

University of Nevada, Reno

**Advancing Knowledge toward the Development of an
Effective Healthy Beverage Lesson Plan
for School-Age Children**

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in
Nutrition

by
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Abstract

The purpose of this thesis study was to conduct formative research that would ultimately lead to an effective healthy beverage lesson plan for children ages 6-9. Education professionals in the Sparks-Reno area who expressed interest in using a healthy beverage lesson plan served as research participants. This study was conducted in two phases. In Phase I, characteristics of effective lesson plans were explored with study participants (n=9). Semi-structured interviews were conducted with community and school-based education professionals for this purpose. In general, interview questions pertained to the preferred content and organization of lesson plans. Interviews were audio-recorded and later transcribed verbatim. The resulting qualitative data were then sorted into categories and analyzed by two independent coders. Interrater coding agreement was 84%. Findings from this phase of the study indicated that participants perceived that learning activities that went beyond students listening were important in keeping children ages 6-9 engaged. They described a number of nutrition related activities; some of which involved food and beverage ingredients. Other characteristics of effective lessons included colorful visual aids and those with pictures of children opposed to drawings. Participants also mentioned the importance of reviewing the content of the lesson with students. Other findings revealed generally positive opinions of demonstrations, games, and stories as instructional methods. In Phase II, the sample of professionals from the first phase were asked to review the Rethink Your Drink Healthy Beverage Lesson Plan and to complete a survey regarding their opinions of the lesson plan. The survey was administered online using Qualtrics. Results indicated that participants (n=8) had positive opinions of the instructional design of the lesson plan,

agreed that it was relevant and appropriate for the intended audience, and found it generally complete and appropriately organized. Finally, participants all reported that they would both use the healthy beverage lesson plan and recommend it to their colleagues. This study gathered valuable information regarding the preferred content and organization of effective lesson plans among educators. Additionally, the results informed the development of a lesson plan that was later viewed positively among the same sample of professionals. The findings of this study are not generalizable to other educators. In addition, it would be of benefit to evaluate the effectiveness of the lesson plan in achieving the stated objectives among a diverse sample of children ages 6-9. In conclusion, this formative research study provided new information that was used to develop a lesson plan on healthy beverages for young, school-age children.

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Chapter 1

Introduction to Thesis

This thesis includes an introduction and overview of the study (Chapter 1), a review of literature pertaining to the research topic (Chapter 2), and the purpose, aims, and methods employed for each phase of this study (Chapter 3). Immediately following in Chapter 4 are the study findings. Finally, Chapter 5 includes a discussion on the findings, including the strengths and limitations of this thesis study, the implications and conclusion.

In Chapter 1, research regarding the trends in sugar-sweetened beverage (SSB) consumption, related health consequences, and interventions to modify this behavior are characterized. Next, the context of this study is described. Lastly, the purpose and aims are articulated followed by a brief description of methods employed.

Statement of the Problem

Research indicates that after a steady increase in consumption of SSBs in previous years, consumption has leveled off among children and adults in the U.S.^{1,2,3} Findings from studies using nationally representative data indicate that children and adolescents are consuming less soda, less fruit juices with added sugar, and less fruit-flavored drinks.^{4,5} In addition, a study by Koma et al. found that SSB consumption has declined in children participating in the Supplemental Nutrition Assistance Program (SNAP).⁶ Despite decreasing trends in the consumption of SSBs among children, it remains a problem. In the years 2011-2014, it was estimated that 66% of youth consumed at least one sugary beverage per day.⁷ In addition, it is estimated that children are consuming 17% of their total daily calories from added sugars, and nearly half of those

calories are from SSBs alone.⁸ Considering the 2015-2020 Dietary Guidelines for Americans that recommend limiting added sugars to less than 10% of total calories consumed, it is evident that children are consuming an excess of SSBs.⁹

There are differences in SSB consumption by ethnicity, gender, and age.^{7,8} In a study using nationally representative data, it was observed that White, Black and Hispanic boys had a higher average calorie intake of SSBs compared to Asian boys. Among girls, non-Hispanic blacks had the highest average calorie intake from SSBs. A higher percentage of boys consumed at least one SSB per day compared to girls across all age groups.⁷ In addition to differences in SSB consumption by ethnicity and gender, there is evidence of differences in consumption by age. A study by Rosinger et al. indicated that children ages 2-5 consumed the least amount of calories from SSBs across all age groups, and children ages 12-19 consumed the most amount of calories from SSBs across age groups from the year 2011-2014.⁷

Several harmful health consequences are associated with the consumption of SSBs including obesity and overweight, and type II diabetes. According to a study by Dubois et al., consuming SSBs between meals more than doubles a child's odds of being overweight.¹¹ Obesity, in turn, increases the risk for type II diabetes and other negative health outcomes.¹² Moreover, childhood obesity increases the risk of becoming obese in adulthood. In addition to obesity and its related comorbidities, tooth decay has been associated with SSB consumption.^{13,14}

As a result of SSB consumption patterns among children and the associated health consequences, there are numerous efforts to reduce SSB intake. These efforts include public policy initiatives, public health approaches such as social marketing, as well as

education. Policies to reduce SSB consumption include taxation and school-wellness policies. While taxation affects those with purchasing power (i.e. parent/guardian of children) to a greater degree, studies suggest the implementation of school-wellness policies have a direct positive impact on child health outcomes.^{15,16,17} Another effort to reduce SSB intake is social marketing. Social marketing uses marketing principles and techniques on multiple platforms to improve the welfare of people and the environment in which they live.¹⁸ Several social marketing campaigns involving SSBs have elicited positive change in the communities they reach, including *Rethink Your Drink Nevada*, which is described in greater detail below.^{19,20} Finally, the beneficial role of education in health promotion has been well documented in the literature. For example, Davis et al. examined the impact of a curriculum where educational strategies were used to address motivational mediators of outcome expectations, goal intentions, and self-efficacy. The goal was to increase personal motivation in participants, thus decrease obesity-risk behaviors, including consumption of SSBs, and packaged and processed snacks. Findings indicated that those exposed to the curriculum significantly reduced their intake of added sugars, including SSBs.²¹

The employment of education, social marketing, and policy, system and environmental approaches have been encouraged by Food and Nutrition Service for use among agencies funded through the Supplemental Nutrition Assistance Education Program, otherwise known as SNAP-ED.²² To help ensure the effectiveness of nutrition education efforts, including those implemented as a part of SNAP-ED, it is important that materials are developed using a systematic approach. Nutrition education, as defined by Contento, is a combination of educational strategies, accompanied by environmental

supports and policy, designed to facilitate the adoption and maintenance of behaviors conducive to health.¹⁸ Furthermore, she writes nutrition education consists of a set of learning activities that are systematically designed with a purpose in mind.¹⁸

Context

This thesis study is one component of the *Rethink Your Drink Nevada* (RYD) campaign, a larger effort to promote healthy beverages and reduce SSB intake among children and adults residing in low-income households. The goal of this study was to obtain new information that would lead to an effective healthy beverage lesson plan that would reduce the intake of SSBs among young, school-aged children.

Rethink Your Drink Nevada is led by Dr. Jamie Benedict from the Department of Nutrition at the University of Nevada, Reno. The current primary target audience is parents/guardians of children ages 6-12 living in participating SNAP households in northern Nevada. A secondary audience includes medical and dental professionals who treat children from low-income households. The goal of RYD is to promote healthful drink choices, and to reduce SSB consumption by enhancing parent/guardians' knowledge and skill related to healthful beverage selection for children. Efforts include a multi-media campaign with outdoor and newspaper advertising, pamphlets sent by mail to select households, point-of-purchase displays and events, social media platforms including Facebook and Instagram, and the provision of education materials to medical and dental offices.^{19,20}

Developed using the social ecological model as well as social marketing approaches, RYD targets individual knowledge and skills, in addition to implementing

policy, systems and environmental approaches. The intervention settings include home, school, communities, and grocery stores, as well as medical and dental care offices.

Recently, those familiar with RYD have expressed a need for educational materials that are directed at young children, specifically a need for a lesson plan.

Purpose and Methods

The purpose of this study was to conduct formative research that would ultimately lead to an effective healthy beverage lesson plan as one component of the RYD program. To obtain this information, education professionals were interviewed and surveyed in Phases I and II respectively. The findings of the first phase (Phase I) were used to inform the methods of the second phase (Phase II).

The purpose of Phase I was to explore the characteristics of effective lesson plans. The purpose of Phase II was to obtain educators' opinions of the RYD Healthy Beverage Lesson Plan. The following questions guided Phase II of this study:

- a) To what extent do education professionals find the healthy beverage lesson plan to reflect sound instructional design?
- b) To what extent do education professionals find the healthy beverage lesson plan to be relevant and appropriate for children ages 6-9?
- c) To what extent do education professionals find the healthy beverage lesson plan to be complete and organized?

Interviews were conducted among a sample of education professionals in Reno, Nevada during the month of April in 2019 (Phase I). The findings of the interviews were used to inform the development of the RYD Healthy Beverage Lesson Plan. Next, an online survey regarding the lesson plan was conducted among the same sample of education

professionals in April 2020 (Phase II). Hence, this study resulted in both qualitative and quantitative data.

In this chapter, there was an overview of the study including the statement of the problem. The context and purpose were then provided, followed by a synopsis of the research methods.

Chapter 2

Review of Literature

As background for this study, trends in sugar-sweetened beverage (SSB) consumption among children are discussed, followed by the consequences. Next, three strategies to reduce SSB consumption are described in this review of literature. Finally, identified gaps in the research are discussed as the basis for this thesis study.

Sugar-Sweetened Beverage Consumption Among Children

Sugar-sweetened beverages (SSBs) can be described as beverages containing one or more added caloric sweeteners. Many have little to no nutritional value.²³ Examples include soda, sports drinks, fruit-flavored drinks, flavored milk, sweetened tea and coffee.²³ While there is evidence in the literature that consumption of SSBs has leveled off, SSB consumption is still precariously high among all children in the U.S.²⁴ Using data from the National Health and Nutrition Examination Survey (NHANES), it is estimated that almost two-thirds of U.S. youth consumed at least one SSB on a given day in years 2011-2014. Compared to 2004 when nearly 80% of youth consumed at least one SSB per day, reported consumption has steadily decreased, yet still remains a problem.^{24,25}

Research findings also suggest differences in SSB consumption by race, ethnicity and gender. A recent study by Rosinger et al., quantified SSB consumption data using the 2011-2014 NHANES cohort of children ages 0-5. White, Black and Hispanic boys had a higher average calorie intake from SSBs than Asian boys. Among girls, non-Hispanic blacks had the highest average calorie intake from SSBs. A higher percentage of boys (64%) consumed at least one SSB per day, compared to 61.3% of girls across all age

groups.⁷ A study done by Demmer et al., also analyzed NHANES data for children 0-5 years old. The study confirmed that from 2011 to 2014, non-Hispanic black young children consumed the most SSBs, the most 100% juice, and the least amount of milk. Examiners concluded that the decrease in consumption of nutrient-rich beverages, including milk, was associated with lower intakes of essential nutrients including calcium and vitamin D.²⁵

In addition to differences in SSB consumption by ethnicity and gender, there is evidence of differences in consumption by age. According to a study of NHANES 2005-2008 cohort, the percent of calories from SSBs increases with age for both boys and girls.²⁴ In a more recent analysis of preschool children in NHANES, using the 2011-2014 cohort, SSB consumption and the associated factors were examined. Examiners found that the most consistent predictor of SSB intake was the age of the child, noting that as age increased, a higher proportion of children drank SSBs. Additionally, they found that nearly 94% of children ages 3-5 consumed sweetened-milk products, almost 88% consumed fruit-flavored drinks, 63% consumed sodas and 56% consumed sports drinks or sweet tea. Children ages 6-11 were consuming roughly 6% of total daily calories from SSBs and those ages 12-19 were consuming 10% of their total daily calories from SSBs.²⁶

Comparing these consumption patterns to recommendations from the Dietary Guidelines for Americans highlights the problem SSBs pose in the diets of young, school-age children. The guidelines recommend limiting added sugar to less than 10% of total daily calories.⁹ This includes sugar from SSBs and sugar added to foods such as cookies, baked goods, and cereals. From 2005-2008, the average percent of total daily

calories from added sugars was 16% for boys and girls ages 2-19. It is estimated that children consume approximately 143 calories from SSBs per day.²⁷ To put this into perspective, a 12 ounce can of soda has about 10 teaspoons of added sugar, which equates to roughly 160 calories. In a 2000 calorie diet, 160 calories accounts for 8% of the total daily intake. Just one can of soda can put any child close to their daily recommended limit of added sugar, delivering little to no nutritional value. Considering that dietary patterns developed during a child's first few years of life have been shown to impact dietary choices made later in life, the importance of early intervention becomes even more pertinent.²⁶

Consequences of SSB Consumption

There is a growing body of evidence that associates SSB consumption to several negative health consequences including obesity, type II diabetes, dental caries, decreased nutrient intake and other unhealthy behaviors. Affecting over 600 million people globally, including over 42 million children, obesity has become a serious health challenge.²⁷ The U.S. has one of the highest rates of obesity compared to all other countries, affecting low-income populations disproportionately.²⁸ Per the Centers for Disease Control and Prevention (CDC) nearly 1 in 5 school age children between the ages 6-19 in the U.S. is obese and 1 out of every 3 children is overweight or obese.²⁷ The prevalence of obesity among school-age children 6-11 years old was 18.4% in 2015-2016, which was higher than preschool-age children (13.9%). Children ages 12-19 had an even higher prevalence of obesity (20.6%).²⁹ Landmark studies done by Ogden et al. also confirm an increasing trend in obesity observed in children.^{30,31} The following is a summary of literature regarding SSB consumption and the risk for obesity.

A study by Olsen et al., assessed the intake of sugar in relation to changes in weight among children ages 8-10. These researchers used data from The European Youth Heart Study (EYHS) to examine whether the intake of soft drinks, a type of SSB, was more closely associated with weight gain than other food sources containing added sugar. Four physiological mechanisms were discussed: sugary liquids causing excess caloric intake, sugary liquids failing to trigger satiety, sugary liquids causing less thermogenesis, and finally, consumption of these liquids displacing milk. Investigators proposed a fifth mechanism; that the intake of SSBs and subsequent weight gain may be facilitated by increases in the release of insulin. Height, weight, and waist circumference were measured in 1997-1998 and once more in 2003-2004 in 359 children from the Danish part of the EYHS. Dietary intake was measured using a 24-hour dietary recall, a qualitative food record and a food frequency questionnaire. Fasting insulin levels were measured, and physical activity was obtained from a questionnaire. Results were consistent with the hypothesis that “liquid sugar” was more closely associated with changes in BMI and waist circumference than sugar from food sources.³²

A longitudinal study done by Kral et al., assessed beverage consumption patterns and their relationship to weight status in a cohort of children ages 3-6 born with either low (n=27) or high risk (n=22) for obesity based on maternal BMI.³³ Mothers of the low-risk children had an average BMI of 19.4kg/m² and mothers of the high-risk children had an average BMI of 31.2 kg/m². A 3-day food record was obtained from each child (done by the primary caretaker). Next beverages were coded into seven categories including milk, fruit juice, fruit drinks, caloric and noncaloric soda, soft drinks either with or without fruit juice. Anthropometric measures including height, weight, and waist

circumference were assessed yearly. Children's BMI scores were converted to z-scores for analysis. Investigators next conducted a longitudinal analysis relating changes in beverage intake to changes in anthropometric measures. Multiple regression analysis was used where BMI z-score was the outcome measure and total energy intake, risk group, calories consumed from beverages, and beverage intake by risk group interaction were the predictors. The investigators found differences beverage consumption between low-risk and high-risk children over time. Those born at a high risk for obesity had a higher intake of SSBs including soft drinks, and a lower intake of milk compared to those born at a low risk for obesity. They also found that an increase in soda consumption over a 3-year period was associated with an increased waist circumference, and a greater increase in milk consumption was associated with a reduced waist circumference.

A similar longitudinal study was done by Dubois et al., who examined the relationship between children consuming SSBs between meals and the prevalence of overweight.¹¹ A comparatively larger sample of 1,944 children from Quebec, Canada participated in the study. Investigators used a 24-hr dietary recall obtained through an in-person interview. The heights, and weights of children were collected, as well as food frequency questionnaires which were sent to the child's caregiver. Data was treated as cross-sectional and longitudinal. Cross-sectional data was used for exploratory analysis of SSB consumption at each year of age and longitudinal data was used to examine SSB consumption over time. Investigators found that 15.4% of children who consumed SSBs between meals were overweight, compared to 6.9% who did not. Ultimately, regular SSB consumption between meals more than doubled the odds of a child being overweight. Additionally, those from low-income households who consumed SSBs were more than

three times as likely to be overweight compared to those from sufficient income households who did not consume SSBs.

A much larger cross-sectional, the Growing Up Today study, involved over 10,000 U.S. children. The results indicated that consumption of SSBs was significantly associated with a 0.06-unit increase in BMI per serving among females, while results among males were insignificant.³⁴

In a systematic review of 13 studies on children and adolescents, Malik et al., found that the majority established significant positive relationships between SSB intake and obesity.³⁵ In their review of 30 publications, including large cross-sectional and prospective cohorts paired with periods of follow-up, a positive association was found between high intakes of SSBs and weight gain and obesity among children and adults.

These and other studies demonstrate an association between SSB consumption and obesity. In addition to weight gain, diabetes is another negative health parameter associated with SSB consumption. Type 2 diabetes is part of the metabolic syndrome characterized by a high waist circumference, dyslipidemia and fatty liver.³⁶ It has been well documented that the rise in the prevalence of diabetes parallels the obesity epidemic. Data from the CDC indicate that 210,000 children under 20 years old had type 1 or type 2 diabetes in 2018.³⁷ In addition, the prevalence of type 2 diabetes among youths increased significantly from 2002-2012, affecting youths of minority racial and ethnic groups at a higher rate.³⁸ A likely risk factor for both obesity and type 2 diabetes is SSB consumption.^{39,40} The following is a summary of literature regarding SSB consumption and the risk for diabetes.

The relationship between SSB and type 2 diabetes has been examined using a variety of designs, and different populations. For example, a prospective cohort analysis was conducted from 1991 to 1999 among young women in the Nurses' Health Study II. The objective was to examine the association between SSB consumption and weight change as well as risk of type 2 diabetes. Investigators found that highest weight gain over a 4-year period was observed among those who consumed one or more soft drinks per day. The smallest weight gain was observed in young women who decreased their SSB intake. Furthermore, women who consumed one or more soft drinks per day had an 83% higher risk of developing type 2 diabetes compared to women who consumed less than one soft drink per month. They also found that consumption of fruit punch, a form of SSB, was associated with an increased risk for diabetes.³⁹

Similarly, in the Black Women's Health study (n=40,000), SSB consumption was measured over a 10-year time span utilizing a food frequency questionnaire.⁴¹ Palmer et al., found that those who consumed more than two SSBs per day had a 24% higher risk of developing type 2 diabetes compared to those who consumed less than one SSB per month. In addition, the association between type 2 diabetes and consumption of soft drinks was said to be mostly mediated by BMI, while the association with fruit drink consumption was not entirely mediated by BMI. Authors explained that weight gain is a possible mechanism for the observed associations between diabetes risk and SSB intake, noting that SSBs are calorie dense, and contribute little to satiety. Another possible mechanism described was the glycemic effects of SSBs, as they contain large amounts of rapidly absorbed carbohydrates which lead to an increase in glucose and insulin concentration.⁴¹

In addition to obesity and diabetes, tooth decay has been associated with SSB consumption. According to the CDC, one in five people suffer from untreated tooth decay, leading to pain and infection.⁴² Tooth decay is described as the breakdown of tooth enamel caused by bacteria feeding on fermentable sugars from dietary sources, such as those present in SSBs. The enamel of teeth can also be worn down by the acidity of foods and beverages. Most SSBs such as sodas, sports drinks, energy drinks and fruit-flavored beverages have a low pH that is associated with the destruction of enamel, thereby promoting the beginning stages of tooth decay.⁴³

A cross-sectional study of Australian children examined demographic and socioeconomic differences in SSB consumption and the association with tooth decay, or dental caries. Additionally, investigators studied whether water fluoridation modified the association. Taking information from over 16,000 school-age children ages 5-16, authors of the study assessed dental history, sources of water, SSB consumption, socioeconomic status and tooth brushing frequency. Tooth decay was significantly associated with SSB consumption. Young children who consumed three or more SSBs per day had an average of 47.1% more decay, missing and filled teeth compared to those who did not consume SSBs. Investigators concluded that SSB consumption was a major risk factor for developing dental caries. Those who drank three or more SSBs per day had a decayed, missing and filled permanent teeth score 25.7% higher than children who consumed zero SSBs.⁴⁴

In another study, a cohort of children from the Iowa Fluoride Study was followed from birth to 5 years of age to examine the impact of changes in dietary patterns on dental caries. Associations among dental caries and intakes of dairy, SSBs, and overall

diet quality were investigated using food and nutrient intakes from 3-day diet records. Children who experienced caries had lower median intakes of milk than children without caries, and children with caries also had higher median intakes of SSBs in the form of soda. Children who consumed no SSBs had a lower risk of developing dental caries. The intake of milk did not have a significant association with dental caries. The authors concluded that their results supported the Dietary Guidelines for children which stipulate consuming two or more servings of dairy daily, limiting 100% juice, and restricting SSB consumption to occasionally.⁴⁵

Emerging studies also suggest SSB consumption may have a negative impact on brain health, as well as sleep quality and duration. Sugar consumption, especially from SSBs, was shown to be associated with adverse effects in child cognition in a recent study conducted by Cohen et al.⁴⁶ Participants were recruited from Project Viva, which is a prospective cohort study of prenatal factors, pregnancy outcomes and child health. Using semi-quantitative food frequency questionnaires, beverage intake was assessed among 1,234 mother-child pairs. The Harvard nutrient composition database was used to calculate added sugar consumption. Investigators adjusted for maternal and child characteristics, based on previous literature including mother's age, BMI, education, smoking during pregnancy, and household income. Childhood SSB consumption was associated with poor verbal intelligence. Additionally, investigators found that higher SSB consumption during the prenatal period was associated with poorer cognition in the offspring.

A much larger, multinational, cross-sectional study was conducted by Chaput et al., to examine the relationships between measured sleep patterns, including duration and

efficiency, and SSB consumption among children from all over the world.⁴⁷ Data was collected from The International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE) and the sample included 5,873 children ages 9-11. Overall, examiners found that children with shorter sleep durations also had higher intakes of regular soft drinks. Children who reported drinking at least one SSB per day averaged twelve minutes less of sleep than children who consumed less than one SSB per day, or none at all. Additionally, earlier bedtimes were associated with lower intakes of soft drinks. In the context of sleep duration, missing twelve minutes of sleep a night may seem negligible. However, over the course of weeks or months, those minutes can add to hours of restorative sleep that are lost.

In addition to the sugar content of SSBs, caffeine is also present in many soft drinks, sodas and energy drinks, which is thought to trigger the excitation of the reticular system in the brain.⁴⁸ This excitation can cause insomnia, psychomotor agitation and headaches according to a Polish study by Wierzejska.⁴⁸

Furthermore, those who consume greater amounts of SSBs are also more likely to get more screen time, exercise less, consume less fruit, sleep for a shorter duration and eat fast food more frequently.^{49, 50, 51} These findings emphasize the importance of reducing SSB intake among young children.

Strategies to Reduce SSB Consumption

Considering the alarming SSB consumption patterns and associated health consequences, there have been expansive efforts to reduce SSB intake throughout the U.S. and in many other countries. Some target behavior change at the individual level,

others employ societal and multilevel approaches to elicit positive behavior change. The following examines three areas of focus for the reduction of SSB consumption.

Policy

The power of policy to influence behavior change, has been well documented in the literature^{52,53,54,55} Taxation is one strategy that has been used to reduce the sale of SSBs. In the US, the Sugar-Sweetened Beverages Tax or SWEET Act was first proposed in 2014. The SWEET Act would result in a 1 cent per 4.2 grams of added sugar excise tax on SSBs. Introduced by Representative Rosa DeLauro, the purpose of the act is to diminish the costs, both human and economic, of obesity, diabetes, tooth decay and other diet-related health problems discussed previously. Additionally, the SWEET Act is intended to discourage the consumption of SSBs and designate the generated funds to the prevention of diet related health conditions in vulnerable populations. The bill has been referred to the Committee on Ways and Means and to the Committee on Energy and Commerce to be determined by the Speaker whether the provisions fall within a certain committee.⁵⁴

Berkley, California is one example of a local effort to tax SSBs in the form of an excise tax. A cross-sectional study used repeated annual beverage frequency questionnaires from 2014 to 2017 in Berkeley and comparison neighborhoods including San Francisco and Oakland to measure SSB consumption. Reductions in SSB consumption were sustained in Berkeley and changes in consumption were significantly different from those in comparison cities. The reduction in SSB consumption in Berkeley was attributed to the excise tax.⁵⁵ Other jurisdictions have passed similar policies

including Albany, CA, San Francisco, CA, Oakland, CA, Boulder, CO, Cook County, IL, and Navajo Nation.⁵⁵

Many other countries and nations are utilizing policy to reduce SSB consumption. Mexico employed an excise tax that resulted in a one peso per liter tax on beverages with added sugars. Just two years after Mexico's tax went into effect SSB sales were reduced by 12% according to an observational study done by Colchera et al.⁵⁶ Authors used beverage purchase data in Mexico from January 2012 to December 2014 from a representative panel of 6,253 households in 53 cities with over 50,000 citizens. The beverage categories were modeled after the 2012 National Health and Nutrition Survey and included taxed and untaxed beverages. Taxed beverages included sodas and non-carbonated SSBs, and untaxed beverages included carbonated drinks, water, and other drinks like dairy and juices. Overall, the reduction in SSB sales was greatest among low socioeconomic households, reaching over 17% by December 2014.⁵⁶

In an effort to reduce sales, Chile updated its SSB tax in 2014, which resulted in a tax rate on beverages containing high amounts of sugar (those greater than 6.25 grams of sugar per 100 milliliters) from 13% to 18%. Additionally, the Chilean government decreased the tax rate on beverages with low or no sugar from 13% to 10% as a means of increasing the purchase of healthier beverages. This strategy created a price-differential between high- and low-sugar drinks, which was unique to other tax systems. Examiners used household food purchases from January 2013 to December 2015 obtained from Kantar WorldPanel Chile, a longitudinal data set which represented 74% of Chile's urban population. After the change in tax rates were established, the decline in high-sugar beverages was small. Largest declines in purchases were observed in high socioeconomic

households compared to low socioeconomic households. A limitation of this study was there was no control group.⁵⁷

Another change impacting SSB consumption are school wellness policies. Since 2006, school wellness policies have been required to address the quality of all foods and beverages offered in schools. Congress recognized that schools are critical in the promotion of school-age children's health, and in response the Child Nutrition and Special Supplemental Nutrition Program for Special Supplemental Nutrition Program for Women, Infants, and Children Reauthorization Act (CNR) was passed. The act, passed in 2004, required that all school authorities that participate in the National School Lunch Program create a local school wellness policy, further stipulating those policies be reevaluated every three years by appointed committee members.⁵⁸ In 2010, the Healthy, Hunger-Free Kids Act added provisions for school wellness policies, which now require Smart Snacks in School nutrition standards, thereby decreasing the availability of competitive foods and beverages in schools, including SSBs. A study done by Gortmaker et al., projected Smart Snacks in Schools alone would result in significant health care cost savings for every dollar spent on the initiative, as well as prevent cases of childhood obesity over the span of 10 years.⁵⁹ Other studies also suggest the implementation of school wellness policies have had a positive impact on health outcomes, and the food and beverage environment.^{60,61}

One such effort examined 4,790 children ages 4-15 who were recruited from over 130 communities involved in the Healthy Communities Study. The research aim was to assess the association between the implementation of school nutrition wellness policies and the weight status and dietary outcomes of the children. Investigators also assessed the

association among school wellness committees, weight status and dietary outcomes. They concluded that active implementation of a wellness policy was associated with a reduced obesity among students. They similarly concluded that an active wellness committee was associated with lower BMI z-scores among students. Authors reported a lower BMI in schools with committees that met as little as once per year.¹⁵

Taking into consideration children's food and beverage environments, a recent study examined the association between school policies regarding competitive food and beverages, and the availability of foods high in fats, sugars and sodium. Examiners used a pooled, cross-sectional design and analyzed annual data from 1,814 elementary schools all over the U.S. from 2008-2009 through 2010- 2011. Conclusively, SSBs were 9.5% less likely to be available when district policies prohibited them in their policy.¹⁶ This change reduced children's access to SSBs in schools where they spend the majority of their day, thus improving their food and beverage environment.

A team of researchers set out to evaluate school wellness policies at the national level, comparing 256 policies to federal requirements. The sample was made up of small, medium and large schools from every state, with the exception of Hawaii. In comparing the content of the school wellness policies to the requirements of CNR, investigators found that 68% of the sample met the minimum requirements. Only 2% of the schools sampled included all of the components in the area for school meals, and less than 1% addressed all components for measurement and evaluation.¹⁷ While there is evidence school wellness policies are associated with positive health outcomes and environments, this study highlighted the need for continued improvement in school wellness policies and implementation.

Social Marketing

Social marketing is another strategic approach to influence human behavior. In general, marketing principles and techniques on multiple platforms are utilized to improve the welfare of people and the environment in which they live.⁶² *Live Sugar Freed* was one such effort implemented in a lower-income U.S. community. It was a 15-week multiplatform media campaign that compared the health effects of soda to cigarettes through television, digital channels and local organizations. Campaign ads were delivered on YouTube, Hulu, and Facebook as well as regular television. Additionally, local organizations were given incentives to support healthy beverages. Using a strong evaluation design including objective SSB sales data and a comparison group, the campaign resulted in a 3.4% decline in SSB sales overall, and more specifically, a 4.1% decrease in soda sales.⁶³

A much longer campaign in Howard County, Maryland, used a similar design over the course of three years. Titled, *The Howard County Unsweetened Campaign*, efforts ranged from the interpersonal to the policy level and involved multiple community organizations. The message of the campaign was to reduce all SSB consumption, echoed through television advertisements, digital marketing, mail sent directly to Howard County citizens, outdoor messaging, and social and earned media. Over 17 million impressions were accounted for. After the three-year period, SSB sales declined by 19.7% in Howard County, while comparative store sales remained stable, confirming the usefulness of social marketing.⁶⁴

Rethink Your Drink Nevada is another social marketing effort, which will be discussed in greater detail in Chapter 3. The goal of *Rethink Your Drink Nevada* is to

promote healthful drink choices, and to reduce SSB consumption. Efforts include a multi-media campaign with outdoor and newspaper advertising, pamphlets sent by mail to select households, point-of-purchase displays and events, social media ads on both Facebook and Instagram, and the provision of education materials to medical and dental offices.⁶⁵ Recently, those who utilize *Rethink Your Drink Nevada* have expressed a need for educational materials that are directed at young children, specifically a lesson plan (Jamie Benedict, Ph.D., personal communication, August 2018). This thesis project is formative research in the development of said lesson.

Education

The beneficial role of education in health promotion is well documented in both the school and community environment. Many education interventions adopt a theoretical frame-work in the development, thus increasing the effectiveness of the intervention.^{66,67,68} Common frame-works for interventions targeting young school age children include Bandura's Social Cognitive Theory, the Theory of Planned Behavior, and the social ecological model, all demonstrating positive effects on eating patterns.^{68,69} For instance, the previous study described *Howard County Unsweetened* was designed to address all levels of the social ecological model from intrapersonal to societal and policy level.⁶⁴ This model emphasizes the interaction between, and interdependence of factors across specific levels of a health problem; SSBs in this case. At the individual, or intrapersonal level, a child might be influenced to drink SSBs based on their knowledge, attitudes or beliefs about whether they are good for them or not. At the interpersonal level, family or friends might influence whether or not they drink SSBs.

Another example by Davis et al., aimed to slow the escalation of obesity and diabetes among youth, particularly those in low-income communities.²⁰ Ten middle schools were randomly assigned to the intervention group or delayed control conditions. All schools were in the same school district in low-income New York City neighborhoods, matched on school size, race and ethnicity, free and reduced lunch percentage, and test scores. Investigators examined the impact of *Choice, Control & Change*, a curriculum which was based on the social cognitive, and self-determination theories. Educational strategies were used to address motivational mediators of outcome expectations, goal intentions, and self-efficacy. The goal was to increase personal motivation in participants, thus increasing obesity risk-reducing behaviors. Educational activities included monitoring progress of goals, learning about the sugar and fat content of frequently consumed food, the use of pedometers and collecting personal food consumption. Students in the intervention group reported a decrease in obesity-risk behaviors including consumption of SSBs, consumption of packaged, processed snacks, and also reported eating smaller portion sizes at fast food restaurants.

Additionally, a cluster randomized controlled trial was conducted in New South Wales, Australia as a pilot study to assess the effectiveness of a school-based intervention to reduce SSB consumption. Six schools were recruited, three of which were controls, and children were ages 7 to 9 at baseline. Three strategies were employed in effort to reduce SSB consumption including lessons on SSBs, communication with both students and parents, and school nutrition environment modifications. Examiners utilized domains of the Health Promoting Schools framework. The domains for this framework included curriculum and teaching, ethos and environment, and partnerships and services. Students

participated in two education lessons covering topics on SSB sugar-content awareness, adverse health effects of SSB consumption, healthier drink alternatives, and goal setting to monitor SSB consumption. The two lessons were taught by Health and Physical Education teachers from the recruited schools. This pilot study was the first intervention of its kind in Australia.⁶⁶

There are also examples in the literature of research focused on utilizing nutrition lessons as an intervention. For example, in a recent study by Schmitt et al., teachers were given a nutrition education curriculum with the objective of improving second grade student's preference for fruit and vegetables and knowledge of nutrition and health.⁶⁷ The curriculum was developed during a one-day workshop with three third grade teachers. Investigators recognized that teachers involved in the study were looking for short, feasible lessons that aligned with required education standards. Fifteen to twenty-minute lessons were implemented including direct instruction and multiple tastings for the second-grade students (n=131). Children were taught two lessons per week over a 6-week period, totaling 12 lessons. Those in the intervention group were exposed to teachings highlighting the MyPlate framework as well as the *Two-Bite Club*, a book encouraging children to eat at least "two bites" of new foods they are introduced to. A survey developed by the research team measured the efficacy of the intervention. Findings of the survey suggested that those in the intervention showed greater preferences for healthier foods such as fruits and vegetables at post-test than those in the control group. Additionally, teachers reported that children were engaged as well as enjoyed the lessons with which they were involved.

A much larger study by Tilles-Tirkkonen in Finland utilized a theory-informed curriculum with fifth and sixth graders, also taught by teachers in the schools.⁶⁸ The investigators utilized the self-determination theory as a theoretical framework for the development of the curriculum. Concepts including the “Health at Every Size” and sensory-based food education were drawn upon in the development of the lessons. Fourteen teachers taught the curriculum in the school year 2012-2013 to 194 students ages 10-13 years. All of the fourteen teachers in the intervention schools reported teaching the lessons and were able to integrate them into different subjects such as biology. All of the teachers reported that the lessons were easy to teach and would use at least some of the content in the future. Four teachers reported that it was too much work to teach all of the lessons in one semester and that they should be tied more strongly to certain time points of the school year as well as the curriculum.

Another investigator, Vercammen, gathered perspectives from expert stakeholders on strategies to reduce SSB consumption among young children.⁶⁹ Instead of drawing on teacher’s perspectives as Schmitt had, Vercammen drew upon expert perspectives outside of the field of education.⁷⁰ Two surveys were emailed to experts including those in research, advocacy and government. The first survey asked respondents to name novel and innovative strategies to promote healthy beverages. The second survey had respondents rank each of the strategies that emerged from the first survey on five domains (importance, feasibility, effectiveness, reach and health equity). The second survey also included open-ended questions that were coded and analyzed for themes. Overall, there were six overarching strategies that emerged to promote healthy beverage

behavior including: education, campaigns and contests, marketing and advertising, price changes, and improving the capacity of settings to promote healthy beverages.

In summary, this chapter provided background information as basis for this thesis. Consumption of SSBs among children is too high. Research indicates an association between the consumption of SSBs and negative health consequences including obesity, type II diabetes, and dental caries. Several efforts to reduce the consumption of SSBs were described including public policy, the use of social marketing, and education. The studies on education described previously demonstrate the positive impact of education on dietary outcomes among young children. Some of these studies targeted SSB consumption as part of a broader dietary intervention, others were specific to SSBs.⁶⁷⁻⁷⁴ While many investigators noted a theoretical framework, they lacked details of how actual lessons or curricula were developed.^{20,67,68} Additionally, most research on nutrition education interventions has been conducted in the school setting. It is important to note that nutrition education also takes place in other settings within the community.⁷² There is a need for a systematic approach to developing lessons in both the school and community setting. There is also a need for more knowledge on the desirable characteristics of a lesson plan for those who may be teaching the lesson, specifically for age-appropriate lessons on SSBs, as noted by recent research.⁷³ This thesis project aims to fill the gap by gaining insight into education professionals' preferences in regards to a healthy beverage lesson plan for young school-age children.

Chapter 3

Methods

In this chapter the purpose and aims of the two phases of this thesis study are presented. Lastly, a description of the data analysis is noted.

The goal of this study was to obtain new information that would ultimately lead to an effective healthy beverage lesson plan. To obtain this information, interviews with education professionals were conducted to gain insight about the preferred content and organization of lesson plans. The findings of the first phase (Phase I) were used to inform the methods of the second phase (Phase II), including the development of the Rethink Your Drink Healthy Beverage Lesson Plan. As mentioned in Chapter 2, this study represents a component of a much larger effort to promote healthy beverage choices and decrease SSB intake among children and adults, particularly those living in low-income households. Developed using the social ecological model as well as social marketing approaches, RYD targets individual knowledge and skills, in addition to implementing policy, systems and environmental approaches. The intervention settings include home, school, communities, grocery stores, as well as medical and dental care offices.

This thesis study was conducted in two phases. The following describes the purpose, design and data collection procedures of Phase I, followed by the purpose, design and data collection procedures of Phase II.

Phase I

Purpose and Aim

The purpose of the first phase of this study was to explore the characteristics of effective lesson plans. The aim was to identify the perceptions of education professionals

regarding the preferred content and organization of lesson plans. Semi-structured interviews were conducted with education professionals to gather this information. The intent was to conduct 10 interviews at a minimum, or until saturation was achieved.

Participants

First, a list of agencies who might potentially have an opportunity to teach a healthy beverage lesson was generated by Dr. Jamie Benedict and myself. Each agency was contacted by phone for the purpose of inquiring whether the lesson might of use to the agency. If the answer was affirmative, they were asked who would be responsible for implementing the lesson. From there a list of specific professionals, along with their email addresses, was generated. If an agency did not express interest, no further information was gathered.

Both community and school-based professionals were considered in order to reflect a variety of types of education. Additionally, it was important that the education professionals worked in the Reno area as interviews were conducted in person. Finally, the sample needed to include education professionals with experience and knowledge in the development and implementation of lessons for young children. Snowball sampling was employed, in that the research team considered professionals referred by those with whom we initially contacted. Based on the above-mentioned criteria, a list of education professionals was generated by the research team. The initial list included 20 persons anticipating that some would decline to participate.

After obtaining approval from the Institutional Review Board at the University of Nevada, Reno (Appendix A), an invitation email (Appendix B) was sent directly to potential participants that included an information sheet (Appendix C), and a handout

(Appendix D). The information sheet described the study in detail and served as a method to ensure informed consent. The handout explained RYD in greater detail and highlighted the intended characteristics of the lesson plan. In the email invitation participants were notified that they would be sent an RYD education tool as a way of expressing gratitude for their participation. In the event that there was no response from a potential recruit, a follow up email (Appendix E) was sent one week after the invitation email.

As education professionals responded to the email invitation, the specified interview date, time and location was arranged. It was suggested by the interviewer that the participant choose a private, quiet place. Some were conducted in the office of the participant, while others were conducted at the University of Nevada, Reno campus in private rooms located in the Matthewson-IGT Knowledge Center. One interview was conducted at an elementary school in a classroom after students had left for the day.

First, the interviewer asked if the participant had time to review the information sheet. If they replied they did not have time, another copy of the information sheet was presented and the participant was given time to review. Then they were asked if they had any questions. Next, verbal consent was obtained from the interviewee. With verbal consent, the interviews were audio-recorded. The moderator reminded the participant that their name would not be mentioned in the recording and turned on the recording device.

Data Collection Procedures

Interviews were conducted using a semi-structured interview guide (Appendix F). The interview guide was developed for the purpose of obtaining education professionals' preferred content and organization of a lesson plan for young school-age children. The guide was pretested with an education professional not included in the sample from this

study. Minor changes were made to the interview guide as a result. The interview guide included a series of open-ended questions. Follow-up questions were used to probe for details. The interview guide started with a series of questions about lesson plans they used previously. Next, participants were asked a series of questions pertaining to their experiences with young children, ages 6-9. The last part of the interview consisted of a series of questions about the effective organization and presentation of lesson plans, as well as their opinion on various instructional methods.

Data Analysis

Audio recordings of the interviews were transcribed verbatim by a member of the research team. Transcriptions were then coded utilizing QSR-NVivo computer software for qualitative data analysis. Initially, coding categories were created using major topics included in the interview guide. Data within each category were then compared and coded into more refined categories, herein referred to as subcategories.

Intercoder agreement was assessed in this study to ensure reliability of the coding process. Another research team member independently coded the transcriptions using the same procedures described above. The data within each category and subcategory were compared between both coders. If the same data bit was in both categories established by each coder, the data bit was considered in agreement. If the data bit was not in both coders' category, then the data bit was not in agreement. The percent agreement was then calculated by dividing the number of data bits in agreement by the total number of data bits for each category or subcategory. The results are shown in Table 1, which can be found at the end of the chapter. The overall mean percent agreement was 84% which is deemed adequate for intercoder reliability.⁷⁵

Phase II

Purpose and Aims

As described previously, the findings of Phase I were used to inform the methods of Phase II. Specifically, the results of Phase I guided the development of a healthy beverage lesson plan and the survey instrument. The purpose of the second phase was to obtain educators' opinions of this lesson plan.

The research questions for this phase were as follows:

- a) To what extent do education professionals find the healthy beverage lesson plan to reflect sound instructional design?
- b) To what extent do education professionals find the healthy beverage lesson plan to be relevant and appropriate for children ages 6-9?
- c) To what extent do education professionals find the healthy beverage lesson plan to be complete and organized?

Participants

All participants from Phase I of this research study were asked to participate in Phase II. After obtaining approval from the Institutional Review Board at the University of Nevada, Reno (Appendix G), an invitation email (Appendix H) was sent directly to participants. The content of the email thanked professionals for their participation in Phase I and invited them to take a survey about the newly developed healthy beverage lesson, which was attached to the email. Visuals included in the lesson plan were also attached to the email for participants to reference. A link to the survey was provided for each participant in the body of the email. In the event there was no response from a

potential recruit, a reminder email was sent one week after the invitation email (Appendix I).

Data Collection Procedures

A 35-item survey instrument was developed by Dr. Jamie Benedict and myself (Appendix J). Survey items were written to ensure each research aim was addressed. Content from a community nutrition education textbook was utilized to generate questions that were then worded in a statement format.⁷⁵ Specific content used from the textbook include instructional design characteristics and principles that should be included in the lesson such as feedback, consonance, relevance, and individualization. In addition, the information that was gathered from the findings of Phase I was used to inform the content of the survey. A long list of important information to include in the survey was developed from the interview findings. The list was scaled back so as not be redundant and to ensure participants could answer the survey in a reasonable amount of time. The survey was pretested with an education professional to test for completeness, comprehension and clarity.

The final survey tool was formatted in Qualtrics, an online survey software, by a RYD team member. The online survey, titled, “Healthy Beverage Lesson Survey” included three parts. After reading the lesson plan, survey participants were asked to respond to 27 statements in reference to the lesson (Part I). They were instructed to choose one of five responses; “Strongly agree,” “Agree,” “Disagree,” “Strongly disagree,” or “No opinion.” Those who selected “Disagree,” or “Strongly disagree,” were prompted to elaborate, as all of the statements in Part I were positive. Part II of the survey included two general questions about the lesson. Questions read, “What is the likelihood

that you would use this lesson plan to instruct children ages 6-9?”, and “What is the likelihood that you would recommend this lesson plan to your colleagues that instruct children ages 6-9?” Participants were instructed to choose one of five responses; “Very likely,” “Somewhat likely,” “Somewhat unlikely,” “Very unlikely,” or “No opinion.” Participants were then presented with six questions pertaining to their professional experience and background characteristics (Part III). After completing the survey, participants were sent a small token of appreciation, as well as a thank you note from the RYD team.

Data Analysis

Survey responses from each participant were downloaded from Qualtrics into an Excel spreadsheet. Next, responses for each survey statement in the survey item were tabulated. Inferential statistics were not computed due to the small sample size.

Chapter 3 of this thesis describes the purpose, aims, participant recruitment, and data collection procedures of this study. The findings are described in the following, Chapter 4.

Chapter 4

Results

This chapter begins with a description of the participants involved in this study. Next the findings from Phases I and II are described.

Participant Characteristics

From the list of 20 potential participants, nine participated in Phase I. The remainder did not respond to the email invitation or reminder sent by email. Eight (89%) participated in both study phases.

For the purpose of describing the sample, study participants were asked to provide information about their professional experience and background in the survey administered during Phase II. The results are shown in Table 2. Half of the participants worked in a community-based setting, while the remainder worked in a school-based setting. Nearly all survey participants (n=7) reported having experience teaching nutrition related topics at the preschool or early elementary school level. All but one possessed at least a baccalaureate degree. One participant had earned a dietetic credential.

Phase I: Interview Findings

As described previously, participants were asked a series of open-ended questions about lesson plans they used previously and considered effective. In addition, they were then asked about their experiences with keeping young children ages 6-9 engaged. Next, participants were asked specific questions about ways to effectively organize and present a lesson plan. Lastly, their opinions on specific instructional methods were sought.

Findings from each portion of the interview are described below.

Characteristics of an Effective Lesson Plan

The participants were first asked about a lesson plan they had used previously and considered effective. The resulting data were sorted into three subcategories, Lesson Plan Aspects, Lesson Plan Activities, and Areas of Improvement. After reviewing the data within each subcategory, a representative sample was identified. This information, along with the corresponding interview questions are shown in Table 3, located at the end of this chapter. The findings revealed positive opinions of lessons with visually appealing hand-outs, opportunities to review content with the students, and hands-on (i.e., kinesthetic) activities. Regarding the activities themselves, multiple participants provided examples that were related to healthy beverages such as label reading, learning about the amount of sugar in drinks and incorporating a recipe. A more direct interview question about activities resulted in additional examples of activities (subcategory “Lesson Plan Activities”). Similarly, examples that related to healthy beverages were mentioned (e.g., “...jumps for how many teaspoons of sugar are in the drinks”) in addition to more general food/nutrition activities (e.g., “sorting into food groups”). There was also mention of role-playing. While not an activity per se, one participant expressed their preference for leaving activities for another time.

In the last subcategory titled “Areas of Improvement,” results revealed examples that related to activities, the location of the lesson, and the assessment method. Only one participant mentioned there was no area of improvement. In regard to activities, participants’ responses reflected issues of time, level of difficulty and lack of parent participation. It was noted that parents were not aware of the lessons being taught, and therefore could not reinforce the information at home.

Student Engagement

During the second portion of the interview, participants were asked about their experiences engaging children ages 6-9. The resulting data were sorted into three subcategories, Student Engagement Methods, Types of Hands-on Learning, and Visual Aids. After reviewing the data within these subcategories, a representative sample was identified. This information, along with the corresponding interview questions are shown in Table 4. The subcategory findings “Student Engagement Methods” revealed an emphasis on activities that required students to do more than just listen to the teacher; avoiding “teacher talk” as described by one participant. One participant noted that the activity needed to be fun. In reply to the question on hands-on learning (subcategory “Types of Hands-on Learning”), responses yielded examples that were specific to food and nutrition (e.g., counting teaspoons of sugar, cooking) including those that incorporated multiple senses. Tasting, smelling, and touching real food were among the examples. One participant noted the benefit of giving students “individual jobs.” In reply to the question on visual aids, use of real examples opposed to pictures, incorporation of color into any text, and showing pictures that included children were noted. There was also mention of the MyPlate model.

Effective Organization and Presentation

Participants were next asked about the most effective ways to organize and present a lesson plan. The resulting data was sorted into four subcategories, Lesson Plan Organization, Order of Activities, Important Components and Length of Lesson Plan. Representative data from this portion of the interview as well as the corresponding questions are show in Table 5. In regard to “Lesson Plan Organization,” most

respondents mentioned using paper that could be placed in a binder or folder and easily copied for other professionals to share. One mentioned the use of a USB. Numerous replies to a question on the order of activities within a lesson plan (subcategory “Order of Activities”) included mention of a short introduction to the topic. Breaking the lesson up into short intervals was also noted in several responses. A quote from one respondent captures both of these preferences, *“We usually start with a review from the previous lesson, and then a little introduction of the topic of the lesson, and then an activity.”* Another noted the effectiveness of doing interactive components of the lesson following the “paperwork.”

Participants were asked what components should be included. Responses included suggestions of activities and content that were specific to SSBs (e.g., identification of and reasons to limit sugary drinks, measuring sugar). The inclusion of hands-on activities was mentioned repeatedly. Additionally, one noted a materials list and objectives. In the last subcategory, “Length of Lesson Plan,” responses varied greatly with a range of 30 to 90 minutes in length for children 6-9 years old.

Opinions on Instructional Methods

In the next portion of the interview, participants were asked their opinion on the effectiveness of several instructional methods. Data were sorted into eight subcategories within the category “Opinions on Instructional Methods:” Demonstrations, Games, Group Work, Role Playing, Stories, and Worksheets. Representative responses from participants and the related questions for each subcategory are shown in Table 6.

All participant responses reflected a positive opinion about demonstrations. One response was to keep the demonstration short. Overall, participants had mixed opinions

on games as an instructional method. Some participants viewed them as very effective stating the benefits, while others viewed them as “tricky.” One participant noted, *“I’m hesitant to say they’re good, it just depends how you implement it in the class.”* In regard to the opinions of role playing, many agreed that it could be effective, however, no one stated that they currently applied the method of instruction. One participant viewed it as “helpful” while others described it as “embarrassing,” and “challenging.” Opinions of the effectiveness of stories were generally positive. In describing stories as a method of instruction, two participants used the word “love” multiple times. One response was, “they can be a powerful tool,” while another mentioned they were “super important.” There were also some responses that were more cautionary noting the age appropriateness, the length, and the method.

In regard to the subcategories “Group Work” and “Worksheets,” responses reflected mixed opinions on their effectiveness. Positive opinions of group work related to the social aspect (e.g., “they naturally work as a group”) and their opinion it was a “transferable skill.” Less affirmative opinions reflected the need to have enough adults, and noted it depended on the activity itself. A response from one participant, *“It depends what they’re doing with their group.”*

The last instructional method discussed was worksheets. Overall, participants were less enthusiastic about this method. Most participants either did not use worksheets, or they considered them ineffective. While one participant noted that they were useful for instructors, they mentioned worksheets were not effective for children.

Participants were also asked about supplies needed to teach a lesson. Responses were characterized by the use of budget to buy supplies, and the use of materials on-hand. One noted buying their own supplies. These responses are not shown in a table.

Phase II: Survey Findings

Following the completion of Phase I members of the RYD team used the results to guide the development of the RYD Healthy Beverage Lesson Plan. This lesson plan was then provided to participants in Phase II for the purpose of obtaining educators' opinions on the instructional design, relevance and completeness of the lesson. An online survey was used to obtain this information. The results of the survey are described below.

Survey participants' relative agreement to statements regarding the instructional design characteristics of the lesson plan is shown in Table 7. In general, participants' responses indicated agreement that the lesson plan reflected sound instructional design. Briefly, participants reported that the lesson plan provided a solid foundation in the introduction (100% agreed/strongly agreed); content corresponded to learning objectives (100% agreed/strongly agreed); allocation of time for each activity was appropriate (75% agreed/strongly agreed); it was likely learning objectives would be achieved (88% agreed/strongly agreed); included appropriate amount of self-directed learning (88% agreed/strongly agreed); introduced and emphasized key ideas (100% agreed/strongly agreed); engaged every type of learner (100% agreed/strongly agreed); and that the visual aids complemented the activity (100% agreed/strongly agreed).

Table 8 lists survey participants' relative agreement to positive statements regarding the organization and clarity of the lesson plan. As noted, all participants agreed

or strongly agreed to most of the statements. Two participants (25%) disagreed with the statement, “This lesson is complete and not missing any key components.”

Finally, survey participants’ relative agreement to positive statements regarding the age appropriateness and relevance of the lesson plan is shown in Table 9. Participants agreed or strongly agreed to most of the statements as noted. This included engaging every child (100% agreed/strongly agreed); appropriate student learning objectives for children (100% agreed/strongly agreed); appropriate amount of text included in visual aids (100% agreed/strongly agreed); appropriate amount and type of physical activity (100% agreed/strongly agreed); and appropriate duration of the lesson (100% agreed/strongly agreed). While most agreed or strongly agreed that children would enjoy the lesson (88%), one participant (12%) had no opinion. One participant (12%) also disagreed with the statement that the lesson is appropriate for children ages 6-9.

All participants answered that they were either “somewhat likely,” or “very likely” to use the lesson plan to instruct children ages 6-9 and recommend the lesson plan to colleagues who teach children ages 6-9 (not shown).

Chapter 4 of this thesis describes the participants involved in this study, as well as the findings from Phase I and Phase II. The following chapter includes a discussion of the findings, in addition to the study limitations and strengths, implications and conclusions.

Table 1. Interrater coding reliability estimates of qualitative data from participant interviews (n=9)

Category/Subcategories	Percent agreement
Effective lesson plan	94%
Lesson plan aspects	100%
Lesson plan activities	100%
Aspects that added to effectiveness	74%
Improvements	90%
Category/Subcategories	Percent agreement
Student engagement	100%
Activities	100%
Lesson flow	100%
Questions	100%
Repetition	100%
Category	Percent agreement
Visual aids	89%
Category/Subcategories	Percent agreement
Types of hands-on learning	100%
How to make activities effective	100%
Order of activities	100%
Category/Subcategories	Percent agreement
Content and organization	93%
Lesson plan organization	79%
Format of a lesson plan	85%
Electronic	88%
Hard copy	100%
Mixed	100%
Important components in lesson	100%

Table 1 Continued

Category/Subcategories	Percent agreement
Opinions on instructional methods	
Demonstrations	
Mixed	100%
Negative	100%
Neutral	100%
Positive	86%
Games	
Mixed	100%
Negative	50%
Neutral	100%
Positive	100%
Group work	
Group sizes	100%
Mixed	100%
Negative	100%
Neutral	100%
Positive	100%
Role playing	
Mixed	100%
Negative	80%
Neutral	100%
Positive	100%
Stories	
Length of story	67%
Mixed	100%
Negative	100%
Neutral	100%
Positive	100%
Worksheets	
Mixed	100%
Negative	100%
Neutral	100%
Positive	100%

Table 1 Continued

Category	Percent agreement
Protocol on gathering supplies	100%
Person of contact for dissemination	100%

Category/Subcategories	Percent agreement
Length of lesson plan	91%
Under 30 minutes	100%
30-60 minutes	100%
Over 60 minutes	100%

Table 2. Survey participants' professional experience and background characteristics (n=8)

	<u>%/n</u>
Work setting	
Community-based	50/4
School-based	50/4
Previous experience teaching nutrition or taught nutrition concepts	
No	12/1
Yes	88/7
Age groups taught (those who answered "yes" above)	
Pre-school	71/5
Early Elementary	29/2
Highest level of education	
Associate Degree	12/1
Baccalaureate Degree	50/4
Graduate Degree	38/2
Dietetic Credential (RDN and/or NDTR)	
No	88/7
Yes	12/1

Table 3. What are the characteristics of an effective lesson plan?: Representative data from participant interviews (n=8)

Category: Effective lesson plan			
Subcategory	Related Interview Question	Representative Data	
Lesson plan aspects	<i>“What aspects of the lesson made it effective in your opinion?”</i>	<p>“The graphics of the hand-outs and such are very visually pleasing.”</p> <p>“We do an activity where they find out how much sugar the drinks have.”</p> <p>“Having as many hands-on activities as you can...”</p> <p>“Giving them an opportunity to try it themselves.”</p> <p>“Reviewing what they just did, what they just talked about, and what they just learned is really important in any lesson.”</p>	
	<i>“Was there anything that added to its effectiveness?”</i>	<p>“When we work it (the lesson) in concert and fold it into our lessons.”</p> <p>“Usually with our afterschool programs, we also include a recipe...”</p> <p>“So I got a lot of positive feedback on how to read a label.”</p> <p>“They were engaged, and they were the ones building the lesson.”</p> <p>“...more kinesthetic, I think that it keeps their interest longer.”</p> <p>“Giving them an opportunity to taste that food....”</p>	

Table 3 Continued

Subcategory	Related Interview Question	Representative Data
Lesson plan activities	<i>“What, if any, activities were included in the plan?”</i>	<p data-bbox="557 373 613 1056">“Jumping jacks or jumps for how many teaspoons of sugar are in the drinks.”</p> <p data-bbox="638 772 662 1056">“Sorting into food groups.”</p> <p data-bbox="686 856 711 1056">“The food tasting.”</p> <p data-bbox="735 594 760 1056">“They’re acting out whatever their part is...”</p> <p data-bbox="784 373 857 1056">“Almost any lesson plan they do, I leave activities, whether it’s a coloring or fill in the blank, for them to do later in the week.”</p>
Subcategory	Related Interview Question	Representative Data
Areas of improvement	<i>“Were there any areas that could have been improved?”</i>	<p data-bbox="995 779 1019 1056">“No they work really well.”</p> <p data-bbox="1044 331 1101 1056">“...we do think that showing them how to read the label and how to convert the grams to teaspoons can be a little hard for them”</p> <p data-bbox="1125 632 1149 1056">“I think I would change my assessment.”</p> <p data-bbox="1174 772 1198 1056">“The parent participation.”</p> <p data-bbox="1222 569 1247 1056">“Probably, where we were, the location of it.”</p> <p data-bbox="1271 373 1343 1056">“I would have liked to have real food and sat and had a real meal together, but time did not allow for that.”</p>

Table 4. How can we keep learners engaged?: Representative data from participant interviews (n=8)

Category: Student engagement		
Subcategory	Related Interview Question	Representative Data
Student engagement methods	“What methods have you found helpful in keeping students engaged?”	<p>“So we do the lesson by asking questions, and that’s really engaging.”</p> <p>“Active learning, having them involved, rather than just teacher talk, that’s really important.”</p> <p>“I feel like a hands-on activity, because kids that age don’t like to just sit and listen.”</p> <p>“...feeding them and having them try it, and like it.”</p> <p>“...it needs to be fun.”</p>

Table 4 Continued

Subcategory	Related Interview Question	Representative Data
Types of hands-on learning	<i>"What types of hands-on learning work best?"</i>	<p>"Anytime that they can actually use multiple senses."</p> <p>"With that age group, it would be just doing as a whole class, counting the teaspoons of sugar..."</p> <p>"...examples of different kinds of food that they can feel and touch, just to increase their exposure."</p> <p>"I would say outdoor is more fun for them, but it's harder to keep them on task."</p> <p>"I think people really, really like the hands-on act of cooking."</p> <p>"Everything you can possibly do."</p> <p>"...when they have individual jobs, it makes them feel really important..."</p>
Visual aids	<i>"What type of visual aids work best with students?"</i>	<p>"Colorful, and appealing."</p> <p>"I think real examples work better than necessarily just like a picture."</p> <p>"We have a lot of the My Plate Model."</p> <p>"... pictures of the kids in the classroom, doing certain things all the way through."</p>

Table 5. What is the most effective way to organize and present a lesson plan?: Representative data from participant interviews (n=8)

Category: Content and organization			
Subcategory	Related Interview Question	Representative Data	
Lesson plan	<i>“What is the best way to organize</i>	<i>“We usually don’t use power-points; we usually use a couple posters.”</i>	
organization	<i>and present the material when you are preparing a lesson?”</i>	<i>“Something big and visual that is easy to take from place to place, like even put on a USB is beneficial.”</i>	
		<i>“Just a couple pieces of paper.”</i>	
Subcategory	Related Interview Question	Representative Data	
Order of activities	<i>“Is there a particular order of activities that works best?”</i>	<i>“So, we usually start with a review from the previous lesson, and then a little introduction of the topic of the lesson, and then an activity.”</i>	
		<i>“ ...if it’s something that’s interactive I like to wait until they’ve already done like the paper work...”</i>	
		<i>“I think breaking it up with activities really helps, and making sure to not have a ton of material all at once.”</i>	

Table 5 Continued

Subcategory	Related Interview Question	Representative Data
Important components	<i>“What components should we be sure to include?”</i>	<p>“Definitely hands-on activity. And if you can, a little recipe.”</p> <p>“I think it’s really important for kids to know what is a sugary beverage, and the why behind why we shouldn’t drink so many.”</p> <p>“I definitely think the measuring how much sugar is in something...”</p> <p>“Definitely a materials list, of course. I think objectives are really important.”</p> <p>“But if you can get them to recognize the energy they have from not drinking the sugary drink vs. drinking the water. And they’re never going to recognize that unless they experience it.”</p>
Category	Related Interview Question	Representative Data
Length of lesson plan	<i>“How long would you recommend a lesson be for children 6-9?”</i>	<p>“30-40 minutes of active engagement.”</p> <p>“I’d say 50 minutes to one hour.”</p> <p>“My lessons are 50 minutes, and I think that’s generally pretty good.”</p> <p>“I think an hour, maybe a little bit more if there is a lot of activities.”</p> <p>“I would say at the most an hour fifteen, and hour thirty.”</p> <p>“30-45 is usually a good time.”</p>

Table 6. What are the most effective instructional methods?: Representative data from participant interviews (organized by subcategory)

Category: Opinions on instructional methods		
Subcategory	Related Interview Question	Representative Data
Demonstrations	<i>"What are your thoughts on the effectiveness of demonstrations?"</i>	"...it should be pretty short..."
		"They are very helpful."
		"Demonstrating what you want from them is huge..."
		"That would be good for that age group for sure."
		"They absolutely have to have some demonstrations, highly effective."
Games	<i>"What are your thoughts on the effectiveness of games?"</i>	"Very effective."
		"I think games are great too, especially with that age group."
		"I'm hesitant to say that they're good, it just depends how you implement it in the class."
		"Don't always rule out, especially with older kids, planning it all for them."

Table 6 Continued

Subcategory	Related Interview Question	Representative Data
Group work	<i>“What are your thoughts on the effectiveness of group work?”</i>	<p>“...is a transferable skill so I think that’s really good.”</p> <p>“...this age group is more like a whole class.”</p> <p>“I think it depends on what the activity is, and how it’s set up.”</p> <p>“I think group work was great as long as there was enough adults watching the tables.”</p> <p>“Another one I’m very hesitant on.”</p> <p>“I don’t think that is as effective, it depends what they’re doing with their group.”</p> <p>“Yes, they naturally work as a group.”</p>

Table 6 Continued

Subcategory	Related Interview Question	Representative Data
Role playing	<i>"What are your thoughts on the effectiveness of role playing?"</i>	<p>"I think that's very helpful."</p> <p>"No."</p> <p>"It's the same as the games aspect, is making sure that there's a clear point to it, and then having time to reflect after, to talk about what was going on during that play."</p> <p>Role playing is good, if you do it from day one."</p> <p>"I think it could work if you set it up correctly."</p> <p>"I think bringing kids up in front of other kids at that age is embarrassing to them."</p> <p>"As long as you explain it really well, I think that would be effective, but I think that's where it's challenging..."</p> <p>"I wouldn't put it as far as the hands-on and stuff, but it's fun."</p>

Table 6 Continued

Subcategory	Related Interview Question	Representative Data
Stories	<p data-bbox="483 1104 509 1444"><i>“What are your thoughts on the effectiveness of stories.”</i></p>	<p data-bbox="483 877 509 1014">“Love them.”</p> <p data-bbox="537 390 563 1014">“Children love to tell stories; they love, love to tell stories.”</p> <p data-bbox="591 310 617 1014">“I think they will work, but only for a short story, not a long story.”</p> <p data-bbox="644 415 670 1014">“...they can be a powerful tool if they’re done correctly.”</p> <p data-bbox="698 275 760 1014">“I don’t know if 6-9 would be too old for stories. I guess it depends on the story.”</p> <p data-bbox="787 625 813 1014">“I’m not sure about the age-group.”</p> <p data-bbox="841 814 867 1014">“Super important.”</p>
Worksheets	<p data-bbox="954 1104 980 1444"><i>“What are your thoughts on the effectiveness of worksheets?”</i></p>	<p data-bbox="954 772 980 1014">Representative Data</p> <p data-bbox="1008 800 1034 1014">“Not very effective.”</p> <p data-bbox="1062 512 1088 1014">“They’re effective but we use them minimally.”</p> <p data-bbox="1115 275 1177 1014">“I think that they’re more useful to us as practitioners, than it is for a child.”</p> <p data-bbox="1205 331 1230 1014">“My kids do not like them because that is what they always do.”</p> <p data-bbox="1258 260 1284 1014">“...it’s something that they can take home and share with their family.”</p> <p data-bbox="1312 310 1373 1014">“... might not be as effective because they are still learning how to write...”</p>

Table 7. Survey participants' relative agreement to statements regarding the instructional design characteristics of the Healthy Beverage Lesson Plan (n=8)

Instructional Design Characteristics	Strongly Agree %/n	Agree %/n	Disagree %/n	Strongly Disagree %/n	No Opinion %/n
The introduction provides a solid foundation for the learner.	75/6	25/2	0/0	0/0	0/0
The lesson content corresponds closely to the learning objectives.	50/4	50/4	0/0	0/0	0/0
The time allocated to each activity is appropriate given the learning activities included in the lesson.	50/4	25/2	12/1	0/0	13/1
It is likely that the learning objectives would be achieved given the learning activities included in the lesson.	50/4	38/3	12/1	0/0	0/0
Learning activities reflect an appropriate amount of self-directed learning.	38/3	50/4	12/1	0/0	0/0
Key ideas are effectively introduced and emphasized throughout the lesson.	62/5	38/3	0/0	0/0	0/0
The lesson would effectively engage every type of learner.	50/4	50/4	0/0	0/0	0/0
The visual aids complement the corresponding learning activity.	50/4	50/4	0/0	0/0	0/0

Table 8. Survey participants' relative agreement to statements regarding the organization and clarity of the Healthy Beverage Lesson Plan (n=8)

Organization and clarity	Strongly Agree %/n	Agree %/n	Disagree %/n	Strongly Disagree %/n	No Opinion %/n
Student learning objectives are clearly stated.	75/6	25/2	0/0	0/0	0/0
The order of the learning activities is logical.	50/4	50/4	0/0	0/0	0/0
Demonstrations are effectively incorporated in the lesson.	50/4	38/3	12/1	0/0	0/0
The last activity in the lesson effectively brings the lesson to a close.	38/3	50/4	12/1	0/0	0/0
The lesson plan is well-organized.	50/4	50/4	0/0	0/0	0/0
This lesson is complete and not missing any key components.	25/2	50/4	25/2	0/0	0/0
I am familiar with the terminology included in this lesson.	88/7	12/1	0/0	0/0	0/0
The background information for the instructor is clear and complete.	75/6	25/2	0/0	0/0	0/0

Table 9. Survey participants' relative agreement to statements regarding the appropriateness and relevance of the Healthy Beverage Lesson Plan (n=8)

Age Appropriate and Relevant	Strongly Agree %/n	Agree %/n	Disagree %/n	Strongly Disagree %/n	No Opinion %/n
Every child would have the opportunity to be engaged during this lesson.	62/5	38/3	0/0	0/0	0/0
In general, the lesson is appropriate for children ages 6-9.	50/4	38/3	12/1	0/0	0/0
The learning activities are appropriate for children ages 6-9.	50/4	38/3	12/1	0/0	0/0
This lesson includes an appropriate amount active learning for children ages 6-9.	50/4	38/3	12/1	0/0	0/0
Children ages 6-9 would enjoy this lesson.	50/4	38/3	0/0	0/0	12/1
Children ages 6-9 would find the content of the lesson interesting and relevant.	50/4	38/3	0/0	0/0	12/1
Children ages 6-9 would find the visual aids relevant to their experiences and knowledge.	50/4	38/3	12/1	0/0	0/0
Student learning objectives are appropriate for children ages 6-9.	50/4	50/4	0/0	0/0	0/0
The visual aids include an appropriate amount of text for children ages 6-9.	62/5	38/3	0/0	0/0	0/0
The amount and type of physical activity included in the lesson is appropriate for children ages 6-9.	50/4	50/4	0/0	0/0	0/0
The duration of the lesson, from start to finish, is appropriate for children ages 6-9.	50/4	50/4	0/0	0/0	0/0

Chapter 5

Discussion

As described in Chapter 4, the information gathered from the interviews and surveys provided data pertaining to the research aims. In this chapter the findings from Phase I are discussed, followed by the findings from Phase II. Next, the strengths and limitations are discussed followed by the implications of this thesis study.

The goal of this study was to obtain new information that would ultimately lead to an effective healthy beverage lesson plan. The aim of Phase I was to identify the perceptions of professionals regarding the preferred content and organization of lesson plans. In Phase II of this study, the purpose was to obtain education professionals' opinions on the newly created lesson plan. Aims of Phase II were to learn to what extent education professionals found the healthy beverage lesson plan to reflect sound instructional design, to be relevant and appropriate for children ages 6-9, and finally, to be complete and organized.

Phase I: Discussion of findings

There were several indications from the findings of Phase I. As described in the previous chapter, interviews were conducted to identify the preferred content and organization of lesson plans. Findings from the interviews indicated that activities are important in keeping children ages 6-9 engaged. The significance of including hands-on activities was repeatedly mentioned throughout the interview process. While some participants explicitly use the term "hands-on," others provided examples of activities that were engaging, active, and inclusive. In addition, findings indicated that the lesson be broken up into short intervals of time. There was also mention of giving the children

an opportunity to review the lesson, whether it be right after the lesson, or at a later time. Interview findings from the last portion of the interview indicated that participants found demonstrations to be an effective method of instruction, while they found worksheets to be generally less effective. Results on participant opinions of games, group work, and role playing were inconclusive, with varied responses from participants.

Several participants drew on their experiences teaching lessons on SSBs, despite the research aim of obtaining their opinions on effective lesson plans in a more general sense. There are several potential reasons this occurred. First, the email invitation sent to participants stated that the research study was about a healthy beverage lesson plan. It is possible participants took that into consideration and tailored their responses. Second, the majority of the sample were nutrition education professionals. The lessons they teach, considering the associated consequences discussed in Chapter 2, would likely incorporate SSBs to some degree.

Findings from this thesis study correspond to other studies that drew on education professionals' opinions in the development of a lesson plan or curriculum. For example, a study done by Schmitt et al. involved teachers in the development of a nutrition education curriculum with the objectives of improving student's preference for fruit and vegetables as well as increasing knowledge of nutrition and health.⁶⁷ Teachers in the study reported they were looking for short, feasible lessons that also followed education standards. They also reported that children were engaged as well as enjoyed the lessons. Findings also suggested that students in the intervention showed greater preferences for fruits and vegetables than students who were not given the lesson. These results highlight the positive impact of including education professionals in the development of lesson plans.

While this study is similar in that educators were formative in the development of the lessons, there were several differences. The 6-week curriculum was developed in a one-day workshop. This is significantly less time than our team took to develop the RYD Healthy Beverage Lesson Plan. Additionally, while the Social Cognitive Theory was cited as a grounding theory, no other mention of a systematic approach to developing the curriculum was mentioned.

Phase II: Discussion of findings

In Phase II of this study, opinions on the RYD Healthy Beverage Lesson Plan were obtained using an online survey. This lesson plan included the purpose of the lesson, student learning objectives, the time and materials list, background information for the instructor, an overview, and instructions for each portion of the lesson including a suggested script for the instructor. The purpose of the lesson was to increase knowledge of healthy drink choices and to decrease the intake of sugary drinks among young school-aged children. Activities and games included in the lesson incorporated the stoplight approach, which has been shown in scientific literature to be effective.⁷²

Findings from this phase indicated that the majority of survey participants had a positive opinion of the instructional design characteristics of the lesson. For example, all participants agreed to statements that the introduction provided a solid foundation, that the lesson content corresponded to the learning objectives, and that key ideas were effectively introduced and emphasized throughout the lesson. All participants also agreed that the lesson would effectively engage every type of learner, and that the visual aids complimented the learning activities. Most also felt that there was an appropriate amount of time allocated to each activity, and the learning objectives were achievable. Similarly,

most reported that the learning activities reflected an appropriate amount of self-directed learning.

Results also indicated that participants had a positive opinion on the relevance and appropriateness of the lesson. For instance, most agreed that every child would have the opportunity to be engaged. Additionally, most agreed that the visual aids included an appropriate amount of text. The healthy beverage lesson plan was designed to be 45 minutes long, and all participants agreed that this was an appropriate amount of time for children ages 6-9. This is also consistent with the duration of lessons used in other studies.^{68,69,70}

In addition, results indicated that the majority of participants found the lesson to be complete and well organized. For example, all participants agreed that the learning objectives were clearly stated, and the order of the learning activities was logical. All participants also noted they were familiar with the terminology in the lesson and the background information was clear to them.

Finally, professionals involved in this thesis study all reported that they would both use the healthy beverage lesson plan and recommend it to their colleagues. These results are similar to a study by Tilles-Tirkkonen et al. Investigators collaborated with teachers, as well as experts in nutrition, psychology and education in the development of a curriculum for fifth and sixth graders.⁶⁸ All of the teachers reported they were able to carry out the curriculum and that it was consistent with their aims. All of the teachers also reported they would continue to carry out the curriculum in the future, indicating they had a positive opinion of the material, which is consistent with our findings. While

investigators in this study collaborated with a wider range of professionals, the positive impact of involving educators in the development was underscored in the results.

Limitations and Strengths

There are several limitations of this study that should be considered. One such limitation was the sampling methods and sample size. Participants were recruited exclusively from the Reno-Sparks area. In addition, the sample size was very small. Considering these limitations, the results of this investigation cannot be generalized to other education professionals. While the qualitative methods employed in the first phase of this study had a purpose, they could also be considered a limiting factor. Qualitative research is used with the intent to learn participants' views on a particular phenomenon, including the context of participants' thinking.⁷⁶ This could not be accomplished using quantitative methods. In regard to the interview method, there is always a possibility that participants did not disclose everything and may have not reported their true opinions regarding their experiences. There are a few limitations to consider in the second phase of this study. For example, the same participants from Phase I participated in Phase II. It is possible this could have led to social desirability bias.⁷⁶ All of the data collected was also self-reported. The survey tool itself lacked a question regarding the cultural appropriateness and relevance of the lesson plan. Finally, if the participant agreed or had no opinion to a portion of the survey items, they were not given an opportunity to elaborate.

Despite these limitations, there were some strengths to this study. In Phase I, participants were interviewed in person. This allowed access to real examples of handouts, materials and visuals participants used in their lessons. The interview guide

included open-ended questions with time and opportunity for the interviewer to probe for details as/if needed. It also provided opportunities for study participants to ask for clarification. All participants were interviewed in a place of their choosing; most in their place of work. Presumably, this allowed participants to feel comfortable and speak candidly during the interview. Strengths of Phase II of this study include the ample amount of time the participants had to review the lesson before the survey. Participants were also in a private setting while taking the survey, allowing for frank feedback. In addition, the survey instrument was comprehensive in regard to the wide variety of education principles reflected in the survey items. This study was unique in that the opinions of professionals were gathered before implementation. In other studies, lessons were developed and immediately given to educators to teach.^{68,69} As noted in the literature, some educators found these types of lessons difficult to incorporate into their curriculum.⁶⁸

Implications and Conclusions

Given the findings of this study and considering the limitations, there are a number of implications for future research. Findings from Phase I were based on participants' actual experiences with teaching children. They were not solely based on a theoretical framework as other studies have reported.^{20,67,68} Additionally, many of the experiences participants described involved SSBs, giving us insight into what was specifically challenging or successful for them.

In regard to Phase II, study results showed positive opinions on the lesson plan developed. Professionals all reported that they would both use the healthy beverage lesson plan and recommend it to their colleagues. However, the feasibility and outcomes

of the lesson are unknown as implementation has not been studied. Additionally, as noted, the sample was not generalizable. This provides a point of reference for future studies. Replicating the study among a larger, more generalized sample is warranted, followed by a study on the implementation of the lesson. The effectiveness of the lesson could be measured in a number of ways including the use of a control group, or pre- and post-testing for learning outcomes among children. In addition, it would be of benefit to evaluate the effectiveness of the lesson plan in achieving the stated objectives among a diverse sample of children ages 6-9, ensuring the concepts and material are culturally appropriate. Similarly, it would be of benefit to compare and contrast the effectiveness of the lesson between children in different grade-levels.

In conclusion, the goal of this study was to obtain new information that ultimately lead to an effective healthy beverage lesson plan. The goal was achieved in that valuable information regarding the preferred content and organization of effective lesson plans among educators was obtained. Additionally, the results informed the development of a lesson plan that was later viewed positively among the same sample of professionals.

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Appendix A Institutional Review Board Approval Phase I



University of Nevada, Reno

Research Integrity
218 Ross Hall / 331,
Reno, Nevada 89557
775.327.2368 / 775.327.2369 fax
www.unr.edu/research-integrity

DATE: March 19, 2019
TO: Jamie Benedict, PhD, RD
FROM: University of Nevada, Reno Institutional Review Board (IRB)

PROJECT TITLE: [508842-26] "Rethink Your Drink": Development of a Social Marketing Campaign to Reduce Intake of Sugar-Sweetened Beverages among School-Age Children
REFERENCE #: Social Behavioral; Children
SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVED
APPROVAL DATE: March 19, 2019
EXPIRATION DATE: November 13, 2019
REVIEW TYPE: Expedited Review
REVIEW CATEGORY: Expedited review #6 and #7

The UNR IRB has reviewed and approved in the above-referenced protocol in accordance with the requirements of the Code of Federal Regulations on the Protection of Human Subjects (45 CFR 46 and 21 CFR 50 and 56). This approval is based on assessment that the research met all applicable regulatory criteria. The research must be conducted in accordance with this approved submission. This submission has received Expedited Review based on applicable federal regulations.

Instructions for preparing a modification, continuing review, or status report are located at <http://www.unr.edu/research-integrity/human-research/irbnet>. Call our office if you have any questions or problems with use of IRBNet software.

Approved Documents

- Amendment/Modification - Amendent Request 3_18_2019.docx (UPDATED: 03/18/2019)
- Cover Sheet - Cover page 3-18-2019.docx (UPDATED: 03/18/2019)
- Letter - Appendix K_Stakeholder Confirmation Email.docx (UPDATED: 03/9/2019)
- Letter - Appendix I_Stakeholder Invitation Email #2.docx (UPDATED: 03/9/2019)
- Letter - Appendix H_Stakeholder Invitation Email #1.docx (UPDATED: 03/9/2019)
- Letter - Appendix G_Content Expert Reminder Email.docx (UPDATED: 03/9/2019)
- Letter - Appendix F- Content Expert Survey Packet letter.docx (UPDATED: 03/9/2019)
- Letter - Appendix B_Content Expert Invitation Email #2.docx (UPDATED: 03/9/2019)
- Letter - Appendix A_Content Expert Invitation Email #1.docx (UPDATED: 03/9/2019)
- Other - Appendix L_Handout for Stakeholders.docx (UPDATED: 03/9/2019)
- Other - Appendix M_Stakeholder Information Sheet.docx (UPDATED: 03/9/2019)
- Other - Appendix J_Stakeholder Scheduling Script.docx (UPDATED: 03/9/2019)
- Other - Appendix D_Booklet.pdf (UPDATED: 03/9/2019)
- Other - Appendix C_Content Expert Script.docx (UPDATED: 03/9/2019)

Appendix B
Interview Invitation Email

Dear _____,

We are writing to invite you to participate in a research study about a healthy beverage lesson plan for young school-age children.

This research is part of the Rethink Your Drink Nevada effort. The goal of this initiative is to promote healthy drink choices and reduce sugary drink consumption. Your valuable input will be used to develop a lesson plan to accomplish this goal.

You are among a group of professionals that have been identified as having the experience and knowledge we need. To benefit from your expertise, we would like to ask you to participate in an interview. The in-person interview will be scheduled at your convenience and will last no longer than 20-30 minutes. As a gesture of gratitude, we will leave you with a *Rethink Your Drink Nevada* soda model, a visual representation of the sugar content in soda (valued at \$70.00).

If you have questions or are interested in participating, please call 775-784-6450 or send an email to eengle@nevada.unr.edu at your earliest convenience.

Thank you in advance for considering this invitation.

Sincerely,
Jamie Benedict, Ph.D., R.D., L.D.

Erin Engle

Jamie Benedict

Erin Engle

Associate Professor

Nutrition Graduate Student

Appendix C
Healthy Beverage Lesson Plan Study
Information Sheet

We are conducting research to evaluate stakeholder feedback on effective lesson plans. The findings of this study will be used to develop a healthy beverage lesson plan for young, school-age children.

You have been asked to participate because you have professional experience and knowledge in developing effective lesson plans for children.

If you volunteer for this study, you will be asked to participate in an in-person interview. The topics will include effective lessons you have used, methods you have used to keep students engaged, effective visual aids, ideas for hands-on learning activities, and effective organization of a lesson plan.

The interview should take approximately 20-30 minutes and will be audio-recorded.

This study is considered to have minimal risk of harm. The risk level is similar to what you might experience during a normal day. Because the interview may take place in public, there is a possibility that someone else may overhear your responses to the interview questions. Remember that you can refuse to answer any questions and may withdraw from the study at any point.

There are no direct benefits to you as a volunteer in this study. The benefits of conducting research are not certain, but we hope to develop a lesson that is effective in reducing consumption of sugary beverages and increasing water intake among young, school-age children.

To thank you for your time and effort, you will receive a *Rethink Your Drink Nevada* soda model (valued at \$70).

Researchers of the University of Nevada, Reno will treat your identity and information collected with professional standards of confidentiality and protect it to the extent allowed by law. Your name will not be included in any publications or reports that may result from this study. Your name will not be mentioned in the recorded portion of the interview. The U.S. Department of Agriculture, the Division of Welfare and Supportive Services, the U.S. Department of Health and Human Services, the University of Nevada, Reno Research Integrity Office and the Institutional Review Board may look at our study records. Data collected will be destroyed no later than 5 years after the study has ended.

You may ask questions at any time by using the contact information below:

Jamie Benedict, PhD, RD, LD: email jamieb@cabnr.unr.edu, phone 775-784-6445

Erin Engle, Nutrition Researcher: email eengle@nevada.unr.edu, phone 775-784-6450

Megan Wahrenburg, MS, Research Associate: email mwahrenburg@cabnr.unr.edu, phone 775-784-6450

Your participation in this study is completely voluntary. You may stop at any time. If you decide not to participate or refuse to answer any questions, there will be no consequences for you.

You may ask about your rights as a research participant. If you have questions, concerns, or complaints about this study, you may report them by calling the University of Nevada, Reno Research Integrity Office at 775-327-2368.

Appendix D Handout



What is *Rethink Your Drink*?

This is a community-based program designed to promote healthful beverage choices and to decrease the intake of sugary drinks among school-aged children.

Audience:

The primary audience of this program has been parents/guardians of young, school age children. A small, but growing amount of programming is directed at children themselves.

Approach:

The program includes several complementary interventions that include:

- Direct-mailings to households
- Digital and Social Media (e.g., Website, Facebook, Pinterest)
- Print media (e.g., billboards)
- Partnerships with medical and dental care professionals
- Promotion of healthy drinks in select grocery stores

Funding:

USDA Supplemental Nutrition Assistance Program- SNAP

Why a lesson plan?

Rethink Your Drink Nevada has been promoting healthy drinks since 2013. We have received requests for direct education materials on sugary drinks from several community agencies. To meet this need, we plan to develop a lesson to facilitate direct education to young, school-age children in a variety of settings.

What is our vision for the lesson plan?

We have identified several key characteristics listed below.

- Audience:
 - Children age 6-9
- Learning objectives/outcomes
 - Participants will be able to:
 - Identify a sugary drink
 - State one benefit of making healthy beverage choices
 - State one change they can make at home to choose a healthy beverage
 - Participant will:
 - Affirm their intention to more often choose water over a sugary drink
 - Participants' experience
 - Hands-on learning opportunities
 - Positive, empowering tone and messages



University of Nevada, Reno



Your role: To provide us with your perspective and ideas on this healthy beverage lesson plan

Appendix E
Interview Follow-up email

Name
Address

Dear _____,

Recently, you were sent an email inviting you to participate in an interview about a healthy beverage lesson plan for young, school-age children. If you are interested please let us know by emailing eengle@nevada.unr.edu or calling 775-784-6450.

We value your time and hope to hear back from you at your earliest convenience.

Thank you in advance for considering this invitation.

Sincerely,
Jamie Benedict, Ph.D., R.D., L.D.

Erin Engle

Jamie Benedict

Associate Professor

Erin Engle

Nutrition Graduate Student

Appendix F Interview Guide

Verbal consent:

Thank you again for taking the time to meet with me today. As noted in the Information Sheet, I will be asking you some questions about effective lesson plans. Have you had time to review the information? Do you have any questions about the study before we start? (If the answer is no, sufficient time will be provided)

After I begin recording I will not mention your name to ensure it is not on record. I am turning the recorder on now.

Do I have your verbal consent to participate in this interview and for it to be audio recorded?

Introduction:

I'd like to start by asking some general questions about lesson plans you have used previously.

1. To begin with, please think about a lesson plan you used recently that you considered effective. (Time to reflect)
 - a. Would you please describe it for me briefly?
 - b. What aspects of the lesson plan made it effective in your opinion?
 - c. What, if any, activities were included in the plan?
 - d. Was there anything that added to its effectiveness?
 - e. Were there any areas that could have been improved?
 - f. Was there anything else significant about the lesson plan that we haven't discussed?

That was very helpful, thank you. For the next few questions, please think about your experiences with young children, ages 6-9 specifically in 1st, 2nd, and 3rd grades.

2. What methods have you found helpful in keeping students engaged? (Probe, ask for specifics, "Can you tell me more about that?")
3. What type of visual aids work best with students?
 - a. Do you have any you can show me?
4. What types of hands-on learning (or experiential learning) work best with students?
 - a. What about these activities makes them effective?

For this final part of the survey, I would like to ask you some specific questions about the new lesson we have planned.

5. Let's start with content and organization.
 - a. In your opinion, what is the best way to organize and present the material when you are preparing a lesson plan?
 - b. Is there a particular order of activities that works best?
 - c. What components should we be sure to include in the lesson plan?

6. Again, thinking about your experience with children ages 6-9, what are your thoughts on the effectiveness of the following instructional methods?
 - a. Demonstrations
 - b. Games
 - c. Worksheets
 - d. Stories
 - e. Role playing
 - f. Group work

7. If the lesson plan required supplies, such as cups, sugar, and handouts, how would you go about getting them?

8. For our purposes, how long would you recommend a lesson be for children 6-9 years old?

Thank you. Finally, our plan is to make this available to other agencies and programs, we would like your thoughts on how to best distribute the lesson plan.

9. Who in your agency would be the best person to contact in order to disseminate the lesson plan?

Again, I would like to thank you for your time and participation; your input is greatly appreciated. And here is your Rethink Your Drink soda model.

Appendix G Institutional Review Board Approval Phase II



University of Nevada, Reno

Research Integrity
218 Ross Hall / 331,
Reno, Nevada 89557
775.327.2368 / 775.327.2369 fax
www.unr.edu/research-integrity

DATE: April 10, 2020
TO: Jamie Benedict, PhD, RD
FROM: University of Nevada, Reno Institutional Review Board (IRB)

PROJECT TITLE: [508842-30] "Rethink Your Drink": Development of a Social Marketing Campaign to Reduce Intake of Sugar-Sweetened Beverages among School-Age Children

REFERENCE #: Social Behavioral; Children
SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVED
APPROVAL DATE: April 10, 2020

REVIEW TYPE: Expedited Review
REVIEW CATEGORY: Expedited review # 7

The UNR IRB has reviewed and approved in the above-referenced protocol in accordance with the requirements of the Code of Federal Regulations on the Protection of Human Subjects (45 CFR 46 and 21 CFR 50 and 56). This approval is based on assessment that the research met all applicable regulatory criteria. The research must be conducted in accordance with this approved submission. This submission has received Expedited Review based on applicable federal regulations.

- Amendment/Modification - Amendent Request 4-3-20.docx (UPDATED: 04/3/2020)survey nutrition education professionals for the purpose of obtaining their opinions of a healthy beverage lesson plan.
- Letter - Appendix D_Survey Invitation 2.docx (UPDATED: 04/3/2020)
- Letter - Appendix A_Survey Invitation 1.docx (UPDATED: 04/3/2020)
- Other - Appendix E_Phone call script.docx (UPDATED: 04/3/2020)
- Other - Appendix C_Lesson plan visuals.pptx (UPDATED: 04/3/2020)
- Other - Appendix B_Healthy Drinks for Healthy Kids lesson plan.docx (UPDATED: 04/3/2020)
- Protocol - Protocol 4-3-20.docx (UPDATED: 04/3/2020)
- Questionnaire/Survey - Appendix F_Healthy Drinks for Healthy Kids lesson plan Survey.docx (UPDATED: 04/3/2020)
- Training/Certification - Jones, Deborah Human Research Group 1 Social Behavioral Research Investigators and Key Personnel Group - Completion Certificate.pdf (UPDATED: 04/7/2020)
- Training/Certification - CITI_Treftz, Chenin.pdf (UPDATED: 04/7/2020)
- Training/Certification - CITI_Megan Wahrenburg.pdf (UPDATED: 04/7/2020)
- Training/Certification - CITI_Erin Engle.pdf (UPDATED: 04/7/2020)
- Training/Certification - CITI_Elizabeth Christiansen.pdf (UPDATED: 04/7/2020)
- Training/Certification - CITI_Eiler, Kelly .pdf (UPDATED: 04/7/2020)

Appendix H
Survey Invitation Email

Dear _____,

We would like to thank you for your participation in the first phase of our research. Your contributions were used to develop a lesson plan for young, school-age children about healthy beverages called the Healthy Drinks for Healthy Kids lesson plan. The purpose of this note is to invite you to participate in the next phase which involves completing an online survey about the overall effectiveness of the lesson plan.

As you may recall, this research is a part of the *Rethink Your Drink Nevada* effort. The goal of this program is to promote healthy drink choices and reduce sugary drink consumption. Upon completion, the healthy beverage lesson plan resulting from these efforts will be incorporated into the program.

Your participation in this study is completely voluntary, and you may decide to quit at any time without penalty. The study poses very little risk and there is no direct benefit to you. Your survey responses will be kept confidential, and your name will not be included in any reports. Because of the small number of professionals selected for this survey, your participation is very important to us. Therefore, we will send you a reminder email in about a week.

Should you decide to participate, please first review the lesson and visuals attached to this email. Next, please enter the URL shown below into a web browser to access the survey. At the beginning of the survey, you will be prompted to enter the access code. Please be sure to type in the website URL and access code exactly as they appear below. The website URL is case sensitive.

Website URL: <https://tinyurl.com/RYDLessonPlan>

Access Code:

Reviewing the lesson plan materials will take approximately 15 minutes and completing the survey will take about 10 minutes. We know your time is valuable. As a way of saying thanks we will send you our latest models that illustrate the amount of sugar in energy drinks and sweetened coffee drinks, plus our *Sip Your Way to Health* recipe book. Please respond to this email with your mailing address once you have completed the survey so we may promptly send your gifts.

If you have questions, please call 775-784-6445 or send an email to eengle@nevada.unr.edu at your earliest convenience. There is an office that provides oversight called the Research Integrity Office. You may call them if you have any concerns on the conduct of the study at (775) 327-2367.

Thank you in advance for considering this invitation.

Sincerely,

Jamie Benedict, Ph.D., R.D.N., L.D.

Jamie Benedict

Rethink Your Drink Project Director

Erin Engle

Erin Engle

Nutrition Graduate Student

Appendix I
Survey Follow-up Email

Dear _____,

We recently sent an email inviting you to participate in an online survey about the effectiveness of a lesson plan for young, school-age children called the Healthy Drinks for Healthy Kids lesson plan. Our research team would greatly benefit from your feedback and participation. You are among a small group of nutrition education professionals who have been selected to take the survey.

Should you decide to participate, please first review the lesson and visuals attached to this email. Next, to access the online survey, type in the website URL and access code exactly as they appear below. The website URL is case sensitive.

Website URL: <https://tinyurl.com/RYDLessonPlan>
Access Code:

As a reminder, reviewing the lesson plan materials will take approximately 15 minutes and completing the survey will take about 10 minutes. As a thank you, we will send you our latest models that illustrate the amount of sugar in energy drinks and sweetened coffee drinks, plus our *Sip Your Way to Health* recipe book. Please respond to this email once you have completed the survey with your mailing address so we may promptly send your gifts.

If you have questions, please call 775-784-6445 or send an email to eengle@nevada.unr.edu at your earliest convenience. There is an office that provides oversight called the Research Integrity Office. You may call them if you have any concerns on the conduct of the study at (775) 327-2367.

Thank you in advance for considering this invitation.

Sincerely,

Jamie Benedict, Ph.D., R.D.N., L.D.

Jamie Benedict

Rethink Your Drink Project Director

Erin Engle

Erin Engle

Nutrition Graduate Student

Appendix J Survey Instrument

Start of Block: Introduction

Healthy Drinks for Healthy Kids lesson plan survey

Thank you for your interest.

The purpose of this survey is to obtain your opinions regarding the overall effectiveness of the Healthy Drinks for Healthy Kids lesson plan.

If you have any questions please call 775-784-6445.

Please click the button below to continue.

End of Block: Introduction

Start of Block: Agree to participate

If you are 18 years or older and wish to participate in the study, please indicate that you agree to participate by clicking the button below.

- I agree to participate
- I do not agree to participate

Skip To: End of Block If If you are 18 years or older and wish to participate in the study, please indicate that you agree... = I agree to participate

Thank you. To exit the survey, please close your browser.

Skip To: End of Survey If Thank you. To exit the survey, please close your browser. Is Displayed

End of Block: Agree to participate

Start of Block: Part 1

Part I. The following statements refer to the Healthy Drinks for Healthy Kids lesson plan that you recently read. Please choose the response that most accurately describes your opinion.

The introduction provides a solid foundation for the learner.

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
 - No Opinion
-

Display This Question:

If The introduction provides a solid foundation for the learner. = Disagree

Or The introduction provides a solid foundation for the learner. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

Student learning objectives are clearly stated.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If Student learning objectives are clearly stated. = Disagree

Or Student learning objectives are clearly stated. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

The order of the learning activities is logical.

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
 - No Opinion
-

Display This Question:

If The order of the learning activities is logical. = Disagree

Or The order of the learning activities is logical. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

The lesson content corresponds closely to the learning objectives.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If The lesson content corresponds closely to the learning objectives. = Disagree

Or The lesson content corresponds closely to the learning objectives. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

The time allocated to each activity is appropriate given the learning objectives.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If The time allocated to each activity is appropriate given the learning objectives. = Disagree

Or The time allocated to each activity is appropriate given the learning objectives. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

It is likely that the learning objectives would be achieved given the learning activities included in the lesson.

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
 - No Opinion
-

Display This Question:

If It is likely that the learning objectives would be achieved given the learning activities include... = Disagree

Or It is likely that the learning objectives would be achieved given the learning activities include... = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

Learning activities reflect an appropriate amount of self-directed learning.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If Learning activities reflect an appropriate amount of self-directed learning. = Disagree

Or Learning activities reflect an appropriate amount of self-directed learning. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

Key ideas are effectively introduced and emphasized throughout the lesson.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If Key ideas are effectively introduced and emphasized throughout the lesson. = Disagree

Or Key ideas are effectively introduced and emphasized throughout the lesson. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

The lesson would effectively engage every type of learner (i.e., visual, kinetic, auditory learner).

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
 - No Opinion
-

Display This Question:

If The lesson would effectively engage every type of learner (i.e., visual, kinetic, auditory learner). = Disagree

Or The lesson would effectively engage every type of learner (i.e., visual, kinetic, auditory learner). = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

The visual aids complement the corresponding learning activity.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If The visual aids complement the corresponding learning activity. = Disagree

Or The visual aids complement the corresponding learning activity. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

I am familiar with the terminology included in in this lesson.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If I am familiar with the terminology included in in this lesson. = Disagree

Or I am familiar with the terminology included in in this lesson. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

The background information for the instructor is clear and complete.

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
 - No Opinion
-

Display This Question:

If The background information for the instructor is clear and complete. = Disagree

Or The background information for the instructor is clear and complete. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

Every child would have the opportunity to be engaged during this lesson.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If Every child would have the opportunity to be engaged during this lesson. = Disagree

Or Every child would have the opportunity to be engaged during this lesson. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

Demonstrations are effectively incorporated in the lesson.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If Demonstrations are effectively incorporated in the lesson. = Disagree

Or Demonstrations are effectively incorporated in the lesson. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

The last activity in the lesson effectively brings the lesson to a close.

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
 - No Opinion
-

Display This Question:

If The last activity in the lesson effectively brings the lesson to a close. = Disagree

Or The last activity in the lesson effectively brings the lesson to a close. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

In general, the lesson is appropriate for children ages 6-9.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If In general, the lesson is appropriate for children ages 6-9. = Disagree

Or In general, the lesson is appropriate for children ages 6-9. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

The learning activities are appropriate for children ages 6-9.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If The learning activities are appropriate for children ages 6-9. = Disagree

Or The learning activities are appropriate for children ages 6-9. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

This lesson includes an appropriate amount of active learning for children ages 6-9.

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
 - No Opinion
-

Display This Question:

If This lesson includes an appropriate amount of active learning for children ages 6-9. = Disagree

Or This lesson includes an appropriate amount of active learning for children ages 6-9. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

Children ages 6-9 would enjoy this lesson.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If Children ages 6-9 would enjoy this lesson. = Disagree

Or Children ages 6-9 would enjoy this lesson. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

Children ages 6-9 would find the content of the lesson interesting and relevant.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If Children ages 6-9 would find the content of the lesson interesting and relevant. = Disagree

Or Children ages 6-9 would find the content of the lesson interesting and relevant. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

Children ages 6-9 would find the visual aids relevant to their experiences and knowledge.

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
 - No Opinion
-

Display This Question:

If Children ages 6-9 would find the visual aids relevant to their experiences and knowledge. = Disagree

Or Children ages 6-9 would find the visual aids relevant to their experiences and knowledge. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

Student learning objectives are appropriate for children ages 6-9.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If Student learning objectives are appropriate for children ages 6-9. = Disagree

Or Student learning objectives are appropriate for children ages 6-9. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

The visual aids include an appropriate amount of text for children ages 6-9.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If The visual aids include an appropriate amount of text for children ages 6-9. = Disagree

Or The visual aids include an appropriate amount of text for children ages 6-9. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

The amount and type of physical activity included in the lesson is appropriate for children ages 6-9.

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
 - No Opinion
-

Display This Question:

If The amount and type of physical activity included in the lesson is appropriate for children ages... = Disagree

Or The amount and type of physical activity included in the lesson is appropriate for children ages... = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

The duration of the lesson, from start to finish, is appropriate for children ages 6-9.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If The duration of the lesson, from start to finish, is appropriate for children ages 6-9. = Disagree

Or The duration of the lesson, from start to finish, is appropriate for children ages 6-9. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

The lesson plan is well-organized.

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- No Opinion

Display This Question:

If The lesson plan is well-organized. = Disagree

Or The lesson plan is well-organized. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

This lesson is complete and not missing any key components.

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
 - No Opinion
-

Display This Question:

If This lesson is complete and not missing any key components. = Disagree

Or This lesson is complete and not missing any key components. = Strongly Disagree

Please explain how the lesson plan could be improved relative to this characteristic:

End of Block: Part 1

Start of Block: Part 2

Part II. Next, please answer the general questions about this lesson.

What is the likelihood that you would use this lesson plan to instruct children ages 6-9?

- Very likely
- Somewhat likely
- Somewhat unlikely
- Very unlikely
- No opinion

Display This Question:

If What is the likelihood that you would use this lesson plan to instruct children ages 6-9? = Somewhat unlikely

Or What is the likelihood that you would use this lesson plan to instruct children ages 6-9? = Very unlikely

Please describe the characteristics of the lesson plan that could be improved:

What is the likelihood that you would recommend this lesson plan to your colleagues that instruct children ages 6-9?

- Very likely
- Somewhat likely
- Somewhat unlikely
- Very unlikely
- No opinion

Display This Question:

If What is the likelihood that you would recommend this lesson plan to your colleagues that instruct... = Somewhat unlikely

Or What is the likelihood that you would recommend this lesson plan to your colleagues that instruct... = Very unlikely

Please describe the characteristics of the lesson plan that could be improved:

End of Block: Part 2

Start of Block: Part 3

Part III. Finally, we have a few more questions about you and your work experience.

How many years of experience do you have working as an education professional?

- 1-4
 - 5-9
 - 10-14
 - 15+
-

Which of the following best describes your work setting?

- School-based setting
 - Community setting
 - Other. Please explain:
-

Have you previously taught food/nutrition related concepts to children?

- No
- Yes

Skip To: Q33 If Have you previously taught food/nutrition related concepts to children? = No

What age group(s) have you taught food/nutrition related concepts?
Check all that apply.

- Pre-school (age 3-5)
 - Early elementary (6-8)
 - Upper elementary (9-12)
 - Middle school (13-15)
 - High school
-

In what setting did this instruction take place?

- School-based
 - Community-based
 - Other. Please Explain: _____
-

What is your highest level of education?

- High school
 - Associate's degree
 - BA, BS
 - Master's degree
 - Doctorate
 - Other _____
-

Do you hold a dietetic credential?

- Yes, NDTR
 - Yes, RDN
 - Yes, NDTR and RDN
 - No
-

What is your gender?

- Male
- Female
- Non-binary

End of Block: Part 3

Start of Block: Name and Address

Thank you for answering our questions. Please provide your name and address so that we can send you your Sip Your Way to Health recipe book and drink models.
