

DEVELOPMENT OF A PARENT-FOCUSED eLEARNING PROGRAM TO IMPROVE HEALTHY BEVERAGE CONSUMPTION AMONG BLACK FAMILIES OF YOUNG CHILDREN

by

CHISOM BLESSING OKOLI

(Under the Direction of CAREE J. COTWRIGHT)

ABSTRACT

About 3 in 5 children (57.1%) aged 1-5 years in the United States consume at least one sugar sweetened beverage (SSB) weekly with trends higher (62.5%) in Georgia. Sugar sweetened beverage consumption among children is a risk factor for overweight, obesity and dental cavities. Specifically, Black children consume higher amounts of SSBs (71.7%) as compared to Hispanic (67.2%), Asian (56.2%) and White (49.6%) children. Barriers like unawareness of beverage recommendations, inability to read nutrition labels and targeted beverage advertising confront Black parents' ability to consume and serve healthy beverages to their young children, creating a need to close these gaps. Electronic learning (eLearning) is an effective tool for behavioral health changes. However, there is a dearth in literature on its use in promoting healthy beverage consumption among Black parents. Previous research emphasizes the importance of needs assessment to inform the development and implementation of culturally adaptive programs. Therefore, conducting a needs assessment among Black parents of young children is a first step towards an effective online beverage program. This project conducted in two (2) phases used a mixed-method approach for data collection. The first phase used focus groups to qualitatively explore Black parents' perceptions, barriers and resources required to limit SSBs to young children. In the second phase, a survey and semi-structured individual interviews examined Black parents' eLearning format preferences, expectations, and motivations for participation in eLearning beverage program. Social Cognitive Theory (SCT) informs the study design.

The specific aims of this study were to: 1) Conduct a needs assessment to explore Black parents' perceptions, barriers, and resources required to limit SSBs consumption among their children; 2) Conduct formative evaluation of eLearning format prototypes, program expectations and motivation for program participation among Black parents of preschoolers; and 3) Develop and share lessons about the development of the *Drink Smart* e-program. Informed by the study findings, the product, "DRINK SMART" program, consist of 5 lesson videos and creates a framework to promote healthy beverage consumption to Black parents and their young children, thus addressing health equity and the problem of childhood obesity.

INDEX WORDS: eLearning, Sugar-Sweetened Beverages (SSBs), Black Young Children, Black Preschoolers, Drink Smart, Needs Assessment, Social Cognitive Theory (SCT), Childhood Obesity, Health Equity, Racial Equity, Online Learning, Mixed-Methods Research, Program Development.

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DEDICATION

This study is dedicated to God Almighty and every child including Chibuike, Chidubem, and Jidenna dreaming to positively impact the world.

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CHAPTER 1

INTRODUCTION

Childhood obesity is a public health concern affecting 19.7% of children aged 2-19 years in the United States (U.S.).¹ Among young children aged 2-5 years, 12.7% of young children are currently with obesity.¹ Within this public health crisis, there are disparities among children of color. Hispanic (26.2%) and Non-Hispanic Black children (24.8%) have higher obesity prevalence than non-Hispanic White (16.6%) and Asian (9.0%) children.¹ Moreover, children from families experiencing low wealth ($\leq$ 130% federal poverty level [FPL]) are disproportionately affected by obesity.² A significant contributor to childhood obesity is sugar-sweetened beverages (SSBs).³ Statistically, about 3 in 5 children (57.1%) aged 1-5 years in the United States consume at least one sugar sweetened beverage (SSB) weekly with trends higher (62.5%) in Georgia.⁴ In particular, there are SSBs consumption disparities by race and ethnicity.

Black children consume higher amount of SSBs daily than peers of other races/ethnicities.^{4,5,6} One reason may be high rates of parental consumption of SSBs.^{7,8} Evidence shows that parental modeling of beverage intake influences child beverage intake, revealing positive associations.⁹ For instance, Black adults, like Black children, are also more likely to be frequent SSB consumers than Hispanic adults and non-Hispanic whites.^{10,11,12} This correlation elucidates the importance of Black parent focused interventions to effectively advance health equity by reducing SSBs consumption disparities among young Black children.¹³ Health equity is the state in which everyone has a fair and just opportunity to attain their highest level of health irrespective of racial identity or location.¹⁴ To achieve health equity requires using strategies tailored to communities to address existing health disparities.¹⁴ Nutrition education delivered via eLearning is an emerging approach for addressing health behaviors and promoting health equity.^{15,16} However, there is a lack of documented research on the use of a culturally adaptive eLearning program to promote healthy beverages among Black families of young children,

indicating a research gap. The long-term goal of this study is to develop a parent-focused eLearning beverage program to promote healthy beverage consumption in Black families of young children.

This study is a cross-sectional study design that used a mixed-method approach to explore the study aims. The Social Cognitive Theory (SCT) guided the study's theoretical framework.¹⁷ Developed by Bandura, SCT consists of six (6) core constructs namely reciprocal determinism, expectations, behavioral capability, self-efficacy, observational modeling and reinforcement. In our study, reciprocal determinism which describes how the relationship between personal, behavioral, and environmental factors influences human behaviors provides an understanding of personal, behavioral, and environmental factors influencing household beverage choices in Black families of young children. The self-efficacy construct, which is a person's belief in their capability to successfully perform a particular task informed lessons and activities included in the e-beverage program. For example, the newly designed beverage program includes lessons that teach Black parents how to read nutrition labels of beverages to differentiate between SSBs and non-SSBs, a barrier noted by parents to limiting SSBs intake. It is important to note that the acquisition of knowledge is a boost to a person's confidence to make a positive healthy behavior change. The observational modeling construct is applied to teach Black parents the significance of role modeling healthy beverage behaviors to their children and communities. Finally, during program implementation, reinforcements like gift cards, water pitchers and filters can be used to support and encourage healthy beverage practices from the program lessons. Overall, the development of eLearning beverage program called "DRINK SMART" guided by SCT focuses on decreasing SSBs consumption, increasing water consumption among Black families of young children and promoting health equity.

The aims of the study are as follows:

- 1) Conduct a needs assessment to explore Black parents' perceptions, barriers, and resources required to limit SSBs consumption among their children
- 2) Conduct formative evaluation of eLearning format prototypes, program expectations and motivation for program participation among Black parents of preschoolers; and

3) Develop and share lessons in the development of *Drink Smart* e-program.

The study outcome created a culturally relevant program ready for pilot testing among Black families. Ultimately, the specific aims serve as the groundwork for implementing culturally appropriate eLearning beverage nutrition education to limit SSBs consumption among Black families. Chapter Two of this study provides a review of the literature related to health disparities in childhood obesity and SSB consumption, achieving health equity in SSB consumption, Black-centered nutrition interventions, eLearning, building self-efficacy in eLearning training, and a statement of purpose and rationale. Chapter Three includes details on how the study embodies the SCT (theoretical framework), research design, sample size and selection, research sites, data analysis, IRB approval, subjectivity statement, study strengths and limitations, and grants awarded for the study. Chapters Four through Six provide results to the study's specific aims. Findings are presented in a manuscript publication style according to the journal's guidelines.

Statement of Purpose and Rationale

The rationale of this dissertation project focused on developing a parent-focused eLearning beverage program to limit SSBs consumption among Black families of young children. Lessons and activities included in the program are informed by findings from answering the study's research questions via a needs assessment. Therefore, the end-product "DRINK SMART", is a culturally relevant training for future pilot testing among Black parents of young children.

The specific research questions answered in this dissertation include:

1. What are the perceptions, barriers, and resources required to limit SSB consumption in Black families?
2. What are Black parents' eLearning format preferences, expectations, and motivations for eLearning participation?

We hypothesized that understanding the beverage consumption barriers and eLearning needs of Black parents to limit SSBs served to their children can inform the development of an effective online beverage program for the study's priority audience. Black adults of parenting age are shown to be the highest consumers of SSBs (>1 daily) compared to their peers by race. Parental confusion about healthy beverage recommendations, healthy alternatives to SSBs and inability to read nutrition labels have been reported as barriers to promoting healthy beverages in their families. The use of eLearning is a promising approach to improving nutrition-related health behaviors. ***However, little is known about the development and implementation of an eLearning beverage program to improve healthy beverage consumption among Black families of young children.***

CHAPTER 2

LITERATURE REVIEW

Childhood Obesity Prevalence, Health Disparities, and Health Consequences

Childhood obesity is defined as a body mass index (BMI) at or above the 95th percentile of the Center for Disease Control and Prevention (CDC) sex-specific BMI-for-age growth charts.¹⁸ The National Health and Nutrition Examination Survey (NHANES) 2017 -2020 data exhibited that the United States has a childhood obesity prevalence of 19.7% affecting 14.7 million children and adolescents.¹ This is higher than rates from previous year cycles,¹⁹⁻²¹ indicating a public health concern. More specifically, 12.7% of children aged 2 to 5 years are affected with obesity.¹ Documented reports show existing health disparities in childhood obesity rates when examined by race, ethnicity, and socioeconomic status.^{22,23} For example, a higher prevalence exists among Hispanic children (26.2%) and Black (24.8%) children compared to 16.6% of White children and 9% Asian children.¹ Children from families experiencing low wealth ($\leq 130\%$ FPL) have higher obesity rates than children from families with a higher-income ($> 350\%$ FPL) status.^{2,23,24} Findings from 2014 NHANES data among youth 2-19 years show obesity prevalence higher among the lowest income ($\leq 130\%$ FPL) group (18.9%) and middle-income ($> 130\%$ to $\leq 350\%$ FPL) group (19.9%) compared to the high-income ($> 350\%$ FPL) group (10.9%).²⁵ Interestingly, even within the same low-household income level of $\leq 130\%$ federal poverty level, higher prevalence exists for Black children (19.4%) compared to White (18.9%) and Asian children (13.2%).²⁵

There are health consequences associated with childhood obesity. Children with obesity are more likely to have hypertension and hypercholesterolemia, which are risk factors for cardiovascular diseases (CVDs).²⁶ Additionally, impaired glucose intolerance, insulin resistance, type 2 diabetes, asthma, sleep apnea, joint problems, fatty liver disease, gall stones, and heartburn are linked with childhood obesity.²⁶⁻³² Moreover, children with obesity are more likely to experience anxiety, depression, low self-esteem,

bullying, stigma, and self-reported quality of life.³³⁻³⁵ Studies have shown increased likelihood for an adult to be obese with more severe disease risk factors if they experienced obesity in childhood.^{36,37} Therefore, the design and implementation of interventions to tackle obesity risk factors such as decreasing SSB consumption may be useful strategies for childhood obesity reduction.

Sugar-Sweetened Beverage Consumption, Health Disparities, Health Consequences

Behaviors such as consuming high-calorie, low-nutrient foods like sugar-sweetened beverages (SSBs), insufficient sleep, and sedentary lifestyles may influence excess weight gain among children.³⁸⁻⁴⁰ Sugary drinks or SSBs are any liquids sweetened with various forms of added sugars such as brown sugar, corn sweetener, corn syrup, dextrose, fructose, glucose, high-fructose corn syrup, honey, lactose, malt syrup, maltose, molasses, raw sugar, and sucrose.^{41,42} Examples include soft drinks/soda, fruit drinks, fruit-flavored drinks, fruit-ades, sports drinks, energy drinks, sweetened waters, sweetened coffee, and sweetened teas.^{43,44}

Evidence shows that SSBs majorly impact the onset of overweight and obesity in children;⁴⁵ and a leading source of added sugars in children's diets.^{3,46} About 57.1% of children aged 1-5 years consume SSB weekly, putting them at greater risk for obesity.⁴ Daily consumption of SSB has also been reported among almost 50% of children aged 2 – 5 years.⁴⁷ Sugar sweetened beverages supply an average of 116Kcal to a child's daily caloric requirement.⁶ Surprisingly, there is evidence showing early exposure to SSBs among infants of ages of 6 - 12 months.⁴⁸ Fruit-flavored drinks are the most consumed SSBs among children with about 12 ounces (about 354 ml) consumed daily,^{6,49} attributed by misleading nutrient and health claims to parents and caregivers.⁴⁹ Moreover, racial and ethnic disparities exist in SSBs consumption.⁴⁻⁶

Significantly higher SSB consumption (71.7%) is evidenced among Black children aged 1 to 5 years as compared to others, such as 49.6% for White children.⁴ This trend was similar to findings from

the 2016 Feeding Infants and Toddlers Study (FITS) findings where 62% of Black children aged 2-4 years consumed higher amounts of SSBs compared to White (45%) and Hispanic (45%) children.⁶ Results also indicated that Black children consumed more energy from SSBs and fruit-flavored drinks (152 kcal and 149 kcal, respectively).⁶ These recurrent trends suggest the importance of developing interventions specifically for Black children and families to promote the limiting of SSB intake and increase in healthy beverage consumption.

There is documented evidence showing the association of consumption of SSBs to body weight increase among young children.^{50,51} For example, a longitudinal study of Black children aged 3-5 years, found a positive association between SSB intake and Body Mass Index (BMI) z scores.⁵² Further findings from the study showed a 4% increase in the risk for obesity with each additional ounce of SSB consumed after two years monitoring.⁵² Researchers in Australia study also found a similar correlation between high BMI z-score with daily consumption of SSBs.⁵⁰ Besides obesity, the consumption of SSB among children share linkages to dental cavities and decay,⁵³⁻⁵⁵ asthma,⁵⁶ poor dietary quality,^{57,58} low academic performance⁵⁹ and arthritis.⁴² Interestingly, even animal model studies suggest that early life exposure to simple sugars like sucrose and high fructose corn syrup can elicit learning and memory dysfunction.⁶⁰ To tackle obesity among children, there is sufficient evidence showing the positive effect of decreasing SSB consumption on obesity development.^{3,61} For example, in a cohort Danish study among children aged 9 years, a daily substitution of 100g water or milk for 100g SSB was inversely associated with changes in Body Mass Index z score (BMIz), waist circumference (WC) and skin fold over 6 years.⁶¹ Government procurement standards on beverages like the Child and Adult Care Food Program (CACFP) and local school wellness policies have effectively reduced the availability of SSBs in ECE settings.⁶²⁻⁶⁵ Given the movement to provide healthy beverage options to children at school, there are still concerns of differing consumption practices children may be exposed to at homes, hampering school's efforts in tackling SSB accessibility. For example, an agent-based model showed that a complete decrease in the availability of

SSBs in the home resulted in a 67% decreased consumption in early childhood.^{66,67} These results hold a promising context for home-based intervention to promote healthy beverage consumption and decrease SSB intake among children.

Parental Influence on SSB Consumption Among Children

Research shows parents and caregivers as primary point of SSB access to children.^{7,8,68,69,70} Ferris and team reported correlations between parental consumption of SSBs to child SSB consumption.⁷¹ By race, Black adults are more likely to be SSB consumers compared to their peers of other ethnical and racial backgrounds.¹⁰⁻¹² Prevalent factors like parental education level, need for reward, feeding practices, maternal responsiveness, and frequency of co-shopping with child influence parental purchase and serving of SSBs to children.^{9,72,73} Moreover, targeted marketing, an approach used to raise awareness for a product among a specific group impacts beverage consumption behavior.²⁴

Targeted marketing is significantly higher among Black families and low-income households.^{24,74,75} A high recall of fast-food advertising, including SSBs over healthy food advertisements associated with targeted marketing impact its purchase and consumption.⁷⁶ Most beverage targeted advertising focus on culturally relatable content to encourage viewers to purchase SSBs, leading to increased consumption.⁷⁵ Other generic factors like parental confusion about healthy beverage recommendations, healthy alternatives to SSBs, and inability to read nutrition labels are reported barriers to healthy beverage consumption.^{77,78} Specific to Black people, a study by Tipton, 2014 to understand SSBs behaviors of Black preschoolers and their caregivers in Louisiana using the Theory of Planned Behavior (TPB) showed interesting findings.¹³ Factors like cost, taste, eating out, availability at stores, and tantrums were reported to influence SSBs consumption.¹³ However, no published research prior to ours has applied the SCT constructs to understand SSB behaviors among Black preschoolers and their caregivers. For example, how Black parents feel if their children saw them drinking less SSBs

(observation modeling) and the trust in one's ability to reduce SSBs (self-efficacy). With existing racial consumption disparities and documented solution gaps, it becomes imperative to develop effective approaches to educate and motivate Black parents to limit sugary beverages to their children.

Approaches To Influencing Parents to Decrease SSB Served to Young Children

A health objective for Healthy people 2030 is to "reduce consumption of added sugars by people aged two years and over".⁷⁹ Several approaches have been used to decrease SSB consumption among young children.^{15,80-90} In the Massachusetts Childhood Obesity Research Demonstration (MA-CORD) study in Massachusetts, reported findings showed an improvement in SSBs consumption and sleep duration among 835 Women, Infant and Children (WIC) enrolled children aged 2 to 5 years who participated in the childhood obesity prevention initiative implemented by WIC providers using documented evidence-informed practices.^{88,91}

In another study, 51 overweight and obese mothers with children aged 3 to 5 years consuming at least 12 fl.oz/day of SSBs and juice were recruited for the six (6) months Smart Moms randomized controlled-trial study. Mother-dyads participants in the Smart Moms intervention group received a mobile health (mHealth) nutrition education lesson on a mobile website and text messages to promote reduction in high-calorie foods and SSB consumption.^{14,89} Results from the study showed a significant reduction in child's SSB and juice consumption post intervention compared to control group.⁸⁹ Additionally, mothers in Smart Moms groups experienced significant weight loss than control group although no significant changes were found in children's BMI from both groups.⁸⁹

In another study, thirty-three (33) Hispanic mother-child dyads participated in the pilot testing of a culturally appropriate and linguistically tailored nine (9) month *Vida Saludable* program to evaluate changes in SSB consumption, mother's pedometer steps and BMI.⁸⁰ This study integrated a community engagement approach, in a two-phase intervention delivered over nine (9) months. Lessons on healthy

drinks (water and 1% low-fat milk) in place of SSBs, physical activity especially with children and parental role modeling for healthy behaviors were delivered in Spanish and English. Tailored lessons included visual images of typical Hispanic families and women walking and children drinking water and milk.⁸⁰ Post-intervention, SSBs consumption significantly decreased, and water consumption significantly increased among dyads.⁸⁰ Maternal BMI also decreased with no changes in children's BMI.⁸⁰

The use of warning labels showed effectiveness in influencing healthy beverage choices by parents for their children.⁹² Researchers randomly assigned 2381 demographically and educationally diverse parents to 1 of 6 label conditions: (1) no warning label (control); (2) calorie label; or (3-6) 1 of 4 text versions of a warning label (e.g., Safety Warning: Drinking beverages with added sugar[s] contributes to obesity, diabetes, and tooth decay). Parents chose a beverage for their child in a vending machine choice task, rated perceptions of different beverages, and indicated interest in receiving beverage coupons via an online survey.⁹² Results showed that warning labels reduced demographically diverse parents' choice for SSBs coupons and intent to purchase SSBs.⁹² Furthermore, results from a study among parents of children 2 to 12 years (n = 325) who completed a shopping task in a convenience store laboratory in North Carolina were promising to reduce parents' purchases of SSBs for their children by making parents think SSBs are less healthful.⁹³ Additional results from a study by Grummon et al., found healthy beverage promotion story books like "Potter the Otter", as a promising strategy for motivating parents to serve more water and fewer SSBs to their children.⁹⁰

In a 12-week intervention (Water Up! @ Home) study, 92 parents of preschoolers participating in three Early Head Start home-visiting programs that serve predominantly Hispanic, low-income communities were randomized to receive an educational intervention +a low-cost water filter pitcher or only the filter.^{94,95} The issuance of water pitchers and filters addressed physical barriers to tap water consumption (water safety) and the curriculum addressed sociocultural barriers to replacing SSBs and juice with water.⁹⁵ Participants self-reported results in both groups indicated significant reductions in

SSBs from the baseline and increase in water consumption for both parents and children.⁹⁵ Qualitative evaluation among study participants showed the water filters increased parents' perception of water safety, acted as a cue to action to drink water, improved the flavor of water and increased the perception that the use of water filters and pitchers was more economical than purchasing bottled water.⁹⁴

Unlike interventions implemented to evaluate program effectiveness in reducing SSB consumption among young children, other formative studies have been conducted to understand parents' perceptions and facilitators to serving SSBs to young children.^{13,70,78,96,97} For example, Morel et al. applied a qualitative approach to understand twenty (25) parent WIC enrollees' perception of SSB consumption and acceptability of potential interventions strategies to promote SSBs avoidance among racially diverse low-income families in the first 1000 days.⁷⁸ Results showed taste, pregnancy cravings, confusion over beverage recommendations, and lack of control over beverage choices as primary facilitators for SSBs choice for their families.⁷⁸ Suggestions on illustrating sugar content, and health consequences of SSBs consumption were possible solutions raised by parents to discourage high SSBs consumption in families of young children.⁷⁸

Various Hispanic community settings have been studied to understand why parents serve SSBs to their children.^{96,98,99} Using a qualitative focus group design, 35 Hispanic caregivers of children aged 0-5 years experiencing low-income in Chicago choose SSBs based on cost, availability, health and behavioral concerns and older family members' influence on children's preferences.⁹⁹ In Northern California, interviewed Latino parents considered cultural homemade drinks containing added sugars like "agua fresca" as healthy and store-bought brands as unhealthy.⁹⁸ In a cross-sectional study, Social Ecological model (SEM) framework was used to evaluate 350 Hispanic parents' perceptions of consuming and serving SSBs to their children aged 1 to 5 years using a survey.⁹⁶ From the study, higher average rating of SSB healthfulness, child's age, normative beliefs that others serve SSBs to children, being born in the US/Puerto Rico, and parent and child enjoyment of SSBs were positively associated with serving more

SSB types. Nevertheless, concerns about SSBs for their own health was negatively related.⁹⁶ Studies like this are imperative in shaping message development to tackle SSB consumption barriers within the Hispanic population. However, similar efforts are lacking in the Black population to combat the high SSB consumption in families.

Considering racial backgrounds, there are reported differences on factors that influence the type of beverages parents serve to children, thus underscoring the importance of developing culturally centered interventions to address individual racial barriers.^{100,101} For example, researchers found that a drink being homemade, made with fruit and containing vitamins was more influential among Hispanic parents related to what they serve their children compared to Black parents.¹⁰¹ Whereas, Black parents were more influenced by perceived beverage sugar and sweetener content, being natural and containing certain nutrients.¹⁰¹ In another study, a child's desire to drink SSBs influenced why Black fathers serve SSB to children. Comparatively, Hispanic fathers considered concerns about underweight, use of food as reward and to calm, and difficult in feeding as dominant factors to serving SSBs.¹⁰⁰ In Louisiana, Tipton et al. applied the Theory of Planned Behavior to explore nineteen (19) Black caregivers' beliefs and perceptions regarding serving SSBs to their preschoolers.¹³ Convenience, cost, taste, potential health consequences, availability, pressure from other parents and caregivers modeling of dietary habits were primary facilitators for SSBs provision by caregivers to their Black preschoolers.¹³ Additionally, caregivers believed that stores and restaurants purposefully market SSBs to young children to increase sales.¹³ Caregivers' self-efficacy and children's lack of willingness to consume water and milk were factors that would keep caregivers from serving SSBs to Black preschoolers.¹³ However, there are still limited research studies in understanding Black parents' perceptions and barriers to limiting SSBs to their young children especially with the use of theories like SCT.

Parental role modeling can help reduce SSB intake among children (Natale et al., 2014; Vargas-Garcia et al., 2017 Nezami et al., 2018).^{15,102,103} For example, one intervention centered on healthy parent

lifestyle role-modeling has been observed to significantly influence a decrease in children's junk food consumption including SSBs compared to the control group.¹⁰² Additionally, educational strategies for both parents and children have been identified as an important tool for reducing SSB consumption in children.^{104,105} Effective strategies can promote self-efficacy among parents to consume and serve healthy beverages to their young children, thus creating better health outcomes and behaviors.^{38,106,107} Traditional face-to-face health interventions have effectively promoted desirable positive health outcomes, especially among low-income families.¹⁰⁸⁻¹¹⁰ However, this strategy comes with barriers like transportation, childcare, and fluctuating work schedules.^{111,112} The increase in smartphone ownership and the use of digital health to address health related problems expands opportunities to develop an eLearning program to overcome learning barriers and expand outreach among Black parents.^{16,113}

eLearning: An Emerging Trend for Parent-Focused SSBs Reduction

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has posed restrictions in conducting face-to-face research studies.^{114,115} In response to COVID-19, eLearning has become increasingly common.^{116,117} Electronic learning (eLearning) is the use of electronic educational technology like the internet, text messaging, and applications in teaching and learning.^{16,118} The mode of delivery for eLearning education includes desktop computers, laptops, tablets of smartphones.¹¹⁹ Reliable internet and smartphone access, once considered as a disparity among low-income individuals to access the internet regularly, has been alleviated by the presence of inexpensive mobile devices.¹²⁰ A 2021 report revealed that 86% and 76% of Americans with low income (< \$30,000) used the internet and smartphones respectively.^{120,121} eLearning may be instructor-led (synchronous eLearning) or designed for self-paced individual study (asynchronous eLearning).¹¹⁹ With increased access to the internet and mobile devices, the use of eLearning is becoming increasingly acceptable for nutrition education.

The application of eLearning in adult education is grounded in eLearning theory which describes cognitive principles that elicit cognitive processing essential for effective technology-based learning.¹²² The use of eLearning has been effective to improve increased fruit and vegetable intake and adherence to diabetes or weight management diets.^{15,16,113,123-127} For example, participants in a 12-week mobile health intervention decreased body weight (about 1.6 kg), increased light intensity activity, and increased vegetable intake post-intervention.¹²⁸

Concerning SSBs, multiple parent-focused electronic health interventions have promoted a reduction in SSB consumption though combined with nutrition education on food behavior changes such as increased whole grain, fruit, and vegetable consumption. For example, the SMART Moms randomized control trial (RCT) applied a 6-month smartphone program delivery to reduce sugar-sweetened beverage and juice consumption among children aged 3-5 years.^{15,89} In a texting motivational interview RCT, researchers noted that low-income parents (48% Blacks) engagement in daily text messaging made it a feasible approach.¹²⁹ Parents noted the eLearning format helped them make good health decisions such as SSBs provision to their children.¹²⁹ Furthermore, a combined online mobile and text-message nutrition education program significantly improved nutrition knowledge, self-efficacy, cooking confidence, fruit and vegetable, and SSB consumption among mothers of young children.¹³⁰ However, little is known about using eLearning beverage training to improve Black parents' self-efficacy to limit SSBs to their young children.

Building Self-Efficacy Using eLearning Programs

Self-efficacy is a person's belief in their capability to perform a particular task successfully.¹³¹ A person's perceptions of their capabilities affect how they behave, their level of motivation, their thought patterns, and their emotional reaction in taxing situations.¹³² Additionally, self-efficacy explains how confident and aware a person is of their control to put it into action.¹³³ Self-efficacy is considered a

powerful motivational predictor of how well a person performs any endeavor, task, or goal.¹³⁴ Harnessing ways to improve self-efficacy among a primary audience can be a roadmap to promoting successful health outcomes.¹³⁵⁻¹³⁷ A high degree of self-efficacy can lead people to work hard & persist in the face of setbacks.¹³⁸ Research has shown how vital self-efficacy is to maintain efforts required in scenarios such as losing weight, choosing healthier food options, and adopting a healthy lifestyle.¹³⁹⁻¹⁴²

Building on the work on Bandura, Heslin describes the three (3) key sources of self-efficacy as enactive self-mastery, role modeling, and verbal persuasion.¹⁴³ Enactive self-mastery explains the conviction a person has to achieve difficult tasks after completing a similar smaller task. Self-mastery is best achieved via progressive mastery.¹⁴³ This involves breaking difficult tasks into small steps that are easy, to ensure a high level of initial success before increasing the tasks. Role-modeling occurs when people observe others perform a task that they are attempting to learn.^{143,144} For example, in the use of demonstrations or mentoring. Role models are most effective at raising self-efficacy when they are personally liked and are seen as having similar attributes (e.g., age, gender, family ties & ethnicity) to the observer.¹³⁴ This is applicable in the use of parents as role models for increased water consumption to their young children.^{15,80} Finally, the use of verbal persuasion, inspiration, and rewards can build self-efficacy and improve performance.¹³⁴ Inspiration can include positive self-talk with emphasis on potential success from devoting sufficient effort to make changes.¹³⁴

Self-efficacy is measured by presenting a list of tasks and asking people to judge their strength of perceived efficacy on a point scale.^{145,146} The state of self-efficacy can range from high uncertainty (not at all confident, strongly disagree) to complete certainty (totally confident, strongly agree).¹⁴⁵⁻¹⁴⁸ Instruments such as the eating habits confidence questionnaire and child dietary self-efficacy scale measure participants' confidence in their ability to change eating habits, food selections, and cooking methods among adults and children.^{149,150} Self-efficacy, a construct of SCT, and the health belief model (HBM) are instrumental for research design and expected outcomes.

There are studies supporting the role of self-efficacy in creating and sustaining healthy nutritional habits.¹⁵¹⁻¹⁵⁴ For example, an increase in eating self-efficacy and physical self-efficacy led to weight loss and healthy behavioral changes in Step-Up, an 18-month randomized controlled trial.¹⁵⁴ More so, there are associations between self-efficacy and SSB consumption.¹⁵⁵⁻¹⁵⁷ For example, self-efficacy was the strongest predictor of reducing SSB consumption in Taiwanese adolescents.¹⁵⁶ In another study, participants in a mobile health (mHealth) study improved SSB reduction and physical activity behaviors explained by changes in self-efficacy.¹⁵⁸

A few studies have highlighted the importance of self-efficacy as a central construct in studies designed for Black communities. For example, a study among Black adolescents living in low-income neighborhoods in Baltimore, Maryland found higher SSB consumption associated with lower self-efficacy and lower outcome expectancies.¹⁵⁹ Moreover, caregivers of Black preschoolers identified an increase in caregiver's self-efficacy as a factor to motivation Black parents serving more water and fewer sugary beverages to their children.¹³

Applying A Health Equity Lens in Research Studies

Health equity is defined as the principle underlying a commitment to reduce and ultimately eliminate disparities in health and its determinants, including social determinants.^{14,160} Applying a health equity lens requires designing and implementing policies and interventions that meet the needs of socially disadvantaged populations. The Getting to Equity (GTE) model proposed by Dr. Shiriki Kumanyika is a framework that can provide an equity lens to nutrition researchers to critically think about the importance of equity consideration in the design and implementation of policy, systems, and environment (PSE) interventions.¹⁶¹ Four quadrants embody the GTE model and are to be considered for obesity prevention and treatment interventions.¹⁶¹ Applying the GTE framework in research studies is relevant for addressing nutrition behaviors of minority populations.

The application of the four quadrants in solving health inequity begins with identifying what health disparities exist within the primary audience (e.g., Black communities) to define the problem.¹⁶² Next, it is important to identify facilitators like price, socioeconomic status, neighborhood store designation, and set-ups that are deterrents to reducing SSBs consumption in the Black community. Besides price and forementioned deterrents, Black and Hispanic/ Latino communities are targets for beverages marketing, compared to non-Hispanic Whites and Asian communities, which are associated to high SSB purchase and intake amongst them.^{24,74,161} Identifying deterrents illuminates resources needed to provide and promote healthy behaviors, for example healthy beverage options in this, thereby promoting health equity. To identify effective resources, the GTE model and other studies propose engaging communities as equal research partners to discover community strengths and establish achievable goals.^{80,161,164} For example, the *Vida Saludable* (Healthy living) intervention applied the community engagement approach to significantly decrease SSBs consumption and increase water consumption among Hispanic mother-child dyads.⁸⁰ Furthermore, needs assessment, a form of formative evaluative research is a vital tool in promoting community engagements for effective interventions.

One way to enhance community engagement is via formative evaluation approaches such as focus groups and key informant interviews to engage communities for useful information needed to develop effective interventions.¹⁶⁵ For example, needs assessment and formative evaluation conducted among low-income adult Georgians was essential when developing an effective nutrition education eLearning program titled, "Food eTalk".¹⁶⁶ Upon implementation, program evaluation showed effectiveness in increasing fruits and vegetables among the target population.¹⁶⁶ In like manner, a needs assessment by Cotwright and team reported a higher preference for videos by early care and education (ECE) teachers across Georgia to learn about healthy beverage practices.¹⁶⁷ However, to the best of our knowledge, such formative work has not been conducted among Black parents of preschoolers to understand reasons for serving SSBs to their children. Therefore, this study proposed to use quantitative

(survey) and qualitative methods (focus groups and individual interviews) to understand the SSB intake disparities among Black parents of preschoolers and identify the community needs to close the gap.

Relevance of Developing a Culturally Appropriate Online Training

Taking into account the unique cultural values, beliefs, socio-economic status and environment of ethnic minority populations is vital when designing interventions.^{168,169} Improvements in health behaviors may be less effective if there are disregard for culturally adapt intervention for people of color.¹⁷⁰ Studies have indicated a relative absence of appropriately adapted obesity interventions for minority racial groups.^{164,171} Culturally appropriate interventions can enhance intervention relevance, effectiveness and feasibility within the homogenous ethnic benefactors.¹⁷¹ To develop a culturally appropriate eLearning beverage training for Black families, it may be of importance to apply a two-dimensional cultural sensitivity structure (surface structures and deep structures).¹⁷² Surface structure adaptations also called peripheral strategies,¹⁷³ employ visual and auditory cues for culturally appropriate messages reflecting settings and lived experiences of the ethnic group, including music, pictures, foods, clothing, locations, and people.^{171,172} Deep structure adaptation involves a comprehensive understanding of the ethnic group's core cultural values, norms, and stressors such as economic, social, and environmental factors affecting health behaviors.¹⁷¹ Both structures require community participation and collaboration for in-depth understanding of the cultural norms within the study population.^{174,175}

Understanding the role of culture in intervention development is vital for health equity promotion.¹⁷⁶ The placement of Black culture at the center of research that involves the Black population is central to establishing effective programs. Otado et al reported responsiveness to participants' needs as best practice for recruiting and retaining Black participants in research.¹⁷⁷ Findings from a previous study in the Childhood Obesity Prevention Laboratory among Black parents for a culturally relevant messaging campaign raised the need to promote Black culture in interventions designed for Black communities (In

press). For example, parents discussed that having family-centered pictures, messages, music, and superheroes symbolic of Black people's strength were central to increase participation and changes in beverage behaviors.

Black-Centered Nutrition Interventions

Several health studies designed exclusively for the Black community have shown improved health biomarkers and behaviors. Distinct study characteristics include conducting the study in predominantly Black locations, using persons they identify with and culturally sensitive materials to deliver the intervention.¹⁷⁸⁻¹⁸¹ A systematic review by Lemacks et al., on Black-centered interventions revealed improved health outcomes, including weight loss, decreased waist circumference, HbA1c, and blood pressure among the Black participants who were adults.¹⁸⁰ Additionally, most research settings included churches, clinical or community health centers, or other community locations like community centers or local gyms.¹⁸⁰ The African American or Black church is pivotal in pursuing equality for the Black community.¹⁸¹ Beyond a place of worship, predominantly Black churches could be pivotal in optimizing health status among Blacks. For example, in a six (6) month intervention called "Sisters in Motion," 71 women aged ≥ 60 years received education in diet and physical activity in a church setting.¹⁸³ Intervention participants received a multi-component curriculum, including scripture readings, prayer, goal setting, a community resource guide, and walking competitions. Both intervention and control participants participated in physical activity sessions.¹⁸³ The study recorded an 85% attendance and 87% retention rate; and a significant decrease in weight and blood pressure.¹⁸³ In another study, 46 Black participants (43.5% men) at risk for diabetes, aged ≥ 18 years, received nutrition and physical activity education for four months located at a church.¹⁸⁴ At the end of the study, participants experienced an improvement in weight, BMI, blood pressure, and fasting glucose levels with positive significant even at 12 months follow-up.¹⁸⁴

Among Black children, an exploratory longitudinal study aimed to determine the association between SSBs consumption and overweight and obesity in preschoolers.⁵² Dietary information was collected using the Block Kids Food Frequency Questionnaire, and height and weight were collected to compute z BMI scores.⁵² Results indicated a positive association between SSB intake and BMI z-scores among Black children.⁵² In another study, providing caloric information on beverages in stores in low-income Black neighborhoods in Baltimore, Maryland, significantly reduced the number of total beverage calories purchased and the likelihood of buying an SSB by Black adolescents.¹⁸¹ Also, the application of the Theory of Planned Behavior understood SSB consumption behaviors among caregivers of Black preschoolers provided great insights into factors fueling the consumption disparity within the community.¹³

There are other studies consisting of various races and ethnicities where the majority ($\geq 50\%$) of the participants identified as Blacks.^{185,186} For example, among 376 participants (67.6% Blacks) from Rural Lower Mississippi Delta, a multivariate linear regression model significantly predicted an association between health literacy and sugar-sweetened beverage consumption and healthy eating index (HEI).¹⁸⁵ Researchers found that every 1 point in health literacy scores was associated with 34 fewer kilocalories per day from SSBs.¹⁸⁵ Such findings illuminate how nutrition education on beverages via eLearning can impact health literacy, leading to decreased SSB consumption among Black families. Despite broad access to the internet and smartphones among Blacks,^{120,121} a systematic review finds an underrepresentation of Blacks in eHealth studies, highlighting opportunities for change.¹⁸⁷ Another mixed racial study (though 46% Blacks) found that exposure to campaign messages on beverages increased intention to reduce SSBs in families residing in Philadelphia.¹⁸⁸ The television and transit ad messages used in the study reflected racial inclusivity and representation.¹⁸⁸ For example, a television ad had an African American mother and son driving home from a doctor's appointment, discussing SSBs' impact on body weight after learning that her son was overweight and at risk for diabetes.¹⁸⁸ Such representation

could impact how an individual of a similar race receives and processes the message sent, leading to behavioral changes. Moreover, a recent study emphasizes Black parents' worry about the influence of Black celebrities' marketing of food and beverages high in fat and sugar (FBHS) on Black consumers.⁷⁵ Parents suggested involving Black celebrities in marketing healthier foods as counter-marketing efforts to promote healthier Black families and communities.⁷⁵

In designing Black-centered studies, research recognizes the importance of working with target communities for program effectiveness and success.^{74,189} These include conducting needs assessments and community engagement activities. For example, researchers reported challenges with recruitment, preliminary training, and measurement periods in the GoodNEWS trial, evaluating CVD-related risk among African Americans using a community-based participatory reproach (CBPR).¹⁸⁹ Challenges were mitigated with the assistance of local community consultants and professional event planners. A popular eLearning program, Food etalk, engaged a convenience sample of Georgia nutrition educators comprising 50% Blacks to inform its development and usage by diverse racial participants.¹⁸⁶ An evaluation by Greene et al., to explore African Americans' satisfaction with SNAP-Ed in Louisiana revealed that Black participants disconnected from the program.¹⁹⁰ Participants felt the program lessons lacked connections to Black culture and history.¹⁹⁰ Further, participants expressed the need to include Black staff who understood the community as program implementers.¹⁹⁰ Developing and implementing more programs reflective of the needs of communities disproportionately affected by the food system becomes imperative.

CHAPTER 3

Theoretical Framework

A theory provides the framework that guides the nature of questions to be asked and answered by the study.¹⁹¹ Additionally, a theoretical framework determines the choice of data collection - quantitative and qualitative or both for research.¹⁹² Social Cognitive Theory (SCT) informed the development of eLearning beverage program in this study. Developed by Bandura, SCT shows the interactions of personal, behavioral, and environmental factors influencing behaviors.¹⁷ The theory has informed the design and implementation of SSB-related interventions among both adults,¹⁰³ adolescents,¹⁹³ and young children.¹⁴² In this study, the program includes modules centered on Black parent participants' knowledge, attitudes, self-efficacy, outcome expectations, observational modeling, and behavioral capabilities related to SSB, 100% juice, and water consumption. The construct of reciprocal determinism is applied to understand what personal, behavioral, and environmental factors like price and neighborhood store settings influence Black parents' beverage choices. These factors may influence beverages served to children and as well as healthy beverage purchasing behaviors. Activities for each program lesson were designed to improve Black parents' skills and self-efficacy (confidence) in replacing SSBs with unsweetened water leading to increased water consumption in families. The SCT provides guidance for lesson development for several topics including: 1) increasing parents' skills in identifying added sugars in beverages before purchase and during event gatherings like cookouts; 2) increasing parents' skills via preparing healthy homemade beverages using recipes shared; and 3) using demos curated by a Black role model to show steps in healthy beverage preparations. For example, one use of observational modeling construct may be demonstrating how parents can prepare flavored water with herbs/ fruits, smoothies, and fizzy drinks without added sugars. The application of reciprocal determinism (See Figure 3.1) is applied

by improving parent knowledge and self-efficacy related to healthy beverages which may influence behavior. For example, improving knowledge about the use of a water filter to increase safe water availability may increase water intake. Similarly, providing guidance about how Black parents can handle children's tantrums without using SSBs for resolutions or rewards may decrease SSB consumption. Other examples include increasing Black parent's media literacy to identify SSB promotions in their neighborhoods, training on social media ads and how to react to them and improving parents' ability to read nutrition labels.

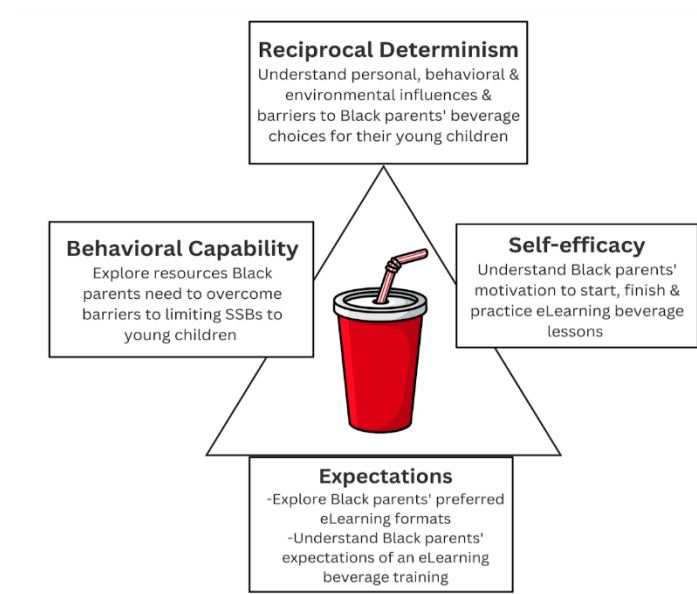


FIGURE 3.1: Theoretical Framework: Social Cognitive Theory

The belief that people learn through observational modeling of significant role models is a core construct that is central to influencing SSB consumption among children.¹⁶ For example, a young child seeing their parent model water consumption at meals and in-between mealtimes can influence them to increase their water consumption. In our study, parents are positioned as modeling 'change agents' to their children and communities to decrease SSB intake and increase consumption of water and other healthy beverages with no added sugars. In particular, the program lessons in this study are developed to

empower parents with evidence-based beverage recommendations for preschoolers, who in turn, will explain the messages to family members and children.¹⁹⁴ In future studies, program participants and their children may receive water filters, pitcher jugs, culturally aesthetic water bottles and toothbrushes to reinforce and maintain positive behaviors. Additionally, text messages, and support groups could motivate parents to remember and practice what they learned.

Research Design

This cross-sectional research study applied a mixed-methods approach to inform the development of an eLearning program to improve healthy beverage consumption among Black families with young children. The mixed methods approach integrates, collects, and analyzes both quantitative and qualitative data within a single study.¹⁹⁵ Mixed-method research is an appropriate strategy to test validity through the convergence of information from different sources,^{196,197} to resolve the limitation of using a single method design to understand the research problem, the research question, objectives, and context.¹⁹¹ In this study, a mixed-method approach using surveys and interviews strengthens conclusions about the phenomena studied. This could reduce or eliminate potential validity threats in the research. For example, the use of individual interviews can provide in-depth Black parents' perspectives of various eLearning prototypes to inform the design of a learning program on beverages. This provides robustness to the study and complements the data collected via a survey (quantitative) on demographics, and eLearning prototype preferences. Additionally, a qualitative approach (individual interviews) explores expectations and motivations for eLearning participation. Focus groups and individual interviews are suitable to help researchers generate ideas and develop interventions.¹⁹⁸

The study design includes a cross-sectional survey (quantitative), focus groups and individual interviews (qualitative) to answer the research questions, providing rich data to inform the study.

SPECIFIC AIM 1- Conduct a needs assessment to explore Black parents’ perceptions, barriers, and resources required to limit SSBs consumption among their children (Phase 1):

Surveys were used to collect information on demographics and SSBs consumption of Black parents and their children. The needs assessment survey can be found in Appendix A.1. Focus groups were conducted to assess Black parents’ perceptions, barriers and resources required to overcome barriers. A total of six focus groups, one in each of the six childcare regions of Georgia’s Child Care Resource and Referral Agency System, were conducted. Participants were recruited from a convenience sample of one Head Start program in each of the six childcare regions consisting of (4-8) parents per focus group. Focus groups lasted approximately 90 minutes and participants received a \$15 gift card for participation. Five focus groups were conducted in-person and the last group via Zoom video conferencing. Semi-structured questions grounded on SCT constructs served as the moderator guide. Moderator guides for focus groups can be found in Appendix A.2.

SPECIFIC AIM 2- Conduct formative evaluation of eLearning format prototypes, program expectations and motivation for program participation among Black parents of preschoolers (Phase 2): Considering various familiar examples of eLearning, the researchers selected five (5) eLearning options and developed prototypes of each option to reflect content relevant to SSBs and water. The five options include: video-based, podcasts, infographics, social media and videogames. Three options (videos, infographics, and videogames) were developed in collaboration with an instructional and graphic designer using two Apps (Vyond and Canva). The social media content and podcast were created by our lead researcher using Canva and a Podcast App. All prototypes were critically vetted for errors and reviewed with 3 Black-parents, graduate students, and a registered dietitian/nutrition professor. With prototypes edited and finalized for testing, a survey was developed to assess Black parents’ eLearning prototype preferences, willingness to participate in eLearning, and prior participation in a beverage nutrition education class. The eLearning survey can be found in Appendix A.3. The researchers

disseminated the survey using QUALTRICS and activated the reCAPTCHA button to prevent bot responses that could create study bias. Sixty-four Black parents completed the survey via a convenience sample. Individual interviews using semi-structured questions were used to explore each parents' rationale for preferred eLearning type, learning expectations of an online beverage program and motivation for program participation. Per a survey question, respondents were contacted if they willingly chose to participate in the interview. Twenty Black parents were interviewed via Zoom conferencing and telephone calls for approximately 40 minutes each until data saturation was reached. Moderator's guide for the individual interviews can be found in Appendix A.4. The interviewer utilized follow-up questions and probes depending on the response of the interviewee(s) for additional relevant discussions (Roulston, 2010). Participants received a \$25 gift card each for completing the survey or / and for interview participation (total of \$50 if they participated in both).

All the focus groups and individual interviews were audio-recorded for transcription and salient notes will be taken by the interviewers. Prior to data collection for both phases, participants provided informed consent either via paper or electronically. The research team reviewed the survey and interview questions before data collection, and questions were piloted with a group of members from the primary audience to test for readability and understandability. This helped the researcher identify problems before implementing the survey, and interviews. The study's measured outcomes include Black parents' perceptions, barriers, and resources required to limit SSBs, eLearning prototype preferences, willingness to participate in an eLearning beverage program, prior participation in a beverage program, expectations of an eLearning beverage program, and motivations for program participation.

SPECIFIC AIM 3- Develop the *Drink Smart* eLearning program and describe lessons

learned: The final product of the study (*Drink Smart*) online beverage program was designed with an instructional designer using Vyond and Canva to reflect Black parents' feedback and findings. Vyond software application hosted five (5) animated lesson videos on varying beverage topics. Each video is less

than 5 minutes of playtime. A sixth video embodies a food demo on healthy beverage recipes. Recipe cards, designed on Canva serve as supplementary resources to the program. The program characteristics and lessons are shared in chapter 6. Figures 3.2 and 3.3 provide a consort diagram and logic model regarding the study. All methods and procedures were approved by The University of Georgia Institutional Review Board for both study phases (Phase1 IRB no: PROJECT00003541; Phase2 IRB No: PROJECT00004358).

Program objective: Development of a parent-focused eLearning beverage program to promote healthy beverage consumption in Black families of preschoolers.

Inputs	Outputs		Outcomes	
	Activities	Participants	Initial	Longer Term
<u>Funding</u> -Robert Wood Johnson Foundation/HER -Owens Institute for Behavioral Research -NOPREN/CDC student grant -UGA Summer Grant - Obesity initiative grant <u>Research Team</u> - Chisom Okoli - Dr. Caree J. Cotwright -Dr. Jung Sun Lee - Dr. Grace Ahn -Dr. Janani Thapa - Dr. Jennifer Thompson -Dr. Sina Gallo <u>Partnership</u> - Head Start & Pre-K programs in GA - Community Health Coalitions <u>Others</u>	-Focus groups -Develop eLearning format prototypes to test -Individual interviews -Surveys - Develop “DRINK SMART” program content (5 modules) - Design healthy beverage recipes (flavored water, smoothies) - Conduct recipe demos -Identify targeted SSB promotion in neighborhood & social media - Archive education	Black parents of preschoolers aged 0 to 5 years in Georgia, GA enrolled in a federal assistance program like early Head Start, Head Start, Pre-K, WIC, SNAP, and Medicaid	Main outcome -Black parents’ perception of SSBs and healthy beverages - Black parents’ reported barriers to decreasing SSBs intake among children -Requested resources to overcome barriers - Black parents eLearning preferences, and expectations for DRINK SMART - Black parents’ motivation for program	Developed “DRINK SMART” eLearning beverage program aimed at: -Increasing knowledge of beverage recommendations for preschoolers among Black parents -Increasing self-efficacy of Black parents to limit SSBs & serve more water to children - Increased willingness of Black parents and their children to try & prefer healthy beverages over SSBs - Encouraging Black parents to role model healthy beverage consumption to their

-Instructional and Graphic designer -Statistician -Interview recorders -Canva -Vyond App -Transportation <u>Incentives</u> -Gift cards - cartoon stickers - Drinking cups - Food Snacks - Beverages (100% juice & bottled water) <u>Analytical Software</u> -NVivo -R software -Atlas.ti	documentary on: families overcoming SSB addiction (goal setting); benefit of water filters for future program implementation		(DRINK SMART) participation	children, family members - Decreasing childhood obesity rates/ risks -Decreasing tooth decay/ cavities
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Assumptions: Black Parents of young children will be interested to participate in developing a culturally appropriate eLearning beverage program. Activities will be engaging to increase beverage knowledge & self-efficacy will limit SSBs to children.

External Factors: Funding, other services available to Black families of young children, research materials on beverage recommendations for children, changing demographics of area.

Figure 3.2: Logic model for the study

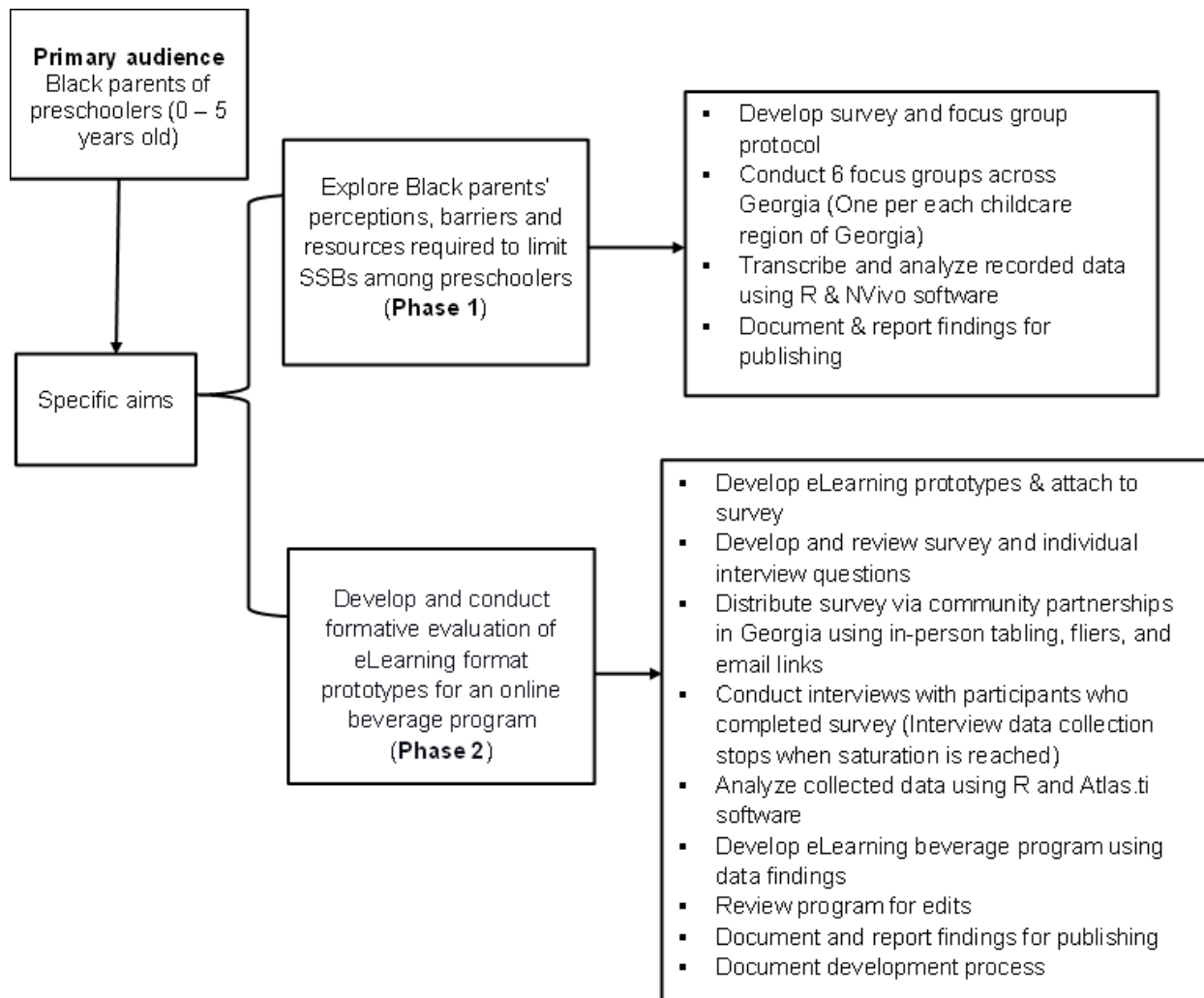


Figure 3.3: A consort Diagram of the study design

Sample Size and Sample Selection

This study focused on Black parents of young children aged 0 to 5 years to promote health equity by addressing the disparity of high SSB consumption among Black families (Hamner et al., 2023; Welker et al., 2018; Park et al., 2016). Inclusion criteria included: 1) Identifying as Black or African American in Georgia (*To identify eligible participants, a question on ethnicity and race was asked on the survey. If participants identified as Black or African American or as having a Black or African American child*

access was granted to complete the survey. However, if they did not identify as Black or African American, participants were notified of ineligibility to proceed with the study and the survey closed); 2) having a young child(ren) (0 to 5 years old) 3) 18 years of age and older; 3) participating in a Federally funded program (Head Start, Pre-K, WIC, SNAP, Medicaid); 4) having a smartphone or computer and internet access.

Rationale for Inclusion criteria: This study is focused on Black parents of preschoolers. Non-Hispanic Black (NHB) young children aged 1 – 5 years are shown to consume higher amounts of SSBs (71.7%) compared to Non-Hispanic Whites (49.6%) and Hispanics (67.2%), indicating disparities.⁴ Significantly higher SSBs consumption (30%) is also evidenced among NHB youth aged 2 – 19 years as compared to others such as Asian youth (9%).⁵ Additionally, about thirty-four percent (34%) of Black adults are more likely to consume SSBs compared to Hispanic adults (23.3%) and non-Hispanic whites (17.2%).¹⁰⁻¹² Despite the significance of the disparities in SSB consumption, there are limited studies in the literature focusing on SSB consumption solely among Black families with preschoolers.^{13,52} Although, there are other studies examining SSB consumption among diverse racial groups including Blacks.^{15,100,101} A systematic review reveals underrepresentation of Blacks in health studies and need for unique programs that culturally address individual racial consumption gaps based on needs.¹⁸⁷

Sites of Research

To reach the primary audience, we partnered with schools and community coalitions in Georgia to recruit Black parents of children aged 0 to 5 years. Our school partnership spanned across Easter Seals of North Georgia schools, Clayton Head Start program, and schools in Savannah and Lowndes County. Early Head Start and Head Start programs are federal programs that promote the school readiness of children from birth to age five (5). These are designed for low-income families by enhancing their cognitive, social, and emotional development.¹⁹⁹ Head Start early care and education (ECE) centers also

engage parents or key family members in positive relationships, with a focus on family well-being.

Preschool programs are usually for children between the ages of 3 and 5 years old.¹⁹⁹ In Georgia, Pre-K programs are a lottery funded educational program to prepare children for kindergarten.²⁰⁰ Georgia's Pre-K program provides a 6.5-hour instructional day, 5 days a week, 180 days a year at no cost to families.²⁰⁰

In Phase 1 of the study, the investigator contacted the Director of one Head Start program in each childcare region via call, in-person meeting and email. Upon invitation, the investigator interacted and recruited parents via in-person tabling, and email containing the sign-up study link to determine eligibility. For the 2nd Phase, existing partnerships and new partnerships were formed. Investigators received invitations to meet and greet with parents during drop off and pickups and offer short nutrition wellness presentations during parents' conference. Parents received fliers containing a QR code to survey link and signed up via paper for reminders to complete survey. Other collaboration for recruitment spanned across health fairs, and electronic distribution of survey link by partners using emails. Follow-up emails were sent to interested interview participants to arrange a convenient time and date for discussion. Convenience and purposive snowball sampling were used for participant selection.²⁰¹

Data Analysis

Descriptive statistics (frequency) analyzed the demographic data collected in specific 1 and the survey data in specific aims 2. All analysis was conducted on R software (version 4.1.2). The analysis framework of Ritchie and Spencer; and Gale et al., guided the focus groups and interviews data analysis.^{202,203} Data from the interviews were analyzed including field notes, memos, debriefing notes, and verbatim transcriptions for constant comparison method.²⁰¹ Recorded data were transcribed verbatim using a professional transcriber (REV transcription services). NVivo software version 12 (QSR International, Doncaster, Victoria, Australia) and Atlas.ti software facilitated the analysis of transcribed data for themes in specific aim 1 & 2 respectively. Deductive coding indexed the data using pre-defined

codes according to the SCT constructs in Specific Aim 1 and eLearning expectations and motivations for participation probes in Specific Aim 2. Due to the researcher's limited knowledge and understanding of the investigated phenomenon (i.e., low-income Black parents' perceptions, barriers and resources required to limit SSBs; Black parents' expectations and motivations for participation for eLearning), the use of inductive coding allowed for unexpected themes to emerge.²⁰⁴ All qualitative data analysis began immediately after the first focus group and individual interviews to determine if preliminary findings answer the research questions and the need to modify the interview guide.

Subjectivity Statement

Conducting this research puts into perspective my positionality as a Black parent of two children under the age of 4 years researching Black parents of young children 0 to 5 years old. The motivation to work on this study stems from lived experiences as an overweight Black child influenced by food, environmental and emotional factors. I recall repetitive health problems I faced, in addition to the stigmatization and bullying that accompanied it. Working towards being healthier stirred the passion with a caption to "catch them young," to teach and educate young children about making healthy choices. Secondly, my experiences as a mother committed to raising healthy children who will utilize learned behaviors into adulthood also informs my personal goal. It would be inhumane to disregard the challenges faced in parenting. For example, parents may feel less self-efficacious in handling challenges such as children's tantrums. Additionally, the enormous amount of health information circulated on social media can be overwhelming to tell which is true or false. Therefore, as a change agent, I am motivated to correct false information and close knowledge gaps to help parents offer healthy beverages to their young children.

My personal goals informed the practical goal of developing a parent-focused eLearning beverage program. A program to provide evidence-based beverage recommendations for young children ages 0 to 5 years, improve healthy beverage consumption, reduce SSBs intake, and reduce child overweight/obesity

prevalence. Studies have shown that Black children are the highest consumers of SSBs in the USA.⁶ Additionally, parents may be a primary source of beverages for their children,^{8,70} making them a primary target to model healthy behaviors to their children. An anticipated question will be, why training? Palsson et al., found that "supporting fathers to develop strategies for living with a new baby and providing expert guidance to fruitful and accurate information may help the construction of a fatherhood identity and strengthen the fatherhood role".²⁰⁶ Also, Soriano et al., in their study, noted that parents highlighted the need to provide multi-layered, flexible, and culturally sensitive approaches to supporting families, with support for parenting directed at various system levels - the individual, group, family, community and society.²⁰⁷ Hence, achieving this practical goal provides fulfillment in encouraging Black families who experience health disparities to live healthier, thus, a roadmap towards health equity.

Besides this study's personal and practical goals, the intellectual goals bring deep reflections. Studies by Cotwright et al. and Stotz et al. emphasize the importance of understanding participants' preferences and expectations for effective training development before developing eLearning nutrition education programs.^{15,166,167} Therefore, research questions like 1) what are Black parents' perceptions and barriers to limiting SSBs to their young children (ages 0 to 5 years old) 2) What are Black parents' eLearning preferences and expectations 3) How can Black parents of young children (ages 0 to 5 years old) be motivated to participate and apply training program lessons? will provide the data to inform and achieve the practical goal. Regardless of my personal experiences with handling SSBs consumption and provision to my toddler, my constructivist thinking seeks more information through interaction with participants.

Before the interaction, I must consider my similarities (insider) and differences (outsider) with my research participants. As a Black person conducting research within the Black community, my "insider" status gets ascribed to my skin color and racial identity. Lived experiences with racism due to skin color and work input needed to earn societal respect compared to other races are relatable to other Black men and women. Furthermore, I am an avid soul food lover and always ready to boogie to hip-hop,

rap, and afro beats. These identities, especially the skin color, become advantageous in recruiting participants who may recognize me as one of them and confide in me to answer the research questions.

Additional insider status is my parental credential, which can impact data collection. My research participants might understand why this study is essential not solely to meet an academic requirement but also a passion for influencing change. However, purposely ignoring the threats of being an insider in the research could question validity. To address these, a self-introduction (academic and parental background) to my participants highlighting my research passion for understanding SSBs consumption in Black families in Georgia is needed. There will be clarifications that besides being a Black person, each participant's unique perspective is needed to get their voices heard and to inform the development of the eLearning beverage training to benefit the Black community. An explanation of their views' importance is to ensure that the training is culturally relevant and appropriate to them to promote healthy beverage (water) consumption for a healthier community will be emphasized.

Before this research, I had no relationship with the participants as an outsider. Parenting practices differ by household, considering family norms, parental personalities, family size, and neighborhoods.^{208,209} The differences can provide diverse, rich participant feedback to inform my study. Also, as a Black immigrant woman born and raised in Nigeria for 25 years, I have experienced cultural shocks facilitated by observed internal differences within the USA's Black community. For example, my accent occasionally impedes communication with a Black person born in the USA who is likely to express cold feet during discussions. I clearly remember a sunny day on a drive-through for lunch orders. For 5 minutes, the call receiver, a Black woman, said she could not comprehend what I said until someone else responded and sorted the meal in seconds. Expectedly, I was enraged and nearly impatient. However, I reminded myself of the potentiality of "internal discrimination" within any social circle. Constantly, there is a reflection on the "accent" impact during recruitment and data collection. In short, with every excitement to recruit and discuss with my participants, the fear of rejection or lack of openness kicks in. Nevertheless, these experiences and observed differences have shaped me into a more patient

researcher and encouraged me to study standard acceptable etiquette within the USA's Black culture before going into the field. Additionally, I recognize my knowledge gaps and why it is crucial to understand the needs of people I serve irrespective of the same racial identity (African American/ Blacks). Besides, I value the collaboration I will develop with members of the priority audience to build an effective solution to limit SSBs regardless of our identical skin color. Kumanyika et al referred to this as making research participants "*research partners*".¹⁶⁴

As earlier mentioned, I was born in Nigeria thirty (years) ago. I migrated to the USA in 2017 for my master's program in Nutrition and Exercise Physiology. I come from a family of seven (7) comprising a father, mother, and four siblings (2 sisters and two brothers). As the oldest child, I was expected to consciously and unconsciously be a teacher and educator by setting good examples for my younger ones. It shaped me into a problem solver whether asked or not asked for a solution. I never want my siblings to make mistakes I made, which prompts the sharing of my experiences to help them navigate life easily. In search of a sustainable solution to my childhood overweight experiences and the quest to live a healthier adult life, I decided to study Nutrition and Dietetics at the University. Besides providing tutelage to my siblings, I enjoy educating, a hobby that fuels my existence. I enjoy sharing nutrition information with family and friends either face to face or via the internet like Instagram and Facebook, bringing the realization that being a nutrition educator will be a top-fulfilling job. In Nigeria, I have worked in various organizations as a health educator, addressing health disparities among socially disadvantaged groups. For example, I developed interventions to provide culturally appropriate resources to communities with reported high HIV statistics.

During my dietetics internship, I also enjoyed developing programs to solve malnutrition problems for mothers and children who are most vulnerable compared to other family members. Each experience strengthened my love for community nutrition. As a community nutritionist, seeking practical solutions to existing problems is a job responsibility to fulfill. Traditional face-to-face learning has improved nutrition behaviors, especially among people from low wealth.^{84,88} However, barriers such as

multiple jobs among low-income Black parents and childcare makes virtual learning (eLearning) an option to explore creatively.^{111,115} Developing accessible interventions such as eLearning beverage training can improve Black parents' knowledge of the beverages to serve young children for healthy growth.

Finally, in a society where whitened culture is glorified and made a generalizable phenomenon without respect for racial/cultural uniqueness, this study becomes timely to address health gaps. Black culture is a unique culture. Until we engage with Black communities to understand their needs and what valuable resources can solve them, we might unconsciously widen the health gap and promote health inequity.

IRB Approval

The University of Georgia Institutional Review Board on Human Subjects approved all methods and procedures of this research project (Phase1 IRB no: PROJECT00003541; Phase2 IRB No: PROJECT00004358).

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CHAPTER 4

BLACK PARENTS' PERCEPTIONS AND BARRIERS TO LIMITING SUGAR-SWEETENED BEVERAGES AMONG YOUNG CHILDREN: A SOCIAL COGNITIVE THEORY APPLICATION

Okoli CB, Arrington N, Hall J, Paulus T, Miles I, Shieh J, Sharpe K, Cotwright CJ. Black Parents' Perceptions and Barriers to Limiting Sugar-Sweetened Beverages among Young Children: A Social Cognitive Theory Application. *Child Obes.* 2022 Dec 26. doi: 10.1089/chi.2022.0086.²⁴⁴

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ABSTRACT

Introduction: Sugar-sweetened beverages (SSBs) are a major contributor to obesity among young children 0 to 5 years of age. In addition, parental beverage intake influences children's beverage intake.

Objective: This study explores Black parents' perceptions about and barriers to limiting SSBs among young children.

Methods: Twenty-seven Black parents participated in six focus groups conducted across the state of Georgia. Questions grounded in Social Cognitive Theory (SCT) assessed perceived health impacts of SSBs and water consumption, influences of beverage choices, barriers to limiting SSB intake, and resources needed to overcome barriers. Before the focus group sessions, participants completed a demographic survey. Quantitative data were analyzed using R statistical software. Focus group sessions were analyzed using NVivo.

Results: Family and cultural norms, price, taste, flavor, water safety, tantrums, and product placement at grocery stores primarily influenced beverage choice and consumption. Restaurant refills, price, lack of confidence, advertisements, cravings, tantrums, and budget were perceived barriers to drinking more water and fewer SSBs daily. Resources Black parents noted would help in promoting and serving healthy beverages to their young children included education on beverage recommendations, training on how to read nutrition labels, healthy alternatives, and the presence of support systems.

Conclusion: Findings from this study will inform interventions to reduce SSB intake among Black families with young

Keywords: barriers; beverages; Black parents; childhood obesity; Social Cognitive Theory (SCT); sugar-sweetened beverages (SSBs); qualitative; quantitative.

Introduction

Overweight and obesity in childhood are serious health problems affecting about 13.4% of children in the United States.¹⁹ They can lead to chronic conditions like hypercholesterolemia and diabetes.^{210,211} Hispanic and non-Hispanic Black children are disproportionately affected with a higher prevalence of obesity than non-Hispanic White and non-Hispanic Asian children.^{22,212} In addition, children from families experiencing low income are more likely to have obesity than those of middle and upper economic classes.²⁵

As a primary source of added sugars in the diets of young children, sugar-sweetened beverages (SSBs) significantly contribute to overweight, obesity, dental cavities, and poor diet quality.^{45,47,51,213,214} About half (46.5%) of young children 2 to 5 years of age consume at least one SSB on any given day.⁴⁷ Moreover, non-Hispanic Black children consume higher amounts of SSBs than their peers.^{6,47} Studies show that parents' SSB consumption patterns correlate with their children's.^{7,8,69,215,216} Non-Hispanic Black adults are more likely to be frequent SSB consumers than their peers.¹⁰⁻¹² Therefore, understanding Black parents' perceptions about drinking SSBs is critical in addressing SSB consumption among children.

Researchers have applied health behavior theories to understand parents' perceptions to limiting SSB intake among young children.^{13,78,96,217} In one study grounded in the Theory of Planned Behavior, convenience, cost, taste, health consequences, availability, pressure from other parents, and modeling healthy habits influenced caregivers' SSB provision to their Black preschoolers.¹³ Additional studies have explored SSB consumption using Social Cognitive Theory (SCT) among Black adolescents and their parents.²¹⁸ However, there is a lack of published research using SCT to understand SSB consumption among Black parents and their young children.

The SCT postulates that environmental factors, personal dynamics, self-efficacy, and observational modeling influence behaviors.²⁷ A recent study found that Black parents disagreed about the use of celebrities to promote unhealthy products like SSBs, demonstrating how observational

modeling influences food behaviors.⁷⁵ In another study, warning labels on drinks increased parents' (especially Black and Latino) self-efficacy to identify SSBs.²¹⁹ Studies like these are critical to providing effective solutions for health equity promotion.^{164,171,220}

In this study, the use of SCT over other health theories centers on the reciprocal determinism construct, examining parents' perceptions of SSBs (personal), their reasons for serving SSBs (behavioral), and how their environment contributes to SSB consumption. Other constructs like self-efficacy and observational modeling address barriers to Black parents' confidence to limit SSBs to their children and children's reactions to what their parents drink. The study aims were to (1) explore Black parents' perceptions about serving SSBs and water to their young children, (2) examine barriers to limiting SSBs served to their young children, and (3) determine resources needed to overcome barriers.

Recruitment and Study Participants

Study participants were eligible if they (1) identified as a Black parent or caregiver for a child (0–5 years) who identified as Black, (2) had a child enrolled in Head Start, and (3) reported drinking at least one SSB per day and serving their child at least one SSB per day (100% fruit juice was not included as an SSB). Head Start is a federally funded early care and education (ECE) program for children 0 to 5 years of age from families experiencing low income to promote school readiness.¹⁹⁹

Our team recruited participants from a convenience sample of one Head Start program in each of the six childcare regions of Georgia based on the ChildCare Resource and Referral Agency System. Researchers held tabling sessions and disseminated fliers at participating Head Start programs to enroll interested Black parents. Eligible parents were invited to focus group sessions through calls and text. Before group discussions, parents were invited to ask questions about the study and provided informed consent. The sample size was met by the number of invitees who attended each focus group. The Institutional Review Board at the University of Georgia approved this study. Five focus groups occurred in person between September 2019 and February 2020. Due to the COVID-19 pandemic, the last focus

group occurred through the Zoom conferencing platform in May 2020. Participants received a \$15 gift card.

Study Design and Approach

The study approach utilized semi structured focus group sessions (N = 6). Before the focus groups, parents completed a brief demographic survey. Focus groups consisted of 4–8 participants and lasted ~ 90 minutes. An experienced moderator and a notetaker (graduate assistant) facilitated each session. Constructs from SCT framed open-ended questions in a guided focus group protocol (Appendix 2). During the focus group, parents were asked to write down commonly consumed beverages and the beverages their children consumed. Next, parents received a beverage handout (commonly consumed beverages) developed by the research team (Fig. 4.1) to aid in beverage recall. Finally, parents were asked to review the beverage handout and list any beverage they may not have recalled on their first list. Audio recordings from focus groups were transcribed verbatim for data analysis.



Figure 4.1: Beverage handout used for daily beverage consumption recall during focus group sessions.

Data Analysis

Demographic survey data were analyzed using R studio (version 1.4.1103–4) as frequencies. The qualitative data were analyzed using the data analysis framework of Gale et al.²⁰³ Coding for a deductive and inductive thematic analysis was performed using NVivo version 12 (QSR International, Doncaster, Victoria, Australia). Deductive coding extrapolated pre-defined themes built on constructs from the SCT-

guided focus group protocol. Inductive coding identified new themes relevant to the study. To establish intercoder reliability, two research team members coded using a pre-developed coding frame. A graduate research assistant coded all transcripts, while a qualitative research expert re-coded a sample of data to establish satisfactory reliability. All research team members met regularly to resolve discrepancies in data categorization and reach a consensus on the final theme interpretation.

Results

Participant Questionnaire

Table 4.1 summarizes the participants' ages (parents and children), household income, education level, and the daily amount of SSBs consumed by parents and their children. A total of 27 parents participated in the focus groups, with 20 completing the questionnaire.

Demographic variables	n (%)
Gender	
Female	20 (100%)
Male	0 (0%)
Age of parent participants	
21-29 years	8 (40%)
30-39 years	9 (45%)
40-49 years	2 (10%)
50-59 years	1 (5%)
Reported age of participants' children (n = 25 children)	
1 year	2 (8%)
2 years	1 (4%)
3 years	11 (44%)
4 years	7 (28%)
5 years	4 (16%)
Income	
< \$20,000	11 (61%)
\$20,000 - \$50,000	6 (33%)

\$50,000 - \$70,000	1 (6%)
Education	
High school degree or equivalent (GED)	8 (42%)
Some college but no degree	6 (31%)
Associate degree	2 (11%)
Bachelor's degree	2 (11%)
Graduate degree	1 (5%)

Table 4.1. Characteristics of Focus Group Participants

Focus Group Results

The focus group discussions revealed several emergent themes. As the focus group protocol was grounded in SCT, themes are presented based on their relationship to specific SCT constructs. Table 4.2 provides selected parent feedback and quotations for each theme.

Reciprocal Determinism (Personal, Behavioral, and Environmental Factors)

Theme 1: SSBs are unhealthy: But it's hard to go cold turkey.

Reciprocal determinism is a construct of SCT that describes the direct interplay among personal, behavioral, and environmental factors in behavior change.¹⁶ Concerning personal factors such as knowledge, findings showed that parents knew the negative impacts of SSB consumption. Responses included excessive thirst, weight gain, dental cavities, concentrated urine, diabetes, back pain, hyperactivity in children, sugar crashes, sluggishness, and skin problems. Dental caries is a specific concern for numerous parents. One parent stated, “It can mess [up] their teeth. All the sugar will break down the enamel on their teeth, making their teeth weak and stuff.” Conversely, some parents associated SSB intake with positive outcomes such as boosting energy and alleviating digestive malaise and gassiness (especially after a fatty or fried meal). A participant explained their reasoning for having a soda with a fried meal, stating, “When you finished eating, it [soda] makes you burp.”

Parents reported regularly consuming water, Sunny D, lemonade, sugar-sweetened coffee, sweet tea, and soda. For children, parents indicated water, 100% juice, fruit punch, Little Hugs, lemonade, Capri

Sun, soda, flavored milk, Gatorade, and Sunny D as commonly consumed beverages. Interestingly, a parent noted, “I prefer lemonade because I like lemons and give it to my son because I have had kidney problems as a child. So, I know lemons are really good for you. It’s better for you than most juices and stuff” as a healthy drink due to the presence of lemon fruit.

More than half of the parents reported that they would be willing to make small changes (e.g., drinking more water); however, it would be hard to eliminate SSBs from their own diets, but easier to limit SSBs in their children’s diets. A parent described the difficulty of limiting SSBs for herself, “I might have a caffeine attack, I’ll be like okay, let me go ahead and get me one [soda]. But I be trying to be good and get my water or whatever, and then I think, well go on ahead and get it.”

Theme 2: Water is healthy: But it can’t be the only thing we drink.

The majority of parents reported frequent urination and bed-wetting as negative health consequences of water consumption. They also perceived excessive water consumption without sufficient electrolyte replacement as a health danger among those with high activity levels. Parents highlighted the benefits of drinking water, such as hydration, re-energizing the body, sluggishness reduction, clear skin, clear urine, stimulation of frequent bowel movements, and back pain reduction. Numerous parents reported that their children loved to drink water. However, parents explained that their children also desired to have other types of beverages.

Theme 3: Decisions about beverages to serve are based on a variety of factors.

Across all focus groups, parents reported that flavor, health concerns, familial and cultural norms (one’s upbringing), individual preferences, the content of food eaten (e.g., fried meals), attractive beverage placements at grocery stores, and beverage content (e.g., food dyes) primarily influenced beverages purchased and served in their homes. Other factors like Women, Infants, and Children (WIC) Supplemental Nutrition Program authorized beverage options, weather, beverages in the refrigerator, peer

influence, the need for energy to work, doctor's recommendations, social media advertisements, and the need to pacify children were mentioned by parents.

Theme 4: The environment influences parents to serve more SSBs.

Many parents expressed concerns over the safety and quality of tap water at restaurants. One parent stated, “You think about it, you get water, and it might not be as good as that pink lemonade.” As a result, parents preferred consuming SSBs over water while dining out. In addition, parents explained their inability to forgo sugary drinks when purchased meals automatically come with a fountain drink. One parent stated, “The McDonald's sweet tea. It's not very expensive. It's a dollar, and you get a big thing, yeah!.” Some parents even described making lemonade using sugar packets while dining out instead of drinking plain water. In neighborhood stores, prices, preferences, and placement of SSBs motivated the purchase of sugary drinks.

Expectations

Theme 5: Parents want clear benefits and resources to overcome SSB consumption barriers.

Parents highlighted weight loss, better sleep, fewer cavities, and the ability to save money from regular health visits as benefits of limiting SSB intake among Black families. Suggested resources to overcome SSB consumption barriers were education on nutrition labels and beverage recommendations, familial support systems, SSBs being out of sight, no refills at restaurants policy, changes in family norms, healthy alternatives, and making water fun. In addition, “if they hike the prices up” was another influential factor in decreasing SSB consumption few parents mentioned.

Self-Efficacy (Parental Confidence)

Theme 6: The nutrition label is helpful: but choosing healthy drinks is confusing.

Most parents reported using the product name, information found on the nutrition label, beverage viscosity, previous beverage knowledge, and health education to identify sugary beverages. Interestingly, parents verbalized interest in learning the difference between artificial sweeteners and added sugars. A parent discussed, “I have a question, so when it says artificial vs. sugar added, what’s the difference?.” Such questions indicate challenges with SSB identification, which could influence parent self-efficacy to make healthy beverage choices.

Theme 7: Barriers are common to limiting intake to one or less SSB per day.

Most parents mentioned a lack of confidence, child tantrums, cravings, and food content (e.g., fried foods) as barriers to limiting SSBs. Child tantrums related to SSB consumption resonated with many parents. For example, one parent stated, “I’m not about to let my child act up in the restaurant [over a drink].” Some parents described other barriers, like grocery store advertisements, and bottled water being more expensive than SSBs. When the moderator asked participants about their confidence in consuming one or less SSB daily, at least half reported being confident. Nevertheless, some parents emphasized their unwillingness to give up SSBs, but expressed willingness to take small steps to reduce intake.

Observational Modeling

Theme 8: Kids want to drink what they see their parents drinking.

Most parents reported that parental consumption modeling could motivate children to demand and drink fewer SSBs. However, despite healthy beverage consumption modeling, a child’s tantrum can pressure parents to serve SSB upon demand. A parent said “For instance, my daughter sees me drinking soda, she wants soda. Like, “Mommy, I want soda.” Forget the juice, forget the water, she wants soda.”

Behavioral Capability

Theme 9: Parents desire support to limit SSB consumption.

Parents highlighted ways they could convince other parents to serve fewer SSBs and more water to kids. They suggested holding discussions on the health benefits associated with less SSB consumption. In addition, creating health challenges like “water drinking challenges,” receiving nutrition education on beverages, and ensuring that parents can appropriately read and interpret nutrition labels were also mentioned by many parents.

Theme 10: Advertisements are a powerful influence on SSB consumption.

Parents expressed the influence of advertisements on beverage choices. One parent describing a commercial stated, “The Coca Cola [ad], it snaps open and, it drips wet on the thing. When they open the drink, and it has a little drip, I need one of those.” Many parents consistently stated that advertisements made SSBs hard to resist. In addition, the use of celebrities like “LeBron James in the Sprite ad” could encourage SSB purchases and consumption. However, a few parents recalled that campaigns on decreasing SSBs elicited the need to shift to healthier alternatives.

Reinforcements

Theme 11: Parents desire consistent messaging about healthy beverages.

Participants provided an array of beverage information sources such as dentist and doctor’s advice, the internet, newsletters from insurance companies, schools, television, documentaries, social media, and peers to influence what they drink and serve their kids. Most parents raised concerns about the lack of synergistic beverage counseling among health professionals and the need for uniformity. In addition, a parent expressed concern over misinformation disseminated through social media, noting, “[They] were saying, Drink more milk. But now I’m reading milk is bad.”

Additional Important Findings

There were some important ideas that parents shared outside of their relationship to the theory constructs. A few parents raised the importance of having schools (ECE centers) serve more water to children. In addition, some mentioned integrating beverage lessons into teaching curricula to decrease SSB intake among children. Parents expressed the desire to have synergistic messages promoted at home, school, and health care facilities.

Parents also discussed the expected message campaign structure, previous beverage messages encountered, and preferred mode of receiving beverage information. Many parents expressed that beverage campaign messages should contain both the positive effects of drinking ≤ 1 SSB daily and the adverse effects of SSBs on children and adults.

Some parents noted increased advertising of SSBs and products containing ‘50% less sugar’ as healthier alternatives. Several parents also recalled seeing messages about the sugar content of beverages on social media platforms. Finally, parents preferred text messages, social media, and email for receiving information.

SCT Construct & Associated Themes	Parent Feedback	Supporting Quotes
Reciprocal Determinism (<i>SSBs are unhealthy: But it's hard to go cold turkey</i>)	Concentrated urine associated with drinking SSBs	“Yeah, but even with the urine like two years prior, my kids didn't drink as much water as they did. And one of my sons, his urine was so strong from not drinking water.”
	Weight gain and sluggishness associated with drinking SSBs	“They gain weight just drinking all that stuff. They may not want to be active because they are too tired. That's another thing.”
Reciprocal Determinism (<i>Water is healthy: But it can't be the only thing we drink</i>)	Health benefits of water	“But drinking water more often I noticed that you have more bowel movements. it's regular. Your urine and skin are clearer.”
	Health danger of water intake among physically active persons	“That football player, I heard about on the news. He was playing football and his intake was all just water, no

		electrolytes. But instead of drinking all that water, he could've been drinking water and Gatorade because of the electrolytes he was losing in his system. I think that boy died.”
Reciprocal Determinism <i>(Decisions about beverages to serve are based on a variety of factors)</i>	Taste	“I know I don’t like the WIC juice. And my son, he doesn’t like that apple juice because it tastes like it has like a low sugar more of a diabetic like juice.”
	Familial and cultural norms	“I decide by, I mean the way I grew up at home. We started off with Kool-Aid. So, I know what my family likes. So, a typical dinner has either Kool-Aid or some type of soda.”
Reciprocal Determinism <i>(The environment influences parents to serve more SSBs)</i>	Price of sugary drinks	“The prices at Kroger. Especially if you see a two for four. I know Hi-C’s been having a lot of two for fours. Like, “Oh, let me go ahead and grab this.”
	SSB placement at stores motivates purchase	“Yeah, they have it laid out, it's like as soon as you come into the store you're presented with the little coolers. Then you have the aisle where it's like drinks and they're letting you know they're on sale. And then of course you got two separate aisles, you've got your juice and your soda aisle. And the soda aisle is where the water is.”
Expectations <i>(Parents want clear benefits and resources to overcome SSB consumption barriers)</i>	Nutrition education as a resource to reduce SSB consumption	So just having somebody to come in and help me understand because every parent is not perfect. I have my issues, and my child lives with me, so it's going to trickle to him, but I want him to be healthy. I don't want him addicted to soda because addictions lead to other addictions.
	SSBs out of sight to reduce consumption	“I think one shouldn't even buy the 12 packs of sodas or whatever. Because I love Debbie cakes. I can't buy Debbie cakes in this house because they'll be gone. So, if I physically have to go to the store to do it, it's like; man, forget

		that Debbie cake. In my house, I'm not going to get it."
Self-efficacy <i>(The nutrition label is helpful: but choosing healthy drinks is confusing)</i>	Use of beverage viscosity to identify SSBs	"Sometimes I flip it just to see all that sugar and stuff moving around in it. If it's too thick I don't really care about it."
	Use of nutrition label to identify SSBs	"Then you read the ingredients on the back... And if you don't see high fructose corn syrup or fructose corn syrup or something, I will get it."
Self-efficacy <i>(Barriers are common to limiting intake to one or less <u>SSB</u> per day)</i>	Price as a barrier to limiting SSB intake to one or less daily	"And stuff that's healthy is higher too"
	Grocery advertisements	"It's temptations right there as soon as you walk in the door. From the moment you walk in the door to checkout, checkout lines they got it right there, drinks, sugary drinks. You might have a little corner with water there."
Observational Modelling <i>(Kids want to drink what they see parents drinking)</i>	Parental consumption modeling influences child's intake	"The kids drink what they see you drinking and stuff. A kid can only get what you give them or what's around them." "For me with soda, I don't like drinking soda around my kids because they want it because they see it."
Behavioral Capability <i>(Parents desire support to limit SSB consumption)</i>	Convincing their peers to decrease SSB intake	"I would just basically say just do your research. Whatever you're putting in your body, just research. Because there is a lot of new stuff out now that we didn't have when we were younger and growing up and stuff. So, just educating yourself and your child in the process of what to take in, and what not to take in."
	Use of nutrition education to promote healthy beverage consumption	"I think if they knew what was in the beverages or the food, they wouldn't be feeding it to their kids."

Reinforcements <i>(Parents desire consistent messaging about healthy beverages)</i>	Doctor's advice as a beverage information source	"It had to take for my daughter's doctor to say; hey, during bedtime, no juice or not even no milk, because it can decay your teeth and stuff. So, that's another step that I took. Like okay, water at bedtime or nothing at all."
	Lack of synergistic beverage counseling among health professionals	"I'm confused with his pediatrician saying one thing, and WIC is telling me another. Now, if the pediatrician is still saying add water to all his juice, no matter what brand it is, because of the teeth issue or something like that or that it still carries sugar. So, it's like, what am I doing?"
Additional Important Findings		
Messaging	Previous beverage messages viewed by parents	"They advertise more sweet stuff than ever these days" over healthy drinks."
	Campaign message structure	"I think you ought to do both. I wonder if something like, don't give them sugary beverages until they turn six. Up until this point, they don't need it in their diet. Additionally, saying how it stunts their growth, that you want them to grow healthy and strong. So, don't even give it to them."
School Involvement in the Promotion of Water among Young Children	Schools should serve more water	"Because I had asked once before, about putting water in there. After children eat their food, they're drinking milk, they ain't drinking no water behind it. So, support more water."
	Inclusion of beverage lessons in children's academic curriculum	"I just feel like it starts also from schooling. They don't really talk much in school about healthy and whatnot. So, I feel like that should be put into school. I don't know if they have it, because where I'm from we have little electives and stuff. They have cooking classes and stuff like that. Back in cooking class, I don't remember them

		talking about healthy stuff really, just making other stuff. Pancakes and cakes, and stuff like that.”
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Table 4.2. Sugar-sweetened beverage perceptions: Emergent themes across Social Cognitive Theory constructs showing parent feedback and supporting quotes.

Discussion

This study examined Black parents’ perceptions about consuming and serving SSBs to their young children using a theoretical framework informed by SCT. Behavioral factors such as familial norms notably influenced parental beverage choices for their children. Familial norms and traditions play a vital role in health behavior.^{221,222} Interventions elucidating the effects of cultural health practices can encourage Black parents to forgo unhealthy norms and create healthy habits. In Louisiana, similar to our findings, caregivers of Black children noted that aggressive marketing of SSBs by stores like product placement and price influenced their beverage choices.¹³ Product placement and price promotions at attractive in-store locations favor unhealthy foods purchase.²²³⁻²²⁶ Policies that reduce the prevalence of unhealthy beverage price promotion and placement can be a public health approach to improving population diets.

Furthermore, water safety influenced beverage choices. Findings are similar to Onufrak et al’s report on parents choosing to give children SSBs because they believed tap water was unsafe to drink.²²⁷ Water mistrust can affect SSB consumption, as seen in the water crisis in Flint, Michigan.²²⁸ Routine inspections and quarterly reports on water safety within restaurants could restore parents’ trust in the safety of tap water, resulting in higher water consumption. Also, tap water filters could increase water intake at home or while eating out.^{94,194,229}

Parents reported higher SSB prices over water as a motivator to consume fewer SSBs daily. Studies highlight the impact of high food taxes in modifying SSB consumption.^{230,231} For example, excise

and sales tax imposed by the city of Berkeley, California, and Philadelphia, Pennsylvania, were strategic tools to curb sugary beverage consumption.²³²⁻²³⁵ In addition, taxes generated revenues to fund early childhood initiatives, infrastructure improvements, and health programs.²³⁶ The adoption of excise and sales tax could effectively decrease SSB consumption among Black families and children.²³⁷

In our study, parents indicated seeing limited healthy beverage campaigns over SSBs. Targeted marketing promoting SSBs is higher in Black communities.^{24,238-240} Previous studies show correlations between exposure to SSB advertisements and consumption.^{241,242} In addition to promoting healthier beverage campaigns, using Black celebrities for counter-marketing strategies can reduce SSB consumption in Black families.⁷⁵

Our findings have some limitations. Our qualitative study limits generalizability across different racial and ethnic groups as the findings are from data on Black communities experiencing low wealth. However, these findings add to the wealth of literature on the factors contributing to childhood obesity among minority groups. Another study limitation is the dependence on self-reported perceptions of perceived contributors to high SSB consumption. There may be additional factors that the participants did not consider, which could impact their SSB consumption.²⁴³ Also, using SCT to understand health behaviors does not distinguish which factors are more influential on SSB consumption among Black parents of young children.

Implications for Future Research Practice

To the authors' knowledge, this is one of the first studies to explore Black parents' perceptions and barriers to consuming and serving SSBs to their young children using SCT. Highlighted resources needed to improve healthy beverage consumption among Black families of young children have informed future research steps. Impact Statement Sugar-sweetened beverage consumption significantly contributes to childhood obesity, especially among Black children. Children's beverage preferences and consumption habits are heavily influenced by their parents. Understanding Black parents' perceptions about sugary

beverages is essential for developing effective, culturally appropriate childhood obesity prevention interventions.

CHAPTER 5

BLACK PARENTS' ELEARNING PREFERENCES AND EXPECTATIONS OF AN ONLINE BEVERAGE PROGRAM TO IMPROVE HEALTHY BEVERAGE CONSUMPTION AMONG YOUNG CHILDREN

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ABSTRACT

Objective: To conduct a needs assessment to understand Black parents of young children eLearning preferences and expectations to inform the development of an online beverage program

Methodology: A convenience sample of Black parents (N=64) completed a survey on eLearning format preferences. Individual interviews (n=20) among survey respondents explored parents' program expectations and motivation for participation. Descriptive statistics and qualitative content analysis were used for data analysis.

Results: Video was the most preferred eLearning format. Expectations included engaging, concise, and short (5 - 10 minutes) videos. Participants expressed the need to use cultural identifiers (e.g., hair, skin color) to make the program culturally adaptive. Topics of interest include sugar content of beverages, label reading, health consequences of sugar-sweetened beverages, healthy beverage alternatives, and easy-to-make recipes.

Conclusion and implications: Findings elucidate the importance of needs assessment for developing culturally appropriate content for Black families of young children.

Keywords: Childhood Obesity; Sugar-Sweetened Beverages; Health Equity; eLearning; Black-centered nutrition studies

Introduction

Sugar-sweetened beverages (SSBs) are a leading source of added sugars in children's diets.^{3,46} Sugar-sweetened beverages are carbonated & non-carbonated liquids sweetened with added sugars like brown sugar, corn sweetener, corn syrup, dextrose, high fructose corn syrup, honey, maltose, molasses, and sucrose.^{42,44} About 57.1% of children in the United States aged 1 - 5 years consume at least one SSB weekly, with trends higher (62.5%) in Georgia.⁴ Children who consume SSBs are at risk for overweight, obesity, dental cavities, poor diet quality, low academic performance, and arthritis.^{42,50,54,58,59} A longitudinal cohort study has also shown infancy exposure to SSBs where about 2% of infants consumed SSB at 6 months and 7% at 12 months.⁴⁸ Moreover, racial and ethnic disparities exist in SSBs consumption.^{4,6} The 2016 Feeding Infants and Toddlers Study (FITS) reported higher consumption of SSBs and fruit-flavored drinks among Black children aged 2-4 years compared to peers.⁶ Additionally, the 2021 National Survey of Children's Health (NSCH) revealed 71.7% young Black children consumed SSBs compared to young Hispanics (67.2%), Asian (56.2%) and White (49.6%) children.⁴ Several studies have shown that parents influence what children consume,^{7,8,69,70} notably with more Black adults consuming SSBs than their peers.^{11,12} These disparity gaps are impacted by higher exposure to beverage marketing that uses culturally-relatable content to encourage viewers to purchase SSBs.^{24,74,75} Other factors include confusion about beverage recommendations, difficulty in effectively reading nutrition labels on SSBs, water safety and SSB price promotions.^{77,78,244} To overcome these barriers, a previous needs assessment revealed Black parents' need for a nutrition education program on beverages to motivate limiting of SSBs to their children.²⁴⁴

Traditional face-to-face nutrition education programs have effectively reduced SSB consumption.^{80,83,88} However, childcare, transportation, work schedules, and COVID-19 are barriers to implementation.^{114,115} With increased internet accessibility, electronic learning (eLearning) using audio, video, and electronic applications become a promising nutrition education delivery tool to overcome in-

person implementation barriers.^{117,120} Although parent-focused eLearning interventions have effectively reduced SSB consumption among ethnically diverse participants in the same cohort,^{15,90,129} a systematic review finds an underrepresentation of Blacks in eLearning studies, highlighting gaps in the existing body of evidence and signaling opportunities for change.¹⁸⁷ Studies has shown that Black-centered interventions reflecting central cultural elements can drive study participation, study retention, desirable health outcomes and promote health equity.^{64,171,172,180,245} This becomes integral to develop a culturally relevant program on beverages for Black families of young children to reduce ethnic SSB consumption gaps. Kumanyika's getting-to-equity framework specifically calls for needs assessment via community engagement to develop effective interventions, reflective of the community needs.¹⁶¹ Several studies have shown the importance of needs assessment in developing effective eLearning education programs.^{161,167,186,246} However, despite published needs assessment studies on the development of Black-centered nutrition education^{247,248}; the literature specifically focused on understanding Black parents' eLearning needs to inform the development of beverage education program is limited.

Social cognitive theory (SCT) informs the current study's theoretical framework.¹⁷ Social cognitive theory posits that learning occurs through a tripartite interaction of the person, their environment, and their behavior.¹⁷ An eLearning beverage program can create an environment where Black parents acquire the knowledge to make healthy beverages choices for their children. Their children, via observation, can reproduce healthy beverage consumption behaviors modeled by parents as they grow. Moreover, the program can increase parents' self-efficacy and behavioral capability to successfully limit their children's SSB consumption at home. To our knowledge, this is one of the first studies to explore the use of eLearning to limit SSB consumption among Black parents and their young children. Understanding Black parents' eLearning needs is imperative to developing solutions that drive healthful outcomes and promote health equity. Therefore, the aims of the study were to 1) evaluate preferred eLearning formats and willingness to participate in an eLearning beverage program among Black parents

of young children and 2) characterize Black parents' expectations and motivations to participate in an eLearning beverage program.

Methods

Study Design

This study used a mixed-method approach using surveys and individual interviews. We surveyed a convenience sample of Black parents of children aged 0 to 5 across Georgia (12 counties including Fulton, Clayton, Jackson, Walton, Putnam, Milledgeville, Clarke, Barrow, Henry, Chatham, Ben Hill and Bartow). Participation eligibility included: 1) identifying as a Black parent or caregiver for a child (aged 0-5 years), 2) 18 years old and older in Georgia, 3) participating in a Federally funded program (Head Start, Pre-K, WIC, SNAP, Medicaid), and 4) having smartphone and internet access. Through our partnerships with Early Child and Education (ECE) programs and community coalitions, the researchers recruited participants via in-person tabling sessions during parent conferences at schools, community health events; and virtually via community-social media handles using fliers and posters. Seventy-four participants (66% females) completed the survey. Per a survey question, researchers contacted survey respondents willing to participate in individual virtual interviews until data saturation was reached. Twenty survey participants were interviewed for this study. Participants received a \$25 gift card for survey completion and an additional \$25 for interviews. The Institutional Review Board at the [BLINDED FOR REVIEW] approved this study (PROJECT00004358). Participants provided informed consent online before completing the survey.

Survey

The investigators created a survey to understand Black parents' internet use, prior beverage program participation, willingness to participate in an eLearning beverage program, preferred eLearning format, and demographics. Survey questions were adapted from Cotwright's similar study among Early Care and Education Teachers in Georgia.¹⁶⁷ This study's survey requested that participants select their

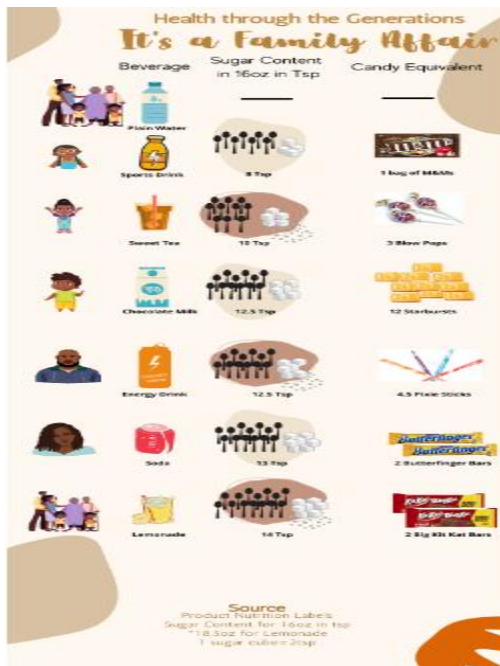
preferred eLearning format from five provided options: videos, social media, podcasts, infographics, and video games. Additionally, participants were asked to provide an open-ended response following a “No or Maybe” response to a question on willingness to participate in the online beverage program. Before distributing surveys, two nutrition education experts (nutrition professor and community nutritionist), three parents, and three graduate students’ pilot-tested the survey and provided feedback for modifications. To provide a visual representation of several eLearning formats presented in the survey, Ms.Okoli worked with a graphic designer to develop prototypes attached to the survey. For example, for a video prototype (duration: two minutes and 28 seconds), two parents had a conversation about SSBs where one curiously inquired about her friend's recent health improvements. Her friend disclosed that limiting SSBs access within her family (including for children) and switching to healthier options like plain milk and water, had improved her health. Figure 5.1 shows examples of the video, infographics, social media, and video game prototypes attached in the survey.



A



B



C



D



E



F

Figure 5.1: Developed prototypes of eLearning formats attached to the study survey. A & B are video prototypes, C is an infographic prototype, D is an example of a social media post, and E & F shows the video-game prototype displayed to parents.

Interviews

Participants who completed surveys received an invitation to participate in individual semi-structured interviews. Twenty participants (85% female) expressed interest and ultimately participated in interviews via Zoom conferencing, with each lasting approximately 40 minutes. A trained graduate student took notes and facilitated all interviews. The interview guide included questions to understand the participant's rationale for the pre-selected eLearning format, preferred device for hosting the eLearning beverage program, program expectations, and motivations for participation (Appendix 4 for interview guide). During the interview, parents were shown the eLearning prototypes attached in the survey for a recall before answering related questions. Interview participants agreed to the moderator recording the session for transcription.

Data Analysis

Collected survey data were analyzed using R studio (version 1.4.1103-4). Descriptive statistics were calculated to determine frequencies for prior beverage program participation, willingness to participate in an eLearning beverage program, and eLearning preferences. Interviews were audio recorded via Zoom Web conferencing,²⁴⁹ and a phone recording app (my recorder); and transcribed via Rev.com, a third-party transcriptionist.²⁵⁰ Transcribed interview data were uploaded into ATLAS.ti (version 22, Scientific Software Development GmbH, Berlin, Germany, 2022),²⁵¹ and analyzed using a conventional approach content analysis to identify emergent themes.²⁵² A trained graduate student and a qualitative researcher expert reviewed and independently coded all transcripts. To validate analysis, coders met and discussed differences in coding to reach a consensus on the final theme interpretation.

Results

Survey

Demographics results from the survey are presented in Table 5.1. Videos (48%) were preferred over infographics (20%), social media (13%), video games (11%), and podcasts (8%) for eLearning. About 78% of participants have never participated in a beverage program either in-person or virtually. Most respondents (66%) indicated they were willing to participate in the training after development. Time constraint and prior knowledge of beverages were reasons for no (9%) or maybe (25%) selection to the willingness to participate in the eLearning beverage program.

Variables		n (%)
Gender		
Female		42 (66%)
Male		22 (34%)
Age		
18-29		20 (31%)
30-39		38 (59%)
40-49		5 (8%)
50-59		1 (2%)
Income		
< \$20,000		20 (31%)
\$20,000 - \$50,000		29 (45%)
\$51,000 - \$70,000		11 (17%)
> \$70, 000		4 (6%)
Education		
Less than high school degree		3 (5%)
High school degree or equivalent (GED)		9 (14%)
Some college but no degree		15 (23%)
Associate degree		8 (13%)
Bachelor's degree		19 (30%)
Graduate degree		10 (16%)
Marital Status		
Never Married		26 (41%)
Married		33 (52%)
Separated		3 (5%)
Divorced		1 (2%)

Widowed	1 (2%)
Reported Age of Participants' children (n = 88)	
< 1 year	5 (6%)
1 year	16 (18%)
2 years	13 (15%)
3 years	20 (23%)
4 years	22 (25%)
5 years	12 (14%)

Table 5.1. Characteristics of Survey Participants.

Qualitative Findings

We identified several emergent themes in our interviews. Among interviewees, sixteen (16) selected videos, three selected infographics, and 1 chose podcasts as preferred eLearning format. Results are presented in (4) categories: Preferred electronic device for learning, participants' rationale for eLearning format selection, expectations for an eLearning beverage program and motivation for program participation.

Theme #1: Preferred Electronic Device for Learning

Parents were most likely to use their phones to surf the internet. Information surfed online includes entertainment, health advice, news, weather, shopping, social media, kid's shows, and school assignments. More than half of the participants preferred a phone over other devices for receiving and viewing program content. Participants described phones as "convenient," "portable", "easily accessible," affordable, and transportation friendly. A parent reporting about easy internet connectivity with phones, said "They're [phones] smarter than my tablet when it has to do with network. It loads fast and reduces my stress of having to wait".

Theme #2: Participants' Rationales For eLearning Format Selection

We identified three sub-themes related to participants' rationales for their preferred eLearning format. Participants indicated that videos made learning fun and engaging; infographics were less distracting and preferred short videos for learning.

Videos make learning fun and engaging and it facilitates recall

Video-based learning was the most preferred eLearning format in the survey completed by Black parents. For this reason, all interviewees provided feedback on the video, whether or not they selected it as their preferred format. They noted that learning via videos was fun and promoted engagement. For example, a parent stated, "I'm really finding this fun. I'm still concentrating, so I have sound and I have graphics. For me, that stimulates me and then I'm able to concentrate". Some parents also expressed likeness to the animated graphics including the people portrayed in the video prototype. A parent mentioned: "Even the children can watch along because again, it's something sound and visual. Then we can all learn together and say, okay, this is what is good for you, this is why soda is not good for you, this is why this is good for you.", to suggest the impact of video animations to make learning a family affair including kids. Indicating a preference for short videos, others said they liked videos because "It was quick [and] It got straight to the point.", referencing the video prototype in the survey.

Most parents perceived video-based learning as beneficial to promote knowledge recall. One mentioned that he likes the video format "because I can always play to remember. I can always play it as many times as I want, and I can see. So, I can follow and see what I'm hearing." Another parent, comparing the video to the infographic option, explained their preference for videos this way:

Infographic, this one, I would zoom in, look at it, look at it, look at it, look at it, but it's like you scan. I will just scan; "Oh, okay, I can see spoons, I can see water, I can see cup with a straw in it. I don't know. Oh, this is a sweet tea. Okay, the next one, 30 ice cubes. Okay, good." I will forget

easily. Even if I take my time to look at each component carefully, I will still forget. But audiovisuals [referring to videos] have a way that leaves impressions on your brain.

Parents also found the grocery store conversation between the two parents and the content narration in the video prototype interesting and catchy for learning. Parents noted it made learning enjoyable and captivating to draw a learner's attention to vital health lessons. One parent shared, "If you're just going to put information on the screen, it's going to get boring. But then those people acting it out, it just gets the attention." Another parent shared how the video motivated her to assess the drinks in her home. She stated, "I liked the video because, one, it started off as a story, and then it ended up leaving you with something to think about. Because after watching that video, I had to go to my juice to look at how many added sugars was on that." Participants were asked about their reaction to the body images of “plump and slender” women portrayed in the video. Many of them were indifferent, explaining that it challenged the viewer to reflect on the impact of SSBs on body weight.

- **Parents prefer short videos for learning**

The moderator inquired about parents' preference regarding either multiple video lessons published routinely or a one-time training day. Most participants opted for multiple short videos compared to a 30 - 60 minutes one-time training. They emphasized that videos should be about 5 minutes, or a maximum of 10 minutes for reasons like "I don't have a lot of time." and "When I try to learn once, and after some weeks, I might even forget." which could hinder knowledge recall. Some parents liked the length of the video prototype in the survey, with a parent stating, "*The video was so short and cute.*" The small number of parents who preferred a one-time training emphasized that it should be no longer than 60 minutes.

Concerning video publishing frequency, parents preferred weekly distribution of new videos rather than daily. The need for a consistent drop time pattern was also raised by a parent who said,

I like consistency, you get it? If there's something on Monday, I like it to be on Monday. I like consistency. But if it's a Monday, you drop it at 3:00 p.m., on Tuesday, come and five p.m. On Wednesday, you come and drop at 7:00 p.m. I may not watch it. So, I like consistency to know this is what I do at this time.

When discussing the best time of the day to send videos, parents said they preferred times when they were less busy with the kids, like "when the kids may be sleeping," "any time after school," or "lunch time when most people get on their phones and just scroll while eating lunch."

Infographics are less distracting and easily accessible

Infographics were the second most preferred eLearning format. The two parents who selected this option shared that they found infographics to be less distracting and easily accessible to read. Though not opposed to videos for learning, one parent who preferred infographics noted:

That's how I like to learn. So, that was my favorite. I can go without all the extra, and sometimes it's distracting with all the extra stuff. So, I can learn just looking at slide sheets. It doesn't have to be a voice, a character, even though that's okay, but that kind of distracts me. I will turn away from a marketing item, anything if it's too much. Sometimes all you got to do is show me a spreadsheet. Let me see it. I can read the facts and everything myself, comprehend it, nice inquiry, and move on quickly.

The other parent who spoke about accessibility explained that she preferred infographics, "because I can access it anywhere. My son has autism, so he has a lot of appointments. I can be at his appointment, you know, well, his therapies and be learning on my phone." She further explained that she disliked the video format because of the fear of phone damage and identity theft associated with video links.

Finally, the parent's explaining her choice of podcast noted that, "when I'm driving or doing work. I could listen to it." Though, she welcomed learning via videos if that was the only available option.

Theme #3: Expectations of an eLearning Beverage Program

We identified four subthemes that focused on parents' perspectives of representation, beverage content topics, learning engagement and general content outline within the program. Together, these subthemes provide guidelines for program development.

Program should be culturally representative

The majority of the parents expressed the importance of representation within the program. Parents wanted to see people that looked like them in skin color and hair styling. A parent said "I would want to see things more like us, because we don't get that often. Of course, the world is diverse, but you never see posters of African Americans or people of our own culture or color.", discussing the rarity of Black centered programs. Another parent excitedly noted that, "Well, I like seeing videos like that because they mimic us. So that's what I want to see more of", referring to the video prototype of the two Black women in the survey. Nevertheless, some parents emphasized that they prioritized the quality of content over culturally sensitive representations.

Few parents drew attention to the inclusion of family dynamics within the program . One parent commented on, "How Black kids and families are raised." Explaining further, she noted that, "What I'm trying to say: it is not going to be a mom and dad and kids. Most Black cultures don't have a dad or some of them don't have a mom. I guess maybe a grandma or something in the household." Such feedback illuminates the collective roles of family members in raising a child beyond the parents.

For language, many parents liked the accessible English Language (fifth grade) used in the prototype, noting that it was "clear" and "understandable", and it should be replicated within the final

program. For music, although a few parents suggested adding pop music to the program, the majority of parents disclosed that music could distract learning, understanding, and comprehension.

Beverage content topics

Across interviews, participants mentioned what they hope to learn from the training. Many parents had shared interest in the nutrition topics they wanted in the program. Topics of interest include: (1) health - including sugar content and SSBs health consequences; (2) need for healthy alternatives; (3) interest in recipes they can make at home. Regarding health, a parent highlighted that the importance to talk about the health consequences of SSBs consumption within the program because "when people see the dangers and the effects of these things [SSBs] and what it actually causes and how they don't really have a straight treatment to it, they will actually be interested." Another parent referencing the video prototype, said "I thought that was really cool in the video, just breaking down the labels because sugar comes under different names, and sometimes it's tricky because it sounds healthy or whatever." Another parent also mentioned that "It [prototypes] was so educative, the fact about cutting sugars off and what indicates what sugar is in a drink, or food. It blew my mind." Other points raised were interest to learn about "the quantities to give my children" and the ability to read beverage nutrition labels to learn about the "calories, [and] the maximum amount maybe my children will have to consume a day".

Beyond health, parents expressed interest in "[flavorful and tasty healthy] options that [they] can go for", emphasizing their dislike for plain water bland taste despite its health benefits. A parent commented:

Because I feel like if you're teaching them, "Don't drink Coke." So, you come up with something to replace that habit. What should they drink? You can't tell them, "Don't drink Coke, drink water." Everybody knows water is boring. So, if you can't think of something else, maybe, "Don't

drink Coke, but make smoothie." Or "Don't drink Coke but buy fruits from the store or buy a juice extractor and then make your own juice.

Interestingly, one interviewee curiously asked, "are there options that are better than sugar sweetened beverage?", noting the need to enlighten learners on healthy beverage options within the program. Parents were also interested in easy recipes they could make at home. One example, "I would like to know how to make our own beverages healthy beverages, because I do get them sparkling water more than anything. But I would like to know how to mix it up and try something different and fun and nutritious", emphasizes the need for nutrition and taste consideration in recipe selection. Besides easy method of preparation, parents mentioned that recipe ingredients should be "cost efficient", "easy to find" and "two or three, maximum". Finally, across the individual interviews, when participants were asked if they would like food demos, showing recipe preparations, participants answered "yes".

Content should be captivating, concise, and colorful

Parents expressed the need for training content that captures attention and is visually appealing. A parent provided a footprint (a popular commercial) for content development by stating,

You have to go above and beyond to cater to that community [that you want to reach], to get their attention. You see what Mountain Dew does? They have these crazy commercials, these crazy characters, these crazy colors, everything is popping out and it's fun and it's interesting. In order for you to get us to do something healthy, you got to jump out there, as big as a rainbow as you can, to grab that community.

Another parent voiced, "you have to put some captivating messages that will make listeners go back home with something.", to emphasize how program messages can promote message recall and in turn, inform positive drinking behaviors. Beyond captivation, some parents emphasized the importance of

conciseness—such that eLearning should be “straight to the point because you don't want to bore people with plenty of information, like dancing around.”

Learning Engagement

Interviewees identified several important elements to promote learning engagement. These include adding real-life scenarios and settings that inform beverage consumption such as cookouts, grocery shopping, religious places and dine ins. Referring to the conversational scene between the two female characters at the grocery store in the video prototype, many parents requested for similar concepts by explaining the role of conversations to “draw [one] to what the person is saying at the moment.” When asked about the addition of quizzes into the program, most parents welcomed the idea, with one parent stating, “If I know that if there's a quiz at the end, I pay more attention.” However, parents suggested that quizzes should be short and objective, with no open text.

Theme #4: Motivations for program participation

Individual parents’ feedback was collected to understand motivations for program participation. Specifically, parents identified motivators to begin and complete the program in addition to motivation to practice healthy behaviors post-program. To begin the program, many parents indicated explicit recruitment invitation with clear learning objectives and health benefits as a major motivation to consider participation. For example, a parent mentioned: “Maybe sensitization. [something] like “Hey, there's a training coming up. These are the things that you're going to learn if you do this training, and it would be good for you and your family.” Just something like that. Maybe having sensitization, sensitizing parents about what to expect in the training.” Other highlighted program commencement motivations include incentives (money, food, water pitcher & filters, vouchers), health need, “If it's coming from a friend that I know.”, “if it’s about African Americans”, and self-interests.

Regarding motivation to complete the program upon implementation, the majority of parents talked about making the program content catchy and compelling, keeping in mind the expectations already discussed above. Additionally, a few parents suggested providing parents with resources they could access to support knowledge gained from the program in addition to autonomous motivation. Overall, majority of parents felt that "if it's [the program] not boring and I'm actually learning and benefiting.", they would be eager to finish the program and not drop out.

Finally, the researchers wanted to understand motivations for adopting and practicing the healthy behaviors learnt from the program at home. Several parents recommended sending summarized reminders after the implementation phase, with one sharing her learning experience:

For me, there's something that happens to me. Okay, recently I was surfing the net and I realized that drinking water helps prevent kidney stones and a lot of things. And I'm not really a fan of water itself, like water as liquid. I prefer to substitute for juice and all that. But that day I learned a lot about the disadvantages of not drinking water and for three good days straight, I made sure, oh my God, I need to drink water, I don't want to have kidneys stone. But with time, oh my God, trust me, after the third day, that was story for me. Motivation was not there anymore. Okay, it's like the feeling just came for the first three days. So, I would say that to help parents to continue being informed or use this educated factor, let it be that after signing up for the class and learning it, there should be kind of notifications to them, once in a while, just drop this and be like, maybe okay, we're like, hope your daughter had a milk today. Remember it does the blah, blah, blah. It helps increase the IQ.

A few parents were also interested in joining support groups to learn from other parents via shared pictures and recipes. One mentioned that support groups promote "accountability" by helping parents know what they are supposed to do and when to do it. Another parent highlighted that: "If I join a

support group, [I] just [want] to see what other mothers are creating because I can also get inspired. Oh, somebody did it with a pumpkin; oh, okay, let me see if I can do it with pumpkin too. Because maybe I might not have thought about pumpkin." This example showcases the role of support groups to inspire healthy behaviors in families. Other motivations to integrate program materials into practical behaviors include perceived health benefits, self-care, family wellness, recipes, technical assistance and recorded successful feedback like "Because I'm hearing it from a real person and their real experience, they have experienced it and they see results and I'm seeing the results from it.". In summary, parents were excited about an educational program focused on addressing the health issues in the community and looked forward to accessing the program in the future after development.

Discussion

The current needs assessment study used a mixed method approach to identify Black parents' eLearning preferences to inform the development of an online beverage program resource for Black families of preschoolers. The goal is to develop a program to become a transformative tool that will motivate Black parents to limit SSBs to their children, thus promoting health equity. In our results, the majority of parents expressed willingness to participate in a self-paced online training on beverages. Other studies have found similarities among participants in Federal Assistance programs who expressed interest in receiving online nutrition education.^{253,254} For example, majority of Women, Infant and Children (WIC) clients indicated willingness to use internet to receive nutrition education and support from WIC staff and other mothers.²⁵⁴ Online training to mitigate challenges with in-person training has demonstrated improved health behavioral outcomes.^{8,255-257} For example. A thirty-minute self-paced online training including graphics and videos among providers in California showed increased knowledge and awareness of California's 2010 Healthy Beverages in Child Care Act (AB2084).²⁵⁵ Notably, there are recorded similarities in significant changes in nutrition behavior among both online and traditional in-person learners.²⁵⁶ There is a growing interest in the use of eLearning for nutrition education among

adults. Plausible reasons include increased access to the internet and the commonality of smartphones in the United States.¹²⁰ Therefore, eLearning, also called online learning, has the capacity as a health promotion tool to reduce SSB consumption among Young Black children.

Interviewees emphasized the need for elements reflective of Black culture within the program. Cultural representation is a critical application of equity lens in addressing health problem among minority populations.¹⁶⁴ These involves including people, clothing, foods, locations, and pictures reflective of ethnic groups to foster program participation and adoption.^{171,172} An evaluation by Greene et al., to explore African Americans' satisfaction with SNAP-Ed in Louisiana reiterates the need for representation in training design, development, and implementation of Black-centered programs.¹⁹⁰ Black participants felt the program lessons lacked a connection to Black culture and history.¹⁹⁰ Additionally, participants preferred Black staff who understood the community as program implementers.¹⁹⁰ Thus, it is time for researchers to re-examine how minoritized populations are reflected in interventions by considering what makes them feel seen, including landmark locations and the personalities they listen to. For example, Black churches are historic centers of strength for the Black community especially during the American Civil Rights Movement.¹⁸² Likewise, health programs implemented in Black-dominated churches have been effective for weight loss and reduction of associated health risks.²⁵⁸⁻²⁶¹ Explanations for its success rates include the use of lay church health workers with whom members can identify, using culturally sensitive materials, the influence of church clergy on congregation's beliefs, behaviors, attitudes without encountering resistance and modifying the program based on participants' input.²⁶²⁻²⁶⁴ In another study across 21 states and the District Columbia, a culinary heritage cooking course "A Taste of African Heritage (ATOAH)", based on African diet traditions to promote eating patterns significantly improved intake of fruit, vegetable, and greens.²⁶⁵ Almost all (98%) participants in the ATOAH program indicated that the cultural history and heritage depicted in the program were positive motivators of eating and living well as evidenced in the improvement of weight, waist circumference and systolic blood

pressure recorded.²⁶⁵ Additionally, there are several studies showing the influence of racially targeted food and beverage advertisements using Black actors on the food choices a Black person makes.^{75,244,266,267} It becomes logical, that the use of Black actors in a Black-centered online nutrition education program on beverages could also drive participation, learning, application of knowledge gained and overall program effectiveness.

The majority of Black parents in our study preferred video (vodcasting) technology for learning about beverages. Further, participants' rationale for videos provides valuable insights and suggestions for effective training development. Studies have documented research participants' preference for videos to enhance learning in nutrition education programs.^{167,268,269} For example, Extension paraprofessionals in the Expanded Food and Nutrition Education Program (EFNEP) preferred video-based training because "they feel it is easy to access and it grabs attention," which is similar to our findings.²⁶⁸ Further, Georgians participating in an online SNAP-Ed program recommended including videos to improve the educational program.²⁷⁰ Our participants' preference for using real scenarios and relatable settings are similar to the key characteristics for effective videos to promote learning identified by Ramsey et al.²⁷¹ The strength of video-based learning lies in presenting knowledge in an engaging and attractive way.^{272,273} Hence, this can leave a remarkable impact on the learner to inform positive behavioral modifications.

A higher preference for short videos over long video training courses was common across interviews. Considering video length, a learner's retention in eLearning via videos can be challenging.²⁷⁴ In Michael Allen's Guide To eLearning (2nd edition), making shorter videos and adding interactivity can build engagement and increase the program's effectiveness.²⁷⁵ A comparative study has shown that participants' largest dissatisfaction with online learning related to the time required to complete online modules.²⁷⁶ Furthermore, video clips under 6 minutes have been found to be more engaging with participants more likely to disregard long educational videos for learning.²⁷⁷ Moreover, experts in developing web-based nutrition education programs advocate that lessons < 10 minutes in length are ideal

for learning and participation.²⁷⁸ With increased push for short and captivating media clips focusing on what is essential for learning promotion, it is important that institutions take into account time duration in the design of video programs. This can benefit the human attention span, a scarce resource in the modern world.

Motivation is one of the basic principles of adult learning.²⁷⁹ Several characteristics determine adult learning experiences, including whether the learner is motivated to keep learning and put into practice information received for behavioral modification. Similar to our study, other studies have found that incentives are a common motivator for learning among adults.^{95,141} For example, given the mistrust in unfiltered tap water quality, water filters have proven to be effective as an incentive to reduce SSBs among parents and their children.⁹⁵ Furthermore, internal motivations like family wellness, self-care, and perceived benefits suggested by participants in our study are important considerations in designing reflective questions within the program to challenge and encourage healthful beverage decisions for prospective learners.

Our findings have some limitations. Study results are not generalizable across the nationwide Black population. However, these findings are transferable and vital to understanding the adaptation of eLearning for culturally sensitive nutrition interventions. Another limitation is the possibility of change in Black Parents' eLearning preferences over time. As technology evolves with the advent of new applications, people are more likely to lean toward the trend, leading to changes in learning choices.

Implications For Future Research and Practice

To the authors' knowledge, this is one of the first studies to assess Black parents' preferences and motivations aimed at designing a culturally appropriate eLearning beverage program to address SSB consumption among Black families of young children ages 0 to 5 years. Nutrition education is more likely to be effective when it is culturally appropriate, considering the needs and motivations of individuals.^{280,281} In our study, participants highlighted various expectations and recommendations which

have informed the development of video modules on beverages for implementation and evaluation. Moreover, our study suggests a blueprint to approach disparity gaps in nutrition related problems. Research organizations and communities can apply health equity lens in designing and conducting nutrition interventions by first, understanding priority audience needs through needs assessments and then, designing programs based on participants' feedback. This approach can inform accurate program budgeting, expenditure, and time allocation.

CHAPTER 6

PROCESS DEVELOPMENT OF A PARENT-FOCUSED ONLINE BEVERAGE PROGRAM FOR
BLACK FAMILIES OF PRESCHOOLERS

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ABSTRACT

The purpose of this paper is to share the lessons learned and experiences in developing an eLearning program, *Drink Smart* tailored for Black families of preschoolers to increase healthy beverage consumption. Insights from this process emphasize the importance of a needs assessment among prospective program participants to inform the program content and production. Capturing the intended user's eLearning preferences and expectations provided a roadmap for a program reflective and adaptive to the primary audience. Additionally, this report discusses the program curriculum, resources used for production and lessons learnt in its development.

Keywords: Childhood Obesity; Sugar-Sweetened Beverages; Health Equity; eLearning; Racial Equity; Black Preschoolers

Introduction

Sugar-sweetened beverages (SSBs) are a major risk factor for overweight and obesity onset among preschoolers. Over half (57.1%) of children ages 1 – 5 years drink SSB at least once weekly.⁴ By race, a greater proportion of Black children (71.7%) consume SSBs compared to Hispanic (67.2%), Asian (56.2%) and White (49.6%) children.⁴ In Georgia, 62.5% of children consume SSBs weekly, higher than the nation's average rate.⁴ Parents supply the majority of SSB consumed by children.^{7,8,48,68} Black parents and adults are more likely to consume SSBs than their peers, elucidating a need for a solution.¹⁰⁻¹² Observational Modeling, a core construct of Social Cognitive Theory, posits that people are likely to shape their behaviors by following what they see others within their inner circle do.¹⁷ Therefore, parents can positively influence what their young children drink by modeling healthy beverage consumption.^{8,15,81,88,92} Previous research by the author shows that the lack of knowledge on beverage recommendations for children, inability to read beverage nutrition labels, and need for healthy alternatives were some barriers to Black parents' provision of healthy beverages to their children.²⁴⁴ Although there is a body of literature on parent-focused interventions to reduce SSB consumption among children,^{15,93,94,95,97} experts suggest that designing culturally tailored interventions might most effectively address public health issues affecting minority groups, including Blacks, thus promoting health equity.^{164,171-173} Specifically, the effectiveness of culturally tailored intervention has increased water consumption & decreased SSB intake in Latino households of young children.^{94,95,99} However, there is a lack of data regarding the effectiveness of a standalone Black-centered intervention to reduce SSB intake and increase water consumption among Black preschoolers.

Nutrition education combines educational strategies and environmental supports to facilitate the voluntary adoption of food choices and nutrition behaviors conducive to wellness.¹⁶ Previously, traditional face-to-face classes were the primary way to deliver nutrition education.^{80,88,91} However, many individuals, including parents, face barriers like childcare, transportation, work schedules, and fear of

contracting airborne sickness like COVID-19, making it difficult to attend in-person classes.^{114,115} To overcome the challenges of attending face-to-face nutrition classes, electronic learning (eLearning) becomes an emerging necessity.^{116,117} Electronic learning (eLearning) uses electronic educational technology like the internet, text messaging, and applications in teaching and learning.^{16,118} A 2021 report revealed that 86% and 76% of Americans with low income (< \$30,000) used the internet and smartphones, respectively.^{120,121} By race, 93% of Blacks use the internet, making eLearning potentially viable to increase program audience among this audience. A systematic review shows an underrepresentation of Blacks in eHealth interventions, identifying opportunities for change.¹⁸⁷ Therefore, a parent-focused eLearning program on beverages can be a helpful resource to increase Black parents' self-efficacy to reduce SSB access to their children while increasing water consumption. This paper aims to share the lessons learned and experiences in developing an eLearning program tailored for Black families of preschoolers to increase healthy beverage consumption. Our report serves as a guide for researchers who may be interested in developing culturally adaptive eLearning programs for their audiences.

Development Process

Choice of eLearning Format

With the existence of several eLearning formats, our research team tested five (5) eLearning format prototypes: videos, infographics, social media, podcasts, and video games among our primary audience (Black parents) to arrive at the most preferred for program development. The authors conceptualized each prototype content and reviewed it among nutrition educators and nutrition graduate students before testing. Upon final content editing, the authors hired an instructional designer with expertise in graphic design to visually illustrate the concept of three (3) eLearning formats (videos, video games, and infographics). The instructional designer used the Vyond software application (GoAnimate, Inc., San Mateo, CA, 2007) to

design the video-based prototype. The Vyond application is an eLearning production tool that delivers animated character features and templates depending on the designer's choice.

Interestingly, the app allows eLearning designers to build customized characters to engage and educate audiences. For the infographics, the graphic designer used the Canva application to graphically showcase the sugar content of various beverages and compare each SSB's added sugar quantity to popular candies. Articulate Storyline 2 (Articulate Global Inc, New York, NY, 2016) was used to develop the video game prototype to provide participants with a user-friendly and engaging interface. The interactivity of the video game enabled users to categorize beverages into SSBs or non-SSBs using the beverage education provided in the video game. Other eLearning format prototypes (social media and podcast) were designed by Ms. Okoli using a Canva application template to create a social media post and a recording App for the podcast.

Considering resources like money and time needed for development, we applied a mixed method approach using a survey and individual interviews to explore Black parents' most preferred eLearning format, which informed the program's format delivery. The researchers recruited a convenience sample of Black parents in Georgia (n = 64) to complete a survey using a link from an email and a QR code. The survey contained prototypes of the above eLearning format described, asking Black parents to watch and select their "most preferred" format for learning about beverages. Additionally, survey respondents were invited to participate in individual interviews (n = 20) via Zoom conferencing to understand participants' rationale behind their choice and program expectations. This step was necessary to ensure the engagement of our priority audience, accounting for their needs and recommendations during production. The body of literature suggests the importance of a community-based participatory approach as a strength for designing culturally adaptive programs.^{161,164} At the end of our data collection and analysis, the video-based format was the most preferred, followed by infographics, and podcasts received the least selection.

Drink Smart Curriculum

Five short culturally adaptive animated video lessons (< 5 minutes) were developed using Vyond application software based on the participants' most preferred choice and other program expectations. The researchers also created a separate video (Healthy variety) recorded in a kitchen, capturing a food demo of healthy beverage recipes. The five *Drink Smart* animated video lessons were titled Know your Beverages, Beverages Best for My Child, Black Health Matters, Reading Beverage Nutrition labels, and Yes You Can. Each lesson was framed within an SCT construct relevant to the program objective to inspire Black parents to make healthier beverage choices for their children. Before final video productions, each lesson's objectives were clearly outlined to guide the messaging content (APPENDIX A-5). The length of each video lesson varied, depending on the lesson content portrayed. For example, Drink Smart lesson 1, "Know your Beverages", requires approximately 4 minutes and 48 seconds to watch. The video focused on introducing the program, the definition of SSBs versus non-SSBs, and the sugar content of various beverages (Figure 6.1). Guided by the principle of Social Cognitive Theory, this lesson educated the learner to be confident (increased self-efficacy) to differentiate beverage types given by the examples shared in the lesson. For the Food demo category, a graduate student assisted with the recording while the first author demonstrated the recipes in the laboratory's kitchen using appropriate wares, appliances and lighting... Children were involved in the demonstrations, like dropping the ingredients into the blender for smoothie making and filling the water jug for flavored water recipe. The overall objective of including children in the demo video was to teach viewers on the importance of making healthy beverage consumption a family affair.

Most of the information on each lesson's curriculum (content) was sourced from evidence-based beverage recommendations assembled by the Healthy Eating Research, a Robert Wood Johnson Foundation national program focused on infant and child feeding. In 2019, a panel of experts from 4

organizations: the Academy of Nutrition and Dietetics, the American Academy of Pediatric Dentistry, the American Academy of Pediatrics, and the American Heart Association put forward beverage recommendations based on the best available evidence.²⁸² These recommendations provide consistent messages for health care providers, public health practitioners, and parents and caregivers to improve the beverage intake patterns of infants and young children. The full guidelines and accompanying report are published as a useful resource for consistent messaging.²⁸³ Additional resources informing the *Drink Smart* lesson contents were sourced from the Center for Disease Control and Prevention (CDC) scientific database.²⁸⁴

Many things were learnt from designing *Drink Smart*. First, mapping out lesson names and objectives in writing formed an integral design step before production. Objectives provided the framework for what and how subject matter should be discussed in each lesson, lessening the likelihood of redundancy in content delivery. Secondly, a clear outline of objectives made it easier to flesh out video scripts for production. In addition to writing the video scripts, we recommend the use of comments in each script to clearly emphasize and communicate the creator's vision for graphics, ellipsis, call to action and tone to the eLearning designer. Extra steps to translate all written video scripts into PowerPoint slides served as story boards to visually convey production expectations, citing examples of graphics or illustrations required for each video sequence. Thirdly, we observed that completing & reviewing a video lesson before the next ensured smooth production and allowed for a creative flow to address challenges. Before video production begins, researchers and eLearning designers should engage in introductory meetings either face to face or virtually (in our case, via Zoom) to discuss the aims and objectives of the program including service charge. There should also be an agreement on a preferred online personal storage for sharing and exchanging materials, in addition to proper archiving for track changes, edits and final products. At the end of each meeting, proper documentation of agreements and discussions should be shared between both parties via email and a preferred communication method. Finally, required video edits and reviews should be written and communicated effectively. If possible, provide attachments

showing screenshots of errors and samples of expected edits in emails to the eLearning designer for comprehensive tracking and clear communications of needs.

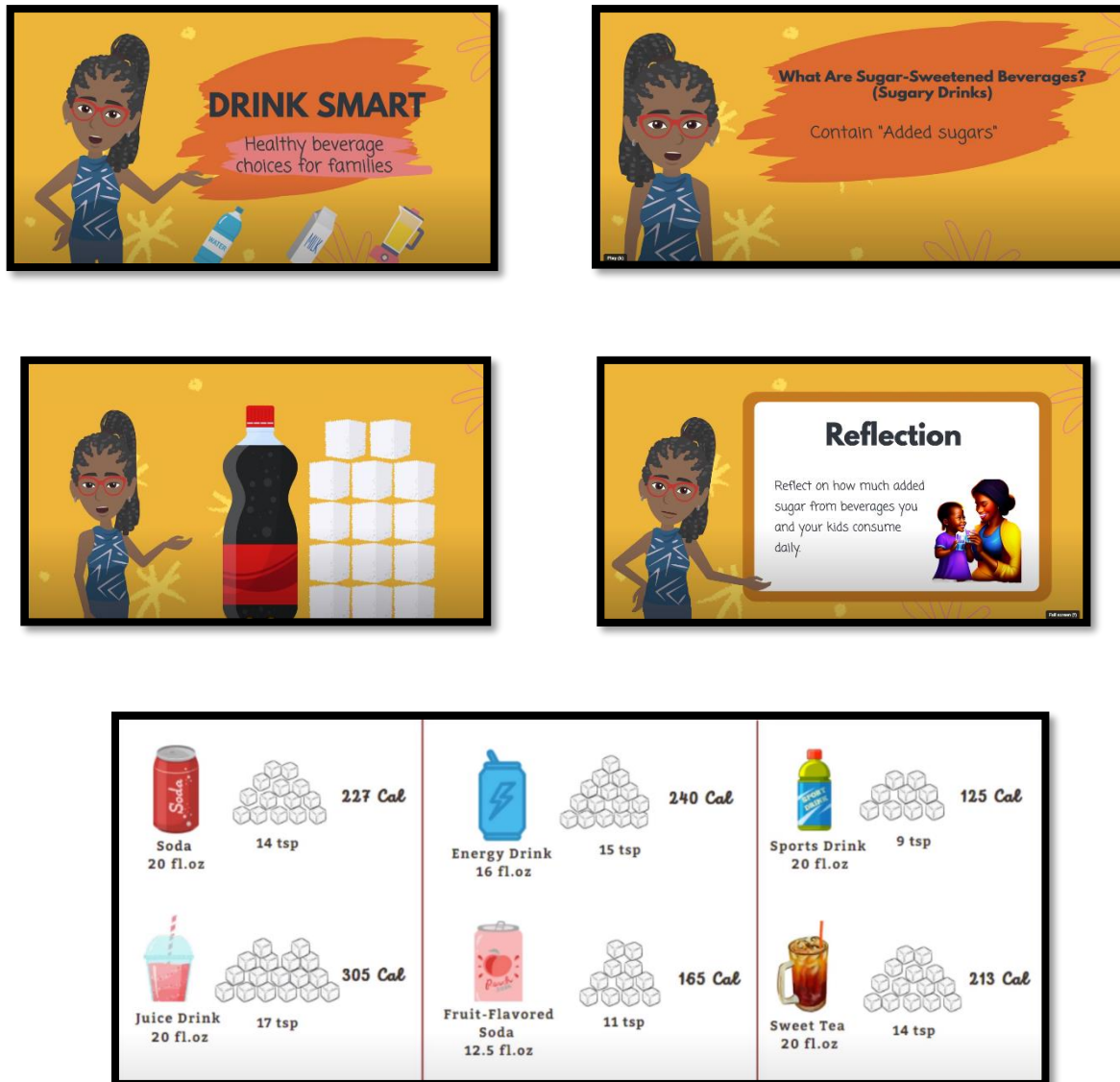


Figure 6.1: Slide examples on lesson 1 (Know Your Beverages) of the *Drink Smart* eLearning Program.

The female character named Chelsea introduces the classes and guides the learner through the lessons. All lessons ended with a “reflection”, leaving the listener with something to think about regarding what they drink.

Resources Needed

An earlier nutrition study reported on the resources needed to develop their eLearning program.¹⁵ For example, the development of Food eTalk, an online SNAP-ed program, required using Articulate Storyline 2 (Articulate Global Inc, New York, NY, 2016) to make the learning engaging and interactive.¹⁵ The creation of Food eTalk with Articulate adapted to the program's uniqueness of creating a user experience saturated with hands-on activity, including games for its users.¹⁵ However, in developing the *Drink Smart* e-program, we utilized the "Vyond" application software we tested among participants during the prototype testing phase. Additional resources include materials for the food demo production like location, cost of food ingredients, lighting materials, and kitchen wares for taste testing. In contrast to other studies,¹⁵ we relied earlier on our needs assessment research findings among our priority audience to inform the program design, cutting out the need for post-design evaluation. However, all videos and additional materials embedded in the program were critically reviewed after production by graduate students, academic professors, and Black parent volunteers. Future evaluation includes pilot-testing the program among Black parents of young children for effectiveness. Finally, it is essential to highlight that all participants in the needs assessment phase were compensated monetarily for completing surveys (\$25) and individual interviews (\$25). Figure 6.2 shows a flow chart of the program development process. In total, creating *Drink Smart* was a year and a half process: 6 months for needs assessment, 3 months for video script creation, 5 months for production and 4 months to review and edit videos.

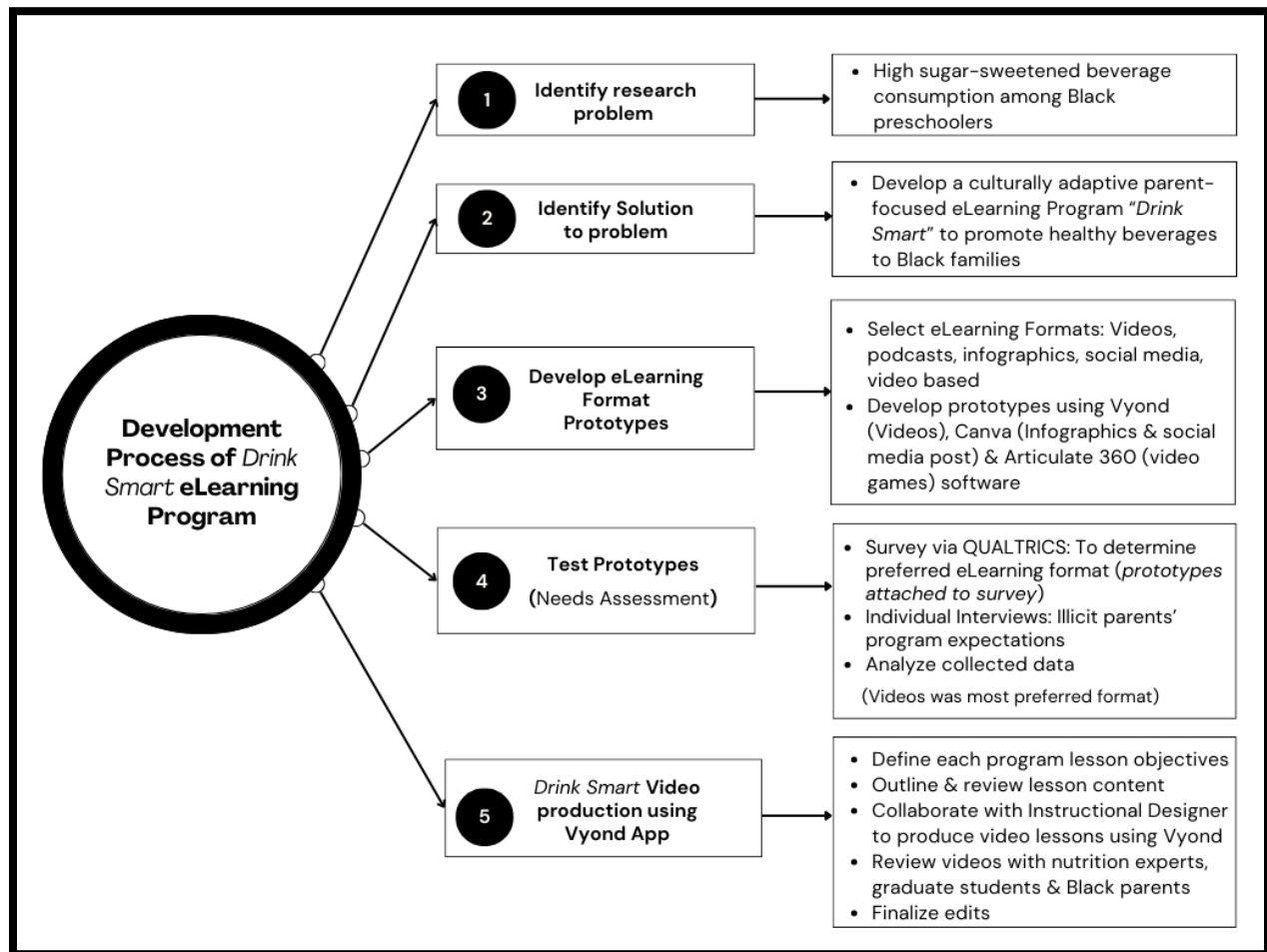


Figure 6.2: Flowchart of the development process of Drink Smart eLearning Program.

Conclusion and Study Implications

Designing and developing nutrition education programs is a challenging task that requires critical thinking, creativity, and organizational skills. Through our study, we provide lessons other developers can draw from to avoid mistakes that consumes time and money to remedy. Moreover, our study provides a blueprint beyond programs for Black communities. We also suggest the utilization of formative evaluation and needs assessment to address existing health gap in other under-represented communities

who are disproportionately affected by public health issues. Culturally appropriate, adaptive and sensitive nutrition education programs especially within federally food assistance programs like WIC and SNAP-Ed is key to promoting health and racial equity.

CHAPTER 7

CONCLUSION

Statement of Problem

The childhood obesity epidemic disproportionately affects children of color compared to White and Asian Children.¹ A significant factor fueling overweight and obesity onset among children is sugar-sweetened beverage.^{3,6} One in 4 preschoolers consume SSB weekly, with the highest rate among Black children.⁴ Moreover, Black children consume the lowest quantity of water compared to their peers.⁵ Previously, schools were primary access points of SSBs for children.^{62,63,65} However, research findings show that despite policy efforts like CACFP to enforce healthy beverages in school, home environment and parents influence what their children drink.⁶⁶ For example, research also shows a higher SSB consumption and lowest water intake rate among Black adults compared to their peers.^{4,5} The existing disparities are a wake-up call for parent-focused interventions to encourage parents and caregivers to serve healthy beverages to their children over SSB. The body of literature has shown the effectiveness of various parent-focused studies delivered traditionally face to face or via eLearning on reducing SSB consumption among preschoolers.^{15,87,88,90,92} Although the majority of these studies included a racially diverse audience, the systematic review shows an underrepresentation of Blacks in research studies, especially eHealth studies.¹⁸⁷ A possible explanation could be the lack of culturally relevant and adaptive intervention for the Black community.¹⁶⁴ For instance, researchers suggest the relevance of racial standalone interventions to address health disparities and promote health equity minority communities.^{164,172,174} This include actively engaging the community in the design and implementation of interventions that reflect their culture and provides a sense of belonging.^{172,174} Latino-centered studies using cultural elements common to participants reveal a sense of belonging and participants' willingness

to adopt healthier behavior.^{94,95} Likewise, similar observations are seen in Black-centered studies targeted for adolescents and adults showing significant positive changes in biomarkers and good study retention rate.^{177,181,184} In other studies, Black participants expressed the lack of representation in the research project design and implementation.¹⁹⁰ This evidence suggests the need for more Black-centered studies especially among preschoolers to address the childhood obesity prevalence rate and its associated risk factors. With challenges associated with traditional face to face learning, eLearning becomes an essential nutrition education tool for Black parents' parents to learn about healthy beverages for their children.^{113,115} Therefore, this study applies a mixed method approach to understand Black needs to inform the development of an eLearning program, Drink Smart for promoting healthy beverages within the same racial community.

Summary of Findings

Integral to *Drink Smart* development, was to conduct a two-phase needs assessment among black parents of preschoolers. In the first phase, focus groups explored Black parents' perceptions and barriers to serving SSBs to their young children using the SCT. Additionally, the researchers accessed resources required by Black parents to overcome SSB consumption barriers. Six focus groups were conducted among twenty-seven Black parents (100% female), with one in each childcare region of Georgia according to the childcare referral system. Prior to our study, a study in Louisiana qualitatively explored Black caregivers' intention to serve SSBs to their preschoolers using the Theory of Planned Behavior (TPB). Unlike TPB, the SCT constructs are relevant for understanding what environmental and personal factors (reciprocal determinism) interact to influence Black families of preschoolers' beverage choices in Georgia. Other constructs like observational modeling and self-efficacy provided context to questions on Black parents' confidence to model healthy beverage choices to their children, which TPB does not answer. Each SCT construct revealed themes central to understanding the SSB consumption patterns in Black families of preschoolers. A major finding in this study's phase indicated the impact of family

norms/traditions to influence how and what generations consume. Further analysis revealed the key role of an individual's food environment to inform food norms, habits and traditions. For instance, our study participants mentioned how SSB placement and price roll backs in surrounding grocery stores are barriers to limiting SSBs in the community. This was not surprising considering the documented evidence on the higher exposure to beverage targeted marketing among Black families compared to other racial groups. In fact, some parents mentioned the higher circulation of ads on SSBs over healthy options like milk and water. Parents also highlighted the power of culturally identical celebrity influencers on Black family's beverage choices. Similar findings were found in a different Black cohort study by Eaton and his team on the impact of caloric dense foods marketed by celebrities have on Black consumers. The same cohort recommended the need for the use of celebrities to counter advertise healthy food options including beverages. Other mentioned barriers included water mistrust, cost of bottled water, cheap cost of SSBs and lack of synergism in beverage message across health professionals. Further inquiry among the participants in Phase 1 of this study revealed resources required to overcome aforementioned barriers. These resources included creating awareness on the beverage recommendations for children, education on nutrition labels and healthy alternatives, hike in SSB prices, support systems, and changes in family food traditions. The quest to respond to Black parents' resources to limit SSBs consumption and access to preschoolers led to the study's 2nd Phase.

Establishing the need to create a resource to promote healthy beverages to Black families, targeted to Black preschoolers, the current study's 2nd phase evaluated the potentiality of an eLearning program to fulfil this aim. To inform the development of an effective program, a second needs assessment was conducted among Black parents using a mixed approach (survey & individual interviews) to determine eLearning preferences, prior beverage program participation, willingness to participate in the program, program expectations and motivations for participation. Five eLearning format prototypes: videos, infographics, social media, podcast and videogames were developed and tested via survey among

Black parents of young children. Survey respondents were invited to a survey question to engage in individual interviews to understand rationale behind eLearning format choice, program expectations and motivation for participation. Sixty-four Black parents (66% female) of preschoolers completed the survey. About half of the parents (48%) preferred videos over infographics (20%), social media (13%), video games (11%) and podcasts (8%) to learn about healthy beverages. The majority of the respondents (78%) had never participated in any beverage program either in-person or virtually. While 66% of the parents expressed willingness to participate in the program.

Among respondents, twenty Black parents engaged in individual interviews providing rationale for eLearning format selection. Reasons for videos preferences include its ability to make learning fun, engaging and facilitating recall. Parents also liked the conversational scene between two parents displayed in the video prototype noting that "If you're just going to put information on the screen, it's going to get boring. But then those people acting it out, it just gets the attention." Participants also expressed higher preference for short videos (< 10minutes) that are concise, straight to the point and informative. A major program expectation was representation. Parents underscored the scarcity of Black -centered health promotion programs, expressing excitement at the current program development and how it can fill existing gaps. Parents wanted representation across skin color, traditions and way of life. Beverage content topics were discussed, with parents interested to learn about sugar content of beverages and health consequences of SSB consumption. Other topics of interest include healthy alternatives including recipes they can make at home, education on reading beverage nutrition labels and appropriate beverages for young children. Parents pinpointed that embodied program contents should be concise, captivating, colorful and engaging using short quizzes and real-life conversations on issues peculiar to Black families.

To identify factors to increase program participation and retention, parents discussed motivators for participation. To begin the program, recruitment invite with clear objectives and health benefits was a major motivation for parents. Parents wanted sensitization on program benefits in addition to incentives.

To remain in the program, parents emphasized the expectation of a captivating and concise program, giving little to no room for boredom. Finally, to adopt and practice healthy behaviors from the program, parents recommended summary of key points to encourage recall, support groups for learning and accountability, autonomous motivation, recipes shared and technical assistance.

Findings from both needs assessment studies informed the development of Drink Smart. Drink Smart is a culturally adaptive eLearning program consisting of 5 short (< 5 minutes) animated lesson videos developed on Vyond software application. The sixth video features a family centered food demo on two healthy beverages alternative peculiar to the Black community. Other program parts include recipe cards and infographics on maximizing cost in accessing healthy beverages. The animated videos were created in collaboration with a graphic/ instructional account taking into account parents' feedback from the study. Each lesson was connected to a SCT construct to embody the content. Lessons titles include know your beverages teaching parents about the differences between SSBs and unsweetened drinks. The second lesson, Beverages Best for my child, provides education on the recommended beverages for children ages 0 – 5 years using the evidence-based resource from Healthy Eating Research, a national program of RWJF. The third video, Black lives matters illustrates health risk associated with SSB and excessive 100% juice consumption. In the fourth lesson, Reading Beverage Nutrition Labels, parents are taught how to identify SSBs. The fifth animated video, Yes You can, encourages parents to advocate for healthy beverages for children in symbolic Black events like cook outs and family reunions. The final video, Healthy Variety teaches parents and young children to try new healthy beverage options by making them at home together.

Our program development is an iterative process. Lessons provide the template for future program development. The foremost is to clearly flesh out each lesson objectives and content in writing before sharing with a graphic or instructional designer. There should be emphasis on the best means of communication during the development process to reduce communication gaps. Additionally, program

edits requested should be explicitly conveyed in writing, referencing edits needs using screen shots where errors were cited and providing samples for change.

Implications for Practice and Future Research Directions

This study reflects one of many ways to promote inclusivity in the design of programs for promoting positive health behaviors. It is apparent that in order to close racial health disparities, the application of a health equity lens is required. Conducting needs assessment prior to executing any intervention, extrapolates the needs of the primary audience. Needs assessment is a useful tool to identify solutions to existing problems, which was efficient in our study to address the disproportionate consumption of SSBs among Black preschoolers via their parents. Beyond identifying needs, a needs assessment prior to program development informs budget planning, prevents waste and can save time.

Findings from our study explicate the importance of representation in the design and implementation of health programs like SNAP-Ed, WIC, factoring the demographics of the intended users. For example, a beverage messaging campaign in a native American dominated location, should include pictures and characteristics unique to that location to capture the minds of the participants. This can provide a sense of belonging and intentionality to adopt advertised healthy behavior among the priority audience. Moreover, this becomes a useful strategy for promoting health and racial equity across ethnicities and races.

Furthermore, an individual's environment is an important support system for enhancing new adopted health behaviors. The enactment of policies on targeted marketing can control the frequency of adverts on beverages high on added sugars among Black consumers and neighbors. This effort should be a joint intervention across all arms of government (local, state and federal) which can lead to sustained improvement in behaviors along with health programs.

The next step for *Drink Smart* program is to conduct a pilot testing using a randomized controlled trail design to test its effectiveness of reducing SSB consumption in Black preschoolers. Findings from the pilot testing will inform larger studies and dissemination across other states in the United States.

Strengths and Limitations

One strength of this study includes the use of a mixed method (cross-sectional quantitative and qualitative) approach to obtain rich data to answer the research questions to inform the development of an eLearning beverage training. Mixed methods are useful in the design of effective culturally relevant technological interventions as no single method adequately solves a problem.¹⁹¹ Additionally, the use of a theoretical framework (Social Cognitive Theory) to guide the eLearning training development provides a basis on what questions to be asked, answered and method of data collection. Another strength of this study is the use of formative evaluation (needs assessment) to design a culturally appropriate intervention specifically for Black families. Input from Black parents provides a foundation to promote health equity to address the obesity and SSB consumption disparities in the Black community.

One limitation to the study is that the sample size does not allow for generalizability. The study may also be specific to Black parents in Georgia and may not be generalizable to other areas of the country. According to Hammarberg et al., larger sample sizes in qualitative research do not always produce greater applicability.²⁰⁵ In particular, depth of data may be sacrificed for breadth. Therefore, despite our sample size, the depth of evidence generated is transferable and meaningful to inform the development of effective interventions crucial for closing health disparity gaps and promoting health equity in under-studied populations across the nation. Secondly, parents are often overwhelmed and overstretched with caring for their children, leaving little or no room for research participation. To encourage participation, parents received incentives like colorful child-friendly drinking cups and stickers, and water bottles during recruitment. Additionally, gift cards (\$15) and lunch were provided in

focus groups (Phase 1) and Phase 2 participants received \$25 each for either or both survey completion and individual interviews (\$50 total). Additionally, self-reported perceptions and barriers may be biased and not necessarily reflect the absolute behaviors of the participants. Finally, there is the possibility of change in Black Parents' eLearning preferences over time. As technology evolves with the advent of new applications, people are more likely to lean toward the trend, leading to changes in learning choices.

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APPENDIX A: Demographic Survey (for Study AIM 1)

Head Start Center: First Name: Last Name:

1. Are you Hispanic or Latino? (Select one)

- Yes
- No

2. I identify my race as: (Check all that apply)

- White
- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- Multiple races (Please specify)
- Other (specify)

3. I identify my CHILD's race as: (Check all that apply)

- White
- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- Multiple races (Please specify)
- Other (specify)

4. Which category below includes your age?

- 17 or younger
- 18-20
- 21-29
- 30-39
- 40-49
- 50-59
- 60 or older

5. Please select your gender

- Male
- Female

- Other
 - Prefer not to say
6. **What is your zip code?.....**
7. **Please select the combined yearly income earned by all members of your household.**
- < \$20,000
 - \$20,000 - \$50,000
 - \$51,000 - \$70,000
 - \$70,000 - \$100,000
 - > \$100,000
8. **What is your marital status?**
- Married
 - Widowed
 - Divorced
 - Separated
 - Never Married
9. **What is the highest level of school you have completed OR the highest degree you have received?**
- Less than high school degree
 - High school degree or equivalent (e.g., GED)
 - Some college but no degree
 - Associate degree
 - Bachelor's degree
 - Graduate degree
10. **Please select the number of children you have between the ages of 0 and 5**
- 1
 - 2
 - 3
 - 4
 - 5
11. **Please select the ages of your child/ children**
- 0 – 12 months
 - 1
 - 2

- 3
- 4
- 5

APPENDIX B: Moderator Guide for Focus Group Interviews

Focus group to answer research question 1: Examine Black parents' perceptions, barriers and resources required to limit SSBs and increase water consumption.

Approach: Focus group

Social Cognitive Theory as Applied to Sugar-Sweetened Beverage Consumption among Black Families		
Welcome and Warm Up	<i>Hello everyone! Thank you for joining me today. My name (Moderator's Name) and I'm the moderator for today's focus group session. The purpose of this discussion is to talk about your experiences with serving sugary beverages to your family. I'll be seeking information about your opinions and your experiences. Feel free to be straightforward with your responses. I'm an evaluator and researcher at the University of Georgia. A graduate researcher, Chisom Okoli, also from the University of Georgia, will be taking notes during the focus group. We are working as a research team to explore how families make choices about the beverages they drink. There are a few ground rules that I would like to explain before we begin.</i>	
Ground Rules	1. Please turn off all mobile phones/devices. 2. This session will last about 90 minutes. 3. Before we begin please review the consent forms and complete the brief parent survey. 4. Please note that the session will be audio recorded. 5. All information in this focus group will remain confidential. The final report will keep all participant names anonymous. The audio will only be made accessible and viewed by the researchers. 6. There are no wrong or right answers; we are looking for honest responses and different points-of-view. We want to know your opinions. 7. We need everyone to talk, but each person doesn't have to answer each question. 8. Please talk one at a time and in a clear voice. Avoid side conversations because it is distracting to the group and I don't want to miss any of your comments. 9. Paper and pens have been provided for you to participate in the focus group. 10. Does anyone have any questions before we begin?	
Construct	Definition	Focus Group Questions
Reciprocal Determinism	The dynamic interaction of the person, behavior, and the environment in which the behavior (sugar-sweetened beverage consumption) is performed	<u>Personal Factors</u> To begin, Of the drinks you consume on a typical day, what's your favorite? Of the drinks your child consumes on a typical day, what's his or her favorite drink?

		Now, we would like you to take a sheet of paper and a pen. Think back to yesterday about all of the different beverages you drank. Fold the paper in half. On one side, list or draw the beverages you drank yesterday on the paper. On the other half of the paper, I would like for you to draw or list the beverages your child drank yesterday. [PASS OUT BEVERAGE HANDOUT] Now, I would like you to look at the handout in front of you. Look through the different beverages to see if there are any beverages listed on the handout that you forgot to list on your paper. On one side of the paper (labeled YOU) circle, any of the beverages YOU drink regularly. On the other side of the paper, (labeled (CHILD) circle beverages that YOUR CHILD drinks regularly. <u>Behavioral Factors</u> Now that you've had a chance to think about what you and your children drink on a typical day, I'd like to discuss how you make decisions about the different beverages (or drinks) you and your family choose to drink. [REFER TO PARTICIPANTS' LISTS AND PICTURES] How do you decide what types of beverages to serve to your family? What are some things that influence how you make decisions about what you drink? Probe 1: How much does price play a role in your decision making? (e g., drinking water with a meal to avoid cost or purchasing beverages that are cheaper) What about taste? What about health concerns? (Healthy teeth, weight gain) Probe 2: What about commercials, advertisements, social media, peers? Now, we are going to discuss drinks that have added sugar, or sugary beverages. Sugar-sweetened beverages (SSBs) are any liquids that are sweetened with various forms of added sugars like brown sugar, syrups, glucose, high-fructose corn syrup, honey, maltose, molasses, raw sugar, and sucrose. Examples of sugary beverages are sodas, flavored juice drinks such as Sunny Delight, Tampico, lemonade, fruit punch, Kool-Aid, sweet tea, coffee with sugar, or energy or sport
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		drinks, like Gatorade and flavored milk like chocolate or strawberry. This does not include 100% fruit juice without added sugar like 100% orange or apple juice. Tell me about some of the good things associated with drinking beverages with added sugar or sugar-sweetened beverages. Tell me about some of the good things associated with drinking water or other beverages without added sugar (e.g., unflavored milk). Tell me about some of the bad things associated with drinking beverages with added sugar or SSBs. Tell me about some of the bad things associated with drinking water or beverages without added sugar (e.g., unflavored milk). <u>Environmental Factors (Access & Availability)</u> National health and nutrition experts recommend drinking no more than one sugar-sweetened beverage (SSB) per day. What makes it easy for you to drink 1 or less sugar-sweetened beverage per day at home? Probe 1: In your neighborhood? Probe 2: What about at fast food places or sit-down restaurants? What makes it hard for you to drink 1 or less sugar-sweetened beverage per day at home? Probe 1: In your neighborhood? Probe 2: What about at fast food places or sit-down restaurants? What makes you buy SSBs at the grocery store?
Self-Efficacy	Confidence in one's ability to take actions and overcome barriers (e.g. limiting SSB intake)	Tell me how confident you are that you can identify sugar-sweetened beverages (e.g., soda) vs. beverages without added sugar (e.g., water)? Probe 1: What are some ways to identify SSBs? (e.g., by reading the label)

		Tell me how confident you are that YOU could consume <i>1 or less SSB</i> each day. Tell me how confident you are that your KIDS could consume <i>1 or less SSB</i> each day.
Expectations	Anticipated outcomes of a behavior (e.g., high consumption of SSBs vs. limiting SSBs)	<i>National health and nutrition experts recommend drinking no more than one sugar-sweetened beverage (SSB) per day.</i> If you and your family decided to only drink one SSB per day, tell me about: What barriers would you and your family have to overcome to make you successful? What benefits would you and your family gain? What would you and your family need to help meet this recommendation?
Observational Learning (Modeling)	Behavior acquisition that occurs by watching the actions and outcomes of others' behavior (e.g., Beverage habits passed down by family; children viewing parents drinking SSBs)	What would happen if your kids saw you drinking less SSBs? How would it change their own drinking habits?
Behavioral Capability	Knowledge and skills to perform a given behavior	Now we are going to discuss considerations when limiting the SSBs your family drinks.

	(e.g, identifying SSBs and reading labels)	What would convince you and your family that limiting SSBs would be healthy for you? Next, I would like to discuss any recommendations you might have for getting parents involved in promoting healthy beverages to their children. What could someone say to you or to other parents like you that would convince you to give kids fewer sugary beverages and more water? For example, imagine if you saw a text message, or ads, a billboard to help families like yours meet the recommendation of drinking one or less SSBs each day: Should the messages focus on the bad health effects of drinking SSBs like diabetes or weight gain OR should they focus on the positive effects of drinking water, milk, and other beverages without added sugar, for example weight loss and healthy teeth. Why? What do you think about messages or ads that compare the amount of sugar in SSBs to the sugar in candy (e.g., comparing a Capri Sun to a Snickers bar)? In what ways would that make families like yours less likely to serve SSBs to their children?
Reinforcements	Responses to person's behavior that increase or decrease the likelihood of reoccurrence. (e.g., feeling and looking better as a result of limiting SSBs vs. not feeling good after limiting SSBs)	<i>Families use different resources such as websites, doctors' advice, and handouts to assist with limiting their children's SSB consumption. I'd like to ask you about any resources you might use to help limit your child's SSB intake.</i> What information about limiting SSBs have you found helpful? And where do you get your information?
Additional question (not related to SCT construct)		

Messaging		If you have encountered any messages or advertisements about drinking less SSBs in the past, what did you think about them? Probe 1: Tell me about what the messages said. Probe 2: What impact did the messages/ads have on your family's SSB consumption? What type of advertising do your children typically respond to in a positive manner? (Using characters from books, TV, movies; having a spokesperson?) What type of advertising do you respond to in a positive manner?
Closing		What else would be helpful for us to know? What additional questions or comments do you have?

APPENDIX C: Self-Administered Survey (for study AIM 2)

Survey to answer research question 2: Explore Black parents' eLearning prototype preferences and willingness to participate in online learning

ReCAPTCHA tab will appear for parent to approve before proceeding

INSTRUCTIONS: Please answer the following questions

Attach consent form in Qualtrics (Use consent form in approved IRB application)

Name (*Please provide First & Last Name*):

Email Address:

Phone Number:.....

What county in Georgia State Do you Reside in? (Open text).....

1) Are you Hispanic or Latino?

a) Yes

b) No

2) How would you best describe yourself? (*if ‘Black or African American’ is not chosen, the survey ends*)

a) White

b) Black or African American

c) American Indian or Alaska Native

d) Asian

e) Native Hawaiian or Pacific Islander

f) Other (*Please specify in the box below*)

3) If Black is chosen:

a) African American

b) Barbadian

c) Caribbean

d) Ethiopian

e) Ghanaian

f) Haitian

g) Jamaican

h) Liberian

i) Nigerian

- j) Somali
- k) Others (Specify)

4) How many children aged 0 – 5 years live in your household? (*if “none” is chosen, the survey ends*)

- a) 1
- b) 2
- c) 3
- d) 4
- e) More than 4
- f) None

5) What are your Kids Ages?

6) How would you best describe your child? (*Can choose more than one option*)

- a) White
- b) Black or African American
- c) American Indian or Alaska Native
- d) Asian
- e) Native Hawaiian or Pacific Islander
- f) Other

7) What is your age?

- a) Under 18
- b) 18 – 29
- c) 30 – 39
- d) 40 – 49
- e) 50 – 59
- f) 60 or older

8) What is your sex?

- a) Male
- b) Female

- c) Non-binary/ third gender
- d) Prefer not to say

9) What is your marital status?

- a) Married
- b) Widowed
- c) Divorced
- d) Separated
- e) Never Married

10) What is your household income level?

- a) < \$20,000
- b) \$20,000 - \$50,000
- c) \$51,000 - \$70,000
- d) > \$70,000

11) What is the total number of persons in your household?

12) What is the highest level of school you have completed OR the highest degree you have received?

- a) Less than high school degree
- b) High school degree or equivalent (e.g., GED)
- c) Some college but no degree
- d) Associate degree
- e) Bachelor's degree
- f) Graduate degree

13) Have you or anyone in your household participated in any of the following programs in the last year (Choose all that apply)?

- a) SNAP (formerly food stamps)
- b) WIC
- c) Food pantry
- d) Did not participate in any of these programs

14) Where do you use to access the Internet?

- a) Home
- b) Public Wi-Fi (stores, restaurants)
- c) Library
- d) Work

15) What device(s) do you use MOST times to access the Internet? (choose all that apply)

- a) Laptop
- b) Tablet
- c) Smartphone
- d) Desktop Computer
- e) E-Reader (Kindle etc.)

18) Which social media sites do you use the most?

- a) Facebook
- b) Pinterest
- c) Instagram
- d) Twitter
- e) Other (Please mention) (Open text field)
- f) I do not use social media

19) Which format for an online training program interests you the most? (Select 1) (Prototypes of each format were shown)

- a) Video-based: static text reinforced by videos that are instructional
- b) Social media based: training accessed through Facebook, Twitter, and/or Instagram
- c) Podcast: digital audio file available on the Internet
- d) Infographics: Static text with pictures
- e) Interactive video game: A lesson skit followed by a game activity
- f) Other (_____)

16) Have you ever participated in a beverage program to learn about beverages for your kids?

- a) Yes
- b) No

17) If yes to the above question, how?

- a) In-person
- b) Virtually (online)
- c) Both

18) Are you willing to participate in a free online program to learn about beverage recommendations for your young children?

- a) Yes
- b) No

20) If you choose NO, please explain why? (Open text)

21) If you choose MAYBE, please explain why? (Open text)

22) We are conducting an interview via Zoom to further understand parents' preferences and expectations in developing an eLearning beverage program. Would you be interested in participating? (There is \$25 gift card for participation)

- a) YES
- b) NO

23) If YES, what day and time of week works best for the interview discussion? (*Open text field*)

APPENDIX D Moderator Guide for Individual Interviews

Individual interviews to answer research question 2: Explore Black parents' expectations and motivations for participation in an eLearning beverage program

Approach: Individual interviews

Welcome and Warm up	Hello everyone! Thank you for joining me today. My name is Chisom Okoli and I'm the moderator for today's focus group session. The purpose of discussion is to talk about your expectations and recommendations to inform the development of an eLearning (online) beverage program for Black families. The aim of the developed training is to improve healthy beverage (water, plain milk) among Black parents and their young children. I'm a researcher and PhD student at the University of Georgia (UGA) I will also be taking notes during our conversation to capture important points. Before we begin, there are few ground rules that I would like to explain.
Ground rules	1. Please turn off all mobile phones/ devices 2. This session will last about 45 minutes 3. Before we begin, please review the consent forms 4. Please note that the session will be audio recorded 5. All information in this focus group will remain confidential. The final report will keep all participant names anonymous. The audio will only be made accessible and viewed by the researchers. 6. There are no wrong or right answers; we want to know your opinions. 7. We need everyone to talk but each person doesn't have to answer each question 8. Please talk one at a time and in a clear voice. Avoid side conversations because it is distracting to the group, and I don't want to miss any of your comments. 9. Does anyone have any questions before we begin?
Questions	
1	It seems like almost everything can be done these days via the internet, tell me about your use of the internet? Prompt: "where do you spend most time on the internet" i.e., electronic devices?
2	If you were to learn about beverages online, which device would you prefer to use?

3	In the survey you filled, ... was the most preferred format to launch the online beverage program. Tell me why you preferred this format? Note: Play the format to remind participants of what they saw in the survey What would you change?
5	What might you expect an online class on beverages to include? Prompt: a. Pictures b. Language c. Music
6	What do you hope to learn about in an online program on beverages?
7	How much time are you willing to spend on training to learn about beverages for your kids? For example, “Duration of training’ How much would you be willing to read? What is your preferred learning style? A training broken into different short lessons covering modules/ topics or one long training of all modules taken at once? “Provide reason for answer” Suggested time duration of short modules?
8	Questions on Motivation: Assuming you saw a link directing you to a training course to learn about beverages, what will motivate you to start the training? Describe factors that will motivate you to finish the beverage training. What will inspire you to practice the things you learned from online beverage training for you and your children and make changes if any?
9 (Closing)	What else would be helpful for us to know? What additional questions or comments do you have?

APPENDIX E: Drink Smart eLearning Program Curriculum

Target audience: Black parents of young children aged 0 – 5 years

Topic: Drink Smart eLearning Program

Theory: The curriculum development is grounded on Social Cognitive Theory

Goal: Improve healthy beverage consumption and reduce sugar-sweetened beverage intake among Black families of young children aged 0 – 5years.

Lesson Title	Fink's Taxonomy Application	Learning Objectives	Subject matter covered	Link to SCT construct	Link to Research Findings
Know Your Beverages (Lesson 1)	Foundational Knowledge: Understand the differences between sugar-sweetened beverages (SSBs) & non-SSBs	Understand the differences between sugar-sweetened beverages (SSBs) & non-SSBs Understand the nutrient profile of several SSBs & Non-SSBs	Define SSBs: List common added sugars in SSBs. Define non-SSBs: including non-SSBs with non-nutritive sweeteners. Show the added sugar content of various SSBs (remember juice drinks) & non-SSBs	Reciprocal determinism: The ability to recognize common beverages sold and available in a person's environment	In phase 1 of our study, we discovered an existing confusion of the description of SSBs among Black Parents. For example a parent asked "I have a question, so when it says artificial vs. sugar added, what's the difference?" Such questions indicate challenges with SSB identification, which could influence parent self-efficacy to make healthy

					beverage choices.
Beverages Best for My Child (Lesson 2)	Foundational Knowledge: Learn about the consensus beverage recommendations for young children aged 0 – 5 years	Understand beverage recommendations for young children 0 to 5 years of age.	Beverage recommendations for children ages 0 – 5 years and adults. Source: http://healthydrinkshealthykids.org Explain how much water, 100% juice a child should be drinking daily Dairy (milk) alternatives	Behavioral Capability: Black parents receive valuable resources to inform healthy choices for their children	We discovered an unawareness of beverage recommendations for young children among our participants. Additionally, Black parents demanded for content that will help them know what to feed their children in the 2 nd phase.
Black Health Matters (Lesson 3)	Foundational Knowledge: Understand the consequences of SSBs and non-SSBs consumption	Understand the health consequences of SSBs consumption. Understand the health benefits of non-SSBs (water & plain milk) consumption Understand the health consequences of excessive intake of 100% juice	List the consequences of excessive SSBs & 100% juice consumption: - Diabetes, overweight, Tooth cavities/ tooth decay, increased medical bills, financial debt. Outline annual cost of diabetes management for a Black person.	Outcome Expectations: Parents are informed of health issues associated with SSB & non-SSB intake	In phase 2 of our study, Black parents requested for a lesson content outlining the risk associated with SSBs intake. We retrieved this request from Chapter 5 of this document under beverage content topics embedded in qualitative findings.

			List benefits of water & plain milk consumption: hydration, strong bones, agility, healthy weight Discuss consequences of water dehydration		
Reading Beverage Nutrition Labels (Lesson 4)	Learning how to Learn: Identify, read & interpret nutrition labels of beverages	Understand the relevance of reading nutrition labels to inform beverage choices Learn how to read a beverage nutrition label	Explain the importance of reading beverage nutrition labels: - (to know how much added sugar is consumed) Teach participants how to read a beverage nutrition label (Added sugar quantity and ingredients lists) Short quiz to test participant's understanding of beverage nutrition labels	Self-Efficacy: Increased confidence among Black parents to read a beverage nutrition label to inform healthy options	Black parents wanted to know the sugar content of common beverages they consume. Additionally, they voiced the need to be equipped to identify SSBs. Hence, informing this program lesson.

Yes, You Can! (Lesson 5)	Caring: Be more interested in beverages served and consumed at home, eat-outs and cook-outs	Understand parents' role as CHANGE AGENTS to influence healthy beverage consumption in families and communities	Short clip on a community leader advocating for healthy beverage options for kids at a cook-out planning meeting Showcase scenarios for advocating for healthy options (Dinner time, potlucks, restaurants, churches)	Observational Modelling: Parents' selection and consumption of healthy beverages will encourage children to do so	During the course of this study, we observed how community leaders impacted their member's reception information including nutrition education. Similar to "train the trainer" framework, we saw a need to encourage Black parents to be change agents in various community spaces.
Healthy Variety (Recipes & Food Demo)	Human Dimensions: Decide to increase healthy beverages provision and consumption	Learn and acquire skills needed to create pocket-friendly healthy drinks for the family	Showcase via food demo 2 healthy drinks recipes (Smoothie & Flavored water) Remind viewers they can create their own recipes using fruits and vegetables in season Design recipe cards of 4 healthy beverage drinks	Self-Efficacy: Increased confidence to prepare healthy options for children at home Observational modelling: Children learn the that healthy living should be family-centered	Both phases of our study discovered Black parent's need for healthy alternatives that is tasty, nutritious but matches the sweetness intensity of SSBs. More importantly, parents were not ready to embrace plain water as a major fluid source. Reason being

					that they consider plain water bland & tasteless.
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APPENDIX F: Recruitment Fliers for Phase 1 & 2 of the Study

WE WANT TO KNOW WHAT YOU THINK!



The UGA Department of Foods and Nutrition Childhood Obesity Prevention Lab is seeking the help of parents of children aged 0-5 who are enrolled in a Head Start program in Georgia to participate in a focus group discussion about beverage consumption and preferences for parents and their children.



This is part of a research study. A meal and \$15 Walmart gift card will be provided. The focus group will be held at your child's Head Start location and will last 90 minutes.

THE DETAILS:



Complete a 2 minute survey.



If selected, you will receive a \$15 gift card for sharing your thoughts and opinions with us!

FOR MORE INFORMATION AND TO DETERMINE IF YOU ARE ELIGIBLE:

Text Us: (833) 222-2261

Email: childobesityprevFDNS@uga.edu

THE UGA CHILDHOOD OBESITY PREVENTION LAB INVITES:

BLACK PARENTS WITH YOUNG CHILDREN (AGES 0 - 5 YEARS)

to participate in a research study to understand parent's preferences for eLearning to inform the development of an online beverage training to promote healthy beverage consumption in families

Survey completion time: 7 minutes

Research eligibility criteria: 1) Identify as Black or African-American 2) Have a child ages 0 - 5 years 3) Be 18 years of age & older 4) Participating in a Federal funded program (Head Start, WIC, SNAP, Pre-K, Medicaid) 5) Have a smartphone or computer 6) Have internet access 7) Reside in Georgia

Scan QR code to take survey

Receive \$25 e-gift card for participation

For more information email us at:
choplab@uga.edu
Principal investigator: Dr. Caree Cotwright

APPENDIX G

CONSENT FORM FOR RESEARCH

CONSENT FORM

Development of a parent-focused eLearning training to improve healthy beverage consumption among Black families of young children

Researcher's Statement

We are inviting you to take part in a research study. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. This will help you decide whether to be in the study or not. Please take the time to read the following information carefully. Ask the researcher if there is anything that is not clear or if you need more information. When all your questions have been answered, you can decide if you want to be in the study or not. This process is called “informed consent.” A copy of this form will be emailed to you.

Principal Investigator: Caree J. Cotwright, PhD, RDN

Associate Professor

Department of Foods and Nutrition

University of Georgia

cjcot@uga.edu OR childobesityprevfdns@uga.edu

Key Information about of the Study

- Beverages is an integral part of nutrition in early children (ages 0 – 5). Over-consumption of Sugar-Sweetened Beverages (SSBs) can lead to childhood obesity and other health issues in adulthood. The home setting is an invaluable place for early obesity prevention and cultivation of healthy beverage habits especially among children.
- The purpose of this study is to survey parents on their eLearning program preferences, needs, and expectations to inform the development of an eLearning beverage training for Black families. You are being asked to participate because of your role as a parent or caregiver. Participants for this study must identify as Black or African American, be a

parent or caregiver with 1 or more children enrolled in a Head Start center, possess an active smartphone, and have internet access.

- We hope to recruit 60 Black parents to participate in our study.

Study Procedures

If you agree to participate, you will be asked to:

- Complete a survey (10 minutes).
- Complete a survey to assess beverage consumption (parents and child), eLearning preferences, motivation to start and finish training
- Provide a valid email address and phone number during the survey. Email addresses only may be provided to our business office for the purpose of sending e-gift cards as incentives for study participation. Email addresses and phone numbers will not otherwise be shared with outside parties.
- As a part of the study, you may be invited to participate in an individual interview about needs, expectations, and motivations to participate in the eLearning beverage training. The individual interviews will occur via Zoom and will be recorded for transcription purposes. The interview would last between 45-60 minutes.

Risks and discomforts

- We do not anticipate any risks from participating in this research.

Benefits

- By participating in this research, we expect that you will likely gain beverage nutrition knowledge, and self-efficacy to serve appropriate beverages to children 0-5 years old.

Incentives for participation

- Incentives for survey participation will include one \$25 e-gift card for survey completion
- Incentives for individual interview participation will include one \$25 e-gift card (totaling \$50).

Privacy/Confidentiality

Data collected from participants will be confidential. Any information that identifies them directly (e.g., name) will be coded for data collection. Data collected with personal identifiers will only be used to send incentives for participation. This research study involves the transmission of data over the Internet.

Every reasonable effort has been taken to ensure the effective use of available technology; however, confidentiality during online communication cannot be guaranteed. All data will be transferred later into a secure computer database in the Childhood Obesity Prevention Research Lab of the Department of Foods and Nutrition. Computer files and will be password protected with access to only the key research team. If you are part of an interview for the study, the investigator will emphasize to all participants that comments made during the interview session should be kept confidential. It is possible, however, that participants may repeat comments about beverage consumption and recommendation outside of the group at some time in the future. All interview data will be reported without identifiable names in research reports and a Head Start brief report. All data will be stored for three years after the study completion and all data collection. The data will be destroyed one year after completion of the project and will not be used for future studies. The researchers will not release identifiable information to anyone other than the participants without written consent unless otherwise required.

Taking part is voluntary

Your involvement in the study is voluntary, and you may choose not to participate or to stop at any time without penalty or loss of benefits to which you are otherwise entitled. When you are responding to survey questions, please feel free to skip any questions that you do not wish to answer. Your decision of whether to participate in the research or not will have no effect on your relationship with Easter Seals of North Georgia.

If you have questions

The main researcher conducting this study is *Dr. Caree J. Cotwright*, a *professor* at the University of Georgia. Please ask any questions you have. If you have questions later, you may contact *Dr. Caree J. Cotwright* or at choplabor@uga.edu. If you have any questions or concerns regarding your rights as a research participant in this study, you may contact the Institutional Review Board (IRB) Chairperson at 706.542.3199 or irb@uga.edu.

To voluntarily agree to take part in this study, you may type your initials in the box below. Your initials below indicate that you have read or had someone read to you this entire consent form and have had all of your questions answered.

Sincerely,

Caree J. Cotwright

APPENDIX H: Healthy Beverage Recipe Cards

CUCULEMON WATER

Ingredients

- ½ Cucumber, sliced
- 5 Mint leaves
- 1 Lemon (optional), sliced
- 2 Quart plain water (32 fl. oz)

Directions

1. Wash all produce.
2. Collect, slice into thin pieces, and measure all ingredients before starting to prepare the recipe. For the leaves, tear it into tiny bits.
3. Add all ingredients plus enough cold water to a fill a 2-quart pitcher.
4. Chill overnight in the refrigerator for the most flavor, and store in the refrigerator until ready to drink. The fruit will stay fresh in the water for up to 48 hours after being prepared.
5. After you drink the water, you can eat the fruit or blend it into a smoothie!

Note: Substitute with other fruit choices/ options like orange, blueberries, strawberries or water melon

Preparation time: 10 minutes

Servings: 8

Serving size: 1 cup



Health benefit:
Water hydrates & refreshes the skin from toxins.

8 servings per container	
Serving size 1 cup	
Amount per serving	% Daily Value*
Calories 5	
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	0%
Cholesterol 0mg	0%
Sodium 10mg	0%
Total Carbohydrate 1g	0%
Dietary Fiber 0g	0%
Total Sugars 0g	0%
Includes 0g Added Sugars	0%
Protein 0g	
Vitamin D 0mcg	0%
Calcium 0mg	0%
Iron 0mg	0%
Potassium 10mg	0%

*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Source: MyPlate, U.S. Department of Agriculture (USDA)
<https://www.myplate.gov/recipes/supplemental-nutrition-assistance-program-snap/refreshing-water>. Adapted from: Colorado State University Extension. Eating Smart, Being Active

BAMANGO SMOOTHIE

INGREDIENTS

- 2 cups milk (low-fat 1%)
- 1 mango, pitted (or 4 Tbsp frozen mango juice)
- 1 banana
- 1 Cup baby spinach (fresh, washed)
- 2 ice cubes (Optional)

DIRECTIONS

1. Wash hands with soap and water.
2. Put all ingredients into a blender.
3. Blend until smooth and foamy.
4. Serve immediately.

NUTRITION BENEFITS

- Calcium in milk supports bone health
- Mango is rich in beta carotene for strong immunity
- Banana is rich in potassium, offering benefits to the nerves and muscle.

Preparation time: 10 minutes

Servings: 4

Serving size: 3/4cup



4 servings per container	
Serving size 3/4 cup	
Amount per serving	% Daily Value*
Calories 100	
Total Fat 1g	1%
Saturated Fat 0.5g	3%
Trans Fat 0g	0%
Cholesterol 5mg	2%
Sodium 55mg	2%
Total Carbohydrate 18g	7%
Dietary Fiber 1g	4%
Total Sugars 14g	0%
Includes 0g Added Sugars	0%
Protein 4g	
Vitamin D 0mcg	0%
Calcium 135mg	10%
Iron 0mg	0%
Potassium 240mg	6%

*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Source: MyPlate, U.S. Department of Agriculture (USDA)
<https://www.myplate.gov/recipes/supplemental-nutrition-assistance-program-snap/mango-shake>

Nutrition Benefits:
100% juice contains Vitamin C and antioxidants for immunity boost

JUICE SLUSH



Preparation time: 10 minutes Servings: 6 Serving Size: 1 Cup

Ingredients:

- 12 ounces 100% fruit juice concentrate
- 12 fluid ounces (fl. oz) water
- 3 cups ice

Directions:

1. In a blender, place juice concentrate, water, and half of ice.
2. To prevent spillage, do not pass the top line of the blender.
3. Blend while gradually adding remaining ice.

Serve.

*Use any flavor juice concentrate.
If slush is too thick, add more water.*

Source: MyPlate, U.S. Department of Agriculture (USDA):
<https://www.myplate.gov/recipes/supplemental-nutrition-assistance-program-snap/fruit-juice-slush>



Nutrition Facts

6 servings per container	
Serving size	1 cup (232g)
Amount per serving	120
Calories	% Daily Value*
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 25mg	1%
Total Carbohydrate 31g	11%
Dietary Fiber 0g	0%
Total Sugars 29g	
Includes 0g Added Sugars	0%
Protein 0g	
Vitamin D 0mcg	0%
Calcium 5mg	0%
Iron 0mg	0%
Potassium 1mg	0%

*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Liz's Sparkling New Year Cider

Nutrition Benefits: 100% Apple juice contains vitamin C for immunity boost. Herbs contain antioxidants to support body cell function.



Servings: 6

Prepping Time: 15 min

Serving Size: 1 cup

Ingredients

- 2 cups 100% apple juice
- 1/2 tsp star anise, ground
- 2 whole cloves
- 1/4 tsp cinnamon, ground
- 1/4 tsp nutmeg, ground
- 4 cups sparkling water (unsweetened)

Directions

- Combine the first five ingredients in a pot and cook over medium-high heat for about 5 minutes, stirring the liquid intermittently.
- Place a strainer over a large glass, bowl, or pitcher. Carefully pour the liquid into the container. Discard the star anise and cloves.
- Place the container in the refrigerator to cool for about 30 minutes.
- Once the apple juice mixture is cool, combine it with the sparkling water and serve.

Nutrition Facts

6 servings per container	
Serving size	1 cup (276g)
Amount per serving	330
Calories	% Daily Value*
Total Fat 31g	40%
Saturated Fat 13g	66%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 40mg	2%
Total Carbohydrate 11g	4%
Dietary Fiber 0g	0%
Total Sugars 8g	
Includes 0g Added Sugars	0%
Protein 0g	
Vitamin D 0mcg	0%
Calcium 24mg	2%
Iron 0mg	0%
Potassium 90mg	2%

*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

SUNRISE SMOOTHIE



Preparation time: 10 minutes Servings: 3 Serving size: 1/2 cup

Ingredients:

- 1 big ripe mango, peeled & diced
- 1 small orange, sliced & seeded
- 1 banana, sliced
- 1/3 C low-fat milk OR plain yogurt
- 1 tsp fresh ginger, peeled (optional)
- 2 dates (to sweeten), optional

Directions:

1. Combine all the ingredients in a food blender or processor.
2. Blend for 2 minutes until smooth, thick and creamy
3. Serve chilled

Nutrition Benefits:

- Fruits are rich in fiber to help with bowel movement
- Bananas are rich in potassium to support the nerves and muscle
- Oranges and mangoes are rich in Vitamin C and antioxidants that boost our immunity against sickness.



Enjoy!

Nutrition Facts

3 servings per container

Serving size 1/2 cup (125g)

	Per Serving	Per Container
Calories	180	540
Total Fat	1g	3g
Saturated Fat	0g	0g
Trans Fat	0g	0g
Cholesterol	0mg	0mg
Sodium	15mg	45mg
Total Carb.	45g	135g
Dietary Fiber	5g	15g
Total Sugars	30g	90g
Incl. Added Sugars	0g	0g
Protein	2g	6g
Vitamin D	0.2mcg	0.6mcg
Calcium	80mg	240mg
Iron	0.5mg	1.5mg
Potassium	200mg	600mg

% Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

INGREDIENTS: MANGOES, ORANGES, BANANAS, SKIM / LOW-FAT MILK, DATES, GINGER

Notes:

- a) Substitute fresh mango for 1 C frozen Mango
- b) Substitute orange with mandarin or clementines

Source: Childhood Obesity Prevention (CHOP) Laboratory, University of Georgia (UGA) Athens



Watermelon Slush



Nutrition Facts

4 servings per container

Serving size 1/4 cup (63g)

Amount Per Serving

Calories 90

% Daily Value*

Total Fat 0.5g

Saturated Fat 0g

Trans Fat 0g

Cholesterol 0mg

Sodium 5mg

Total Carbohydrate 23g

Dietary Fiber 3g

Total Sugars 15g

Includes 0g Added Sugars

Protein 2g

Vitamin D 0mcg

Calcium 50mg

Iron 0.6mg

Potassium 420mg

Vitamin C 95mg

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

INGREDIENTS: WATER, WATERMELON, KIWI, LIME JUICE

BENEFITS

1. Fruits are rich in vitamin C and antioxidants to boost the immune system
2. The fiber in fruits help with bowel movement

Preparation time: 15 minutes

Servings: 4

Serving size: 1/4 cup



Ingredients:

- 3 cups cantaloupe or watermelon (Seeded, peeled & coarsely chopped)
- 2 cups kiwi (coarsely chopped, optional)
- 2 tablespoons lime juice
- 2 cups water
- Ice

Directions:

1. Wash hands with soap and water.
2. In a blender, puree fruit with lime juice until smooth.
3. Combine fruit mixture and water in a large pitcher.
4. If desired, pour through a strainer to eliminate pulp.
5. Cover and refrigerate for up to a week.
6. To serve, stir well and pour into tall glasses or cups.

Enjoy!

Source: MyPlate, U.S. Department of Agriculture (USDA):
<https://www.myplate.gov/recipes/supplemental-nutrition-assistance-program-snap/fruit-slush>
 Modified by Chisom Okoli (Childhood Obesity Prevention (CHOP) Laboratory, University of Georgia (UGA) Athens)