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Nutrition Education Resources in North Carolina–Based Head Start Preschool Programs: Administrator and Teacher Perceptions of Availability and Use

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Abstract

Objective: The purpose of this study was to provide new insight into common barriers to the availability and use of nutrition education (NE) resources in Head Start preschool programs based on administrator and teacher perceptions.

Methods: In-depth, semistructured phone interviews (n = 63) were conducted with administrators (n = 31) and teachers (n = 32) from North Carolina–based Head Start programs. Interviews were audio-recorded and transcribed verbatim. Data were analyzed qualitatively using content analysis to identify common themes.

Results: Five emergent themes were identified within the areas of NE resource availability and use and barriers to NE resource availability and use. Participants expressed desire for greater organization of existing NE material resources, increased community support, and professional development opportunities for teachers specific to NE. Funding and time constraints were reported as affecting NE resources.

Conclusions and Implications: Creative strategies for addressing NE resource availability and use and barriers (e.g., NE integration with educational standards) in Head Start are needed.

Keywords: nutrition education resources, teachers, administrators, Head Start, children, qualitative

Introduction

Over 20% of American preschool children (aged 3–5 years) are overweight or obese,¹ which increases their risk of becoming obese adults and developing weight-related chronic diseases later in life.^{2–4} Obesity is most prevalent in children from low-income, low-resource families, who often have limited access to healthy, nutritious, affordable food and safe areas for physical activity and recreation.¹ Many low-income preschoolers attend Head Start (HS), the largest federally funded child care program in the US.^{5,6} All HS programs are governed by program performance standards that mandate implementation of nutrition education (NE) and the provision of healthy meals and snacks.⁷ Unfortunately, many HS staff believe they receive inadequate training to provide NE confidently.⁸

Furthermore, the amount and quality of NE provided in HS is challenged by many factors including restrictive policies and regulations, NE resources, priority given to NE, and time constraints within the classroom environment.^{5,7,8}

Successful implementation of NE in HS classrooms requires addressing NE barriers by identifying effective and feasible NE resources. Past studies demonstrated the effectiveness of multifaceted, all-inclusive NE resources in producing positive health and behavioral outcomes in preschool children.^{9–11} Preschool NE resources often combine traditional strategies and materials (e.g., food tastings, activity sheets, music^{12,13}), incorporate ways to engage families (e.g., recipes sent home), and feature a teacher professional development component (generally specific to a curricular resource).^{12–15}

Despite the need for a targeted approach to channel NE resources effectively, little is known about HS administrators' and teachers' perceptions of NE resources available for the HS classroom. To date, most studies have focused on developing, implementing, or testing an individual curriculum, program, or intervention rather than examining overall NE resource availability and use.⁹⁻¹⁵ Therefore, the purpose of this study was to examine HS administrator and teacher perceptions of resources available to support NE in North Carolina-based programs.

Methods

Study Design

This study presented an inductive content analysis of 63 in-depth semistructured interviews exploring HS administrator and teacher perceptions related to NE resources in HS programs. Researchers developed semistructured interview guides using open-ended and in-depth questioning to examine the state of NE as perceived by North Carolina HS administrators and teachers. Throughout the article, the term "researchers" indicates those responsible for recruitment and data collection.⁸ The North Carolina State University Institutional Review Board approved all study materials and methods.

Participants and Recruitment

Researchers obtained a list of all HS-funded organizations within North Carolina through the state's Office of Head Start Collaboration and the North Carolina Head Start Association. A total of 58 Head Start-funded organizations were identified as operational at the time of the study. Researchers recruited participants systematically. To begin, the Directors of each North Carolina-based HS organization were contacted. Directors facilitated recruitment of health/nutrition coordinators by providing their contact information. Researchers recruited coordinators by contacting them individually via phone to participate in the study. Coordinators then facilitated teacher recruitment by providing information about the study to teachers within their organization. All participants were required to be over age 18 years and employed by a North Carolina-based HS-funded organization.

Researchers compensated participants with a \$20 gift card. Administrators (health/nutrition coordinators) were defined as those responsible for implementing policies and requirements with regard to the HS organizations' federally mandated nutrition requirements. Teachers were defined as those responsible for providing NE to children aged 3–5 years, having direct contact with the children, and needing NE resources.

Data Collection

Four researchers conducted telephone interviews between September, 2011 and May, 2012. Before the beginning of data collection, interviewers were trained in human ethics and qualitative research methods using the 5-phase protocol for training interviewers of Goodell et al.¹⁶ As part of the phased training method and in an effort to ensure consistency and credibility, each data collector also completed 2 pilot interviews, 1 with a fellow researcher and 1 with a non-Head Start preschool administrator or teacher. All interviews were conducted using 1 of 2 in-depth, semistructured guides (1 for administrators and 1 for teachers). Eight interview questions, 7 of which were resource-specific, yielded the greatest amount of insight (Table 1). Primary questions were open-ended and broad in nature; researchers used specific and general probes to gain additional insight into perceptions related to HS NE resources. Questions grew more focused and specific as the interview progressed. Guides were initially evaluated for clarity and content through the 4 mock interviews completed during interviewer training. Researchers further revised the guides after the completion of the first 11 interviews (8 coordinators and 3 teachers) to improve the clarity of participants' responses by adding probes regarding specific requirements, restrictions, and strategies related to classroom-based NE. A total of 52 participants responded to the modified guide (23 coordinators and 29 teachers). Each interviewer completed detailed field notes during interviews. Interviews were audio-recorded and all recordings were transcribed verbatim and coded manually using a basic word-processing program. Final interviews lasted 30–90 minutes and concluded with a review of answers received from participants. Participants were then asked for clarification or confirmation of each answer given. Data collection continued until saturation was reached and new insights were no longer obtained from the interview responses.¹⁷

Table 1. In-Depth Structured Interview Questions Relating to Nutrition Education Resource Availability and Use

What issues come up when your teachers are teaching nutrition education inside and outside their classroom?
What types of training have your teachers had related to nutrition education?
Do you feel that your teachers need more training related to nutrition education?
Are you aware of any other training available to your teachers related to nutrition education?
What type of training have you had related to nutrition?
Can you provide an example of 1 of your teacher's formal and informal nutrition education activities?
What sort of resources do you wish were available for teaching nutrition education in the classroom?
What would your ideal nutrition education curriculum look like or include?

Data Management and Analysis

Analysis was completed using inductive content analysis.¹⁸ Each transcript was reviewed independently and underwent memoing and open coding to develop a preliminary coding manual and identify emergent themes. Once codes were defined, final codes were applied to each transcript, emergent themes were confirmed, and representative quotes were identified for each theme. To achieve consensus during analysis, verbal agreement was reached on each applied code and/or identified theme for all transcripts. Decision for agreement was yes or no; disagreements were discussed until consensus was obtained and a final code was determined.^{18,19} Throughout this process, similar findings were connected together to develop emergent themes fully.¹⁷ Final themes were grouped into 2 categories to describe participants' experiences succinctly with NE resources in North Carolina-based HS preschool programs.

Results

The final sample included 63 HS administrator and teacher interviews (31 health/nutrition coordinators and 32 teachers). The sample represented 60% of North Carolina-based HS organizations, spanning all 3 of the state's geographical regions (mountains, Piedmont, and coastal plain) (Figure). All participants were women aged > 18 years who reported educational attainment of a high school diploma or higher.⁸ Consistent with the study objective, 5 emergent themes were categorized into 2 categories: (1) NE resource availability and use, and (2) barriers to NE resource availability and use.

Current NE Resource Availability and Use

Researchers identified 3 emergent themes within the category of NE resource availability and use based on participants' responses: material resources, human resources, and training resources (Table 2). Resources from all 3 themes were reported as being available, used, and/or desired by administrators and teachers. Material resources included items such as books, games, and models used to teach nutrition, as well as technological resources and nutrition curricula. Administrators and teachers listed several types of material resources either available to them or currently being used in their classrooms, including curricula, models, and books. Some administrators and teachers even mentioned the use of gardens to teach children and parents about the origin of familiar fruits and vegetables. Such hands-on resources were considered especially desirable, and multiple teachers wished they "had more interactive nutritionally based activities." However, regarding material resource availability, administrators and teachers reported differing opinions. Some teachers thought they did not have enough materials resources (in general and/or specific types desired by individual teachers), most often owing to funding constraints or a lack of awareness of available resources. On the contrary, administrators often articulated a differing opinion; for example, one administrator stated, "there are a lot of resources [teachers are] given."

Many participants expressed a common desire for a single, all-inclusive NE resource or curriculum. Administrators reported wanting an organized, easily accessible collection of materials for teachers to provide NE more easily. One administrator said this resource "would have lots of activities related to nutrition," whereas another stated that the resource "would include all the materials [teachers] needed [to teach nutrition]." They believed that having a single resource would allow teachers to spend less time collecting materials or searching for information and more time providing NE. Teachers also discussed the need for greater organization of resources and consolidation of materials; one stating that:

I would love ... to have a resource that I wouldn't have to keep clicking on this and clicking on this, ... so I wouldn't have to keep searching forever for something.

Similarly, other teachers reported, "It would be nice to have just a nutrition guidebook that had specific lesson plans and materials to go along with it," and "If we could make all of those curricula into one curriculum, I feel sure that we could teach nutrition more often."

The second emergent theme was human resources. Participant discussions focused on community members and health professionals (e.g., registered dietitians, dentists, nursing students) who provided educational support in HS classrooms. These human resources were described as valuable because of their level of expertise in health and nutrition, as well as their ability to provide additional supervision and assistance during classroom activities. Administrators often stated that they would appreciate having individuals from outside the classroom assist teachers with NE. Teachers agreed that having individuals from the community visit their classrooms would be helpful. One teacher stated he or she was "all for it" because otherwise the teacher "might miss something that somebody else might be an expert on." Despite a desire for community involvement, teachers often stated they were unsure of how to find individuals in the community who would be willing to visit and work with them in their classrooms. One teacher stated that more well-known, accessible community resources were not always available for preschool programs: "You know, there's like the [Cooperative] Extension, the agriculture department but . they usually go to the older kids."

Finally, the third emergent theme, training resources, was defined as opportunities within and beyond HS programs for teachers to learn how to provide higher-quality NE. Many of these opportunities were offered through agencies such as the *Child and Adult Food Care Program*, North Carolina Cooperative Extension Service, local health departments, and individual HS programs. The majority of participants agreed that there was a need for more teacher training resources. However, some felt differently, as stated by 1 teacher: "I do not feel like I need more training; I feel like we need more materials." Administrators were also more aware of available resources for teacher professional development than were teachers. Whereas administrators reported the availability of multiple trainings, teachers made statements such as "We have not had [really any] training on nutrition."

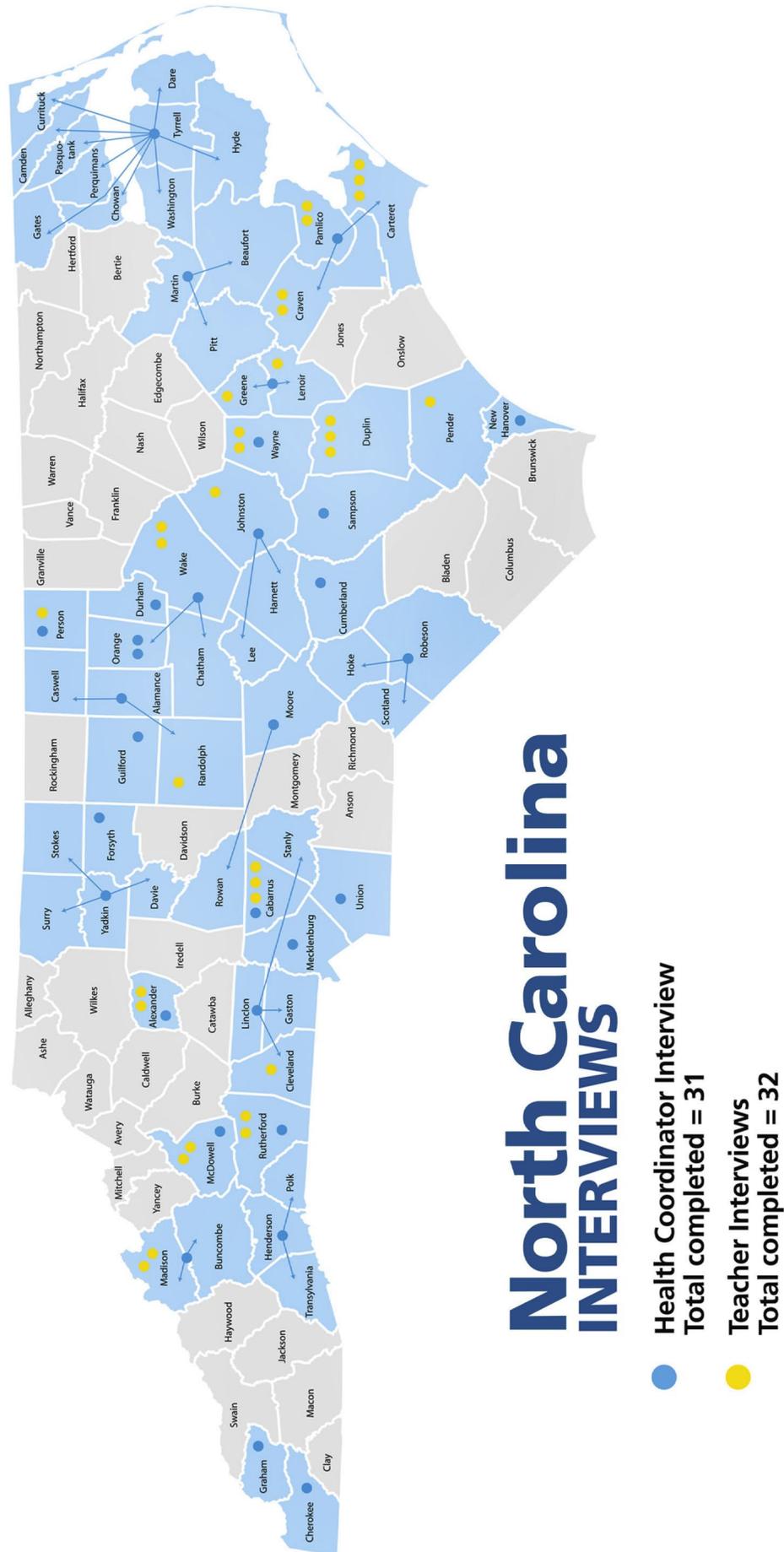


Figure 1. Head Start interview participant sites in North Carolina. Arrows stemming from the health coordinator locations represent their authority spanning across multiple counties and centers.

Table 2. Nutrition Education Resources Reported by North Carolina–Based Head Start Administrators and Teachers (n = 63)

Main Theme	Supporting Participant Quotation	Specific Resources Described	
		General Nutrition Education Materials	Nutrition Education Curricula
Nutrition education materials	<p>... I think that would make it easier for them, you know, if there were some sort of kits that had lesson plans kind of laid out ...—administrator</p> <p>I wish there were more books that I had access to, that I did not have to work so hard for.—teacher</p>	<ul style="list-style-type: none"> • New activities and lesson plans • Catalog of resources library or Internet accessible • Music • Garden • Hands-on books • Realistic pictures • Manipulative materials • Resources for parents • Magazines • Handouts 	<ul style="list-style-type: none"> • More Than Mud Pies²⁰ • I Am Moving, I Am Learning²¹ • Color Me Healthy²² • The Farmer Grows a Rainbow²³ • Be Active Kids²⁴ • The Creative Curriculum (Cooking Unit)²⁵ • FoodPlay²⁶
Human resources	<p>I wish we had a nutritionist or dietitian that could come in and teach the kids.—administrator</p> <p>... Sometimes it would be helpful to have an extra person in there when I'm doing the nutrition activity ...—teacher</p>	<p>Local Individuals</p> <ul style="list-style-type: none"> • Nutritionist/dietitian • High school students • Nursing students • Communities <p>Organizations Offering HR Support</p> <ul style="list-style-type: none"> • Cooperative Extension • US Department of Agriculture • Health department • Local university 	<ul style="list-style-type: none"> • Special Supplemental Nutrition Program for Women, Infants, and Children • Expanded Food and Nutrition Education Program • Smart Start • Local hospital • Partnership for Children • Local food bank • Farm bureau • Local horticulture center • North Carolina Nature Center • Centers for Disease Control and Prevention • Blue Cross Blue Shield • School nutrition departments
Training resources and/or opportunities	<p>... We have 2 different nutrition education programs that all of our teaching, or education staff have been trained on.— administrator</p> <p>... I could definitely see more training could be readily available. —teacher</p>	<p>Support for Training</p> <ul style="list-style-type: none"> • Veteran staff (peer support) • Yearly required training (pre-service and in-service) • Food service staff training • Parent meetings • Workshops <p>State-Level Resources</p> <ul style="list-style-type: none"> • Cooperative Extension • Child Health Care Advocate Program • Eat Smart, Move More²⁷ • Local conferences • Sanitation training • Child and adult care food program training • Other state-funded training programs 	<p>National Resources</p> <ul style="list-style-type: none"> • Dairy Council • Nutrition and Physical Activity Self-Assessment for Child Care²⁸ • Head Start Training • Young Men's Christian Association Training • Training related to specific nutrition education curricular programs • National Conferences <p>Online Resources</p> <ul style="list-style-type: none"> • List serves • Online courses • Preventing obesity in young children training university course

Barriers to NE Resource Availability and Use

Researchers identified 2 emergent themes for barriers appearing to affect NE resources in HS classrooms: funding and time (Table 3). Administrators and teachers described inadequate funding as a barrier limiting their ability to purchase or replace materials, as well as the types of NE resources and strategies they were able to use. One administrator stated that teachers “have had to turn down the opportunity to teach nutrition in a very innovative way because of the price tag.” Other administrators and several teachers also said that their programs could not afford to purchase fruits and vegetables to use for hands-on NE activities, such as tastings: “It would be nice if there was a nutritional fund for the teachers to use to buy things for the children to taste” [teacher]. A few participants reported using their own money to purchase materials, such as food for NE activities in their classrooms; 1 teacher stated, “Most of [money for materials] comes out of the teacher’s pocket as opposed to the school’s pockets or somebody else[s].” Participants thought that if they were required to provide NE, they should be provided with adequate funding to purchase resources or receive reimbursement for resources purchased with their own money.

Participants often reported difficulty in providing NE owing to time constraints. Many participants described difficulties in finding or creating time for NE among the many other subjects they were required to teach, such as math and reading, and acknowledged that nutrition was sometimes given less priority than these other subjects. One administrator stated, “Timing is a big factor because you are having a lot of stuff to go over besides just going through nutrition,” whereas another said, “To get everything in, [teachers] have to put a little less time for nutrition.”

Limited time was not only a barrier during instructional hours; it also affected lesson planning and teacher training. Teachers reported that time constraints often made it difficult to justify spending time away from the classroom to attend workshops, conferences, and training sessions despite the need for more training. Furthermore, teachers discussed the issue of long time delays for obtaining resources or HS approval for NE activities: “[H]aving to get everything approved is the part that takes up the time.” Teachers were less inclined to incorporate NE strategies or activities that

required them to obtain approval, such as tastings or field trips, or submit a formal request for additional resources such as fruits and vegetables. Teachers also reported being less likely to take advantage of resources that required extra time or effort to obtain outside their normal workday. One teacher said that

The library is awesome but when I’m working 8 hours a day and I’m just exhausted at the end of the day I don’t have time to go to the library and focus on my family, too.

Discussion

Head Start programs have an important role in shaping children’s nutrition behaviors. For example, NE delivered in preschool settings can help children (aged 3–5 years) increase fruit and vegetable intake.^{11,29} Many resources are currently available, including curricula and teacher training programs;^{11-13,15,28-33} however, studies are limited that describe the factors influencing resource availability and use, as well as the types of resources teachers find most effective. This study outlines barriers that may influence NE, as well as current reported use and availability of NE resources in the HS preschool setting.

Consistent with previous studies,^{7,8,34} time and funding were cited barriers not to only offering NE in the HS classroom but also to obtaining and using NE resources. Administrators and teachers reported that a lack of available funding limited the quantity and types of material NE resources purchased and perceived a need for more funding for NE. One previous study found that over half of HS program directors in the US thought that they did not receive adequate funds to purchase healthy foods and NE resources for their programs. The ideal solution to this problem would be for state or federal agencies to provide additional funding to improve access to NE resources.⁶ However, a more feasible approach to overcoming funding constraints may be accomplished by establishing collaborations among nutrition professionals, early childhood educators, and local community partners to help HS programs leverage existing NE material, human, and training resources available locally. For example in North Carolina, free NE resources are available for early childcare

Table 3. Barriers to Nutrition Education Resource Availability and Use Reported by North Carolina–Based Head Start Administrators and Teachers (n = 63)

Barrier	Supporting Participant Quotation	Impact on Nutrition Education
Funding	We have 6.5 hours with our children and sometimes you can’t get it all in ... —administrator ... There’s lots of money that’s involved that’s preventing the children from really experiencing foods, some good nutrition experiences.—teacher	<ul style="list-style-type: none"> • Teachers pay out of pocket for materials • Limited ability to incorporate activities such as food tastings
Time	... I wish that there were more resources available free of charge for our program.—administrator ... It would be great if we could just teach nutrition and health ... but we also have to teach math and art and writing and music ... so we have well-rounded children.—teacher	<ul style="list-style-type: none"> • Less priority given to nutrition compared with other subjects • Lower likelihood of teachers seeking training • Lower likelihood of teachers incorporating activities requiring pre-approval

settings through the Nutrition and Physical Activity Self-Assessment for Child Care program and Shape NC: Healthy Starts for Young Children program.^{28,30} Furthermore, NE material resources are available free online to programs nationally from the US Department of Agriculture (USDA)'s *Child and Adult Care Food Program* (CACFP), *Team Nutrition*, and *MyPlate* programs.^{31,32}

Teachers also reported allotting less time for NE compared with other subjects to ensure all required subjects were covered. Because HS is intended to promote kindergarten readiness among low-income children, teachers are responsible for ensuring that children make age-appropriate progress in areas such as literacy and numeracy.⁷ If nutrition is perceived as a less important subject and becomes a low priority, less instructional time will be devoted to NE. Past studies of administrator- and teacher-reported barriers to NE in HS preschool programs have reported similar findings, citing time constraints as a barrier to incorporating nutrition during the day and obtaining resources for NE.^{5,15} One strategy to reduce the influence of time constraints on NE is to integrate nutrition with other subjects rather than set aside specific blocks of time for NE.⁵ Integration of NE with other subjects would likely decrease teachers' concern about fitting in NE among other required subjects and reduce the number of resources required for NE, potentially lowering the cost.

Participants reported using several types of material resources, but many expressed the need for a single consolidated resource that would include all necessary materials and lesson plans. Previous research indicated that providing a single consolidated resource (e.g., Coordinated Approach to Child Health, *Color Me Healthy*) can lead to successful implementation of NE in HS classrooms,^{11-13,15,28-33} lessening the influence of barriers such as time needed to gather materials and funding. Furthermore, integrating NE lessons with educational competencies such as math, reading, or motor skill development may lead to improved prioritizing and efficiency in implementing NE.⁸ Human resources were deemed helpful when available because they often had a greater depth of nutrition knowledge than did teachers. This deeper knowledge may allow for the provision of higher-quality NE, which may in turn lead to improved nutrition and eating behaviors in children.¹⁰ Participants also said that they would like to have people come into their classrooms to supervise and assist with nutrition activities; however, they were not always sure of how to connect with people who would be willing to work in preschool classrooms. Future research is needed to identify strategies for connecting HS administrators and teachers to human resources and to determine how best to use these resources to improve the quality of NE provided.

Finally, participants discussed the need for training resources such as those provided by HS through pre- or in-service trainings or the USDA's CACFP. The importance of teacher training is supported by past studies reporting that teachers who receive training are more likely to incorporate NE in their classrooms.³⁵⁻³⁷ Training builds teachers' knowledge of nutrition, which correlates with teacher confidence and the ability to provide quality NE in the classroom.³⁶ However, the quality, content, and availability of NE training for HS administrators and teachers remains unclear and need further investigation. For example, CACFP is often cited as

an NE training resource for administrator and teachers; however, trainings provided in North Carolina tended to focus on meal pattern requirements, feeding infants, and other administrative issues related to implementing the CACFP standards, compared with basic nutrition content and/or NE teaching pedagogy for preschool children.³⁸ Greater efforts may be needed during state-level CACFP trainings to make administrators and teachers aware of NE-specific resources available through CACFP and other USDA programs.³¹⁻³³ As previously described, some curricula included resources for teacher training.¹²⁻¹⁴ When using specific NE curricula, training provides teachers with an opportunity to familiarize themselves with NE activities before implementing them in their classrooms, ensuring that these curricula are used correctly and effectively; however, availability, cost, and access to these program by all HS teachers remains uncertain. Greater effort should be made to ensure that all HS teachers are aware of available low-cost or free training opportunities for NE.

The experiences and perceptions described in this article may not fully reflect the views and opinions of all North Carolina HS administrators and teachers.⁸ All participants were female and over age 18 years; however, the researchers did not collect demographic data related to race/ethnicity. Participants' views may have been influenced by race/ethnicity. In addition, interviewer guide questions were limited to understanding the state of NE in the HS classroom; the use and availability of NE resources were not directly addressed. Despite these limitations, it is possible that this study's results accurately and generally reflect HS coordinators and teachers.

Implications For Future Research And Practice

This study offers new insights into the types of resources that are considered most useful or desirable for NE. Furthermore, because past research cited funding and time as common barriers to NE in the HS setting,^{5,8} this study drew from the voices of HS teachers to identify strategies to overcome these barriers. First, findings highlighted the perceived need for available NE resources to be consolidated and easily accessible to reduce barriers related to funding and time (e.g., material awareness, lesson planning). Using the current focus on kindergarten readiness standards, nutrition professionals and early childhood educators should consider working together to develop innovative, consolidated resources that also integrate NE with educational competencies important to HS teachers, such as science and mathematics. Further research should also investigate whether using the suggested resources (i.e., condensed, coordinated curricula, improved teacher training, and human resources) would support NE in the HS classroom and increase nutrition knowledge among preschoolers and HS staff.

Second, greater efforts should be made to connect HS educators with community professionals. Both administrators and teachers emphasized the advantages of seeking outside expertise to conduct NE in their classroom; however, it was also cited that the most easily accessible resources (e.g., Cooperative Extension) often focused on older children and/or

adults. Because early childhood is a formative developmental period, state Extension specialists and educators should focus on offering programming specific to HS organizations to reach low-income minority children and families at a higher risk of obesity. Third, and potentially most important, findings revealed a need for development of new NE training resources for HS teachers. Nutrition professionals and early childhood educators should consider working together to develop innovative teacher training focused on improving HS teachers' understanding of basic nutrition content, NE pedagogy in early childhood settings, and potentially self-efficacy toward teaching NE. Whereas past research in kindergarten through grade 12 settings indicated that teachers who receive focused training in NE pedagogy devote more time to the subject and have higher levels of teaching self-efficacy,^{36,37} future research is needed to examine the impact of these factors on HS preschool teachers' personal nutrition knowledge, health behaviors, and actual classroom practice.

References

- Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of childhood and adult obesity in the United States, 2011-2012. *JAMA*. 2014;311:806-814.
- Freedman DS, Khan LK, Serdula MK, Srinivasan SR, Berenson GS. BMI rebound, childhood height and obesity among adults: The Bogalusa Heart Study. *Int J Obes*. 2001;25:543-549.
- National Diabetes Fact Sheet. Centers for Disease Control and Prevention. Atlanta, GA: US Dept of Health and Human Services; 2011.
- Daniels SR, Arnett DK, Eckel RH, et al. Overweight in children and adolescents: pathophysiology, consequences, prevention, and treatment. *Circulation*. 2005;111:1999-2012.
- Hughes CC, Gooze RA, Finkelstein DM, Whitaker RC. Barriers to obesity prevention in Head Start. *Health Aff*. 2010;29:454-462.
- Head Start Program Facts Fiscal Year 2013. US Department of Health and Human Services Administration for Children and Families. <https://eclkc.ohs.acf.hhs.gov/hslc/data/factsheets/docs/hs-program-fact-sheet-2013.pdf> Accessed August 17, 2016.
- Head Start Program Performance Standards. US Department of Health and Human Services Administration for Children and Families. <https://eclkc.ohs.acf.hhs.gov/hslc/standards/hsppps> Accessed August 17, 2016.
- Carraway-Stage V, Henson SR, Dipper A, Spangler H, Ash SL, Goodell LS. Understanding the state of nutrition education in the head start classroom: a qualitative approach. *Am J Health Educ*. 2014;45:52-62.
- Natale RA, Lopez-Mitnik G, Uhlhorn SB, Asfour L, Messiah SE. Effect of a child care center-based obesity prevention program on body mass index and nutrition practices among preschool-aged children. *Health Promot Pract*. 2014;15:695-705.
- Williams PA, Cates SC, Blitstein JL, et al. Nutrition-education program improves preschoolers' at-home diet: a group randomized trial. *J Acad Nutr Diet*. 2014;114:1001-1008.
- Sharma S, Chuang RJ, Hedberg AM. Pilot-testing catch early childhood: a preschool-based healthy nutrition and physical activity program. *Am J Health Educ*. 2011;42:12-23.
- Farfan-Ramirez L, Diemoz L, Gong EJ, Lagura MA. Curriculum intervention in preschool children: Nutrition Matters! *J Nutr Educ Behav*. 2011;43(suppl 2):S162-S165.
- Kannan S, Smith R, Foley C, et al. Fruit-Zotic: a sensory approach to introducing preschoolers to fresh exotic fruits at Head Start locations in western Massachusetts. *J Nutr Educ Behav*. 2011;43:205-206.
- Davis SM, Sanders SG, FitzGerald CA, Keane PC, Canaca GF, Volker- Rector R. CHILE: an evidence-based preschool intervention for obesity prevention in Head Start. *J Sch Health*. 2013;83:223-229.
- Dunn C, Thomas C, Pegram L, Ward D, Schmal S. Color Me Healthy, preschoolers moving and eating healthfully. *J Nutr Educ Behav*. 2004;36:327-328.
- Goodell S, Stage V, Cooke NK. Improving trustworthiness of qualitative research through standardization and training practices [epub ahead of print]. *J Nutr Educ Behav*. 2016 Jul 6. <http://dx.doi.org/10.1016/j.jneb.2016.06.001>
- Bowen GA. Naturalistic inquiry and the saturation concept: a research note. *Qual Res*. 2008;8:137-152.
- Kondracki NL, Wellman NS, Amundson DR. Content analysis: review of methods and their applications in nutrition education. *J Nutr Educ*. 2002;34:224-230.
- Creswell JW. *Qualitative Inquiry & Research Design: Choosing Among Five Approaches*. Thousand Oaks, CA: Sage Publications; 2007.
- National Food Service Management Institute. *More Than Mud Pies*. University of Mississippi; 2014. <http://nfsmi.org/Resource-Overview.aspx?ID=247> Accessed August 23, 2016.
- Head Start. I Am Moving, I Am Learning. 2009. <https://eclkc.ohs.acf.hhs.gov/hslc/tta-system/health/healthy-active-living/imil> Accessed August 23, 2016.
- NC Cooperative Extension and North Carolina Division of Public Health. *ColorMe Healthy*. <http://colormehealthy.com/> Accessed August 23, 2016.
- National Agriculture in the Classroom. *The Farmer Grows a Rainbow*. <http://www.agclassroom.org/rainbow/> Accessed August 23, 2016.
- Blue Cross and Blue Shield of North Carolina Foundation. *Be Active Kids*. <http://beactivekids.org/bak/Front/Default.aspx> Accessed August 23, 2016.
- Teaching Strategies, LLC. *The Creative Curriculum*. 2009. <http://teachingstrategies.com/curriculum> Accessed August 23, 2016.
- FoodPlay Productions. 2009. <http://foodplay.com/> Accessed August 23, 2016.
- Eat Smart, Move More. <http://eatsmartmovemorenc.com> Accessed August 23, 2016.
- Nutrition and Physical Activity Self- Assessment for Child Care (NAP SACC) program. <https://gonapsacc.org> . Accessed August 23, 2016.
- Witt KE, Dunn C. Increasing fruit and vegetable consumption among preschoolers: evaluation of Color Me Healthy. *J Nutr Educ Behav*. 2012;44:107-113.
- Shape NC: Health Starts for Young Children program. <http://www.smartstart.org/shape-nc-home/> Accessed February 17, 2016.
- USDA Team Nutrition. <http://www.fns.usda.gov/tn/team-nutrition> Accessed February 17, 2016.

32. Choose My Plate. <http://www.choosemyplate.gov/health-and-nutrition-information> Accessed February 17, 2016.
33. Child and Adult Care Food Program. Nutrition and nutrition education. <http://www.fns.usda.gov/cacfp/nutrition-and-nutrition-education> Accessed February 17, 2016.
34. Derscheid LE, Kim S, Zittel LL, Umoren J, Henry BW. Teachers' self efficacy and knowledge of healthy nutrition and physical activity practices for preschoolers: instrument development and validation. *J Res Child Educ.* 2012;28:261-276.
35. Hoelscher DM, Feldman HA, Johnson CC, et al. School-based health education programs can be maintained over time: results from the CATCH Institutionalization study. *Prev Med.* 2004;38:594-606.
36. Brandon DP. Self-efficacy: gender differences of prospective primary teachers in Botswana. *Res Educ.* 2000;64: 36-43.
37. Rossiter M, Glanville T, Taylor J. School food practices of prospective teachers. *J Sch Health.* 2007;77: 694-700.
38. Sigman-Grant M, Christiansen E, Fernandez G, et al. Peer reviewed: childcare provider training and a supportive feeding environment in child care settings in 4 states, 2003. *Prev Chronic Dis.* 2011;8:A113.