive helping mothers gain sustainable access to healthy foods as significant. Even though most RDNs perceive helping mothers experiencing food insecurity as important, nineteen percent of RDNs were not familiar with any efforts in North Carolina that address helping mothers gain sustainable access to healthy foods. These differences are visible across practice areas, with RDNs working in community nutrition being the most familiar with ways to help mothers experiencing food insecurity. Knowing these perceptions is essential because RDNs work in various settings where they may encounter mothers experiencing food insecurity. Thus, RDNs practicing in clinical nutrition, community nutrition, and foodservice should be familiar with ways to help mothers gain sustainable access to healthy foods, as asserted by CDR. Knowing the different ways to assist mothers with food access could help decrease the number of households experiencing food insecurity in North Carolina.

Future Work

The outcomes of this study provide an overview of RDN perceptions of helping mothers gain sustainable access to healthy foods and inform recruitment for the second study. However, this study only explored perceptions and did not test RDN knowledge or assess their readiness in this practice area. Therefore, future investigations should explore educational intervention

studies that teach RDNs how to assist mothers who may experience food insecurity—for example, creating and piloting short online modules. These modules should be convenient to RDNs and address knowledge gaps about the efforts designed to help mothers. Additionally, these modules could contain videos, pre-post measurements to assess knowledge gained, and additional resources for RDNs moving forward. Additionally, to make modules attractive and relevant, they should count as continuing education credits.

Identifying the readiness level of RDNs to help mothers can further facilitate targeted experiential activities that may be incorporated into the didactic curriculum. Researchers could conduct an observational study to examine the relationship between RDN perceptions and their actual practices assisting mothers experiencing food insecurity. For recruiting purposes for the second study, RDNs working in community nutrition were ranked as leaders when it comes to helping mothers in NC gain sustainable access to healthy foods. Therefore, we recruited RDNs practicing in community nutrition to interview as key informants to explore RDN readiness using these results. With this recruitment strategy, the study of the readiness of RDNs to help mothers is informed by whom RDNs perceive as leaders in this practice area, not whom the researchers view as key informants.

A mixed-methods study using the community readiness model to assess registered dietitian nutritionists' readiness to help mothers gain sustainable access to healthy foods

Summary

This study investigated RDN readiness to help mothers gain sustainable access to healthy foods. Using a mixed-method approach, we employed a community readiness assessment tool designed to determine the readiness of a community to address a specific issue through key informant interviews. The tool used in this study is based on the Community Readiness Model and indicated that RDNs have a readiness score of four (scores range from one, no readiness to nine, community ownership). This readiness score is consistent with 'pre-planning,' meaning that some RDNs have heard of local efforts, acknowledge that helping mothers is critical, but have limited knowledge about mothers experiencing food insecurity. During interviews, RDNs shared factors contributing to the current readiness score, including leadership priorities, community climate among RDNs, gaps in knowledge about food insecurity and the efforts to address it, and the lack of resources available to RDNs to help mothers. Previous literature posits that RDNs are uniquely positioned in all practice areas to help eradicate food insecurity based on their education.

Therefore, it is crucial to know how ready RDNs are to help mothers experiencing food insecurity and what is necessary to increase the readiness level of the profession as a whole. Since RDNs may contact mothers experiencing food insecurity as early as their internship, undergraduate curricular revisions may be warranted. In this regard, RDNs need to learn how to implement evidence-based food insecurity screenings in all settings. With food insecurity

screens, RDNs can identify mothers and are more equipped to help mothers access the resources they need to gain sustainable access to healthy foods.

Future Work

This study provides the level of readiness of RDNs and an in-depth analysis of key informant perceptions of RDN readiness to help mothers gain sustainable access to healthy foods. Results from this study could investigate strategies designed to increase RDN readiness to help mothers gain sustainable access to healthy foods. The community readiness model recommends that researchers use the results to conduct an environmental scan to identify strengths, weaknesses, opportunities, and threats to increasing RDN readiness levels. Once gathered, researchers can use this information to develop targeted goals and objectives to move RDNs beyond the pre-planning stage. Additionally, researchers could investigate the effectiveness of RDNs using evidence-based food insecurity screening tools in different areas of practice. For example, they could use the validated two-question screener to identify mothers experiencing food insecurity across all practice areas. Hopefully, RDNs will provide mothers with resources and referrals to help them gain sustainable access to healthy foods.

A qualitative exploration of the barriers, opportunities, and needs of RDNs to help mothers gain sustainable access to healthy foods

Summary

This study analyzed the strengths, weaknesses, opportunities, and threats (SWOT) related to RDNs helping mothers gain sustainable access to healthy foods. This component of the CRM examined the emergent themes of barriers influencing the ability of RDNs to help mothers, opportunities available to help, and the perceived needs of RDNs to assist mothers experiencing food insecurity. The SWOT analysis captured key informants' perceptions regarding positive and negative factors inside and outside the community that RDNs could use to guide strategies to increase the level of readiness. Even though investigators did not directly inquire, key informants described obstacles impacting how RDNs help mothers access healthy foods. For example, some key informants characterized undergraduate education as heavily focused on clinical nutrition, often neglecting social issues such as food insecurity. Given key informant perceptions of the undergraduate curriculum, didactic programs should seek ways to incorporate food insecurity experiential learning activities into the curriculum.

Additionally, key informants expressed a need for leaders to support and facilitate RDN participation in the programs, activities, and efforts designed to help mothers. Even though they discussed barriers and needs, key informants also expressed appreciation for the current opportunities to help eradicate food insecurity among mothers. Key informants listed advocacy and collaboration as positive interactions to help mothers gain sustainable access to healthy foods.

Future Work

In this study, key informants communicated their perceptions of the strengths, weaknesses, opportunities, and threats regarding RDNs helping mothers gain sustainable access to healthy foods. Researchers could assemble focus groups of RDNs from different practice areas in the future. Researchers could present RDNs with the information gathered from these studies and have participants build on the SWOT analysis, set goals, and develop objectives. Ideally, intervention targeted strategies to increase RDN readiness to help mothers gain sustainable access to healthy foods would emerge from the focus groups. Based on the key informant interviews, one strategy that may come to light is the need to implement better communication channels between practices by developing a streamlined referral network and process. Following the implementation of these strategies alongside other interventions, researchers could reassess community readiness.

Additionally, as the route to becoming an RDN evolves and changes, investigators could partner with didactic program directors and nutrition education experts to find ways to incorporate food security concepts into the curriculum. Using both quantitative and qualitative assessments of students and educators, researchers could make recommendations to the Accreditation Council for Education in Nutrition and Dietetics (ACEND) to find innovative ways to teach upcoming RDNs about helping people experiencing food insecurity.

Research significance & general conclusions

This dissertation entitled, *"Healthy Foods Access: An Assessment of Registered Dietitian Nutritionists' Perceptions and Readiness to Help Mothers Gain Sustainable Access to Healthy Foods,"* fills a gap in the literature related to RDN perspectives and readiness to help mothers experiencing food insecurity. In three manuscripts consisting of qualitative, quantitative, and mixed methods explorations, researchers determined RDN perspectives of helping mothers experiencing food insecurity and their level of readiness. Additionally, key informant interviews revealed barriers and opportunities RDNs face helping mothers and what is needed to help them continue to do this work. Overall, there were two significant outcomes of this dissertation research: (1) A community readiness score with targeted recommendations for RDNs to move to the next readiness level and (2) a SWOT analysis which provides a framework for developing intervention strategies that are practical and relevant to RDNs.

Readiness Score

The Community Readiness Model employed in this research resulted in a readiness score of four, indicating that RDNs are in the 'pre-planning' stage of readiness when it comes to helping mothers gain sustainable access to healthy foods. A readiness score of four necessitates that RDNs know and understand more about the programs, efforts, and activities available that help mothers experiencing food insecurity. It also suggests that RDNs and leaders among RDNs need to learn more about helping mothers gain access to healthy foods in general. Furthermore, this score reveals a lack of knowledge of the resources that RDNs could use to foster efforts to help mothers. Results from studies one and two signal that RDNs do not learn enough about programs, efforts, and activities related to helping mothers gain sustainable access to healthy foods during their undergraduate education. Given this, didactic programs in dietetics need to

incorporate food security concepts into the undergraduate curriculum through the dietetic internship. Learning about food security and how it impacts a mother's ability to follow prescribed diets, provide food for the household, and secure sustainable access to foods are important concepts critical in many practice areas of RDNs. In addition to learning these concepts, internships should also incorporate concepts about food security into each required hands-on rotation. Introducing these concepts to students early in their education would prepare RDNs to provide mothers experiencing food insecurity with practical recommendations and relevant nutrition education. Furthermore, using these tactics would involve RDNs currently working as directors, educators, and preceptors, potentially increasing the readiness levels of practicing RDNs.

SWOT Analysis

The SWOT analysis describes the factors that RDNs should consider when developing a plan to increase their level of readiness to help mothers gain sustainable access to healthy foods. Providing this information to RDNs before designing interventions for a higher score ensures that everyone is working from the same data. Considering the factors that may prohibit or drive change among RDN practices will allow for developing targeted strategies to increase the readiness score. Future research can include the SWOT analysis into a broader environmental scan that includes local data and community ideas that can help increase RDN readiness to help mothers gain sustainable access to healthy foods.

In summary, this dissertation provides a baseline readiness level of RDNs to help mothers gain sustainable access to healthy foods. It is a step toward a better understanding of how RDNs perceive their role in helping mothers gain sustainable access to healthy foods. The dissertation study also signifies that educators include more food security concepts and experiential learning

objectives throughout the didactic curricula and internship. By making these changes, it is hopeful that RDNs can eventually move from the 'pre-planning' level of readiness (equivalent to a score of four) to the 'community ownership' level of readiness (equivalent to a score of nine).

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APPENDICES

Appendix A: Study 1, Phase 1 Recruitment Materials

Email Recruitment

Subject: NC State is Seeking **Nutrition Experts**

Dear <insert name>,

My name is Latasha Williams and I am a PhD student at North Carolina State University. I am writing to invite you to participate in a research study about registered dietitian/nutritionists (RDNs) helping mothers gain sustainable access to healthy foods. Currently, I am in the process of developing an online survey to assess RDN perceptions of helping mothers who lack or have uncertain access to healthy foods.

In an effort to ensure the survey is measuring what it is designed to measure, I need input from nutrition experts like you.

The entire process should take up to 90 minutes of your time. If you would like to provide your valuable input, you will be asked to participate in a recorded interview via Zoom.

If you are willing, please click on this link <insert link> to view the consent form and provide your best contact information.

I appreciate your help. Please feel free to share this email with other RDNs you think would be interesting in assisting me with this research.

Kind regards,
Latasha Williams

Latasha Williams, MS, RDN
PhD candidate in Nutrition Sciences
North Carolina State University

Electronic Information Sheet: (administered online via Qualtrics)

1. Are you currently a registered dietitian/nutritionist? [If the answer is "no," the participant will be thanked for their time and the survey will end; If the answer is "yes," the participant will proceed to #2.]

2. Participant Name (First and Last)

3. Are you available for an interview?

4. Please select your preferred interview date(s) and time(s)? (Please include weekend availability).

    - <insert option #1>
    - <insert option #2>
    - <insert option #3>
    - <insert "other" option> (provide place for participant to insert an additional option)

5. Preferred email address for interview scheduling and confirmation?

Telephone Recruitment

Hello <insert name>

My name is Latasha Williams and I am a PhD student at North Carolina State University. I am calling to invite you to participate in a research study about registered dietitian/nutritionists (RDNs) helping mothers gain sustainable access to healthy foods. Currently, I am in the process of developing an online survey to assess RDN perceptions of helping mothers who lack or have uncertain access to healthy foods.

In an effort to ensure the survey is measuring what it is designed to measure, I need input from nutrition experts like you.

The entire process should take up to 90 minutes of your time. If you would like to provide your valuable input, you will be asked to participate in a recorded interview via Zoom. Are you interested in helping me with this survey?

- **Yes** – Great! Let's go ahead and schedule your interview now and once we have that on the calendar I will ask you for your email address so that I can provide you the link to the consent form.*
- **No** – Ok! Do you know of any RDNs who might be interested in participating in this study? [End call here]

*Schedule interview and email the link to the consent form.

Prior to your interview, I ask that you read and provide your consent online to participate in the study. We will send an email to remind you about your interview beforehand.

Thank you again for agreeing to be in this study. Have a nice day!

[Participant will be sent link from Zoom with the meeting details]

Email Scheduling (for participants recruited via email)

Subject: RDNs helping mothers with healthy foods

Hello <insert name>,

Thank you for agreeing to help me to develop a survey assessing RDN perceptions of helping mothers gain access to healthy foods. I am writing to schedule a recorded interview with you via Zoom.

In an effort to make this convenient for you please respond to this email with at least 3 days and times you will be available for an interview (please include weekend days if you prefer). Once I have received your preferences, I will send you an invitation to join the Zoom meeting. You will also receive a reminder email prior to the scheduled interview.

If you have any questions or would rather schedule this interview over the phone, please feel free to contact me at 919-327-0219.

I appreciate your time and I am looking forward to talking with you.

Kind regards,
Latasha Williams, MS, RDN/LDN

Email Confirmation of Interview

Subject: RDNs helping mothers with healthy foods

Hello <insert name>,

Thank you again for agreeing to take part in my research study assessing RDN perceptions of helping mothers gain sustainable access to healthy foods.

Your interview has been scheduled as follows:
<insert interview day>
<insert interview time>

On the day of your interview, please connect to Zoom using the following information:
<insert Zoom connection information>

If you have any questions or concerns regarding the information included in this email, please do not hesitate to contact me by responding to this message.

I appreciate your time and look forward to talking to you.

Kind regards,
Latasha Williams, MS, RDN/LDN

Email Interview Reminder

Subject: RDNs helping mothers with healthy foods

Hello <insert name>,

I appreciate your willingness to participate in my study assessing RDN perceptions of helping mothers gain sustainable access to healthy foods. This is an email to remind you of our scheduled interview to be held on <insert date> at <insert time>.

On the day of the interview, you will be able to connect to our Zoom meeting at:
<insert Zoom information>

Please let me know if you have any questions or concerns. I am looking forward to having you contribute to our study.

Kind regards,
Latasha Williams, MS, RDN/LDN

Recruitment Email Follow-up

Subject: NC State is Seeking **Nutrition Experts**

Dear <insert name>,

My name is Latasha Williams and I am a PhD student at North Carolina State University. I am writing to follow up with you about participating in a research study about registered dietitian/nutritionists (RDNs) helping mothers gain sustainable access to healthy foods. Currently, I am in the process of developing an online survey to assess RDN perceptions of helping mothers who lack or have uncertain access to healthy foods.

In an effort to ensure the survey is measuring what it is designed to measure, I need input from nutrition experts like you.

The entire process should take up to 90 minutes of your time. If you would like to provide your valuable input, you will be asked to participate in a recorded interview via Zoom.

If you are willing, please click on this link <insert link> to view the consent form and provide your best contact information.

I appreciate your help. Please feel free to share this email with other RDNs you think would be interesting in assisting me with this research.

Kind regards,
Latasha Williams

Latasha Williams, MS, RDN
PhD candidate in Nutrition Sciences
North Carolina State University

Appendix B: Study 1, Phase 1 Informed Consent Form

Adult Consent Form:
Pilot Study

Title of Study: Healthy Foods Access: Registered Dietitian Nutritionists' (RDNs) perceptions of helping mothers gain sustainable access to healthy foods **(eIRB # 20930)**
Principal Investigator(s): Latasha Williams, ldwilli4@ncsu.edu, and 919-327-0219
Funding Source: None
Faculty Point of Contact: Dr. Suzie Goodell, lsgoodell@ncsu.edu, and 919-513-2632

What are some general things you should know about research studies?
You are invited to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate, and to stop participating at any time without penalty. The purpose of this research study is to gain a better understanding of RDNs perceptions of helping mothers who have limited or uncertain access to healthy foods. We will do this through an online survey.

You are not guaranteed any personal benefits from being in this study. Research studies also may pose risks to those who participate. You may want to participate in this research because the information gathered may positively impact how RDNs help people gain access to healthy foods. You may not want to participate in this research because while the information you provide may benefit the overall practice of RDNs, there is no direct benefit to you.

Specific details about the research in which you are invited to participate are contained below. If you do not understand something in this form, please ask the researcher for clarification or more information. A copy of this consent form will be available for you to download for your records. If, at any time, you have questions about your participation in this research, do not hesitate to contact the researcher(s) named above or the NC State IRB office. The IRB office's contact information is listed in the *What if you have questions about your rights as a research participant?* section of this form.

What is the purpose of this study?
The purpose of the study is to develop and validate an online survey that assesses Registered Dietitian Nutritionists' (RDNs) perceptions of helping mothers gain sustainable access to healthy foods. Before distributing the survey to a statewide sample of RDNs, we would like to get feedback from RDNs for editing purposes.

Am I eligible to be a participant in this study?
There will be approximately 10-15 participants in this study.

In order to be a participant in this study, you must agree to be in the study and be a registered dietitian nutritionist. You cannot participate in this study if you do not meet the inclusion criteria.

What will happen if you take part in the study?

If you agree to participate in this study, you will be asked to do all of the following:

1. Provide consent to participate using an online form. After providing consent, you will be automatically forwarded to an electronic contact form.
2. On the electronic contact form, we will ask you to select interview times and provide an email address where you can be reached for any additional scheduling needs. We will also use this contact information to confirm your interview date and time. (We expect the online consent process and interview scheduling to take about 5-10 minutes)
3. Once the interview is scheduled, we will contact you at the appointed time to conduct the interview. Prior to beginning the interview questions, we will review the consent form and ask you to provide verbal consent to have the Zoom meeting recorded (this includes video and audio).
4. During the interview you will be asked to answer survey questions about RDN perceptions of helping mothers gain sustainable access to healthy foods and answer questions related to the survey items. We expect the interview to last approximately 60-80 minutes.

The total amount of time that you will be participating in this study is 65-90 minutes.

Recording and images

If you want to participate in this research, you must agree to be video recorded. If you do not agree to be video recorded, you cannot participate in this research.

Risks and benefits

There are minimal risks associated with participation in this research.

There are no direct benefits for your participation in the research. The indirect benefits include facilitating the validation of a survey instrument which may be used to positively impact how RDNs help mothers gain sustainable access to healthy foods.

Right to withdraw your participation

You can stop participating in this study at any time for any reason. In order to stop your participation, please contact Latasha Williams at ldwilli4@ncsu.edu or 919-327-0219 or you can contact Dr. Suzie Goodell at lsgoodell@ncsu.edu or 919-513-2632. If you choose to withdraw your consent and to stop participating in this research, you can expect that the researcher(s) will redact your de-identified information from their data set, securely destroy your data, and prevent future uses of your de-identified information for research purposes wherever possible. This is possible in some, but not all, cases.

Confidentiality, personal privacy, and data management

Trust is the foundation of the participant/researcher relationship. Much of that principle of trust is tied to keeping your information private and in the manner that we have described to you in

this form. The information that you share with us will be held in confidence to the fullest extent allowed by law.

Protecting your privacy as related to this research is of utmost importance to us. However, there are very rare circumstances related to confidentiality where we may have to share information about you. Your information collected in this research study could be reviewed by representatives of the University, research sponsors, or government agencies (for example, the FDA) for purposes such as quality control or safety. In other cases, we must report instances where imminent harm could come to you or others.

How we manage, protect, and share your data are the principal ways that we protect your personal privacy. Data that will be shared with others about you will be de-identified.

> **De-identified**. De-identified data is information that at one time could directly identify you, but that we have recorded this data so that your identity is separated from the data. We do have a master list with your code and real name that connects your information to the research data. When the research concludes, there will be no way your real identity will be linked to the data we publish.

To help maximize the benefits of your participation in this project, by further contributing to science and our community, your de-identified information will be stored for future research and may be shared with other people without additional consent from you.

Compensation
For your participation in this study, you will not receive compensation.

What if you are an NCSU employee?
Your participation in this study is not a requirement of your employment at NCSU, and your participation or lack thereof, will not affect your job.

What if you have questions about this study?

If you have questions at any time about the study itself or the procedures implemented in this study, you may contact the researcher, Latasha Williams at ldwilli4@ncsu.edu or 919-327-0219 or you can contact Dr. Suzie Goodell at lsgoodell@ncsu.edu or 919-513-2632.

What if you have questions about your rights as a research participant?
If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact the NC State IRB (Institutional Review Board) Office. An IRB office helps participants if they have any issues regarding research activities. You can contact the NC State IRB Office via email at irb-director@ncsu.edu or via phone at (919) 515-8754.

Consent To Participate

By selecting “I consent to research” below, I am affirming that I have read and understand the above information. All of the questions that I had about this research have been answered. I have chosen to participate in this study with the understanding that I may stop participating at any time without penalty or loss of benefits to which I am otherwise entitled. I am aware that I may revoke my consent at any time.

I consent to research <insert Qualtrics button>

I do not consent to research <insert Qualtrics button>

Appendix C: Study 1, Phase 1 Cognitive Interview Guide

Thank you for agreeing to help us edit our survey. The purpose of the current study is to develop an online survey assessing the perceived knowledge of Registered Dietitian/Nutritionists (RDNs) helping mothers gain sustainable access to healthy foods. This study will also be used to identify who RDNs view as leaders and key informants in the field of dietetics. Before administering the survey to a statewide sample of RDNs, we want to hear your opinion about the wording of the statements on the survey in an effort to determine if we are asking questions in the best way possible.

In order to make sure we capture everything that is being said accurately, I would like to video record this interview. Do you mind if I record the video for this interview session?

[If they respond "Yes"]: Thank you! **[Start recording here]** It's on and you are now being recorded.

[If they respond "No"]: If I am unable to record you I am afraid that we cannot move forward with the interview, but I appreciate your time and willingness to be interviewed. Thank you. **[End interview here]**

Before we begin, we will review the consent form you completed online. Did you have the option to download that?

[If they respond "Yes"]: Great, I am going to put the consent information on the screen and we will review it together. **[Share the consent information on the screen]**

[If they respond "No"]: Ok, I am going to provide you with the link to download it. **[Provide participant with the link to download the consent form]** In the meantime, I am going to share the consent form on the screen and we will review it together. **[Share the consent form on the screen]**

Let's take a few minutes to make sure you understand each part of the consent form. Do you have any questions?

What are some general things you should know about research studies?

You are invited to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate, and to stop participating at any time without penalty.

You are not guaranteed any personal benefits from being in this study. You may want to participate in this research because the information gathered may positively impact how RDNs help people gain access to healthy foods. You may not want to participate in this research because while the information you provide may benefit the overall practice of RDNs, there is no direct benefit to you.

What is the purpose of this study?
The purpose of the study is to develop and validate an online survey that assesses Registered Dietitian Nutritionists' (RDNs) perceptions of helping mothers gain sustainable access to healthy foods. Before distributing the survey to a statewide sample of RDNs, we would like your feedback from RDNs for editing purposes.

Risks and benefits

There are minimal risks associated with participation in this research.

There are no direct benefits for your participation in the research.

Right to withdraw your participation

You can stop participating in this study at any time for any reason. If you choose to withdraw your consent and to stop participating in this research, we will redact your information from their data set, securely destroy your data, and prevent future uses of your information for research purposes wherever possible. This is possible in some, but not all, cases.

Confidentiality, personal privacy, and data management

The information that you share with us will be held in confidence to the fullest extent allowed by law.

Protecting your privacy as related to this research is of utmost importance to us. However, there are very rare circumstances related to confidentiality where we may have to share information about you. Your information collected in this research study could be reviewed by representatives of the University, research sponsors, or government agencies (for example, the FDA) for purposes such as quality control or safety. In other cases, we must report instances where imminent harm could come to you or others.

Data that will be shared with others about you will be de-identified. De-identified data is information that at one time could directly identify you, but that we have recorded this data so that your identity is separated from the data. We do have a master list with your code and real name that connects your information to the research data. When the research concludes, there will be no way your real identity will be linked to the data we publish.

To help maximize the benefits of your participation in this project, by further contributing to science and our community, your de-identified information will be stored for future research and may be shared with other people without additional consent from you.

Compensation
For your participation in this study, you will not receive compensation.

What if you have questions about this study?

If you have questions at any time about the study itself or the procedures implemented in this study, you may contact me, Latasha Williams at ldwilli4@ncsu.edu or 919-327-0219 or you can contact Dr. Suzie Goodell at lsgoodell@ncsu.edu or 919-513-2632.

What if you have questions about your rights as a research participant?
If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact the NC State IRB (Institutional Review Board) Office. An IRB office helps participants if they have any issues regarding research activities. You can contact the NC State IRB Office via email at irb-director@ncsu.edu or via phone at (919) 515-8754.

Consent to Participate
If you agree to participate, please read the following statement that appears on the screen to provide your verbal consent to be a part of this study:

> *"I have read and understand the information provided in the consent form. I have been given a chance to download and print this form to retain for my records. I give my verbal consent to participate in this study with the understanding that I may choose not to participate or to stop participating at any time without penalty or loss of benefits to which I am otherwise entitled."*

[Stop sharing screen]: Thank you for bearing with me on that. Now, in an effort to protect your identity, I am going to ask that you provide a pseudonym or make up a name for yourself. What name would you like for me to call you?

Ok, **[Insert Pseudonym]**, just as I would like to protect your identity, I would also like to protect the identities of any third parties you may want to include in any of your responses. In that regard, I ask that if your responses involve using others to clarify your answer, you do not use their real name. Instead you can refer to them as client, student, colleague, etc.

Do you have any questions?

***[If they respond "Yes"]**: Answer any questions they may have.
***[If they respond "No"]**: Move on to the next section

Great – let's move on. During this interview, I am going to ask you questions about your thoughts on the survey statements and questions. Remember, to give your honest opinion as your expertise is important in editing this survey. In addition to recording the audio, I will also take some notes so if I pause, please do not be alarmed as I may be writing down what you say.

When this survey is distributed to RDNs, it will be delivered in an online format. With that in mind, I will be using the software during this interview that RDNs will be using to take the final survey. I am going to share my screen with you again **[Share screen with interviewee]**.

To get an idea of the population completing the survey, we will start by asking several demographic questions. After reviewing the demographic questions, I will display the instructions for each section that follows and then move on to the survey items in that section. You will be asked to read each item for yourself and asked to provide an answer. Once you have finished reading the item and answering it, I will ask you questions about your answer and what you read.

The first section is composed of demographic questions. I will display each question for you and record your response.

Demographic Questions:

1. How long have you been an RDN?
    - ☐ <1 year
    - ☐ 1-5 years
    - ☐ 6-10 years
    - ☐ 11-15
    - ☐ >15 years
2. Are you of Hispanic, Latino, or Spanish origin?
    - ☐ Yes
    - ☐ No
3. How would you describe yourself? (check all that apply)
    - ☐ American Indian or Alaska Native
    - ☐ Asian
    - ☐ Black or African American
    - ☐ Native Hawaiian or Other Pacific Islander
    - ☐ White
    - ☐ Other:_____
    - ☐ Prefer not to answer
4. How do you identify yourself?
    - ☐ Woman
    - ☐ Man
    - ☐ Other:_____
    - ☐ Prefer not to answer
5. What is your primary area of practice?
    - ☐ Clinical Nutrition
    - ☐ Food Service Management
    - ☐ Community Nutrition
    - ☐ Education
    - ☐ Research
    - ☐ Administration
    - ☐ Retired
    - ☐ Other:_____
6. What is the primary setting of your practice?
    - ☐ Urban
    - ☐ Suburban

- ☐ Rural
- ☐ Other:_____

- What changes, if any, do you think we should make to these demographic questions?

- Are there any demographic questions you think should be added?

- Are there any demographic questions you think should be removed?

Now let's move on to the instructions for the opening survey statement. Please read the instructions to yourself. (**"This is a survey about helping mothers with limited or uncertain access to healthy foods. For the following statement, please indicate the level of importance to you by clicking on one of 6 options, ranging from Not Important at All to Very Important.")**

- Can you tell me in your own words what the directions tell you to do?

- What changes, if any, do you think we should make to these directions?

Next, I am going to display the opening survey question on the screen. Please read the statement to yourself and share your answer with me.

1. **How important is helping mothers gain sustainable access to healthy foods to you?**

    - Participant's level of importance:

    - How did you arrive at choosing your answer?

    - Describe what this statement means to you in your own words.

    - What would it take for you to say that **helping mothers gain sustainable access to healthy foods is important to you**.

    - When you read **"healthy foods,"** what do you think of?

    - What, to you, does it mean to you to **"help mothers gain sustainable access"**?

    - If you were to change this question, what edits would you make?

Now, we are going to move on to the next section and just as I did previously, I will first display the directions, ask you to read them for yourself, and ask you some questions. **[Display the directions for the next section] ("For the following statements, please indicate your level of agreement by choosing one of 6 options, ranging from Strongly Agree to Strongly Disagree.")**

- Can you describe to me in your own words what these directions tell you to do?
- What changes, if any, would you make to these directions?

Next, I am going to display each of the statements in this section. For each statement I ask that you read it to yourself and share your answer with me.

1. **A mother's income level determines her ability to sustain access to healthy foods.**
    - Participant's level of agreement:
    - What thought process did you use to come to that answer?
    - What is the intent of this statement?
    - When you read **"a mother's income level,"** what do you think of?
    - What does **"determines"** mean to you?
    - What does **"ability to sustain access"** mean to you?
    - If you were to change this statement, what edits would you make?

---

2. **A lack of sustainable access to healthy foods interferes with a mother's capacity to care for others.**
    - Participant's level of agreement:
    - How did you decide on that answer?
    - What idea is this statement exploring?
    - When you read **"lack of sustainable access,"** what do you think of?
    - What, to you does it mean to **"have the capacity to care for others"**?
    - If you were to change this statement, what edits would you make?

---

3. **The percent of mothers living in North Carolina who lack sustainable access to healthy foods is lower than in most other states.**
    - Participants level of agreement:

- What thought process did you use to come to that answer?
- Describe what this statement means in your own words.
- When you read **"percent of mothers,"** what do you think of?
- If you were to make changes to this statement, what edits would you make?

---

4. **When a mother lacks sustainable access to healthy foods, no one else is affected.**
    - Participant's level of agreement:
    - How did you arrive at choosing your answer?
    - What idea is this statement exploring?
    - When you read **"no one else,"** who do you think of?
    - What to you does it mean to you to be **"affected"**?
    - If you were to change this statement, what edits would you make?

---

5. **Federal Nutrition Assistance Programs adequately help mothers gain sustainable access to healthy foods.**
    - Participant's level of agreement:
    - What thought process did you use to come to that answer?
    - When you read **"Federal Nutrition Assistance programs,"** what do you think of?
    - What does "**adequately help mothers"** mean to you?
    - If you were to change this statement, what edits would you make?

Now we will move on to the second section of the survey. The second section asks questions about knowledge of the programs, activities, and services in North Carolina that address helping mothers.

First, I am going to display the directions for this section and then ask you a few questions. **[Display directions on shared screen]. ("The following questions address your knowledge**

of programs, activities, and services in North Carolina that address helping mothers. Please answer each question based on your current knowledge.")

- Can you describe to me in your own words what these directions tell you to do?
- What changes, if any, would you make to these directions?

Now, I am going to display the questions in this section. For each question, I ask that you read it to yourself and share your answer with me.

6. **Do you know of any programs, activities, or services in North Carolina that address helping mothers gain sustainable access to healthy foods?**
    - Participant's answer:
    - What is the intent of this statement?
    - When you read **"programs,"** what do you think of?
    - When you read **"activities,"** what do you think of?
    - When you read **"services,"** what do you think of?
    - If you were to change this question, what edits would you make?

*Optional if participant answers **"No"**.

Are you aware of anyone who is trying to get something started to address helping mothers gain sustainable access to healthy foods?

- Participant's answer:
- What idea is this question exploring?
- When you read, **"are you aware,"** what do you think of?
- What does **"get something started"** mean to you?
- If you were to change this question, what edits would you make?

---

7. **About how many programs, activities, or services that address helping mothers gain sustainable access to healthy foods can you identify/name?**

    Please enter a number:_____
    - Participant's answer:

- How did you arrive at that answer?
- When you read **"about how many,"** what do you think of?
- What does it mean to **"address helping mothers,"** mean to you?
- What does **"identify/name"** mean to you?
- If you were to change this question, what edits would you make?

---

8. **Which of the following ways did you gain your primary knowledge about the programs, activities, or services that address helping mothers gain sustainable access to healthy foods?**
    - Participant's answer:
    - In your own words, tell me what this question is asking you.
    - What is the intent of this question?
    - When you read **"gain your primary knowledge,"** what do you think of?
    - Are there any other answer choices that you would like to see on the list?
    - If you were to change this question, what edits would you make?

---

9. **Are you familiar with any misconceptions or incorrect information among RDNs in North Carolina about helping mothers gain sustainable access to healthy foods?**
    - Participant's answer:
    - How did you arrive at choosing your answer?
    - What idea is this question exploring?
    - What does it mean to be **"familiar"**?
    - When you read **"misconceptions,"** what do you think of?
    - When you read **"incorrect information,"** what do you think of?
    - If you were to change this question, what edits would you make?

*If the participant says **"Yes,"** ask question #10

*If the participant says **"No,"** skip to question #11

---

10. **Please list any misconceptions or incorrect information you are familiar with among RDNs in North Carolina about helping mothers gain sustainable access to healthy foods.** To protect the privacy of yourself and others, please speak from your own experience and, if/when you speak about others, refer to them by role (e.g. "mother," "client," "colleague," etc. not by their name.)

    - Participant's answer:
    - What is the intention of this directive?
    - What thoughts come to mind when you read **"Please list"**?
    - What does **"among RDNs"** mean to you?
    - If you were to change this directive, what edits would you make?

Let's move on to the next section. I am going to display the directions for this section and then ask you a few questions. **[Display directions on shared screen]. ("For the following, please indicate the level of frequency you associate with each statement by choosing one of 5 options, ranging from Never to Always.")**

- Can you describe to me in your own words what these directions tell you to do?
- What changes, if any, would you make to these directions?

Now, I am going to display the questions in this section. For each question, I ask that you read it to yourself and share your answer with me.

11. **Helping mothers gain access to healthy sustainable foods is outside my scope of practice.**

    - Participant's level of frequency:
    - How did you arrive at choosing your answer?
    - Describe what this statement means in your own words?
    - What, to you, is **"helping"**?
    - When you read **"outside my scope of practice,"** what do you think of?

- If you were to change the statement, what edits would you make?

---

12. **A mother with a low body mass index should be assessed for her ability to sustain access to healthy foods.**

    - Participant's level of frequency:
    - How did you arrive at choosing your answer?
    - What idea is this statement exploring?
    - What, to you, is **"low body mass index"**?
    - When you read **"should be assessed,"** what do you think of?
    - Describe how you would know if **"a mother has a low body mass index"?**
    - If you were to change the statement, what edits would you make?

---

13. **Screening mothers using evidence-based tools is necessary to determine if she lacks sustainable access to healthy foods.**

    - Participant's level of frequency:
    - What thought process did you use to come to that answer?
    - Describe what this statement means in your own words?
    - What does **"screening mothers,"** mean to you?
    - When you read **"evidence-based tools,"** what do you think of?
    - What does **"necessary"** mean to you?
    - If you were to make edits to this statement, what would you change?

---

14. **Collaborating with other professionals who help mothers gain sustainable access to healthy foods interferes with my ability to help.**

    - Participant's level of frequency:

- What is the intent of this question?
- What thought process did you use to come to that answer?
- When you read **"collaborating with other professionals,"** what do you think of?
- What, to you, are **"other professionals who help"**?
- If you were to change this statement, what edits would you make?

---

15. **A mother with a high body mass index should be assessed for her ability to sustain access to healthy foods.**
    - Participant's level of frequency:
    - How did you arrive at choosing your answer?
    - What idea is this statement exploring?
    - What, to you, is **"high body mass index"**?
    - Describe how you would know when **"a mother has a high body mass index."**
    - What, to you, is **"ability"**?
    - If you were to change the statement, what edits would you make?

---

16. **I support expanding programs, activities, and other services that help mothers gain sustainable access to healthy foods.**
    - Participant's level of frequency:
    - How did you decide on that answer?
    - What idea is this statement exploring?
    - Describe how you would know if you **"support expanding programs, activities, and other services that help mothers"**?
    - What, to you, is **"support"**?
    - When you read **"support expanding programs, activities, and other services,"** what do you think of?

- If you were to change this question, what edits would you make?

The next statement requires you to rank a list of RDNs. I will display the statement, ask you to read it to yourself, and ask you some questions. **[Display statement on the screen]**

17. **Please rank the following RDN positions as leaders in helping mothers gain sustainable access to healthy foods. (Your highest ranking should be at the top and your lowest at the bottom)**

    - Participant's answer:
    - Describe what this statement means in your own words.
    - What is the intent of this question?
    - When you read **"RDN positions as leaders,"** what do you think of?
    - What, to you, is a **"leader"**?
    - If you were to change the question, what edits would you make?

Okay, we have one last section to go. The instructions for this section are the same as the first section we discussed. I will display them again for you now. **[Display the directions for the next section] ("For the following statements, please indicate your level of agreement by choosing one of 6 options, ranging from Strongly Agree to Strongly Disagree.")**

---

18. **RDN leaders encourage RDN participation in programs, activities, and other services that help mothers gain sustainable access to healthy foods.**

    - Participant's level of agreement:
    - What thought process did you use to come to that answer?
    - What idea is this question exploring?
    - What does **"encourage"** mean to you?
    - When you read **"encourage RDN participation,"** what do you think of?
    - Describe how you would know if **"RDN leaders encourage RDN participation"**?

- If you were to change this question, what edits would you make?

---

19. **RDN leaders are too busy to serve as advocates for mothers who lack sustainable access to healthy foods.**

    - Participant's level of agreement:
    - How did you arrive at that answer?
    - Describe this statement in your own words.
    - When you read **"too busy,"** what do you think of?
    - What to you does it mean **"to serve as advocates"**?
    - When you read **"advocates,"** what do you think of?
    - If you were to change this question, what edits would you make?

---

20. **RDN leaders provide opportunities for RDNs to learn about helping mothers who lack sustainable access to healthy foods.**

    - Participant's level of agreement:
    - How did you decide on that answer?
    - What idea is this statement exploring?
    - Describe how you would know if "**RDN leaders provide opportunities for RDNs to learn.**"
    - When you read **"opportunities for RDNs to learn,"** what do you think of?
    - If you were to change this question, what edits would you make?

---

21. **RDN leaders support expanding programs, activities, and other services helping mothers.**

    - Participant's level of agreement:
    - Describe this statement in your own words.

- What is the intent of this statement?
- Describe how you would know if **"RDN leaders support expanding programs, activities, and other services."**
- When you read **"RDN leaders support,"** what do you think of?
- If you were to make changes to this statement, what edits would you make?

Do you have any other suggestions for additional items related to the scope of this survey?

Thank you for taking the time to share your thoughts. Now that the interview is over, I would like to talk to you about sending the information about this study to other registered dietitian nutritionists you might know. Basically, I would ask you to send them information about participating in the interview you just completed. Or if you like, you could provide me with the names, email addresses, and/or phone number of people you think might be interested and I can contact them directly. If you don't want to do this, you do not have to. Would you be interested in helping us identify additional people to interview?

i. **"Yes"** – Okay, is it better for me to send you an email for you to forward to them or for me to send it directly to them myself?
ii. **"No" –** Alright – not a problem!

If you do decide to get people you know to participate, I ask that you do not share any of the information we discussed today.

Thank you again for your valuable input and have a great day.

Appendix D: Study 1, Phase 2 Recruitment Materials

Email Recruitment

Subject: NC State needs your Nutrition Expertise!

Hello Nutrition Expert,

My name is Latasha Williams and I am a PhD candidate at NC State University under the guidance of Dr. Suzie Goodell. We are conducting a research study and would like to hear from **all** Registered Dietitian/Nutritionists in North Carolina no matter what your current area of practice is. The purpose of this study is to understand your perceptions of helping people gain sustainable access to healthy foods.

If you agree to participate, you will be asked to complete a short online survey. You will also be asked to answer a few questions about yourself. The entire process should take 12-17 minutes of your time.

As an added bonus for your participation, we will donate $1 to the North Carolina Academy of Nutrition and Dietetics (NCAND) Capital Campaign for the first 500 participants to fully complete this survey. Your participation can support NCAND's mission of using food and nutrition to optimize the health of the citizens in North Carolina.

To take part in this study, please click the link below:

[insert link]

We encourage you to share this email and link with other RDNs who can assist us with this research.

Your time is greatly appreciated and we look forward to having you contribute to the future of dietetics in North Carolina. If you have questions about this research, you can contact Dr. Suzie Goodell at 919-513-2632 or lsgoodel@ncsu.edu or Latasha Williams at ldwilli4@ncsu.edu or 919-327-0219.

Kind regards,

Latasha Williams, MS, RDN

Email Recruitment Follow-up

Subject: NC State needs your Nutrition Expertise!

Hello Nutrition Expert,

I am writing to follow up with you about participating in our research study to understand RDN perceptions of helping people gain sustainable access to healthy foods. This study is being led by Dr. Suzie Goodell, associate professor at North Carolina State University and conducted by Latasha Williams RDN, graduate student at North Carolina State University.

Our goal is to hear from all RDNs in North Carolina no matter what your current area of practice is. If you decide to participate, you will be asked to complete a short online survey and answer a few questions about yourself. The entire process should take 12-17 minutes of your time.

As an added bonus for your participation, we will donate $1 to the North Carolina Academy of Nutrition and Dietetics (NCAND) Capital Campaign for the first 500 participants to fully complete this survey. Your participation can support NCAND's mission of using food and nutrition to optimize the health of the citizens in North Carolina.

To take part in this study, please click the link below:

[insert link]

We encourage you to share this email and link with other RDNs who can assist us with this research.

Your time is greatly appreciated and we look forward to having you contribute to the future of dietetics in North Carolina. If you have questions about this research, you can contact Dr. Suzie Goodell at 919-513-2632 or lsgoodel@ncsu.edu or Latasha Williams at ldwilli4@ncsu.edu or 919-327-0219.

Kind regards,

Latasha Williams, MS, RDN

Online Recruiting Post/Advertisement

Message to Posting/Advertising site:

Hello <insert name or name of organization/website>,
My name is Latasha Williams and I am a PhD candidate at NC State University under the guidance of Dr. Suzie Goodell. We are conducting a research study to understand RDN perceptions of helping people gain sustainable access to healthy foods. I am contacting you because we need your help to reach as many RDNs in North Carolina as possible. We would greatly appreciate it if you could post the following advertisement on your <website, blog, etc.>:

----------Begin Advertisement----------

Attention all Registered Dietitians in North Carolina

North Carolina State University researchers are seeking registered dietitian/nutritionists (RDNs) to participate in a study about RDNs' perceptions of helping people gain sustainable access to healthy foods. It is important that we hear from all RDNs no matter what your current area of practice is.

Please click the link below to complete a short online survey. It should only take 12-17 minutes of your time. We value your input and would love to hear from you!

<insert link>

As an added bonus for your participation, we will donate $1 to the North Carolina Academy of Nutrition and Dietetics (NCAND) Capital Campaign for the first 500 participants to fully complete this survey. Your participation can support NCAND's mission of using food and nutrition to optimize the health of the citizens in North Carolina.

----------End Advertisement----------

We appreciate you taking the time to help us recruit for this research study. If you have questions about this research, you can contact Dr. Suzie Goodell at 919-513-2632 or lsgoodel@ncsu.edu or Latasha Williams at ldwilli4@ncsu.edu or 919-327-0219.

Kind regards,
Latasha Williams, MS, RDN

Appendix E: Study 1, Phase 2 Informed Consent

Adult Consent Form

Title of Study: Healthy Foods Access: Registered Dietitian Nutritionist's (RDNs) perceptions of helping mothers gain sustainable access to healthy foods **(eIRB # 20930)**
Principal Investigator(s): Latasha Williams, ldwilli4@ncsu.edu, and 919-327-0219
Funding Source: None
Faculty Point of Contact: Dr. Suzie Goodell, lsgoodell@ncsu.edu, and 919-513-2632

What are some general things you should know about research studies?
You are invited to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate, and to stop participating at any time without penalty. The purpose of this research study is to gain a better understanding of RDNs perceptions of helping mothers who have limited or uncertain access to healthy foods. We will do this through an online survey.

You are not guaranteed any personal benefits from being in this study. Research studies also may pose risks to those who participate. You may want to participate in this research because the information gathered may positively impact how RDNs help people gain access to healthy foods. You may not want to participate in this research because while the information you provide may benefit the overall practice of RDNs, there is no direct benefit to you.

Specific details about the research in which you are invited to participate are contained below. If you do not understand something in this form, please ask the researcher for clarification or more information. A copy of this consent form will be available for you to download for your records. If, at any time, you have questions about your participation in this research, do not hesitate to contact the researcher(s) named above or the NC State IRB office. The IRB office's contact information is listed in the *What if you have questions about your rights as a research participant?* section of this form.

What is the purpose of this study?
The purpose of the study is to assess Registered Dietitian/Nutritionists' (RDNs) perceptions of helping mothers gain sustainable access to healthy foods.

Am I eligible to be a participant in this study?
All RDNs licensed to practice in North Carolina will be invited to participate in this study. We expect 500-550 RDNs to participate in this study.

In order to be a participant in this study, you must agree to be in the study and be an RDN licensed to practice in North Carolina. You cannot participate in this study if you do not meet the inclusion criteria.

What will happen if you take part in the study?
If you agree to participate in this study, you will be asked to do all of the following:

1. Provide electronic consent to participate. This should take approximately 2 minutes.
2. Complete an online survey about your perceptions of helping mothers gain sustainable access to healthy foods. We expect this to take approximately 10-15 minutes.

The total amount of time that you will be participating in this study is 12-17 minutes.

Risks and benefits

There are minimal risks associated with participation in this research.

There are no direct benefits to your participation in the research. The indirect benefits include providing perspective which may be used to positively impact how RDNs help mothers gain sustainable access to healthy foods.

Right to withdraw your participation

You can stop participating in this study at any time for any reason. In order to stop your participation, please contact Latasha Williams at ldwilli4@ncsu.edu or 919-327-0219 or you can contact Dr. Suzie Goodell at lsgoodell@ncsu.edu or 919-513-2632. If you choose to withdraw your consent and to stop participating in this research, you can expect that the researcher(s) will redact your de-identified information from their data set, securely destroy your data, and prevent future uses of your de-identified for research purposes wherever possible. This is possible in some, but not all, cases.

Confidentiality, personal privacy, and data management

Trust is the foundation of the participant/researcher relationship. Much of that principle of trust is tied to keeping your information private and in the manner that we have described to you in this form. The information that you share with us will be held in confidence to the fullest extent allowed by law.

Protecting your privacy as related to this research is of utmost importance to us. There are very rare circumstances related to confidentiality where we may have to share information about you. Your information collected in this research study could be reviewed by representatives of the University, research sponsors, or government agencies (for example, the FDA) for purposes such as quality control or safety. In other cases, we must report instances in which imminent harm could come to you or others.

How we manage, protect, and share your data are the principal ways that we protect your personal privacy. Data that will be shared with others about you will be de-identified.

> **De-identified**. De-identified data is information at one time could directly identify you, but that we have recorded this data so that your identity is separated from the data. We do not have a master list with your code and real name that connects your information to the

research data. When the research concludes, there will be no way your real identity will be linked to the data we publish.

To help maximize the benefits of your participation in this project, by further contributing to science and our community, your de-identified information will be stored for future research and may be shared with other people without additional consent from you.

Compensation
There will be no compensation for participation in this study.

What if you are an NCSU employee?
Your participation in this study is not a requirement of your employment at NCSU, and your participation or lack thereof, will not affect your job.

What if you have questions about this study?

If you have questions at any time about the study itself or the procedures implemented in this study, you may contact the researcher Latasha Williams at ldwilli4@ncsu.edu or 919-327-0219 or you can contact Dr. Suzie Goodell at lsgoodell@ncsu.edu or 919-513-2632.

What if you have questions about your rights as a research participant?
If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact the NC State IRB (Institutional Review Board) Office. An IRB office helps participants if they have any issues regarding research activities. You can contact the NC State IRB Office via email at irb-director@ncsu.edu or via phone at (919) 515-8754.

Consent To Participate

By selecting "I consent to research" below, I am affirming that I have read and understand the above information. All of the questions that I had about this research have been answered. I have chosen to participate in this study with the understanding that I may stop participating at any time without penalty or loss of benefits to which I am otherwise entitled. I am aware that I may revoke my consent at any time.

I consent to research <insert Qualtrics button>

I do not consent to research <insert Qualtrics button>

Appendix F: Study 1, Phase 2 Quantitative Survey

Healthy Foods Access: A Quantitative Study

Eligibility Question: Are you a Registered Dietitian/Nutritionist (RDN) licensed to practice in North Carolina?

- ☐ Yes (*Proceed to Demographic Questions*)
- ☐ No (*End survey here*)

Demographic Questions:

7. How long have you been an RDN?
   - ☐ <1 year
   - ☐ 1-5 years
   - ☐ 6-10 years
   - ☐ 11-15
   - ☐ >15 years
8. Are you of Hispanic, Latino, or Spanish origin?
   - ☐ Yes
   - ☐ No
9. How would you describe yourself? (check all that apply)
   - ☐ American Indian or Alaska Native
   - ☐ Asian
   - ☐ Black or African American
   - ☐ Native Hawaiian or Other Pacific Islander
   - ☐ White
   - ☐ Other:_____
   - ☐ Prefer not to answer
10. How do you identify yourself?
    - ☐ Woman
    - ☐ Man
    - ☐ Other:_____
    - ☐ Prefer not to answer
11. What is your primary area of practice?
    - ☐ Clinical Nutrition
    - ☐ Food Service Management
    - ☐ Community Nutrition
    - ☐ Education
    - ☐ Research
    - ☐ Administration
    - ☐ Retired
    - ☐ Other:_____
12. What is the primary setting of your practice?
    - ☐ Urban
    - ☐ Suburban
    - ☐ Rural
    - ☐ Other:_____

Your perceptions are very important to us. In this is a survey, we would like to know how you view helping mothers with limited or uncertain access to healthy foods.

Please tell us the level of importance of the following statement by choosing one of 6 options, ranging from not important at all to very important.

Opening Survey Question: How important to you is helping mothers gain sustainable access to healthy foods?

Not at all important	Unimportant	Somewhat unimportant	Somewhat important	Important	Very important

Please tell us your perceptions of the following statements by choosing one of 6 options, ranging from Strongly Agree to Strongly Disagree.

	Strongly Agree	Agree	Slightly Agree	Slightly Disagree	Disagree	Strongly Disagree
1. A mother's income level determines her ability to sustain access to healthy foods.						
2. A lack of sustainable access to healthy foods interferes with a mother's capacity to care for others.						
3. The percent of mothers living in North Carolina who lack sustainable access to healthy foods is lower than in most states.						
4. When a mother lacks sustainable access to healthy foods, no one else is affected.						
5. Federal Nutrition Assistance programs adequately help mothers gain sustainable access to healthy foods.						

In the following questions, we would like to hear your views of the programs, activities, and services in North Carolina that address helping mothers. Please answer each question based on what you currently know.

6. Are you familiar with any programs, activities, or services in North Carolina that address helping mothers gain sustainable access to healthy foods?

   ☐ Yes (if yes, move on to question #7)
   ☐ No (if no, ask: Are you aware of anyone who is trying to get something started to address helping mothers gain sustainable access to healthy foods? – then skip to question #9)

7. About how many programs, activities, or services that address helping mothers gain sustainable access to healthy foods can you identify/name?

   Please enter a number: _____

8. How did you find out about the programs, activities, or services that address helping mothers gain sustainable access to healthy foods?
   ☐ Undergraduate education in dietetics
   ☐ Graduate education in dietetics
   ☐ Other RDNs
   ☐ Other health professionals (doctors, social workers, nurses, etc.)
   ☐ People living in my community
   ☐ Other: _____

9. Are you aware of any misconceptions or incorrect information among RDNs in North Carolina about helping mothers gain sustainable access to healthy foods?
   ☐ Yes (If yes, proceed to question # 10)
   ☐ No (If no, skip to question #11)

10. Please list any misconceptions or incorrect information you are aware of among RDNs in NC about helping mothers gain sustainable access to healthy foods. To protect the privacy of yourself and others, please speak from your own experience and, if/when you speak about others, refer to them by role (e.g. "mother," "client," "colleague," etc. not by their name.)

From your point of view, please tell us what you think about the following statements by choosing one of 5 options, ranging from Never to Always.

	Never	Almost Never	Sometimes	Almost Always	Always
11. Helping mothers gain sustainable access to healthy foods is outside my scope of practice as an RDN.					

12. A mother with a low body mass index should be assessed for her ability to sustain access to healthy foods.					
13. Screening mothers using evidence-based tools is necessary to determine if she lacks sustainable access to healthy foods.					
14. Collaborating with other professionals who help mothers gain sustainable access to healthy foods interferes with my ability to help.					
15. A mother with a high body mass index should be assessed for her ability to sustain access to healthy foods.					
16. I support expanding programs, activities, and other services that help mothers gain sustainable access to healthy foods.					

17. Please rank the following RDN positions as leaders in helping mothers gain sustainable access to healthy foods. (Your highest ranking should be at the top and your lowest at the bottom)
    - ☐ Dietetics Program Directors
    - ☐ Dietetics Educators
    - ☐ Clinical Nutrition Managers/Supervisors
    - ☐ Food Bank RDNs/Managers
    - ☐ Dietetics Researchers
    - ☐ Food Service Directors/Managers (includes hospitals, schools, etc.)
    - ☐ Community RDNs (RDNs specializing in Community Nutrition)
    - ☐ RDNs who lead local nutrition organizations
    - ☐ Other:_____

Please provide your perceptions of the following statements about the RDNs you ranked in the previous question by choosing one of 6 options, ranging from Strongly Agree to Strongly Disagree.

	Strongly Agree	Agree	Slightly Agree	Slightly Disagree	Disagree	Strongly Disagree
18. RDN leaders encourage RDN participation in programs, activities, and other services that help mothers gain sustainable access to healthy foods.						
19. RDN leaders are too busy to serve as advocates for mothers who lack sustainable access to healthy foods.						
20. RDN leaders provide opportunities for RDNs to learn about helping mothers who lack sustainable access to healthy foods.						
21. RDN leaders support expanding programs, activities, and other services that help mothers gain sustainable access to healthy foods.						

22. If there is anything else you would like to tell us about helping mothers gain sustainable access to healthy foods, please feel free to leave your comments in the space provided.

Appendix G: Study 2 and 3 Recruitment Materials

Recruitment Email

Subject: NC State seeking Leaders in Nutrition for Research Study

Dear <insert name>,

My name is Latasha Williams and I am a PhD student at North Carolina State University. I am writing to invite you to participate in a research study about registered dietitian/nutritionists (RDNs) helping mothers gain sustainable access to healthy foods.

As leaders in nutrition and dietetics, it is important that we hear from you about how RDNs help mothers who may have limited or uncertain access to healthy food.

For your participation in this project, your name will be entered in a raffle to win one of two $25 gift cards.

If you are interested in participating in a 60-75-minute recorded interview via Zoom, please click the link below to enter the raffle, provide consent, and complete a brief eligibility and demographics survey:

<insert link>

I appreciate your time and consideration and look forward to hearing from you. If you have questions about this research, you can contact Latasha Williams at ldwilli4@ncsu.edu or 919-327-0219 or Dr. Suzie Goodell at 919-513-2632 or lsgoodel@ncsu.edu.

Kind regards,

Latasha Williams, MS, RDN

Follow Up Recruitment Email

Subject: NC State seeking Leaders in Nutrition for Research Study

Dear <insert name>,

My name is Latasha Williams and I would like to follow up with you regarding an invitation I recently sent regarding your participation in a research study about registered dietitian/nutritionists (RDNS) helping mothers gain sustainable access to healthy foods.

As leaders in nutrition and dietetics, it is important that we hear from you about how RDNs help mothers who may have limited or uncertain access to healthy food.

For your participation in this project, your name will be entered in a raffle to win one of two $25 gift cards.

If you are interested in participating in a 60-75-minute Zoom interview, please click the link below to enter the raffle and complete a brief eligibility survey:

<insert link>

I appreciate your time and consideration and look forward to hearing from you. If you have questions about this research, you can contact Latasha Williams at ldwilli4@ncsu.edu or 919-327-0219 or Dr. Suzie Goodell at 919-513-2632 or lsgoodel@ncsu.edu.

Kind regards,

Latasha Williams, MS, RDN

Telephone Recruitment Talking Points

Hello, may I speak with <insert name>,

My name is Latasha Williams and I am a PhD student at NC State University. I'm looking for RDNs to participate in a study about how RDNs help mothers gain sustainable access to healthy foods. It is important that we hear from RDNs about the ways their expertise contributes to helping mothers.

For your participation in this project, your name will be entered in a raffle to win one of two $25 gift cards.

Are you an RDN interested in participating in a 60-75 minute Zoom interview?

- "Yes" – Great, may I have your email address so I can send you additional information about how you can participate in our study.

- "No" – Ok, do you know of any other RDNs who may be interested in participating in the study?

*If the participant is not available, a message will be left stating the above information with the option to return the phone call.

Online Recruitment Flyer/Advertisement

Message to Posting/Advertising site:

Hello <insert name or name of organization/website>,

My name is Latasha Williams and I am a PhD candidate at NC State University under the guidance of Dr. Suzie Goodell. We are conducting a research study to understand RDN perceptions of helping people gain sustainable access to healthy foods. I am contacting you because we need your help to reach as many RDNs in North Carolina as possible. We would greatly appreciate it if you could post the following advertisement on your <website, blog, etc.>:

----------Begin Advertisement----------

North Carolina State University researchers are seeking registered dietitian/nutritionists (RDNs) to participate in a study about how RDNs help mothers gain sustainable access to healthy foods. It is important that we hear from RDNs about the ways their expertise contributes to helping mothers.

For your participation in this project, your name will be entered in a raffle to win one of two $25 gift cards.

If you are interested in participating in a 60-75 minute Zoom interview, please click the link below to enter the raffle, provide consent, and complete a brief eligibility and demographics survey:

<insert link>

----------**End Advertisement**----------

We appreciate you taking the time to help us recruit for this research study. If you have questions about this research, you can contact Dr. Suzie Goodell at 919-513-2632 or lsgoodel@ncsu.edu or Latasha Williams at ldwilli4@ncsu.edu or 919-327-0219.

Kind regards,

Latasha Williams, MS, RDN

Virtual Recruitment Talking Points

Hello, it is very nice to meet you. My name is Latasha Williams and I am a PhD student at NC State University. I'm looking for RDNs to participate in a study about how RDNs help mothers gain sustainable access to healthy foods. It is important that we hear from RDNs about the ways their expertise contributes to helping mothers.

For your participation in this project, your name will be entered in a raffle to win one of two $25 gift cards.

Are you an RDN interested in participating in a 60-75-minute Zoom interview?

- "Yes" – Great, may I have your email address so I can send you additional information about how you can participate in our study.

- "No" – Ok, do you know of any other RDNs who may be interested in participating in the study?

Electronic Eligibility Screening and Demographics Survey

Eligibility Screening: To help us determine if you are eligible for this study, please answering the following:

1. Participant name (first and last)

2. Are you currently a registered dietitian/nutritionist licensed to practice nutrition and dietetics in North Carolina?

3. Are you available for an interview?

4. Are you willing to allow your interview to be recorded?

*If participant meets eligibility requirements they will be asked to answer the following questions to schedule an interview:

6. Please select your preferred interview date(s) and time(s)? (Be sure to include weekend availability).

    - <insert option #1>
    - <insert option #2>
    - <insert option #3>
    - <insert "other" option> (provide place for participant to insert an additional option)

7. Please provide your preferred contact information for interview scheduling and confirmation:

    - Email Address
    - Phone Number

8. Would you like to be entered into a raffle/drawing for one of two $25 gift cards upon the completion of your interview?

Demographics:

Please tell us about yourself:

Demographic Questions:

13. How long have you been an RDN? (Please enter a number): _____
14. What is your age? _____
15. Are you of Hispanic, Latino, or Spanish origin?
    - ☐ Yes
    - ☐ No
16. How would you describe yourself? (check all that apply)
    - ☐ American Indian or Alaska Native
    - ☐ Asian
    - ☐ Black or African American
    - ☐ Native Hawaiian or Other Pacific Islander
    - ☐ White
    - ☐ Other:_____
    - ☐ Prefer not to answer
17. How do you identify yourself?
    - ☐ Woman
    - ☐ Man
    - ☐ Other:_____
    - ☐ Prefer not to answer
18. In what area(s) do you practice? (check all that apply)
    - ☐ Clinical Nutrition
    - ☐ Food Service/Food Service Management
    - ☐ Community/Public Health Nutrition
    - ☐ Education
    - ☐ Research
    - ☐ Administration
    - ☐ Retired
    - ☐ Other:_____
19. What is the primary setting of your practice? (check all that apply)
    - ☐ Urban
    - ☐ Suburban
    - ☐ Rural
    - ☐ Other:_____
20. What is the highest level of education you have completed?
    - ☐ Bachelor's degree
    - ☐ Master's degree
    - ☐ Doctorate degree

Appendix H: Study 2 and 3 Informed Consent Form

Adult Informed Consent Form

Title of Study: Healthy Foods Access: Registered Dietitian/Nutritionists' helping mothers gain sustainable access to healthy foods **(eIRB #** 17988**)**
Principal Investigator (PI): Latasha Williams, ldwilli4@ncsu.edu, and 919-327-0219

Funding Source: None
Faculty Point of Contact: Dr. Suzie Goodell, lsgoodell@ncsu.edu, and 919-513-2632

What are some general things you should know about research studies?
You are invited to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate, and to stop participating at any time without penalty. The purpose of this research study is to gain a better understanding of how RDNs help mothers, who may have limited or uncertain access to healthy foods, gain sustainable access to healthy foods. We will do this through individual interviews.

You are not guaranteed any personal benefits from being in this study. Research studies also may pose risks to those who participate. You may want to participate in this research because the information gathered may positively impact all nutrition and dietetics practice areas involving access to healthy foods. The information obtained may also be used in the future to aid in the development of education materials, training opportunities, continuing education credits, and community programs aimed at helping people gain sustainable access to healthy foods. You may not want to participate in this research because while the information you provide may benefit the overall practice of nutrition and dietetics, there are no direct benefits to you.

Specific details about the research in which you are invited to participate are contained below. If you do not understand something in this form, please ask the researcher for clarification or more information. A copy of this consent form will be available for you to download for your records. If, at any time, you have questions about your participation in this research, do not hesitate to contact the researcher(s) named above or the NC State IRB office. The IRB office's contact information is listed in the *What if you have questions about your rights as a research participant?* section of this form.

What is the purpose of this study?
The purpose of the study is to assess how RDNs help mothers gain sustainable access to healthy foods.

Am I eligible to be a participant in this study?
There will be approximately 12-15 participants in this study.

In order to be a participant in this study, you must agree to a recorded interview and meet the eligibility requirements.

You cannot participate in this study if you do not want to be recorded or do not meet the eligibility requirements.

What will happen if you take part in the study?

If you agree to participate in this study, you will be asked to do all of the following:

1. Provide electronic consent to participate.
2. Complete a brief electronic eligibility screening and demographic survey.
3. Provide contact information for interview scheduling purposes and a raffle/drawing.
4. Schedule an interview via Zoom to be conducted at your convenience.
5. Provide verbal consent for your interview to be recorded.
6. Participate in a one-on-one Zoom interview.
7. Forward the recruitment email to other RDNs who you feel may want to participate in the study.

Overall, steps 1-4 above should take approximately 15 minutes and the interview (steps 5 and 6) will last approximately 60-75 minutes. The total amount of time that you will be participating in this study is 75-90 minutes.

Recording and images

If you want to participate in this research, you must agree to be video recorded via Zoom. If you do not agree to be recorded, you cannot participate in this research.

Risks and benefits

There are minimal risks associated with participation in this research.

There are no direct benefits to your participation in the research. The indirect benefits are your contribution to the practice of nutrition and dietetics and literature regarding the ways in which RDNs help mothers gain sustainable access to healthy foods.

Right to withdraw your participation

You can stop participating in this study at any time for any reason. In order to stop your participation, please inform the PI that you no longer wish to continue. If you choose to withdraw your consent and to stop participating in this research, you can expect to have the PI terminate the interview and not include any of the information you provide as a part of the study. If you choose to revoke your consent after all of the research activities are complete, the PI will attempt to redact your data. This is possible in some, but not all cases.

Confidentiality, personal privacy, and data management

Trust is the foundation of the participant/researcher relationship. Much of that principle of trust is tied to keeping your information private and in the manner that we have described to you in this form. The information that you share with us will be held in confidence to the fullest extent allowed by law. Protecting your privacy as related to this research is of utmost importance to us. However, there are very rare circumstances

related to confidentiality where we may have to share information about you. These are limited to instances in which imminent harm could come to you or others.

How we manage, protect, and share your data are the principal ways that we protect your personal privacy. Data generated about you in this study will be re-identifiable.

> **Re-identifiable Data**. Re-identifiable data is information that I can use to identify you indirectly because of my access to information, role, skills, combination of information, and/or use of technology. If your data is re-identifiable, I will report in such a way that you are not directly identified in reports. Based on how we need to share the data, I cannot remove details from the report that would protect your identity from ever being figured out. This means that others may be able to re-identify you from the information reported from this research.

Compensation

For your participation in this study, you will have the option to be entered into a random raffle/drawing to receive one of two $25 gift cards.

If you withdraw from the study prior to its completion, you will not have the option to be entered into a raffle to receive one of two $25 gift cards.

What if you are an NCSU employee?

Your participation in this study is not a requirement of your employment at NCSU, and your participation or lack thereof, will not affect your job.

What if you have questions about this study?

If you have questions at any time about the study itself or the procedures implemented in this study, you may contact the researcher, Latasha Williams by emailing ldwilli4@ncsu.edu or calling 919-327-0219. You may also contact the faculty advisor, Dr. Suzie Goodell via email at lsgoodell@ncsu.edu or by phone at 919-513-2632.

What if you have questions about your rights as a research participant?

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact the NC State IRB (Institutional Review Board) Office. An IRB office helps participants if they have any issues regarding research activities. You can contact the NC State IRB Office via email at irb-director@ncsu.edu or via phone at (919) 515-8754.

Consent To Participate

By selecting “I consent to research” below, I am affirming that I have read and understand the above information. All of the questions that I had about this research have been answered. I have chosen to participate in this study with the understanding that I may stop participating at any time without penalty or loss of benefits to which I am otherwise entitled. I am aware that I may revoke my consent at any time.

I consent to research <insert Qualtrics button>

I do not consent to research <insert Qualtrics button>

Appendix I: Study 2 and 3 Broad Consent

BROAD CONSENT ADDENDUM

Title of Study where Broad Consent is Initially Sought: Healthy Foods Access: Registered Dietitian/Nutritionists helping mothers gain sustainable access to healthy foods **(eIRB #** 17988)
Principal Investigator(s): Latasha Williams, ldwilli4@ncsu.edu, and 919-327-0219
Funding Source: None
Faculty Point of Contact: Dr. Suzie Goodell, lsgoodell@ncsu.edu, and 919-513-2632

This form asks you to make an important choice about the use of your re-identifiable information. It asks you to decide if you are willing to give your consent to the use of your re-identifiable information for future research.

If you agree, researchers in the future may use your re-identifiable information in many different research studies over an indefinite period of time without asking your permission again for any specific research study. This could possibly help other people or contribute to science. If you do not agree to allow your re-identifiable information to be used for future research, your information will not be kept for future use by anyone.

This form explains in more detail what saying "yes" or "no" to this use of your information will mean to you.

If you say "Yes" on this form
The researcher(s) will store, use and share your re-identifiable information, and may do so for the purpose of medical, scientific, and other research, now and into the future, for as long as they are needed. This may include sharing your re-identifiable information with other research, academic, and medical institutions, as well as other researchers, drug and device companies, biotechnology companies, and others.

If you say "yes", there are no plans to tell you about any of the specific research that will be done with your re-identifiable information.

By saying "yes," your re-identifiable information may be used to create products or to deliver services, including some that may be sold and/or make money for others. If this happens, there are no plans to tell you, pay you, or give any compensation to you or your family.

The main risk in saying "yes" is that your confidentiality could be breached. Through managing who has access to your re-identifiable information and through regularly updated data security plans, we will do our best to protect your re-identifiable information from going to people who should not have it.

Another risk is that if you say "yes," your re-identifiable information could be used in a research project to which you might not agree to if you were asked specifically about it.

You will not personally benefit from saying "yes" in this form. Saying "yes" in this form is not a condition of participating in the Healthy Foods Access: Registered Dietitian/Nutritionists helping mothers gain sustainable access to healthy foods study, nor of your enrollment or employment at North Carolina State University.

If you say "no" or do not complete this form

The researcher(s) and institution(s) identified above will not store, use, or share your re-identifiable information beyond the purposes stated in the previous consent form that you agreed to and signed for the study Healthy Foods Access: Registered Dietitian/Nutritionists helping mothers gain sustainable access to healthy foods.

If you want to withdraw your consent

You can stop participating at any time for any reason. Please contact Latasha Williams, ldwilli4@ncsu.edu, and 919-327-0219 or Dr. Suzie Goodell, lsgoodell@ncsu.edu, and 919-513-2632. You can expect that the researcher(s) will redact your re-identifiable information from their data set, securely destroy your data, and prevent future uses of your re-identifiable information for research purposes wherever possible. This is possible in some, but not all, cases.

If you have questions

Please ask the research team to explain anything in this form that you do not clearly understand. Please think about this broad consent and/or discuss it with family or friends before making the decision to say "Yes" or "No."

If you have any questions about this broad consent, please contact Latasha Williams, ldwilli4@ncsu.edu, and 919-327-0219 or Dr. Suzie Goodell, lsgoodell@ncsu.edu, and 919-513-2632.

If you want to discuss your rights as a person who has agreed to, refused, or declined to respond to an offer of broad consent or believe that your rights were violated as a result of your agreeing to this broad consent, please contact the NC State IRB Director, at irb-director@ncsu.edu or via phone at (919) 515-8754.

Please choose one statement

Statement of agreement

I say yes. The future use of my data and consent has been explained to me, and I agree to give my consent to the future research uses of my information. My participation is voluntary, and I may withdraw my consent at any time without any penalty or loss of benefits to which I am entitled.

_____

Printed Name

_____

Date

Statement of refusal

I say no. The consent has been explained to me, and I do not agree to this consent.

_____

Printed Name

_____

Date

Appendix J: Study 2 and 3 Raffle Notification Email

[*Insert Name*]

Thank you for participating in our research study Healthy Foods Access: Registered Dietitian Nutritionists Helping Mothers Gain Access to Healthy Foods.

This email is to inform you that you have been selected as a winner of a $25 electronic gift card for participating. To redeem your gift card, please click on the link below and follow the instructions provided.

<*insert link to electronic gift card redemption instructions*>

Please let me know if you have any questions or concerns.

Kind regards,
Latasha Williams, MS, RDN

Appendix K: Study 2 and 3 Interview Appointment Confirmation

Subject: NC State seeking Leaders in Nutrition for Research Study

Dear <insert name>,

I am writing to thank you for agreeing to participate in a research study about registered dietitian/nutritionists (RDNs) helping mothers gain sustainable access to healthy foods.

This correspondence is to remind you of your interview scheduled as follows:

<insert Zoom meeting information>

Please make sure you have access to the consent form provided to you previously.

For your participation in this project, your name will be entered in a raffle to win one of two $25 gift cards.

I appreciate your time and consideration and look forward to speaking with you. If you have questions about this research, you can contact Latasha Williams at ldwilli4@ncsu.edu or 919-327-0219 or Dr. Suzie Goodell at 919-513-2632 or lsgoodel@ncsu.edu.

Kind regards,

Latasha Williams, RDN

Appendix L: Study 2 and 3 Interview Guide

Participant Pseudonym:
Date:

**Interviewer will follow the Interview Protocol and prepare for the interview 15-20 minutes early by preparing/testing Zoom and gathering other necessary materials prior to calling the interviewee.*

Opening
[Interviewer will first confirm the participant's presence and before beginning the interview.]

> **INTERVIEWER:** Hello, [insert participant's name]. This is [interviewer's name] with NC State University. Is now still a good time to talk? Are you able to hear and see me clearly? *(pause for participant's response)*
>
> We've been emailing, but I want to take some time to briefly introduce myself again. My name is Latasha Williams and I am a PhD student at North Carolina State University in the Department of Food, Bioprocessing, and Nutrition Sciences.
>
> I want to tell you a little bit about this study. Did you get a chance to download the consent form? (Share screen with participant showing consent form so they will know what you are referring to)
>
> *[if the participant does not have the consent form, email them the consent form.]*

Before we get started with the interview, I would like to go through the consent form and explain what it means. It's long so bear with me.

At the end, I will ask you to give verbal consent to participate in this interview.

Are you ready to begin? *(Pause, wait for response, and proceed accordingly)*

What are some general things you should know about research studies?
You have been invited to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate, and to stop participating at any time without penalty. The purpose of research studies is to gain a better understanding of a certain topic or issue. You are not guaranteed any personal benefits from being in this study. Research studies also may pose risks to those who participate.

Specific details about the research in which you are invited to participate are contained in the consent form. If you do not understand something on the consent form, please ask me for clarification or more information. A copy of this consent form is available for you to download for your records. If, at any time, you have questions about your participation in this research, do not hesitate to contact me, Latasha Williams, or the NC State IRB office.

What is the purpose of this study?
The purpose of this study is to assess how RDNs help mothers gain sustainable access to healthy foods. I will ask you questions about RDNs as a community of professionals working with mothers who may have limited or uncertain access to healthy food. I want to hear what you have to say; however, if you do not feel comfortable answering a question, let me know and I will continue to the next question.

What will happen if you take part in the study?
If you agree to participate in this study, we will talk between 60-75 minutes, depending on how much you want to share with me. I will take notes and record the interview session. We will have this conversation over Zoom, but because we are both in private rooms, no one should be able to overhear our conversation.

Recording and images
I would like to ask for your permission to record this interview so that I can refer back to it when I write the research report. Do you mind if I start recording now?"

a. **"No"** – "Thank you!" (Start recording) –
b. **"Yes"** – "Ok. I'm afraid we have to record the interview. Because of that, you will not be able to participate in the interview. Thank you for your time.

[PRESS BUTTON TO START RECORDING NOW] – It's on and we are now being recorded. You have given me permission to record, correct? *(pause to wait for a verbal response to get consent to record on Zoom)*

The next section discusses the risks and benefits associated with this study:

Risks and benefits
We will ask you questions related to your perspectives of what you think RDNs believe, know, and practice in regards to helping mothers gain sustainable access to healthy foods. This process may make you uncomfortable as you will be asked to share your personal beliefs and feelings with me about RDNs. You are free not to answer any questions that you do not wish to answer.

You will not receive direct benefits from participating in this research. However, we plan to use the findings from this project to plan future research projects. We also hope to use this information to improve how RDNs help mothers gain sustainable access to healthy foods.

Right to withdraw your participation
You can stop participating in this study at any time for any reason. In order to stop your participation, please inform me that you no longer wish to continue. If you choose to withdraw your consent and to stop participating in this research, you can expect to have me stop the interview and not include any of the information you provide as a part of the study.

Confidentiality, personal privacy, and data management

The information you share with us will be held in confidence to the fullest extent allowed by law. Protecting your privacy as related to this research is of utmost importance to us.
Since we are both in private rooms, no one should be able to overhear our conversation. Data will be stored electronically on password protected computers accessible only by our research team. Hard copies of interview transcripts will be kept in a secure location on NCSU's campus. Within ten years after the conclusion of the study, the digital recordings will be erased. If we use quotes when presenting the findings, your name will not be linked to the response, and we will not use quotes that could identify you. We would also ask that you not share the questions we ask in this interview with anyone else to avoid contaminating our sample.

Also at this time, I would like to ask you to provide a pseudonym for yourself. That is, I would like you to make up a name for me to call you. What name would you like me to call you?

Ok, [insert pseudonym]. We only have a few paragraphs left.

Compensation
For your participation in this project, you may choose to have your name entered in a raffle to receive one of two $25 gift cards. The raffle will be held after all interviews have been conducted. You will be notified by email if you are selected.

If you withdraw from the study prior to completing the interview, you will not be eligible for the raffle.

What if you have questions about this study?
If you have questions at any time about the study itself or the procedures implemented in this study, you may contact me, Latasha Williams. You may also contact my faculty advisor, Dr. Suzie Goodell. Our contact information is on the consent form.

What if you have questions about your rights as a research participant?
If you have questions about your rights and you would rather contact NC State, you may contact the NC State IRB (Institutional Review Board) Office via the phone number or email address on the consent form.

Consent To Participate
Do you have any questions?

If you agree to participate, would you please read the statement at the bottom of the consent form, giving your consent to participate today?

Participant reads from shared screen:
"I am affirming that I have read and understand the information provided in the consent form. All of the questions that I had about this research have been answered. I have chosen to participate in this study with the understanding that I may stop participating at any time without penalty or loss of benefits to which I am otherwise entitled. I am aware that I may revoke my consent at any time."

Do you have any questions before we begin?

(Transition): Okay, I'm going to start by asking some demographic questions so I can learn a little more about you.

Demographics

You've provided us with a little information previously by completing the eligibility survey we sent you, but I'd like to have those answers on the audio recorder, so I may ask some of those questions again.

1. How long have you been a registered dietitian/nutritionist?
2. Where did you complete your dietetic internship?
3. What year did you finish your internship?
4. In what county do you currently work?
5. How long have you worked there?

(*Transition):* Thank you for answering some of those questions again!

Interview

Next we will discuss how RDNs help mothers gain sustainable access to healthy foods. Just to be clear, we will be specifically talking about RDNs in NC helping mothers who may have limited or uncertain access to healthy foods.

Please feel free to tell me stories and provide examples. When you tell stories, please do not refer to people by their real names. You can make up a name for each person or refer to them by their relationship to you, for example you can use terms like community member, client, co-worker, or boss. If you make a mistake and use a name, we will be sure to omit or change it when we are transcribing and analyzing the information you provide.

At the end of our talk, I will review our conversation and give you a chance to clarify or correct anything that is said. I'll be taking notes throughout the discussion, so I may pause from time to time to finish writing.

What questions do you have about this? *(Pause for interviewees response and answer any questions they may have)*

(Transition): Great - Let's continue.

Community Readiness Interview Questions

For the following question, please answer keeping in mind your perspective of what the Registered Dietitian/Nutritionists (RDNs) in North Carolina (NC) believe about helping mothers, who may have limited or uncertain access to healthy foods, gain sustainable access to healthy foods.

1. **On a scale from 1-10, how much of a concern is helping mothers gain sustainable access to healthy foods among Registered Dietitian/Nutritionists (RDNs) in North Carolina (NC) with 1 being "not a concern at all" and 10 being "a very great concern"?** *(Scorer note: this question contributes to the Community Climate score)*

   Required Probe: Can you tell me why you think it's at that level?

COMMUNITY KNOWLEDGE OF EFFORTS

Now, I'm going to ask you about the current RDN efforts to address helping mothers gain sustainable access to healthy foods. By efforts, I mean any programs, activities, or services that RDNs may use to address healthy food access.

2. **Are there efforts among RDNs in NC that address helping mothers gain sustainable access to healthy foods?**
   If Yes, continue to question 3; if No, skip to question 16.

3. **Can you briefly describe each of these efforts?**
   Interviewer: Write down names of efforts so that you can refer to them in #4-5 below.

4. Optional Probe: How long have each of these efforts been going on? *Probe for each program/activity.*

5. Optional Probe: Who does each of these efforts serve (e.g., a certain age group, ethnicity, etc.)?

6. **About how many RDNs are aware of each of the following aspects of the efforts to address helping mothers gain sustainable access to healthy foods - You may answer none, a few, some, many, or most?**
   - Have heard of efforts?
   - Can name efforts?
   - Know the purpose of the efforts?
   - Know who the efforts are for?
   - Know how the efforts work (e.g. activities or how they're implemented)?
   - Know the effectiveness of the efforts?

7. **Thinking about what you just said regarding how many RDNs are aware of the aspects of the efforts to address helping mothers, why do you think RDNs have this amount of knowledge? (If the participant does not understand the question use this as an example - For example, If you believe that <*insert participant's answer to the***

***question as stated previously*> of the RDNs in NC have heard of the efforts to help mothers, why do you think that is?)**

8. **Are there misconceptions or incorrect information among RDNs about the current efforts?**
   If yes: What are these?

9. How do RDNs learn about the current efforts?*

10. Do RDNs view current efforts as successful?
    Probe: What do RDNs like about these programs? What don't they like?

11. What are the obstacles to individuals participating in these efforts?

12. What are the strengths of these efforts?

13. What are the weaknesses of these efforts?

14. Are the evaluation results being used to make changes in efforts or to start new ones?

15. What planning for additional efforts to address helping mothers gain sustainable access to healthy foods is going on among RDNs in North Carolina?

*****Only ask #16 if the respondent answered "No" to #2 or was unsure.*****

16. **Required Probe (if answered "no" to question #2 or was unsure):** Are RDNs trying to get something started to address food insecurity of mothers with preschool age children? Can you tell me about that?

LEADERSHIP

I'm going to ask you how the leadership among RDNs perceives helping mothers, who may have limited or uncertain access, gain sustainable access to healthy foods. By leadership, I am referring to dietetics educators, policy advocates/makers, clinical supervisors, leaders of RDN organizations, and those who have influence among RDNs and/or who lead RDNs in helping them achieve their goals to help mothers gain sustainable access to healthy foods.

17. **Using a scale from 1-10, how much of a concern is helping mothers, who may have limited or uncertain access to healthy foods, gain sustainable access to healthy foods to the leadership of RDNs, with 1 being "not a concern at all" and 10 being "a very great concern"?**

    Required Probe: Can you tell me why you say it's a _____?

    Required Probe: How much of a priority is helping mothers gain sustainable access to healthy foods to leadership?

Required Probe: Can you explain why you say this?

18. **I'm going to read a list of ways that RDN leadership might show its support or lack of support for efforts to address helping mothers gain sustainable access to healthy foods.**

    Can you please tell me whether none, a few, some, many or most leaders would or do show support in this way? Also, feel free to explain your responses as we move through the list.

    How many RDNs with a leadership role...
    - At least passively support efforts without necessarily being active in that support?
    - Participate in developing, improving or implementing efforts, for example by being a member of a group that is working toward these efforts?
    - Support allocating resources to fund community efforts?
    - Play a key role as a leader or driving force in planning, developing, or implementing efforts?
        - Required Probe: How do they do that?
    - Play a key role in ensuring the long-term viability of RDN efforts, for example by allocating long-term funding?

19. **Does the leadership support expanded efforts among RDNs to address helping mothers gain sustainable access to healthy foods?**

    If yes: How do they show this support? For example, by passively supporting, by being involved in developing the efforts, or by being a driving force or key player in achieving these expanded efforts?

20. Are there leaders who might oppose addressing food insecurity of mothers with preschool age children?

    If yes: How do they show their opposition?

COMMUNITY CLIMATE

For the following questions, again please answer keeping in mind your perspective of what RDNs in NC believe about helping mothers with limited or uncertain access to healthy foods.

21. **How much of a priority is addressing helping mothers gain sustainable access to healthy foods among RDNs?**

    Required Probe: Can you explain your answer?

22. **I'm going to read a list of ways that RDNs might show their support or their lack of support for community efforts to address helping mothers gain sustainable access to healthy foods.**

Can you please tell me whether none, a few, some, many or most RDNs would or do show their support in this way? Also, feel free to explain your responses as we move through the list.

How many RDNs...

- At least passively support efforts without being active in that support?
- Participate in developing, improving or implementing efforts, for example by attending group meetings that are working toward these efforts?
- Play a key role as a leader or driving force in planning, developing or implementing efforts?
    - Required Probe: How do they do that?
- Are willing to pay more (for example, in taxes) to help fund efforts?

23. About how many RDNs would support expanding efforts to address helping mothers gain sustainable access to healthy foods? Would you say none, a few, some, many or most?

***If more than "none"*:** How might they show this support? For example, by passively supporting or by being actively involved in developing the efforts?

24. Are there RDNs who oppose or might oppose addressing helping mothers gain sustainable access to healthy foods? How do or will they show their opposition?

- Describe those RDNs.

KNOWLEDGE ABOUT THE ISSUE

25. On a scale of 1 to 10 where a 1 is no knowledge and a 10 is detailed knowledge, how much do RDNs know about helping mothers, who may have limited or uncertain access to healthy foods, gain sustainable access to healthy foods?

Required Probe: Why do you say it's a ____?

26. Would you say that RDNs know nothing, a little, some or a lot about each of the following as they pertain to helping mothers gain sustainable access to healthy foods? (*After each item, have them answer.)*

- helping mothers gain sustainable access to healthy foods in general *(Prompt as needed with "nothing, a little, some or a lot".)*
- the signs and symptoms of a mother who may have limited or uncertain access to healthy foods
- the causes of limited or uncertain access to healthy foods by mothers
- the consequences of limited or uncertain access to healthy foods by mothers
- how much limited or uncertain access to healthy foods by mothers occurs locally
- what can be done to prevent or treat limited or uncertain access to healthy foods by mothers
- the effects of limited or uncertain access to healthy foods by mothers on family and friends?

27. **What are the misconceptions among RDNs about helping mothers gain sustainable access to healthy foods, e.g., why it occurs, how much it occurs locally, or what the consequences are?**

28. **What type of information is available among RDNs about helping mothers gain sustainable access to healthy foods(e.g. newspaper articles, brochures, posters)?**
    If they list information, ask: Do RDNs access and/or use this information?

<u>*RESOURCES FOR EFFORTS*</u> *(time, money, people, space, etc.)*
I'm now going to read you a list of resources that could be used to address helping mothers gain sustainable access to healthy foods in your community.

29. **For each of these, please indicate whether there is none, a little, some, or a lot of that resource available in your community that could be used to help mothers gain sustainable access to healthy foods?**
    - Volunteers?
    - Financial donations from organizations and/or businesses?
    - Grant funding?
    - Experts?
    - Physical space/available locations?

30. **How are current efforts funded?**

    Required Probe: Is this funding likely to continue into the future?

31. **Would community members and leadership support using these resources to address helping mothers gain sustainable access to healthy foods?**

    Required Probe: Can you elaborate?

32. **On a scale of 1 to 5, where 1 is no effort and 5 is a great effort, how much effort are RDNs and/or RDN leadership putting into doing each of the following things to increase the resources going toward addressing helping mothers gain sustainable access to healthy foods?**
    - Seeking volunteers for current or future efforts to address helping mothers gain sustainable access to healthy foods.
    - Soliciting donations from businesses or other organizations to fund current or expanded efforts.
    - Writing grant proposals to obtain funding to address helping mothers gain sustainable access to healthy foods.
    - Training RDNs to become experts in helping mothers gain sustainable access to healthy foods.
    - Recruiting RDNs to address efforts to help mothers gain sustainable access to healthy foods.

33. Are you aware of any proposals or action plans that have been submitted for funding to address helping mothers gain sustainable access to healthy foods?

If Yes: Please explain.

Additional (optional) policy-related questions:

34. Optional: What formal or informal policies, practices and laws related to this issue are in place in your community? (*Prompt*: An example of **—** "formal" would be established policies of schools, police, or courts. An example of **—** "informal" would be similar to the police not responding to calls from a particular part of town.)

35. Optional: Are there segments of the community for which these policies, practices and laws may not apply, for example, due to socioeconomic status, ethnicity, age?

36. Optional: Is there a need to expand these policies, practices and laws? If so, are there plans to expand them? Please explain.

37. Optional: How do RDNs view these policies, practices and laws?

Review

Now, I am going to take a few minutes to review what you've said. After each question I will ask you if I got that right, if I left anything out, and if there is anything you would like to add. This is an important step in the process to make sure we have the right information. Feel free to stop me at any time and add anything that I may have missed.

**Interviewer will review questions and summarize the interviewee's responses. After each summary, the interviewer will ask the following review probes:*

a. Did I get that right?
b. Is there anything you would like to add?

Wrap Up

Thank you so much for sharing your experiences with me today. We truly appreciate your help. Is there anything else you would like to tell me? *(Pause for response)*

Now that the interview is over, we would like to talk to you about sending the information about our study to other registered dietitian nutritionists you might know. Basically, we would ask you to send them information about participating in the interview you just completed. Or if you like, you could just provide us with the names, email addresses, and/or phone number of people you think might be interested and we can contact them directly. If you don't want to do this, you do not have to. Would you be interested in helping us identify additional people to interview?

i. **"Yes"** – Okay, is it better for me to send you an email for you to forward to them or for me to send it directly to them myself?
ii. **"No" –** Alright – not a problem!

If you do decide to get people you know to participate, we ask that you do not share any of the information we discussed today.

Closing

I learned a lot from you today! Thank you again for being so generous with your knowledge and your time. If you have additional questions or information, please do not hesitate to contact me, Latasha Williams. My contact information is listed on the consent form. I hope you enjoy the rest of your day!

Appendix M: Interview Protocol

Scheduling an Interview

1. Principal Investigator (PI) will gather the information for each eligible Registered Dietitian Nutritionist (RDN) from Qualtrics.
2. Within 24 hours of receiving the information, the PI will schedule a Zoom interview and send an email and meeting invite to the eligible RDN.
3. Once the RDN confirms the interview date and time, the PI will add the interview to the interview schedule located on the shared google drive in the folder "IRB #17988".
4. Research assistants (RA) will then assign themselves to any interviews they are able to conduct. The PI will conduct all other interviews.
5. After assigning themselves to an interview, the RA will notify the PI of their assignment.
6. To ensure the RA can perform all the functions necessary for the interview, the PI will assign the RA as a co-host for the interview during scheduling.
7. Within 24 hours of the interview, the interviewer will send the participant a reminder email with the Zoom information they are to use to sign into the meeting.

Before the interview

1. Gather all of the tools and supplies you will need for the interview:
    0. Interview Guide
    1. PowerPoint slides
    2. Writing utensils
    3. Personal Journal
2. Record any thoughts, feelings, or biases in your notebook/journal prior to each interview – also known as *Epoche*.
3. Sign into Zoom 10-15 minutes early to get as prepared as possible before the interview begins.
4. Practice sharing your slides, locate the interview guide, and work out any technical issues.
5. Please dress in business casual attire. (If you have questions regarding what is appropriate to wear, please consult with the PI at least 24-48 hours in advance of your scheduled interview)

During the interview:

1. Start by introducing yourself according to the interview guide.
2. Follow the interview guide – stopping periodically to make sure the participant does not have any questions or any additional information to add to their responses.
3. When recording, please select "Record to the Cloud" in the Zoom settings.
4. At the end of the interview be sure to ask the participant if they would like to add anything else.
5. During the interview, you can check to make sure it is recording by clicking on "more" in Zoom – if you are recording the option to record should be replaced with the option to stop or pause the recording.

After the interview:

1. If the RDN elects to forward the recruiting information to other RDNs, inform the PI who will then send the participant an anonymous link from Qualtrics that can be used by anyone.
2. Complete the initial analysis assessment within 24 hours and save it on the shared google drive in the folder labeled “Initial Analysis Template” which can be found in the folder labeled “IRB #17988”. (save/rename using the convention: IA.Pseudonym.Date.Your Initials)
3. Once the interview recording is available in Zoom, download the “Audio only” file and save it in the shared google drive in the folder labeled “Raw Audio Interviews” which can be found in the folder labeled “IRB #17988”. (save/rename using the convention: RA.Pseudonym.Date.Your Initials)
4. Next, download the “Audio transcript” file and save it in the shared google drive in the folder labeled, “Raw Transcripts” which can be found in the folder labeled “IRB #17988”. (save/rename using the convention: RT.Pseudonym.Date.Your Initials)
5. Send an email to the research team to inform them that a transcript is ready to be viewed for quality control.
6. Any written materials should be transferred to an electronic document and stored in the shared google drive. Hard copies should be destroyed appropriately.

Appendix N: Study 2 and 3 Initial Analysis Template

Initial Analysis Template

Interview Pseudonym:
Interviewer:
Interview Date:
Interview Time:
Interview Length (use audio file to determine length):

Overall Impression:

1. How open was the RDN?

2. Did you have trouble getting them to talk?

3. Did they seem to be in a good mood?

4. Did they tell you they were tired, happy, sad, sick, etc?

Themes:

1. Were there any themes evident from this interview that you would like to share with the interview team?

Evaluate:

2. Briefly evaluate yourself during this interview
    1. Were you able to follow the interview guide?
    2. Is there anything you may have forgotten to ask/address?
    3. Did you add additional questions that were not on the guide?

Appendix O: Study 2 and 3 Transcription Protocol

Transcription Quality Control Protocol

Setting up the Transcript Files:

1. Access the transcript file by going to the shared google drive in the folder labeled "Raw Transcripts" which can be found in the folder labeled, "IRB #17988".
2. Download the file and use "Command+A" to copy the .vtt file.
3. Paste the .vtt file into a google document on the shared drive in the folder labeled "QC'd transcripts" and save/name "QC.date.initials".
4. Add line numbers to document (you may have to download the chrome extension "line numbers").
5. Delete other numbers and time stamps contained in the original document.
6. At the top of the document, add:
    a. Interview Date
    b. Interviewee Pseudonym
7. Access the audio file by going to the shared google drive in the folder labeled "Raw Audio Interviews" which can be found in the folder labeled, "IRB #17988".

Transcribing Technique:

1. Start audio file and read the transcript alongside it, making any corrections as needed.
2. Whenever it appears, replace the interviewee's name with "Interviewee" (also do this when they speak).
3. Once you are done, listen to the file again and fill in the parts you may have missed. You may need to pause to make sure you get everything.
4. Re-read the transcript to look for typos while listening to the recording one last time.
5. Save the quality controlled transcript in the shared google drive in the folder labeled "QC'd Transcripts" which can be found in the folder labeled, "IRB #17988".
6. On the interview schedule, record the date the transcript was completed and email the research team to let us know that the transcript is ready to be viewed.

Common Questions about Transcribing:

Q1: What do I do when the interviewer says "mmhmm" multiple times while the subject is talking?

A1: Do not transcribe "mmhmm"s when they interrupt the flow of the subjects' answer. Also, if the "mmhmm" is said before the interview asks an additional question, you should not transcribe it. The same goes for any other generic verbal indication that the interviewer is listening.

Q2: What do I do when the interviewer or subject uses a "stalling phrase"?

A2: Do not transcribe stalling phrases when they interrupt the flow of the subjects' answer. Also, if the stalling phrase is said before the interviewer asks a question or before the interviewee answers the question, you should not transcribe it.

Example of transcribing participant using "stalling" phrases:

P123: When I was a child, my favorite food was – **um** – pizza, and – **uh** – it was only my

favorite food – **um** – because – like - my friends liked to eat it – **you know** – all the time.

- Without the stalling phrases the person analyzing the data can more easily read the interviewer's questions or interviewee's statement.

P123: When I was a child, my favorite food was pizza, and it was only my favorite food because my friends liked to eat it all the time.

Q3: What do I do when the interviewer interrupts the subject or the subject interrupts the interviewer?
A3: You denote an interruption by a dash mark "-".

Example:
I: So what you're saying is that you went – P123: I went to the beach.
I: - to the beach on Saturday?
- The interrupting statement is not denoted by a dash mark, only the interrupted statement.

Q4: What happens if I cannot understand what is said?
A4: Denote this in parentheses.

Example:
P123: My grandmother taught me to cook when I was 7 years old. Or maybe it was when... (inaudible). Anyway, I was really young when I first learned how to cook.
- Only use this if you've listened to the file 5 or 6 times and can still not understand what was said.

Q5: How do I transcribe laughter?
A5: You can denote this as (Laughter) when it is real laughter and (Laughs) when it is polite laughter. This helps the analyzer know the context better than if the transcript merely said "Haha." You may also use (Nervous laughter) in some situations where you can tell the subject is laughing to divert the interviewer's attention from a politically incorrect statement.

Q6: What if there is an action like a head nod that is not heard on the recorder?
A6: If you can tell from the audio file that an action occurred but is not an audible indication, denote this in parentheses. If you were the interviewer, you will be able to determine what action you need to insert in parentheses.

Example:
In the audio file, I is reviewing information with P123. Transcribed verbatim the conversation reads:
I: And you believe that the best way to prevent childhood obesity is educating the parents. Do you have anything else to add to that?
I: Okay. So then you said that your experience with Nutrition NUTS helped you ...
- You can tell from this statement that the subject had to give an indication of either "yes" or "no" for the interviewer to move to the next statement. You should denote this as:

I: And you believe that the best way to prevent childhood obesity is educating the parents. Do you have anything else to add to that?

P123: (Nonverbal indication of yes)

I: Okay. So then you said that your experience with Nutrition NUTS helped you ...

Shortcuts:

1. To change all of the names at the start of each paragraph, use Command+F (control+F on windows), and hit the 3 dots.
    a. Type the name that you want to replace in Find
    b. Type the new name in Replace with
    c. Hit replace all

b. To get rid of the timecodes, do the same thing as in #1. This will delete all of the numbers, even in the ones in the actual transcript, but it is much quicker to add these back rather than deleting every single time code
    a. Type 1 in "Find"
    b. Leave Replace with blank
    c. Hit Replace all
    d. Repeat with numbers 0-9
    e. Repeat with →

3. Also replace any common transcription mistake made by Zoom to gain time
    - "RDNs" was often transcribed as "our DNS", so you can find and replace

Appendix P: Study 2 Coding Manual

How to use this coding manual:

Purpose: The purpose of this coding manual is to analyze transcripts of qualitative interviews of the perceptions Registered Dietitian Nutritionists' perceptions of helping mothers gain sustainable access to healthy foods. This coding manual is designed to highlight the five dimensions of the Community Readiness Model (CRM) expressed in the qualitative interviews.

Transcripts of each interview are scored first according to the CRM by dimension. The dimensions serve as the initial codes by which all other data is initially coded and sub-coded. Interview transcripts are loaded into the NVivo software, and the codes listed in this manual are programmed into the NVivo program.

Codes: The codes listed in this manual are organized by the five dimensions identified in the CRM. Definitions of codes are to be applied appropriately to determine the subject of the data and quotes you are analyzing.

Process of Coding

1. Code essential parts of the data keeping in mind that not all data collected is relevant to the research question/purpose of the study.
2. Code as a "lumper" by coding the entire statement, not just the sentence where the code is found. If the statement does not stand alone, include the question or probe in your code.
3. Use selected codes, such as the *a priori* codes, repeatedly to start detecting patterns in the data. If appropriate, subsume codes into broader codes or categories as you continue reviewing the data.
4. Mark great and relevant quotes by highlighting and adding a comment into the transcript for use during the analysis process.
5. When analyzing quotes, be aware that some quotes may contain more than one code. This should be noted by assigning more than one code to such a passage.

    For example:

    "*State leaders often do not communicate with RDNs working in the community about the resources that are available to help people experiencing food insecurity and that is why RDNs know very little about how to help mothers."*

    *This quote could be coded as "Leadership - Support" and "Resources - Knowledge"

General Precautions:

1. Due to the nature of the interview, the participant may give the answer to a later question while answering the current question. For example, when they are talking about the community climate, they may discuss the efforts their organization is involved in related to advocating for mothers experiencing food insecurity. This can be coded as both "Community Climate – RDN Effort" and "Knowledge of Efforts – Advocacy".
2. Focus on what the participant said and then ask yourself, "Is this statement talking about RDN knowledge of food insecurity, knowledge of the efforts to help mothers, community climate, leadership, or resources?"

Coding Manual

Initial Codes

RDN Knowledge of the Efforts (KOE)

This section of codes answers the question: How much do RDNs know about the current programs, activities, services, or campaigns being used to address helping mothers gain sustainable access to healthy foods?

Definition - Codes refer to descriptions/mentions of programs, activities, services, or campaigns being used to help mothers gain access to healthy foods.

(Examples: WIC, SNAP, EFNEP, food bank, food pantry, etc; Eat Smart, Move More; school gardens, backpack buddies, cooperative extension, etc.; and misconceptions/misinformation about the efforts)

KOE – Advocacy

Definition - Any programs, activities, services or campaigns that involve addressing government entities about mothers experiencing food insecurity.

(Examples – letter writing campaigns, going to the state legislature, advocating for women)

KOE – Programs

Definition - Descriptions of any federal, state, county, or other local efforts to help mothers experiencing food insecurity.

(Examples – EFNEP, SNAP, WIC, food banks, foods pantries, CACFP, food drives, cooperative buying programs, farmer's market, NSLP, SBP)

KOE – Practice Area

Definition - Discussion about RDN practice area/niche determining their knowledge of the efforts that help mothers experiencing food insecurity.

(Examples – RDN focus area, community RDNs, clinical RDNs, food service RDNs, work experience, specialty area or area of specialty, career, job position/roles, employment, dietetics concentration area, work settings)

KOE – Education

Definition – Anything pertaining to RDN undergraduate and graduate education and experiences, including the dietetic internship.

(Examples – school/schooling, what was/is taught in school, internship experiences, dietetic degree, education)

KOE -Misconceptions/Misinformation

Definition – Discussions of what RDNs may believe about mothers, efforts, and food insecurity that may not be true.

(Examples – What other RDNs think about programs, misconceptions)

RDN Leadership

This section of codes answers the question: What is RDN leadership's attitude toward addressing the issue?

Definition - Codes refer to discussion/mentions of dietetics educators, policy advocates/makers, dietitian supervisors, leaders of dietitian organizations, and those who have influence among dietitians and/or who lead dietitians in helping them achieve their goals to help mothers gain sustainable access to healthy foods.

*(Examples - Academy of Nutrition and Dietetics (AND), North Carolina Academy of Nutrition and Dietetics (NCAND), managers, supervisors, directors, boss, etc.) *A sub-category here may be "Non-RDN leaders"*

Leadership – Priorities

Definition – Any descriptions of what RDN leadership focuses on or prioritizes

(Examples – leadership priorities, leadership focus, what leaders "show up for", concerns of leadership)

Leadership – Support

Definition – Details about the programs and ideas leadership funds or promotes

(Examples – funding, resources, support of work efforts, program expansion)

Leadership – Driving Forces

Definition – Discussions about RDN leadership playing a key role in leading, developing, implementing, and allocating resources for mothers experiencing food insecurity.

(Examples – leadership decision making, in control of resources)

Leadership – Advocacy

Definition – Anything pertaining to leadership advocating for RDNs and/or for mothers experiencing food insecurity.

(Examples – political advocacy, work around federal legislation, advocates for RDNs)

RDN Climate

This section of codes answers the question: What are RDN attitudes toward addressing the issue?

Definition - Codes refer to explanations and descriptions of how RDNs prioritize helping mothers and perceptions of support or lack of support for helping mothers with limited or uncertain access to healthy foods.

(Examples - passive support - completing surveys, answer online calls for action, etc; active support - play a key role in planning, developing, implementing, or expanding efforts; current and future action plans to help mothers.)

RDN Climate – Advocacy

Definition – Details about RDNs advocating for the profession and/or mothers experiencing food insecurity.

(Examples – helping moms, supporting programs, writing legislators, campaigning for special programs)

RDN Climate – Concern

Definition – Anything related to what RDNs consider important to dietitians

(Examples – show concern, lack concern, very great concern)

RDN Climate – Priority
Definition - Anything related to what RDNs prioritize
(Examples – low priority, prioritizing working with certain disease states)

RDN Climate – Education
Definition - Anything pertaining to RDN undergraduate and graduate education and experiences, including the dietetic internship.
(Examples – school/schooling, what was/is taught in school, internship experiences, dietetic degree, education)

RDN Climate – Practice Area
Definition - Discussion about RDN practice area/niche determining their work experieces.
(Examples – RDN focus area, community RDNs, clinical RDNs, food service RDNs, work experience, specialty area or area of specialty, career, job position/roles, employment, dietetics concentration area, work settings)

RDN Knowledge of the Issue (KOI)
This section of codes answers the question: How much do RDNs know about the issue?
Definition - Code refers to descriptions and explanations of the perceptions of the general knowledge of helping mothers gain sustainable access to healthy foods.
(Example - "I don't think RDNs know…"; misconceptions and misinformation among RDNs about helping mothers; sources of information available to RDNs and their usage of those sources, etc.")

RDN KOI – Education
Definition - Anything pertaining to what RDNs learned in their undergraduate and graduate education and experiences, including the dietetic internship.
(Examples – school/schooling, what was/is taught in school, internship experiences, dietetic degree, education)

RDN KOI – Misconceptions
Definition - Discussions of what RDNs may believe about mothers, efforts, and food insecurity that may not be true.
(Examples – What other RDNs think about mothers and/or programs that may not be true)

RDN KOI – Sources of Information
Definition – Where RDNs get their information about food insecurity, efforts, and people experiencing food insecurity.
(Examples – Google, databases, Academy of Nutrition and Dietetics, national organizations, formal education)

Resources Available to RDNs
This section of codes answers the question: What are the resources that are being used or could be used by RDNs to address the issue?
Definition - Code refers to descriptions/mentions of resources being used to help mothers gain access to healthy foods.
(Examples: people (experts), time (volunteers), space (places mothers can meet with RDNs), money (grants and financial donations), training, recruiting, etc.)

Resources – Funding
Definition – Anything related to money RDNs can access to develop and/or implement programs or activities to help mothers experiencing food insecurity.
(Examples – grants, monetary donations, sponsorships, federal funding)

Resources – Locations
Definitions – Descriptions of physical spaces mothers experiencing food insecurity can go to access the services of RDNs.
(Examples – health departments, doctor's offices, rural areas)

Resources – People
Definition – Discussions of RDN availability to mothers experiencing food insecurity
(Example – volunteers, recruiting RDNs to work in community nutrition)

Resources – Time
Definition – Anything related to the time RDNs have to support mothers while at work or through working on special committees; could also be related to the hours RDNs are available to see mothers.
(Examples – office hours, time to refer mothers to resources, volunteering time)

Appendix Q: Study 2 Scoring Guide
(Adapted from the Community Readiness Model Handbook)

Each interview is scored to provide a readiness level for each dimension. **Two** individuals score each interview independently. Interviews should be labeled #1, #2, etc. so that scorers always refer to the same interview. Make sure to remove all interviewee identifiers before scoring to avoid potential bias that may come from the interviewer knowing the key respondent or knowing information about them, such as their age or their employment.

Step 1: Scoring

ξ Have 5 different colors of highlighters. Designate one color for each dimension so, for example, Community Knowledge of Efforts (CKE) might be assigned the yellow highlighter, Leadership might be assigned pink, and so on. Have the other scorer use the same color scheme, as it will make the joint scoring process easier.

ξ There are five rating scales that you will use to score, one for each dimension.

ξ Have a blank scoring sheet available to keep track of your scores and the final consensus scores. See Appendix C for a blank scoring sheet.

ξ Read through an interview in its entirety before scoring any of the dimensions. This will give you a general familiarity with the interview.

ξ Starting with Community Knowledge of Efforts (CKE), read the CKE rating scale to familiarize yourself with key concepts pertaining to this dimension.

ξ Then read through the entire interview and, using your highlighter for this dimension, highlight statements that refer to aspects of this dimension.

ξ Next, using the highlighted statements, start with the first statement on the anchored rating scale and ask yourself if the community exceeds that statement. If they do, proceed to the next statement and ask whether they exceed that statement.

ξ Continue this until you cannot move on to the next statement in the rating scale, that is, the community has not reached that stage yet. The readiness level for CKE is then at the prior stage. **In order to receive a score at a certain stage, the entire statement must be true.**

ξ In the ―Community Readiness Scoring Sheet, fill in your score for the Interview #1- Community Knowledge of Efforts in the table titled ―Individual Scores.

ξ You do not have to use whole numbers. If you think that a community has exceeded one statement but the next statement is not wholly true, then you can give a score in between the two levels.

ξ Move to Leadership. Skim the Leadership Rating Scale to identify key concepts that pertain to this dimension.

ξ Read through the entire interview, highlighting all the statements (with the highlighter assigned to Leadership) that refer to concepts in Leadership.

ξ Using the rating scale for Leadership and the highlighted statements, score the dimension, and write that score into the appropriate cell in the Individual Scores table on the Scoring Sheet.

ξ Continue to the next dimension until all dimensions are scored for that interview.

ξ Score the rest of the interviews in the same fashion and fill out the ―Individual Scores table as you go.

ξ If there are more interviews than room in the table, simply add columns to this form.

ξ As you become more experienced at scoring, you will be able to read through an interview once and highlight statements pertaining to each of the different dimensions, using the highlighters as designated.

ξ Once you have completed scoring all the interviews for a community, you will meet with the other scorer to discuss your scores. Where your scores differ, you each need to discuss and explain how you arrived at your decision until you reach a consensus on what the score should be. **It is important that there be consensus on the scores by both scorers**, not an average.

ξ Enter your agreed upon scores for each dimension for all the interviews in the ―Consensus Scores table.

Here is an example of how the Individual Scores table might look once you have completed your individual scoring for 6 interviews:

Interview Number	#1	#2	#3	#4	#5	#6
Knowledge of Efforts	4	4.25	2	3.5	3	3.5
Leadership	3.5	3.5	2	3	2.5	4
Community Climate	3.5	2.5	1.5	3.25	4	3
Knowledge of Issue	2.5	2.5	3	2.5	3	3.5
Resources	2	3.5	2.5	3	4	3.5

So for example, for interview #3, you gave Leadership, a score of 2.0.

Step 2: Calculate your average dimension scores and an overall average score.
Once you meet with the other scorer to arrive at consensus scores, the Consensus Scores table might look like:

Interview Number	#1	#2	#3	#4	#5	#6	**Average**
Knowledge of Efforts	3	4.25	2	2.5	3	3.5	
Leadership	3.5	3.5	4	3	2.5	4	
Community Climate	3.5	2.5	1.5	3.25	2	3	
Knowledge of Issue	2.5	2.5	3	2.5	3	2.25	
Resources	4	3.5	2.5	3	4	3.5	
Overall Community Readiness Score							

Calculate the average of the ―Consensus Scores‖ for each dimension across all the interviews. For example, for Knowledge of Efforts, add the scores **across** for all the interviews and divide by the number of interviews ((3.0+4.25+2.0+3.5+3.0+3.5) / 6) to get the average - in this case, **3.04**. Enter the average in the last column marked ―Average in the ―Consensus Scores chart.

Interview Number	#1	#2	#3	#4	#5	#6	**Average**
Knowledge of Efforts	3.0	4.25	2.0	2.5	3.0	3.5	**3.04**

To calculate the ―Overall Community Readiness Score‖, find the average of the 5 final dimension scores. (Add the 5 dimension scores and divide by 5). Enter that score next to ―Overall Community Readiness Score.

Thus, the final community readiness scores for this assessment are:

Interview Number	#1	#2	#3	#4	#5	#6	**Average**
Knowledge of Efforts	3	4.25	2	2.5	3	3.5	**3.04**
Leadership	3.5	3.5	4	3	2.5	4	**3.42**

Community Climate	3.5	2.5	1.5	3.25	2	3	**2.63**
Knowledge of Issue	2.5	2.5	3	2.5	3	2.25	**2.63**
Resources	4	3.5	2.5	3	4	3.5	**3.42**
Overall Community Readiness Score							**3.03**

Step 3: Determine the Readiness Level Stage

Knowledge of Efforts 3.04 Vague Awareness
Leadership 3.42 Vague Awareness
Community Climate 2.63 Denial/Resistance
Knowledge of the Issue 2.63 Denial/Resistance
Resources 3.42 Vague Awareness
Overall Score 3.03 Vague Awareness

For this assessment, the scores are quite similar across dimensions, indicating a relatively low level of readiness for all dimensions.

Sample Community Readiness Scoring Sheet

Community: _____
Date: _____
Scorer: _____

Dimensions	Individual Scores					
	#1	#2	#3	#4	#5	Average
Knowledge of Efforts						
Leadership						
Community Climate						
Knowledge of Issue						
Resources						
Average Readiness Score						

Appendix R: Study 3 Coding Manual

How to use this coding manual:

Purpose: The purpose of this coding manual is to analyze transcripts of qualitative interviews of the perceptions Registered Dietitian Nutritionists' perceptions of helping mothers gain sustainable access to healthy foods. This coding manual is designed to highlight the strengths, weakness, opportunities, and threats (SWOT analysis) expressed in the qualitative interviews.

Interview transcripts are loaded into the NVivo software, and the codes listed in this manual are programmed into the NVivo program.

Codes: The codes listed in this manual are organized by the strengths, weaknesses, opportunities, and threats identified in the interviews. Definitions of codes are to be applied appropriately to determine the subject of the data and quotes you are analyzing.

Process of Coding

1. Code essential parts of the data keeping in mind that not all data collected is relevant to the research question/purpose of the study.
2. Code as a "lumper" by coding the entire statement, not just the sentence where the code is found. If the statement does not stand alone, include the question or probe in your code.
3. Use selected codes, such as the *a priori* codes, repeatedly to start detecting patterns in the data. If appropriate, subsume codes into broader codes or categories as you continue reviewing the data.
4. Mark great and relevant quotes by highlighting and adding a comment into the transcript for use during the analysis process.
5. When analyzing quotes, be aware that some quotes may contain more than one code. This should be noted by assigning more than one code to such a passage.

    For example:

    "*State leaders often do not communicate with RDNs working in the community about the resources that are available to help people experiencing food insecurity and that is why RDNs know very little about how to help mothers."*

    *This quote could be coded as "Leadership - Support" and "Resources - Knowledge"

General Precautions:

3. Due to the nature of the interview, the participant may give the answer to a later question while answering the current question. For example, when they are talking about the community climate, they may discuss the efforts their organization is involved in related to advocating for mothers experiencing food insecurity. This can be coded as both "Community Climate – RDN Effort" and "Knowledge of Efforts – Advocacy".
4. Focus on what the participant said and then ask yourself, "Is this statement talking about RDN knowledge of food insecurity, knowledge of the efforts to help mothers, community climate, leadership, or resources?"

Strengths

This section of codes corresponds to the strengths and/or assets identified among RDNs when it comes to supporting mothers experiencing food insecurity.

Strengths - Expertise

Definition - Refers to descriptions/mentions of RDNs being nutrition experts.

(Examples – knowledgeable, nutrition experts)

Strengths – Helpers

Definition – Anything pertaining to RDNs wanting to help people attain a healthy diet

(Example – passionate about helping, empathetic)

Strengths – Support

Definition – Related to support RDNs provide for mothers and the support RDNs receive from leaders and leadership.

(Example – community RDNs, active support from leaders, passive support for funding and expanding efforts)

Weaknesses

This section of codes corresponds to the weaknesses identified among RDNs when it comes to supporting mothers experiencing food insecurity.

Weaknesses – Education Gaps

Definition – Discussions of lack of education/undergraduate training of RDNs related to how to help people experiencing food insecurity.

(Example – internship rotations, school, schooling)

Weaknesses – Practice Area Silos

Definition – Descriptions of RDNs working alone or being focused on one area of dietetics and nutrition.

(Example – niche practice, lone RDN, RDN focus area)

Weaknesses – Misconceptions

Definition - Discussions of what RDNs may believe about mothers, efforts, and food insecurity that may not be true.

(Examples – What other RDNs think about mothers and/or programs that may not be true)

Opportunities

This section of codes corresponds to opportunities that exist outside the community of RDNs.

Opportunities – Collaborations

Definitions – Anything pertaining to RDNs working with other healthcare professionals to help mothers experiencing food insecurity.

(Examples – training peer educators, teaching doctors about nutrition programs, referrals to social workers)

Opportunities – Advocacy

Definitions – Supporting laws and bills related to nutrition assistance programs for mothers experiencing food insecurity.

(Examples – writing letters to legislators, visiting the state capitol, Academy of Nutrition and Dietetics Calls to action)

Threats

This section of codes corresponds to threats that exist outside the community of RDNs that may prevent them from helping mothers experiencing food insecurity.

Threats – Policies

Definition – Anything related to state and federal policies that prevent resources and funding from being allocated to help mothers experiencing food insecurity.

(Example – government administration, local politics, policies, policymakers, human resources)