University of Nevada, Reno

A Formative Research Study of Physicians and Dentists Regarding Educational Resources to Reduce Intake of Sugar-Sweetened Beverages Among 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 study was to conduct formative research regarding the development of additional educational resources for use in primary and dental care settings that are designed to reinforce the importance of limiting sugary drinks and to promote more healthful choices by parents/guardians. Primary care providers and dentists who treat young, school-aged children from low-income households in Washoe County, and who had previously ordered copies of the Rethink Your Drink campaign materials served as key informants. This study employed qualitative methods to obtain in-depth information from this audience to determine ways to improve existing educational resources, desired characteristics/features of other educational resources, preferences regarding the inclusion of resources in a tool-kit, and differences between preferences of primary care providers and dentists in regards to educational resources. Semi-structured in-depth interviews were conducted using an interview guide specifically developed for this study. Research participants included six primary care physicians and five dentists. Verbatim transcripts of the interviews were coded and organized into categorizes for each of the educational resources being examined. The findings provided information regarding ways to improve the existing brochures as part of the Rethink Your Drink campaign including omitting specific content, enhancing the visual appeal, and translating the materials into several languages. Perceptions about the desired characteristics and features of other educational resources that may be useful in reducing children’s intake of sugar-sweetened beverages were also obtained. These resources included posters, display/model, digital versatile disc (DVD), and a screening tool. The
participants’ responses indicated that a tool-kit including one or more of the resources discussed may be of value in their efforts to reduce intake of sugary drinks among their patients. Compared to physicians, dentists more often expressed the need for resources to emphasize the oral health effects of sugar-sweetened beverages. This study gathered relevant information from health professionals regarding the types and characteristics of additional educational resources that may be useful in primary and dental care settings to limit children’s intake of sugar-sweetened beverages and promote more healthful choices.
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Chapter 1

Introduction

This chapter provides an overview of the research problem, the purpose of this study, and the associated methods. In addition, the section presents a brief summary of published research that addresses sugar-sweetened beverage consumption and its impact on health. Lastly, this chapter includes a brief description about how health behaviors could be improved within a primary healthcare setting.

Statement of the Problem

Among U.S. children and adolescents, total energy intake increased significantly from 1989 to 2004, and subsequently declined through 2010, paralleling obesity rates (Slining, 2013; Ogden, Carroll, Kit, & Klegal, 2014). Sugar-sweetened beverages were a major contributor to the top-10 sources of energy intake from 1998-2010, with time trends showing a steady increase in consumption, especially among children and adolescents (Slining, et al., 2013; Hu & Malik, 2010). Sugar-sweetened beverages (SSB) are generally defined as beverages that have an added caloric sweetener (e.g., high-fructose corn syrup or sucrose) such as sodas, juice cocktails, energy drinks, and sweetened teas (Harrington, 2008).

Multiple studies examining nationally representative samples have shown an increase in consumption of SSB over the past decades including the work from Nielsen and Popkin (2004) who observed that sugar-sweetened beverages increased from 4.8% to 10.3% of total energy intake between the late 1970s and 2001, among youth aged 2 to 19
years. Among all age groups, they found the proportion of total energy intake from soft drinks and fruit drinks increased. In addition, portion sizes of SSB increased significantly over time at both home, and at fast food and restaurant locations. Wang, Bleich, & Gortmaker (2008) found 89% of youth consumed at least one sugar-sweetened beverage, including 100% fruit juice, on a typical day. This level intake remained virtually unchanged from 1988-1994 to 1999-2004. Slinging et al. (2013) observed an increased intake from 1989 to 2004 among children and adolescents. While more recent data, 2005 to 2010, showed a decreased intake, with 6.1% of total energy coming from SSB (Slinging et al., 2013).

With obesity rates and sugar-sweetened beverage intakes closely paralleling each other in recent decades, some have speculated that SSB may be a contributor to the obesity epidemic. Possible reasons include the high added sugar content found in SSB, low satiety following consumption, and lack of compensation for the additional energy intake at subsequent meals (Hu & Malik, 2010; Malik, Schulze, & Hu, 2006). Among the adult population, a number of large-scale epidemiological studies have noted positive associations among sugar-sweetened beverage consumption, long-term weight gain and risk of chronic diseases including type 2 diabetes, metabolic syndrome, and cardiovascular disease (Harrington, 2008). Studies of the pediatric population have found positive associations among sugar-sweetened beverage consumption, excessive weight gain and health risks including insulin resistance, tooth decay, and increased blood pressure (Malik, Pan, Willett, & Hu, 2013; Bremer, Auinger, & Byrd, 2009; Demissie et al., 2013; Kell et al., 2014).
Consequently, reductions in SSB intake were recommended in the 2010 Dietary Guidelines for Americans since they have been identified as the primary source of added sugars in the American diet (USDA & USDHHS, 2010). The 2010 Dietary Guidelines specifically recommends that Americans should reduce intake “by drinking fewer sugar-sweetened beverages and/or consume smaller portions” (Page 16, USDA & USDHHS, 2010), and to “limit excess calories and maintain healthful weight, individuals are encouraged to drink water and other beverages with few or no calories” (Page 48, USDA & USDHHS, 2010). Recommendations to decrease the intake of SSB have also been issued by multiple health organizations including, but not limited to, the American Academy of Pediatrics, American Medical Association, American Academy of Family Practitioners, Academy of Nutrition and Dietetics, and American Dental Association (AHA et al., 2006; Rao, 2008; AAFP, 2014; AND, 2012; ADA, 2014).

The Scientific Report of 2015 Dietary Guidelines Advisory Committee recommends that the new Dietary Guidelines for Americans encourage “Replacing soft drinks and other sugar-sweetened beverages (including sports drinks) with non-fat fluid milk…(to) substantially reduce added sugars and empty calories and increase the intake of shortfall nutrients, including calcium, vitamin D, and magnesium” (Part D. Chapter 1, Page 27, USDA & USDHHS, 2015). With the high contribution of calories from sugar-sweetened beverages they suggested that further “Strategies are needed to encourage the U.S. population to drink water when they are thirsty” (Part D. Chapter 1, Page 46, USDA & USDHHS, 2015). The Advisory Committee also recommends in order to establish healthy food environments, food assistance programs, such as the Supplemental Nutrition
Assistance Program (SNAP), need to align with the Dietary Guidelines for Americans providing standards for purchasing healthful foods and discouraging “…the purchase and consumption of foods, such as sugar-sweetened beverages” (Part B. Chapter 2, Page 9, USDA & USDHHS, 2015).

Multiple factors influence a child’s consumption of food and beverages, including SSB (e.g., socioeconomic, interpersonal, and policy influences), but for young children, parents have been identified as one of the most significant. Parents and guardians are sometimes referred as the “nutritional gatekeepers” for children, determining the types, amounts, and preparation of foods and beverages in the home (Larson and Story, 2009). Children view parents and guardians as models for eating behavior, relying on them for shaping nutrition attitudes and establishing the structure of shared meals. In addition, parental eating patterns have also been found to affect a child’s weight status (Dev, McBride, Fiese, Jones, & Cho, 2013).

Due to the role of parents and guardians on children’s consumption of SSB, researchers have studied ways to influence parent’s behaviors regarding SSB (e.g., Rader, Mullen, Sterkel, Strunk, and Garbutt, 2014). One such study explored the potential role that primary care providers play in influencing parental beliefs and behaviors surrounding these beverage choices. The researchers found that 65.6% of parents would likely reduce SSB consumption if it was recommended by the physician (Rader et al., 2014). This study was supported by other work that noted parents rely on health professionals for information regarding their children’s health, including appropriate amounts of SSB.

**Context**

This thesis study is one component of the *Rethink Your Drink* investigation. The goal of this investigation is to identify community-based strategies that will effectively reduce the intake of SSB among young, school-aged children. The current target audience is parents/guardians of children aged 6-12 years living in households participating in SNAP within Washoe County, NV. The current *Rethink Your Drink* campaign focuses on reducing home availability of SSB by educating parents/guardians about sugary drinks, developing their ability to identify these drinks, and enhancing self-efficacy in choosing healthful beverage alternatives. Thus far strategies developed and evaluated have included a direct-mail intervention, a media campaign, an educational website, and collaboration with health professionals. Regarding the latter, this most recent effort in 2014 included inviting health professionals to distribute *Rethink Your Drink* brochures to parents/guardians of young school-age children. For this thesis study, my contributions were directed toward enhancing these collaborations, specifically exploring health professional’s opinions regarding the types and characteristics of additional educational resources that may be used in primary and dental care settings.

The theoretical basis for this thesis study was the Social Cognitive Theory (SCT). Albert Bandura proposed and developed the SCT as a way to understand human thought, motivation, and action (Bandura, 1986). Bandura described human behavior as a learned process through observation, social interactions, and experiences. The SCT has been
used as a framework for understanding and incorporating both individual and organizational approaches to behavior change. As described by Contento (2011) the SCT has been found to be especially useful in designing public health programs and nutrition education, which address both skill development and motivational behavior practices by the individuals within a community (Baranowski et al., 2000).

**Purpose and Methods**

The purpose of this thesis study was to conduct formative research regarding the development of additional educational resources for use in primary and dental care settings that are designed to reinforce the importance of limiting sugary drinks and promote more healthful choices by parents/guardians. Qualitative methods were employed to address the following research questions:

1) In what ways can the existing educational resources, provided by the *Rethink Your Drink* campaign, be improved?

2) What are the desired characteristics/features of other educational resources that may serve to reinforce the importance of limiting sugary drinks and promote more healthful choices?

3) What educational resources are most preferred for a tool-kit designed to reinforce the importance of limiting sugary drinks and promote more healthful choices?
4) How do the opinions and preferences of primary care providers differ from dentists in regards to other educational resources that reinforce the importance of limiting sugary drinks and promote more healthful choices?

Semi-structured in-depth interviews were conducted to obtain the qualitative data related to these research questions. The sample included primary care providers and dentists in Washoe County, who provided care to children from low-income households and who had previously used materials from the Rethink Your Drink campaign.

In summary, an overview of the research problem, the purpose of this study, research questions, and the associated methods were briefly presented here. In addition, a brief summary of the research pertaining to sugar-sweetened beverage consumption and its impact on health correlates were explained.
Chapter 2

Review of the Literature

As a basis for this thesis study, research related to sugar-sweetened beverages, including consumption patterns and the potential influences on intake among children and adolescents, is described in this review of the literature. In addition, health correlates of sugar-sweetened beverage intake are briefly explained. Lastly, the use of the primary care setting as a location to influence health behaviors will be discussed providing a foundation for this thesis.

Sugar-Sweetened Beverages

Sugar-sweetened beverages (SSB), also commonly referred to as sugary drinks, are defined as beverages that have an added caloric sweetener (Harrington, 2008). A variety of caloric sweeteners are added to SSB including: sugar, sucrose, dextrose, maltodextrin, evaporated cane juice, high-fructose corn syrup, and cane sugar (Jacobson, 2005). Many, but not all, of the studies included in this review of the literature used this definition. A small number have included 100% fruit juices as a sugar-sweetened beverage (Wang et al., 2008). While flavored milks fit the definition of SSB they are typically categorized as a dairy beverage due to the calcium content (Slining, Mathias, & Popkin, 2013). Differences in intake of SSB among studies can potentially be attributed to the inclusion of these additional SSB in comparison to those who used a more restrictive definition. Therefore the definitions used by the study authors are included in the details of the studies described below.
In 1942, the U.S. produced approximately sixty 12-ounce servings of carbonated soft drinks per person. By 2005, this number of drinks per person increased almost 10-fold (Jacobson, 2005). In addition, the variety of SSB available to consumers has grown dramatically since the introduction of carbonated soft drinks. It is estimated that there are now more than 600 sugary drink and energy drink products available in the marketplace, including fruit drinks, sweetened teas and coffees, energy drinks, flavored water, and sports drinks (Harris, Schwartz, & Brownell, 2011; Harrington, 2008).

While the amount of added sugar in SSB has not increased per ounce over the years, consumption has increased and has been partially attributed to the increase in container sizes. In the 1950s, the standard serving size for a soft drink was a 6.5-ounce bottle. This increased to a 12-ounce can in the 1960s, a 20-ounce bottle in the 1990s, and now even larger sizes can be purchased at stores, restaurants, and movie theaters (Jacobsen, 2005). While the average serving has remained at approximately 12-ounces, many individuals have been found to consume greater amounts as a result of purchasing these larger containers (Jacobsen, 2005).

In addition to the increased production of SSB and container sizes, children and adolescents were reported to be exposed to, and influenced by the related marketing. According to one study, youth spent a considerable amount of time exposed to media, television, computers, and video games. For example, in a nationally representative study of 11,429 high-school students, authors estimated that on an average school day, 28.3% of students within the U.S. watched television longer than three hours a day and 23.5% spent more than three hours a day on a computer, playing a video or computer
game (Demissie, Lowry, Eaton, Park, & Kann 2013). Estimates from the same study reported that nationwide, approximately 41% of students ate dinner with the television on most of the time or always, 79.9% had more than three televisions in their home, and 70.2% had a television in their bedroom. Youth with high exposure to the media have been found to be significantly more likely to consume SSB, greater than three times a day in comparison to youth with low to no exposure (Demissie et al., 2013). Consumption patterns will be discussed in greater detail later in this chapter.

The U.S. Federal Trade Commission (2012) reported that in 2009 food and beverage companies spent more than $1.79 billion to promote their products to youth. Carbonated beverages were among the top three youth-directed food marketing categories accounting for $395 million. A slight decrease in youth-directed food marketing was noted between 2006 and 2009 following the Council of Better Business Bureau’s launching of the Children’s Food and Beverage Advertising Initiative; a public voluntary health initiative intended to promote healthier products (Federal Trade Commission, 2012). This initiative was designed to change the types of foods and beverages advertised to children 12 years and younger. Researchers have studied the changes to food and beverage advertising practices prior to, and following the initiative.

Powell, Szycpka, & Chaloupka (2010) examined the changes in the extent and content of food advertising between 2003 and 2007 directed towards youth. The researchers used trend analysis from television ratings data licensed from the Nielsen Media Research. The ratings were examined separately for three age groups: children 2 to 5 years and 6 to 11 years, and adolescents 12 to 17 years. According to their findings,
in 2003, SSB accounted for the greatest proportion of advertising exposure among all food categories. Similar to all food advertisements, which fell between 2003 and 2007, SSB advertisements were reported to be substantially decreased during this time. Exposure to regular soft drink advertising fell by 68.2% among children 2 to 5 years of age, 69.2% among children 6 to 11 years of age, and 66.1% among children 12 to 17 years of age. Exposure to fruit drink advertising fell by 75% among children 2 to 5 years of age, 71.7% among children 6 to 11 years of age, and 61.9% among children 12 to 17 years of age. Fruit juice ad exposure also fell during this time among the three age groups, but was not as significant as the regular soft drink and fruit drink promotions.

Although there is evidence that a decrease in beverage advertising has occurred, additional influences, including interpersonal relationships, on youth remain unchanged; these influences will be discussed later (Powell et al., 2010). In an effort to better understand the consumption patterns of SSB, research studies have focused on changes in both quality and quantity of intake as described below.

**Consumption Patterns of SSB Among Children**

The National Health and Nutrition Examination Survey (NHANES) is a continuous survey used to assess the nutritional status and health of adults and children in the U.S. and determine its association with health promotion and disease prevention (CDC, 2014). According to the Center for Disease Control’s (CDC) NHANES website, this ongoing survey method uses both phone interviews, as well as in-person physical examinations and questionnaires to collect data on over 5,000 participants each year within the U.S. The NHANES program started in the early 1960s and the survey became
a continuous program in 1999 focusing on health and nutrition measurements. The interview component includes socioeconomic, demographic, dietary, and health-related questions; and the physical examination component includes medical, dental, and physiological measurements, and laboratory tests. The sample used for NHANES is a nationally representative sample. To ensure all populations are accounted for and statistics are reliable, NHANES over-samples African Americans, Asians, Hispanics, and persons 60 and older.

The dietary methodology for NHANES uses three collection sources: dietary behavior, 24-hour dietary recall, and food frequency questionnaire (CDC, 2014). Each is briefly described here. Dietary behavior is collected during the household interview and information such as dietary supplement use and dietary modification due to health conditions is collected. A 24-hour recall is conducted during the physical examination component by a dietary interviewer using the multiple-pass method, a method used to ensure all food items and portions are properly collected. Participants, 12 years and older, complete the interview on their own. Proxy-assisted interviews are completed with children 6 to 11 years of age, and proxy respondents report for children 5 years and younger. Since 2002, a second 24-hour dietary recall was added that is conducted by telephone approximately 3 to 10 days after the initial exam. Following the completion of the second 24-hour dietary recall participants are mailed a food frequency questionnaire. The food frequency questionnaire collects information on the frequency of foods and food groups consumed during the previous 12-months. Proxy respondents and proxy-assisted respondents are used the same way as the 24-hour recall.
Results from NHANES are used to determine risk factors for and prevalence of major disease states (CDC, 2014). The data resulting from these surveys have been used as the basis for national standards, such as the CDC growth charts. Survey data is also used to direct and design health programs and services; help to develop public health policy; and to expand the health knowledge for the Nation. As an example, NHANES data provides information important for tracking overweight and obesity trends. With previous time trend data showing an increased rate in the prevalence of overweight and obesity, many programs have been created emphasizing diet and exercise for prevention and treatment of overweight/obesity (Ogden et al., 2014; Larson & Story, 2009).

Investigations of dietary consumption amounts and patterns among different populations can be used to assess nutrition status and its association with disease prevention (CDC, 2014). The Continuing Survey of Food Intakes by Individuals (CSFII) was used prior to NHANES but focused solely on the type and amount of food consumed without a medical examination. CSFII was integrated into NHANES beginning with the 2002 data collection, but questions regarding food shopping, spending, and preparation were not carried over. The combination of these two nationwide surveys represents the What We Eat in America (WWEIA) food survey. NHANES and CSFII data have been used by multiple investigators to assess consumption amounts and patterns of SSB among adults and youth. Recent studies are further described in detail below.

Time trend analyses using NHANES data, have primarily shown a steady increase in sugar-sweetened beverage consumption, especially among children and adolescents, except for one recent study which reported a decrease (Nielsen & Popkin, 2004; Wang et
al., 2008; Slining et al., 2013). In a study by Nielsen and Popkin (2004) SSB were defined as soft drinks and fruit drinks; they did not include flavored milks, sweetened teas and coffees, or 100% fruit juices. Their study analyzed the changes in beverage consumption as a percentage of total energy intake. This was one of the first of trend studies that examined the changes in consumption including the number of servings and portion sizes consumed by age specific subgroups. NHANES and CSFII data were used to characterize three aspects of sugar-sweetened beverage intake: the proportion of persons consuming these beverages, portion sizes, and the number of servings per day. Among those 2 to 19 years of age, it was observed that sugar-sweetened beverage intake per year increased from 4.8% to 10.3% of total energy intake between the late 1970s and 2001. Among all age groups, the proportion of total energy intake from soft drinks and fruit drinks increased. Concurrently, decreases in the proportion of total energy intake from milk were also observed. The largest decrease in milk consumption occurred among children 2 to 18 years, from 13.2% of total energy intake in 1977 to 8.3% in 2001. Soft drink intake increased among this age group from 3.0% to 6.9% of total energy intake, and fruit drink intake increased from 1.8% to 3.4%. The study also showed that portion sizes of SSB increased significantly over time at home as well as at fast food and restaurant locations, with a greater intake of SSB consumed with meals versus snacks (Nielsen & Popkin, 2004).

Wang et al. (2008) compared NHANES data from 1988-1994 to 1999-2004 to further understand beverage consumption patterns among U.S. children and adolescents. The researchers included children and adolescents aged 2 to 19 years from these two
cohorts. SSB were defined as soda, sport drinks, fruit drinks and punches, low-calorie drinks, sweetened tea, fruit juices, and other sweetened beverages. Eighty-nine percent of youth in the study consumed at least one sugar-sweetened beverage, including 100% fruit juice, on a typical day; this remained virtually unchanged from 1988-1994 and 1999-2004. Soda was the most common, contributing 55% of energy from SSB, with the remainder from fruit drinks (37%), sport drinks (3%), and low-caloric and other sugar-sweetened drinks (6%). The average daily consumption level of fruit juice among youth increased from 11.2 oz/day in 1988-1994 to 12.4 oz/day in 1999-2004. Just as Nielsen and Popkin (2004) observed, Wang et al. (2008) found a small decrease in daily milk consumption from 74% to 71% among all youth. Also reported in this study was an increase in the energy from SSB from 242 kcal/day in 1988-1994 to 270 kcal/day in 1999-2004 across all youth, increasing from 17.4 fluid ounces to 20.5 fluid ounces per day. The largest increase in consumption was seen among youth 6 to 11 years with an increase of 20% of energy from SSB. Finally, in 1999-2004, daily SSB energy intakes averaged 7%, 9%, and 13% of total daily energy among youth 2 to 5, 6 to 11, and 12 to 19 years, respectively; 60% to 80% of this energy being consumed was in the home environment (Wang et al., 2008).

Slining et al. (2013) used data from CSFII and NHANES to analyze trends in food and beverage consumption from 1989-2010 among children and adolescents. The researchers used the most recent nationally representative dietary intake data from the past two decades to identify changes in total energy intake. Six survey sets were examined; the CSFII of 1989-1991 and 1994-1996, 1998 and the NHANES 2003-2004,
Increases in total energy intake were observed from the late 1980s to the mid 2000s. The definition used for SSB in this study was all sodas and fruit drinks; excluding fruit juice, sweetened coffees and teas, and sport and energy drinks. Their findings were similar to the studies discussed previously showing an increased intake from 1989 to 2004. More recent data, 2005 to 2010, showed a significant decrease in intake. Among youth 2 to 18 years, the researchers found sugar-sweetened beverage intake increased from 6.3% of total energy intake in 1989 to 9.1% in 2004. There was a decrease in consumption yearly thereafter, to 6.1% of total energy intake in 2010. The researchers attributed this trend to the reported decreased availability of SSB in public elementary schools since 2006-2007, although this was not confirmed (Slining et al., 2013).

With the most recent NHANES findings suggesting that SSB consumption has declined among children and adolescents, Mesirow and Welsh (2015) set out to examine consumption trends of a variety of beverages among U.S. children two to 19 years of age, using NHANES data from 2001 to 2010. They found total energy intake from beverages decreased from 24.4% to 21.1% during this time period. This reduction was the result of a lower intake of SSB, including fruit juice, soda, and fruit flavored drinks. They also noted that the intake of other sweetened beverages (e.g., coffee/tea, energy and sports drinks) increased during this time, but this increase did not compensate for the drop in SSB consumption. In addition, while total energy intake from milk did not change, whole milk consumption was reduced and low-/non-fat milk consumption increased. These changes reflect the expert recommendations to reduction consumption of SSB and
to replace whole milk with low-/non-fat milk as noted by the 2010 Dietary Guidelines for Americans (USDA & USDHHS, 2010).

In an effort to better understand the differences in beverage consumption among age, sex, and race/ethnicity categories, Storey, Forshee, and Anderson (2006) examined consumption patterns using NHANES data from 1999-2002, for the ages 6 years and above. Their results showed that males consumed on average more calories from beverages than females of all ages leading to a greater percent of total energy ingested from beverages alone. Males aged 6 to 11 years consumed on average 17.8% of energy from beverages compared to 16.6% for females. This increased among older children, 12 to 19 years, to 21.5% among males and 19.7% for females. With regard to cultural differences, sugar-sweetened beverage (regular fruit drinks/ades, low-energy fruit drink/ades, and regular carbonated soft drinks) consumption was observed to be higher among white children and adolescents than both African-Americans and Mexican-Americans. Wang et al. (2008), discussed in detail above, reported opposing findings indentifying total intakes of SSB were greater among Mexican American and African-American children in comparison to white children.

In addition, Storey et al. (2006) explored milk and fruit juice consumption. Average milk consumption was found to be higher among males than females between both age categories, and decreased between the age groups 6 to 11 years to 12 to 19 years. African-American children and adolescents consumed approximately half the amount of milk, as did their white counterparts. Examining fruit juice intake alone, African-American male children and adolescents were reported to drink 2.5 times more
juice than their white counterparts and African-American female adolescents drank two times more juice than their white counterparts. While Mexican-American adolescents consumed less fruit juice than other males.

While NHANES provides valuable information about SSB intake among nationally representative samples, additional studies have measured SSB consumption among children using different data sets (Wang et al., 2010; Dodd, Briefel, Cabili, Wilson, & Crepinsek, 2013). These studies utilized both non-representative samples and nationally representative samples, other than NHANES. Two such studies are described below. These studies were included because they provided data on SSB intake among the study population of interest for this thesis.

An example of a non-representative sample was a study conducted by Wang et al. (2010) that examined the dietary intake patterns of 382 African-American adolescents aged 10 to 14 years, 72% of which were low-income, from four public schools within Chicago. Dietary intake was assessed using the Harvard Youth/Adolescent Questionnaire, a semi-quantitative food frequency questionnaire. The results showed that 59% of participants consumed at least one serving of SSB (soft drinks and fruit juice) per day, and 15.9% consumed at least three per day. On average, the studied adolescents were consuming 120 grams of sugar from sweetened beverages, approximately 30 teaspoons of sugar or three 12-ounce soft drinks per day. Because this study included a non-random sample of African-American adolescents, it is not representative of all African-American children in the U.S.
Dodd et al. (2013) used a nationally representative sample of school-aged children and adolescents, in order to characterize beverage consumption patterns among U.S. school children by racial/ethnic groups and location of consumption. Data from 24-hour dietary recalls from the School Nutrition Dietary Assessment Study (SNDA-III) in 2004-2005 were analyzed. The researchers examined two categories for SSB, sodas and other SSB, such as fruit-flavored drinks, sports drinks, and lemonade. Consumption of 100% fruit juices and flavored milks were studied, although not categorized as a sugar-sweetened beverage. Among school-aged children, the researchers found that approximately 75% of all elementary school children and approximately 98% of middle school children and high school students consumed SSB on a given day. A higher percentage of non-Hispanic black elementary students (49%) were observed to consume more other (nonsoda) SSB at home compared to non-Hispanic white (30%) or Hispanic (26%) students. This difference was no longer significant among middle school students, with lower consumption rates observed among non-Hispanic black students and higher consumption rates observed among Hispanic students.

During a study conducted among all school-aged children, while attending school, Dodd et al. (2013) also observed that significantly more non-Hispanic black and Hispanic students consumed 100% fruit juice than their non-Hispanic white counterparts. Among elementary school children, Hispanic students (56%) were significantly more likely than non-Hispanic black students (36%) to drink flavored milk while in school. Students attending middle school and high school were found to have lower intakes of flavored milk when compared to elementary school students; approximately 18% and 31% lower.
respectively. There were no differences noted among racial/ethnic groups in middle and high school students. Overall, the researchers found elementary school children were more than three times more likely to have consumed SSB at home versus while at school, whereas middle school students and high school students were approximately two times more likely to have consumed SSB.

Researchers have further examined how household income and participation in nutrition assistance programs related to consumption rates of SSB. There is evidence to suggest that socioeconomic status may be related to sugar-sweetened beverage intake. Some studies have noted that lower socioeconomic status was negatively associated with availability of convenience stores and consumption of SSB (Powell, Auld, Chaloupka, O’Malley, & Johnston, 2007; Terry-McElrath, O’Malley, & Johnston, 2013). One study also provided evidence that participants in federally-funded nutrition assistance programs, such as the Supplemental Nutrition Assistance Program (SNAP) and Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), consumed greater amounts of SSB in comparison to matched non-participants (e.g., Andreyeva, Leudicke, Henderson, & Tripp, 2012).

Federal nutrition assistance programs, in general, are designed to increase the food purchasing ability of the household, in order to raise the nutrition level among low-income households. Approximately 46 million Americans received SNAP benefits in March 2014 (SNAP, 2014). SNAP does not have a defined food list or menu standards like other food assistance programs (Leung et al., 2013). Public health advocates have questioned whether SNAP benefits promote obesity and poor health over time, due to few
foods being ineligible for purchase and the disproportionate amounts of nutrient-poor foods reportedly being purchased with SNAP benefits (Leung et al., 2013). Studies using data from SNAP households that are designed to measure dietary quality and sugar-sweetened beverage consumption among youth will be discussed in further detail below.

Leung et al. (2013) set out to determine dietary quality differences among SNAP participants and to compare these differences to income-eligible non-participants. The researchers used data from NHANES 1999 to 2008. The sample included 5,193 children (4 to 19 years) in low-income households; 27.9% participated in SNAP. The researchers compared the low-income non-participants with those participating in SNAP. Diet quality was measured using the Healthy Index 2005 (HEI-2005) and the Alternate Healthy Eating Index (AHEI), measures to assess dietary equivalents and patterns of food intake related to chronic disease risk. Both low-income non-participants and those participating in SNAP were far from meeting the national dietary recommendations for consuming whole grains, fruits and vegetables, fish and shellfish, and seeds, nuts, and legumes. Among SNAP participants 22% met none of the dietary recommendations in comparison to 20% of non-participants; 0% of both groups met at least seven out of the ten national dietary recommendations. In addition, both groups of children exceeded the 2010 Dietary Guidelines’ recommended limit (less than 4 servings per week) for SSB, with mean consumption ranging from 2.3 to 2.5 servings per day. SNAP participants were found to consume 43% more servings of SSB than non-participants. Finally, researchers found no association with childhood overweight or obesity and participation in SNAP in comparison to income-eligible non-participants.
A study by Andreyeva et al. (2012) used data from grocery store scanners at a regional supermarket chain to assess non-alcoholic refreshment beverage purchases of 39,172 households from January to June of 2011. The sample consisted of families with a history of WIC participation from 2009 to 2011; approximately half of these households also participated in SNAP. Shoppers who used WIC benefits at least one time at the supermarket chain in January 2009 were flagged and followed through June 2011, even if they no longer used WIC. The results showed that SSB accounted for 48% of beverages purchased by WIC-only households and 58% among households enrolled in both, SNAP and WIC. Additionally, 72% of SSB purchased by SNAP/WIC households were paid for with SNAP and/or WIC benefits, a higher percentage than for all groceries at 63%. Using data on purchases of all SNAP households, the researchers estimated that the SNAP program spends approximately $1.713 billion on SSB annually nationwide (Andreyeva et al., 2012).

In addition to the studies discussed previously, other scientists have reported high intakes of SSB among youth (Nielsen & Popkin, 2004; Wang et al., 2008; Slining et al., 2013; Dodd et al., 2013). Differences in the types of SSB consumed among age, sex, and race/ethnicity categories have also been observed with higher intakes at home versus at school (Storey et al., 2006; Wang et al., 2008; Slining et al., 2013; Dodd et al., 2013). In an effort to reduce the consumption of SSB, many studies have examined the potential influences on intake among children and adolescents (e.g., Larson & Story, 2009). Related studies are described below.
Parental Influences on SSB Intake

There are numerous factors that influence an individual’s food and beverage intake. Eating behavior is highly complex, and involves multiple influences (Larson & Story, 2009). There is a large body of literature addressing the multiple influences that can impact food and beverages choices and behaviors (e.g., Larson & Story, 2009). In this section parental influence on children’s sugar-sweetened beverage intake will be discussed, specifically how parenting, parent’s beliefs and attitudes, modeling, and environment influence consumption. In addition, influences on sugar-sweetened beverage consumption at the policy level will be reviewed.

Interpersonal relationships play an important role during childhood and adolescence. Parents are influential in shaping food and beverage choices and related behaviors. Both children and adolescents’ intake of SSB can be influenced by the variety and accessibility of such beverages within their homes. In 2007, van der Horst et al. investigated perceived parenting styles and practices and their impact on sugar-sweetened beverage intake among adolescents. Given that parents are primarily responsible for determining the availability of SSB within the home, the researchers wanted to see how specific styles of parenting, specifically strictness and involvement, were related to consumption of these beverages. The results showed lower consumption rates of SSB among adolescents with parents who displayed more restrictive practices. These associations were mediated by modeling from parents and self-efficacy. Adolescents who perceived their parents’ style to be highly involved and moderately strict consumed less SSB.
Parental beliefs and attitudes surrounding SSB have been examined in order to determine their relationship to children’s consumption. One such study by Rader et al. (2014) set out to examine children’s consumption of SSB and fruit juices in order to determine possible risk factors leading to excessive consumption, and to understand how parental beliefs and behaviors impact consumption. The researchers examined 830 parents of children 6-months to 12 years, using a 36-item self-report questionnaire. Results of the assessments that measured parents’ beliefs and attitudes regarding SSB and fruit juices, revealed that 90.4% of parents reported having control over what their child drank. Parents stated the most common reason their child was allowed SSB was as a treat or due to the child wanting it; with 33.4% of parents providing fruit juice because they believed it was good for the child. While 59% of parents reported that a pediatrician had discussed sugar-sweetened beverage consumption during an office visit, 98.9% of parents stated they would be very likely or likely to follow such advice from a doctor. Reasons to limit a child’s consumption included: if the beverage was not healthy, if it made the child overweight, or if it damaged children’s teeth. This study identified the potentially large role primary care providers may have in reducing excessive SSB intake by influencing parental beliefs and behaviors surrounding these beverages.

A qualitative study by De Cramer, et al. (2013) aimed to assess parents’ and teachers’ opinions of beverage consumption and physical activity among preschool children. The researchers conducted focus groups in six European countries with households of varying socioeconomic status. The results from 24 focus groups, comprising 122 parents, will be discussed here.
Parents in this study reported that their children typically drank a variety of beverages, with restricted access to soft drinks, fruit juices, and chocolate milk at home. Soft drinks were reported as being limited to special occasions and on the weekend, but most of the time children were allowed to have fruit juice or chocolate milk once a day. Parents further recognized that they influenced their children’s beverage intake by being a role model themselves, and played a major role in promoting healthy drinks. Last, parents stated they would be motivated to decrease their child’s intake if additional information on the topic was provided by the preschool. The researchers concluded that parents and teachers shared responsibility in promoting healthy beverage consumption behaviors among preschoolers.

As noted previously during discussion about consumption patterns, most studies showed that non-Hispanic blacks and Latino children consumed higher amounts of SSB, compared to white children. However, very few studies have examined the attitudes and beliefs of caregivers’ regarding sugar-sweetened beverage intake in young children among these racial/ethnic groups. Tipton (2014) used an elicitation study to examine beliefs and perceptions about sugar-sweetened beverage consumption among caregivers of predominately low-income non-Hispanic black preschoolers. A purposive sample of 19 caregivers was recruited from two publically funded supplemental nutrition clinics in the New Orleans area. The caregivers had to be at least 18 years old and were reported to be providing the majority of the meals and snacks to children between 2 and 5 years within the same household. The results revealed that many caregivers believed that SSB caused hyperactivity and negative health problems, including diabetes, tooth decay, and
urinary and kidney problems. In regards to benefits of SSB, convenience, especially packaging, and the use of SSB as rewards and as a means to prevent the child from “acting out” were noted. In regard to control beliefs, caregivers reported feeling powerlessness due to the low cost of SSB in comparison to healthy beverages and the easy availability at stores and restaurants. Children’s taste preference and persistent requests for SSB was also reported as challenges. Caregivers additionally believed pediatricians and other healthcare professionals would not approve serving SSB to preschoolers. The researchers concluded that healthcare providers needed to listen to caregivers concerns and pressures during nutrition counseling and to identify realistic strategies that result in effective ways to provide healthful, affordable beverages to children.

A qualitative study conducted by Beck et al. (2013) was aimed to determine Latino parents’ beliefs about the health effects of beverages and to identify their preferred information sources. Parents were recruited from three community health centers in the San Francisco Bay Area. Twenty-nine interviews with parents of Latino children 6- to 36-months were recorded, transcribed, and analyzed. A recurrent theme found during the interviews was that parents believed water and milk were healthy and SSB were unhealthy; while mixed views were found on 100% fruit juices. Homemade “agua fresca”, a Latino beverage made with water, fruit, and sugar, were viewed as healthy in comparison to SSB from the store. Parents reported receiving a majority of their information about beverages from WIC, but were confused because they were counseled on avoiding juice, yet WIC benefits provide juice purchasing options. Parents also stated
they preferred information about beverages to come from experts. This study suggested that Latino parents may be open to counseling about healthy beverage choices, and that counseling should address the effects of both homemade and store bought beverages.

Another study examining Latino youth explored parental and home environmental facilitators of SSB consumption (Bogart et al., 2013). The researchers conducted semi-structured interviews with 55 overweight or obese Latino youth aged 10 to 18, and 55 parents from school-based clinics and seventh grade classes in one middle school on the West coast. The youth had to live in a home where at least one sugar-sweetened beverage was available and reported consuming SSB. The researchers found that almost all parents and youth classified soda as unhealthy, approximately half classified juice and energy drinks as unhealthy, and few classified sports drinks as unhealthy. Half of the parents made culturally-specific beverages at home (“agua fresca”) with added sugar, and most felt these were healthy because they were natural and made with fruit. Approximately half the parents reported having rules regarding sugar-sweetened beverage consumption at home, but most parent-child pairs disagreed about the description or interpretation of the rules. The lack of consensus between the parents and children included discrepancy between what the rules stated and whether or not rules were in place regarding SSB. The biggest factor related to sugar-sweetened beverage consumption was found to be home availability, illustrating the importance of educating families about the risks of keeping SSB readily available in the home.

There is evidence to suggest that parental eating patterns affect a child’s weight status (Dev, McBride, Fiese, Jones, & Cho, 2013). According to Dev et al. (2013)
parents were the primary influence on their child’s eating behavior and could therefore influence a child’s risk for obesity. This study used data from a longitudinal study of preschool children, 2 to 5 years, enrolled in the Synergistic Theory and Research on Obesity and Nutrition Group Kids program. The researchers used the ecological approach to identify risk factors associated with obesity. Researchers observed that children of overweight/obese parents consumed greater amounts of high-fat foods, high-calorie foods, and snack foods, had less of a preference for low-calorie vegetables, and were less active (Dev et al., 2013). The authors concluded that family environment plays a critical role because children model their parents’ behaviors, which includes eating habits.

McClain, Chappuis, Nguyen-Rodrguez, Yaroch, and Spruijt-Metz (2009) completed a review of 77 cross-sectional and prospective studies that examined the psychosocial correlates of dietary behaviors among children and adolescents. Of these 77 studies, 10 examined the correlates of sugar-sweetened beverage consumption. Perceived modeling was positively associated with SSB, however, modeling as reported by parents showed inconsistent associations. Perceived modeling is the influence a parents’ eating habits have on a child’s eating behavior. Peer and parent norms were found to be positively associated with sugar-sweetened beverage consumption in 2 of the 3 studies, and milk norms were found to be negatively associated with sugar-sweetened beverage consumption in 1 of the 3 studies. The researchers concluded that perceived modeling in making dietary changes had the most consistent and positive associations with eating
behavior among children and adolescents; with other correlates such as liking and preferences showing positive associations.

A cross-sectional study by Raynor et al. (2014) examined the relationship between parent and child preferences intakes of fruits, vegetables, snack foods, low-fat dairy, and SSB among overweight or obese children ages 4 to 9. The 135 child-parent dyads were recruited from a family-based obesity treatment program in Providence, Rhode Island. The researchers found that in regards to SSB, both parents and children consumed greater than the recommended servings, based on the 2010 Dietary Guidelines for Americans, with children consuming approximately six servings during the three-day food record. Parent’s intake was found to be positively associated with their child’s intake among all food groups, except SSB, which had no association. Limitations of this study included the homogenous sample of families, which limited the generalizability of the findings to other ethnicities or communities. The researchers concluded that the positive associations between parents and children might be due to the availability of these foods in the home, and/or parent modeling.

In a cross-sectional study examining adolescents, ages 11 to 16, with a BMI in the overweight or obese category, positive associations were observed between parents and adolescents intake of SSB (Watts, Masse, Barr, Lovato, and Hanning, 2014). The researchers examined the relationships among parent and teen intakes of seven dietary components: vegetable and fruit servings, grams of total sugars, and percentage of energy from dessert/treats, snacking, total fat, saturated fat, and SSB. One hundred and sixty-five parent-adolescent dyads were recruited from a behavior modification program in Canada.
The researchers found positive associations among parent and teen intake of six out of the seven dietary components examined, excluding dessert/treats. For each additional percentage of energy consumed from SSB by parents, adolescent consumption increased 9%. With the limited number of families participating in this study, results have limited generalizability, which is similar to the study above.

In a review of the literature by Larson and Story (2009), social influences including parents and family members on children’s eating behavior, were examined. The authors described parents as models for eating behavior that may assist in developing a child’s ability to self-regulate intake, to help in determining nutrition attitudes, and to aid in establishing the structure of shared meals. Multiple studies examined during the review used a cross-sectional design to investigate the benefits of shared family meals. These benefits included lower intake of soft drinks and higher intakes of fruits and vegetables (Larson & Story, 2009). In addition, these benefits were found to be carried through adolescence and into young adulthood. Larson and Story (2009) also described food preparers as “nutritional gatekeepers” for children, determining the types, amounts, and preparation of foods and beverages in the home.

Ezendam, Evans, Stigler, Brug, and Oenema (2010) examined cognitive and environmental predictors of SSB consumption in a 4-month longitudinal study of 398 students, ages 12 to 13. The data was collected from the FATaintPHAT intervention; which aimed to prevent excess weight gain through changes in energy balance-related behaviors. The researchers reported that 76% of homes of the students examined always or almost always had SSB available, with 47% of students allowed to drink as much as
they wanted. More restrictions on SSB and lower home availability were associated with a lower consumption from baseline to follow-up: 68% of this decrease was mediated by perceived behavioral control. Ethnicity, education, and subjective norms and intentions were not significantly related to changes in sugar-sweetened beverage consumption. The researchers concluded that interventions to decrease the consumption of SSB should include limiting home availability and stricter family food rules.

In 2013, Hebden, Hector, Hardy, and King completed a cross-sectional study examining the associations between SSB availability at school and in the home, and its impact on consumption among 8,058 Australian school students, ages 4 to 16. This study was a secondary analysis of the New South Wales School Physical Activity and Nutrition Survey 2010, a representative survey of school aged youth in Australia. The associations between home availability and consumption will be discussed here. The researchers found students who typically had availability of soft drinks within the home were twice as likely to be moderate consumers (2-4 cups/week) and approximately five times as likely to be high consumers (≥5 cups/week). Additionally, those who consumed soft drinks with meals were approximately ten times as likely to be high consumers. While causality cannot be determined due to the cross-sectional design of this study, it suggests that students with availability to SSB in the home are more likely to consume greater quantities.

Sharkey, Dean, St. John, and Huber (2010) examined the feasibility of weekly in-home assessments of household food resources over a month in a pilot study. The researchers used a convenience sample of six households, where five in-home household
food inventories were completed over a 30-day time frame to determine the frequency that food items were present compared to a one-time measurement. These inventories were completed in low-income Mexicano Texas colonias, subdivided agricultural lands along the Texas-Mexico border. The households were found to all be food insecure, limited or uncertain access to adequate food, and groceries were purchased within a week of at least four out of the five measurements. The results of this study found that a one-time measurement was inadequate, and would have incorrectly identified half of the participant households without SSB. Sugar-sweetened soda was not observed in five of the six households during the first measurement, but was observed during each subsequent visit. This was also found in four of the five households with 100% fruit juice, and five of the six households with sugar-sweetened drink concentrate (i.e., Kool-Aid). While this study was not generalizable, it does suggest that household food inventories, especially among low-income food insecure populations, can vary each week and a one-time measurement might not fully capture food availability in the home. With significantly high obesity rates among Mexican Americans and the continued increase among low-income populations, researchers have tried to identify specific risk factors for childhood obesity among these populations.

A cross-sectional study conducted by Watt, Roberts, Flores, and Morris (2013) aimed to identify risk factors for early childhood obesity among a low-income, predominately Hispanic sample. With research showing the disparities present among racial/ethnic minorities and the increased risk for obesity, the researchers wanted to explore potential areas for preventative behavioral health interventions among this
sample. The study included 152 women who were in their first trimester, third trimester, or postnatal with an infant up to 12 months old attending a primary care clinic in the Southwestern U.S. Of the sample, 64% were WIC recipients and 50% had received SNAP benefits within the year prior to the study. Among the women sampled, 44% reported drinking SSB daily. Infant feeding practices, including consumption of SSB and fruit juice, were found to be unrelated to infant weight, while high stress levels among mothers was associated with feeding infants (6-12 months) SSB.

Concerns about health care costs due to diet-related disease, and the use of SNAP benefits to purchase SSB, New York state proposed to include SSB on the list of disallowed purchases for SNAP (Brownell & Ludwig, 2011). As described by Brownell and Ludwig (2011), on August 19, 2011 the U.S. Department of Agriculture (USDA) denied this request. This controversial decision sparked debate between opposing parties both for and against the proposed policy. Multiple states have also requested permission from the USDA and Congress for stricter controls on the use of SNAP benefits, with the hope of reducing the burden of obesity-related medical costs on taxpayers. Brownell and Ludwig (2011) expressed that “if the USDA denies existing pilot studies by states, the agency should fund research to generate the needed data to inform policy decisions” (Page 1371). Those opposed to the policy include the American Beverage Association (ABA). In an article by Scott-Thomas (2011) on FoodNavigator-USA the ABA’s director of communications stated, “It’s another attempt for government to tell people what they can and can’t drink. Singling out one specific item is discriminatory and
unfair. Participants in the SNAP program can decide what they want to buy for themselves and their families.”

An additional policy has been proposed to subsidize vegetable and fruit purchases made with SNAP benefits, as a means to encourage healthier food choices (Basu, Seligman, Gardner, & Bhattacharya, 2014). Basu et al. (2014) used NHANES data in addition to econometric and epidemiological modeling to calculate how price and policy changes could affect the eating behaviors among SNAP participants, which in turn, would impact health outcomes including, obesity and type 2 diabetes. The researchers examined the impact of two proposed policies: a ban on SNAP benefits used for SSB and a subsidy in which participants get a thirty-cent credit back to their SNAP benefits card for every dollar spent on vegetables and fruits. Among SNAP participants and matched non-participants, energy intake from vegetables and fruits were lower in comparison to SSB. Consumption of foods among SNAP participants was also found to be significantly sensitive to SNAP benefit changes and food price variations. An increase in SSB price of 1% was associated with a 1.5% decrease in consumption. Fruit juice was found to be the most common substitute for SSB. The researchers further analyzed how this change would impact fruit juice consumption and found an increase of 0.5%. In comparison, a 1% decrease in the price of vegetables was associated with a 0.6% increase in consumption, and a 1% decrease in the price of fruit was associated with a 0.7% increase in consumption. The researchers used this data to further determine the impact of price per item change on health outcomes. The proposed subsidy for vegetables and fruits was estimated to double the proportion of SNAP participants who meet federal vegetable and
fruit consumption guidelines but would not have a significant effect on obesity and type 2 diabetes. In contrast, the proposed ban on SSB was determined to produce a 15.4% (24.2 kcal) decrease in energy intake from SSB and a 17.1% (12.3 kcal) increase in juice intake, producing a 0.6% (11.4 kcal) overall energy decrease among SNAP participants. This would result in a 2.4% decline in obesity prevalence rates and a 1.7% decline in the incidence of type 2 diabetes among SNAP participants during a ten-year simulation.

There are multiple factors that influence a child’s consumption of food and beverages, and ultimately SSB. These include socioeconomic, interpersonal, and policy influences. The above findings provide evidence that parents play an important role in a child’s food behaviors and that low-income households and individuals, especially SNAP participants, are more likely to purchase and consume SSB. Multiple studies have observed the positive association between sugar-sweetened beverage intake, excess weight gain, and chronic metabolic diseases (e.g., Malik et al., 2010). A reduction in sugar-sweetened beverage consumption may reduce the prevalence of obesity and type 2 diabetes (Basu et al., 2014). Related studies are discussed below.

**Health Correlates of SSB Intake**

In recent decades, the U.S. has seen an unprecedented growth in the prevalence of overweight and obesity. While previous time trends using data from NHANES showed an increase in childhood obesity rates between 1976-1980 and 2011-2012, rates between 2003 and 2012 appear to have remained unchanged. A recent NHANES study, among the pediatric population, ages 2 to 19, found 31.8% are overweight or obese, and 16.9% are classified as obese (Ogden et al., 2014). Prevention of unhealthy weight gain in
children has become a public health priority due to its direct correlation to comorbidities later in life (Barlow, 2007).

Obesity results from an energy imbalance caused by, excess energy intake, relative to energy expenditure (Stipanuk & Caudill, 2013). The mechanism of obesity encompasses a complex set of interactions: genetic, cultural, metabolic, behavioral, socioeconomic, and environmental factors (Morrill & Chinn, 2004). Obesity is a pervasive medical condition that is an important risk factor for type 2 diabetes, metabolic syndrome, cardiovascular disease, several cancers, and premature death (Harrington, 2008). Further comorbidities of obesity include breathing problems, such as asthma and sleep apnea, musculoskeletal disorders, gastroesophageal reflux, and fatty liver disease (CDC, 2012). Obesity has also been associated with a decrease in life expectancy; as little as 0.8 years to seven years, with obese adolescent’s experiencing 30% higher rates of mortality as adults (Biro & Wien, 2010). If a child is overweight, the severity of obesity in adulthood is likely to be greater, with an increased risk of multiple comorbidities as adults even if obesity is no longer present (CDC, 2012; Brio & Wien, 2010).

The consumption of SSB has been associated with excess weight gain in several studies (e.g., Harrington, 2008). With obesity rates and sugar-sweetened beverage intakes closely paralleled over recent decades some have speculated that SSB may be a key contributor to the obesity epidemic due to its high added sugar content, low satiety, and failure to compensate energy intake at subsequent meals (Hu & Malik, 2010; Malik, Schulze, & Hu, 2006).
According to Harrington (2008) who completed a review on the relationship of SSB consumption and obesity, within the adult population a number of large-scale epidemiological studies have noted positive associations among sugar-sweetened beverage consumption, long-term weight gain and risk of chronic diseases including type 2 diabetes, metabolic syndrome, and cardiovascular disease. However, studies among children and adolescents have shown inconsistent results with sugar-sweetened beverage intake and overweight or obesity risk. Related studies are described below.

Deboer, Scharf, and Demmer (2013) evaluated children who participated in the Early Childhood Longitudinal Survey – Birth cohort, a nationally representative sample of U.S. children born in 2001. The researchers aimed to explore the relationship between SSB and weight status among children 2 to 5 years. Participants in this longitudinal sample were randomly selected by birth certificates in 2001 and then examined at 9 months, 2, 4, and 5 years. Among the study population there was a high prevalence of overweight and obesity, 30.2%, 32.3%, and 32.1% for children, 2, 4, and 5 years, respectively. An association between sugar-sweetened beverage intake and odds of overweight or obesity was not observed at 2 years. At both 4 and 5 years, children who consumed one or more SSB a day (regular drinkers), compared to children who consumed less than one per day (infrequent drinkers), had higher odds of being overweight or obese. In adjusted models that accounted for gender, race/ethnicity, socioeconomic status, mother’s BMI, and television viewing; the association was no longer observed among 4 year olds, but by 5 years regular drinkers had higher odds of
being obese. The researchers also found higher rates of sugar-sweetened beverage intake were associated with higher BMI $z$ scores for children 4 and 5 years, but not at 2 years.

In a cross-sectional study by Grimes, Riddell, Campbell, and Nowson (2013) that examined a nationally representative sample of Australian children 2 to 16 years, sugar-sweetened beverage intake was associated with obesity risk, although the relationship was no longer present after physical activity adjustment. Participants were 26% more likely to be overweight or obese if they consumed greater than one SSB per day. After adjusting for physical activity, this risk was no longer present. The researchers pointed out the lack of association might have been due to a lack of statistical power, although, other studies examining this association have found no association or only an association among specific subsamples (Grimes et al., 2013; Ebbeling et al., 2012).

In a randomized trial of 224 overweight and obese adolescents, who regularly consumed SSB, researchers aimed to assess the effect of reducing consumption of SSB on weight gain. The experimental group was exposed to a one-year intervention with a one- and two-year follow-up. While decreases in the consumption of SSB were significant among the experimental group at both one-year and two-year follow-ups compared to the control group, no significant effect on BMI was observed at two-years (Ebbeling et al., 2012).

With the inconsistent findings among the relationship between SSB intake and body weight, Malik et al. (2013) conducted a systematic review and meta-analysis to examine the evidence in children and adults. Only the studies examining children will be summarized here. Twenty of the 32 original articles used in this review examined
children including, 15 prospective cohort studies and five randomized control trials. Among the prospective cohort studies, a 12-ounce serving of SSB per day was associated with a 0.06-unit increase in BMI over a one-year time frame. The randomized control trials focused on either discouraging intake of SSB or reducing intake by substituting non-caloric beverages. The results showed significant reductions in BMI gains with lower intakes. Greater benefits were observed in substitution trials, and among overweight children compared to normal-weight children. The authors concluded that there is sufficient evidence to conclude there is an association between SSB and weight gain in children.

A recent study by Zheng et al. (2015) aimed to examine the association between six-year change in body fatness by substituting SSB with water, milk, or 100% fruit juice among children. The sample was a cohort of 358, nine-year-old, children who participated in the Danish part of the European Youth Heart Study. The children were followed for six-years assessing the change in their body fatness from baseline to 15-years of age, measuring BMI z-score, waist circumference, and a skin fold. To assess dietary intake a parent-assisted food record and a face-to-face 24-hour recall was employed. Covariates were also accounted for including physical activity level, demographic data, socioeconomic status, and maternal education level. The researchers found SSB intake among nine-year-olds was the only beverage related to changes in body fatness over the following six-year period; BMI z-score was observed to increase 0.05 units for every 100 gram daily increase in SSB intake over the six-years. Substituting 100 grams of SSB for 100 grams of water daily was found to be inversely related to
changes in BMI z-score and waist circumference, 0.04 units and 0.29 cm respectively. Substitution with 100 grams of milk daily was also found to be inversely related to changes in BMI z-score by 0.05 and waist circumference by 0.33 cm. No observed effect was found when substituting with 100% fruit juice. While additional longitudinal studies and randomized control trials are needed, the researchers concluded this study supports the need to reduce SSB consumption and that replacements with water and milk appear to be beneficial alternatives.

In a study using the 1999-2004 NHANES cohort, the relationship between insulin resistance-associated metabolic parameters and anthropometric measurements based on sugar-sweetened beverage intake and physical activity levels, among 12 to 19 year olds was examined (Bremer et al., 2009). Insulin resistance was assessed using the homeostatic model assessment of insulin resistance (HOMA-IR) which includes a simple fasting method used to measure insulin resistance, widely used for both adult and children studies. The results showed that for each additional daily serving of a sugar-sweetened beverage, HOMA-IR increased 5%, which identified an independent association between SSB intake and HOMA-IR. Additionally, for each SSB serving a 0.90-percentile increase in BMI for age occurred. The researchers also found a low intake of SSB and high physical activity levels were significantly associated with a lower HOMA-IR, suggesting an effect modification.

A smaller cross-sectional study in Canada examined associations between sugar-sweetened beverage intake and metabolic syndrome components among children 8 to 10 years, who were at risk for obesity, defined as a BMI greater than the 85th percentile or a
BMI less than the 85th percentile with an overweight parent (Wang et al., 2012a). Although no significant associations were found between sugar-sweetened beverage intake and HOMA-IR when analyzing all the subjects together, when the researchers stratified the data based on BMI, significant associations were discovered. The results indicated that an increased consumption of 100-mL SSB was associated with an increase in BMI, even when adjusted for total energy intake. No significant associations were found for other metabolic syndrome components, including HOMA-IR. Among overweight children, a 100-mL increase in sugar-sweetened beverage consumption was associated with a 0.1-unit higher HOMA-IR, after controlling for age, sex, fat mass index, total energy intake and physical activity. The authors concluded that results from this study suggested that overweight children are more likely to experience the metabolic effects associated with SSB consumption, when compared to normal-weight children.

Insulin resistance is thought to represent the initial step in pathogenesis of type 2 diabetes. Two recent meta-analyses have shown a positive relationship between sugar-sweetened beverage intake and type 2 diabetes and metabolic syndrome among adults (Malik et al., 2010; Xi et al., 2014). Among children, only risk factors for type 2 diabetes have been studied, as described above.

The association between SSB and diet quality among children has been the focus of several studies (e.g., Marshall, Gilmore, Broffitt, Stumbo, & Levy, 2005; Mathias, Slining, & Popkin, 2013). Since the intake of SSB was associated with a higher intake of energy, Mathias et al. (2013) set out to estimate the amount of energy consumed from SSB and the differences in diets between SSB consumers and non-consumers, age 2 to
18. Using NHANES data from 2003-2010, the researchers observed that total energy intake among SSB consumers was higher compared to non-consumers among age groups 2 to 5 years, 6 to 11 years, and 12 to 18 years. The differences were $166 \pm 32$, $240 \pm 34$, and $359 \pm 47$ kcal, respectively. Higher sugar-sweetened beverage intakes were associated with significantly higher energy intakes and lower intakes of non-sugar-sweetened beverages, fluid milk, and fruit juice.

During another study that analyzed school-based survey data from the National Youth Physical Activity and Nutrition Study, a nationally representative sample of 9th-through 12th-grade students, investigators found SSB accounted for the largest source of added sugars (Demissie et al., 2013). The researchers found 70% of males and 80% of females exceeded the maximum energy allowance for added sugars. Sugar-sweetened beverage intake among adolescents has been associated with excess calorie intake, obesity, risk factors for diabetes, poorer nutrition quality, tooth decay, anxiety, lower bone mineral density, and poor quality or reduced sleep (Demissie et al., 2013).

A recent study has also observed a positive association between added sugar intake, not naturally occurring in foods, and diastolic blood pressure and triglycerides (Kell et al., 2014). This cross-sectional study investigated the effects of racial-ethnic differences on health and metabolic outcomes among 320 children, age 7 to 12. Data collected from the AMERICO study from October 2004 to December 2008 included socioeconomic status, pubertal status, percentage body fat, physical activity level, two dietary recalls, blood pressure, and blood lipids and lipoproteins. The researchers reported a statistically significant positive association between added sugars and diastolic
blood pressures. This association was not observed for systolic blood pressure measures. For each gram of added sugars, the increase in diastolic blood pressure was 0.0206 mm Hg, which was calculated by the researchers to be an approximate increase of 1.8643 mm Hg among boys and 1.4523 mm Hg among girls, with the current average intake of added sugars among U.S. youth. Analysis of lipids indicated that added sugars were positively associated with triglycerides, but not other lipid values. While previous studies among adults and adolescents have observed these relationships, this is the first study that examined the association among children.

It is estimated that over a ten-year period, $82 billion in health care costs are due to excess SSB consumption alone (Wang, Coxon, Shen, Goldman, & Bibbins-Domingo, 2012b). Consequently, reductions in added sugar intake have been recommended with SSB being identified as the primary source of added sugars in the American diet (USDA & USDHHS, 2010).

**Dietary Recommendations**

The Dietary Guidelines for Americans uses science-based evidence to provide diet and physical activity recommendations designed to promote health and reduce the risk for major chronic illnesses (USDA & USDHHS, 2010). The Dietary Guidelines are intended to help healthy Americans 2 years and older make healthful eating pattern choices, and are used in the development of nutrition-related programs. While the Scientific Report of the 2015 Dietary Guidelines Advisory Committee was released in early 2015, the updated 2015 Dietary Guidelines have not yet been published. Until that time the 2010 Dietary Guidelines are the most recent recommendations, which focuses
largely on the rising rates of obesity. The U.S. Department of Agriculture and Department of Health and Human Services (2010) reported that soda, energy drinks, and sports drinks are one of the top four energy sources among Americans 2 years and older, and among the top three for ages 2 to 18 years; providing excess calories with few essential nutrients. Therefore, the reduction of added sugar intake was recommended.

To help promote energy balance, “reducing the consumption of these sources of added sugars will lower the calorie content of the diet, without compromising its nutrient adequacy” (Page 28, USDA & USDHHS, 2010). Specifically, the Dietary Guidelines recommended to “consume fewer and smaller portions of beverages that contain added sugars, such as SSB” (Page 29, USDA & USDHHS, 2010), and to “limit excess calories and maintain healthy weight, individuals are encouraged to drink water and other beverages with few or no calories” (Page 48, USDA & USDHHS, 2010).

An average 12-ounce can of regular soda has approximately 10 teaspoons (40 grams) of sugar, while the American Heart Association recommends children limit their intake to 3-4 teaspoons per day (Jacobson, 2005; Johnson et al., 2009). Recommendations to decrease the intake of SSB have also been suggested by multiple health organizations including, but not limited to, the American Academy of Pediatrics, American Medical Association, American Academy of Family Practitioners, Academy of Nutrition and Dietetics, and American Dental Association (AHA et al., 2006; Rao, 2008; AAFP, 2014; AND, 2012; ADA, 2014). The American Academy of Pediatrics provided dietary strategies for individuals aged 2 and older, that includes, “reducing the intake of sugar-sweetened beverages and foods” (Page 545, AHA et al., 2006). The American
Medical Association suggests parents “limit consumption of sugar-sweetened beverages” to prevent childhood obesity (Page 61, Rao, 2008). The American Academy of Family Practitioners (2014) “supports taxation of sugar-sweetened beverages for the purpose of reducing over-consumption as a method of both improving the health of public and combating the obesity epidemic”. According to the Academy of Nutrition and Dietetics (2012), “consumers should limit empty sources of energy (sugars added to foods) to help achieve or maintain a healthy weight” (Page 754). Last, the American Dental Association (2014) recommends to “limit added sugars in your diet” stating that “sugar-containing drinks are particularly harmful because sipping them causes a constant sugar bath over teeth, which promotes tooth decay”.

These recommendations are in response to the increased consumption of SSB, and its association with excess calorie intake, which can further lead to obesity and further comorbidities (USDA & USDHHS, 2010). Primary care physicians and pediatricians have been identified as crucial in playing a role in the prevention of childhood obesity; specifically identifying and counseling patients on behaviors associated with excess weight gain, such as health education strategies important for limiting SSB consumption (Doymaz & Neuspiel, 2009).

**Prevention in Primary Care**

The American Academy of Pediatrics (AAP) recommended a systems-level approach involving the community, schools, and health care settings for the prevention and treatment of childhood obesity (Barlow, 2007). Health care providers are perceived to be the experts in regard to reducing health risks and promoting preventive behaviors,
and have the potential for taking a leadership role in the prevention of unhealthy weight gain (Sherwood et al., 2013). It is recommended that children have contact with their health care providers an average of 10 times, before the age of two, and yearly thereafter, providing the frequency of contact and the continuity of care needed for successful weight management (AAP, 2014; Klein et al., 2010). In 2007, the AAP released recommendations for the prevention, assessment, and treatment of child and adolescent overweight and obesity (Barlow, 2007). The recommendations for prevention of overweight/obesity stated that clinicians should advise patients and their families to adopt and maintain specific eating and physical activity goals to help prevent excess weight gain, including limiting the consumption of SSB.

One study has specifically assessed the effectiveness of primary care counseling on sugar-sweetened beverage intake. This small, short duration study by Doymaz and Neuspiel (2009) was part of a quality improvement project. Seventy study participants between the ages of two and 20 years were randomly assigned to either a test or control group. Both the parent and child in the test group were counseled by a pediatric resident on how excess calorie intake is related to overweight and obesity and the potential health problems associated with increased consumption of SSB. Among the control and test groups, participants were questioned about the types and amounts of beverages they consume before the intervention and two-weeks following. Reductions in sugar-sweetened carbonated beverages (0.9 cups/participant) and juice (0.46 cups/participant) were observed, but were only statistically significant with sugar-sweetened carbonated beverages. In the test group, increases in both water and milk were observed subsequent
to the decreased intake of SSB. This study has multiple limitations due to the sample size and lack of long-term follow-up. Even with these limitations it does provide some evidence that primary care counseling has the potential to impact consumption of SSB among children and adolescents.

Additional studies have measured the effectiveness of primary care counseling on sugar-sweetened beverage intake, but have also included other behaviors associated with excess weight gain. Other target behaviors recommended by the American Academy of Pediatrics to prevent excess weight gain included: increasing vegetable and fruit intake, limiting screen time, eating breakfast, limiting eating out, increasing family meal times, and limiting portion sizes (Barlow, 2007). Studies that address these behaviors have focused on both the prevention and treatment of childhood obesity.

Few studies have accessed the effectiveness of childhood obesity prevention efforts within the primary care setting, while expert panels have suggested that obesity prevention should be a public health priority due to the long-term health implications that can be associated with childhood obesity (Barlow, 2007). Treatment of childhood obesity in the primary care setting, on the other hand, has been studied. The studies discussed below used different methods to assess the role of the primary care setting on the prevention of childhood obesity, with some observed positive impacts.

In a nonrandomized clinical trial, Schwartz et al. (2007) conducted motivational interviewing as the primary intervention in a pediatric office-based obesity prevention program. Participants were 3-7 years old and had a BMI at the 85th percentile for age or greater, but lower than the 95th percentile, or were normal weight with an overweight
parent. Participants were assigned to one of three groups: a control group, a minimal intervention group that used physicians, or an intensive intervention group that used both physicians and dietitians. The change in outcomes over the six-month study was measured using the Youth/Adolescent Food Frequency Questionnaire. The questionnaire was modified to include questions covering five areas reported to be associated with weight gain in children: sweetened drinks, snacks and desserts, vegetables and fruits, dining out, and television viewing. No significant changes in BMI were observed across the control and intervention groups. Statistically significant changes were observed in the minimal intervention group with decreases in the intake of snacks and desserts. In the intensive group statistically significant decreases were observed in dining out. No significant changes were observed for SSB, fruit and vegetable intake, and television viewing in either the minimal or intensive groups. While participant’s parents perceived this intervention positively, the short length of the study and high drop-out rate limited its value for establishing generalized conclusions.

Kubik, Story, Davey, Dudovitz, and Zuehlke (2008) conducted a pilot study to evaluate parents’ response to a clinic-base primary prevention intervention that aimed to increase the number of 5- to 10-year-olds receiving annual BMI screening and counseling about physical activity, dietary practices, and sedentary lifestyle. The researchers used a post-test only, quasi-experimental design, in two clinics that provided routine health care to school-aged children. A multi-component intervention was implemented in one clinic and the other provided care as usual. A convenience sample of parents completed a survey after a clinic visit. The multi-component intervention implemented in the
intervention clinic was developed using the Social Cognitive Theory, which is based on the assumption that behavior is a result of person, behavioral, and environmental influences. In the reception area, parents and children had access to several interactive intervention tools designed to assist conversation between parent-child and parent-child-health care provider about physical activity, dietary practices, and sedentary practices, focusing on daily recommendations to meet health goals. Upon checking into the clinic, reception staff offered parents the “All-In-A-Day Take Home Tool”, a colorful 4-page brochure that guided parent and child through behavior-related activities. The intervention also included routine measures of height, not just during well child visits. Providers were requested to provide BMI screenings and weight-related behavior counseling during well child and other annual exams, including non-emergent visits if BMI counseling had not been documented within the previous year. The parent survey was provided to parents after the clinic visit and were self-administered either in-clinic or at home and returned by mail. The survey included questions to assess whether health care providers discussed pertinent lifestyle practices, weight, and BMI with parent and child during the clinic visit; children’s physical activity, sedentary practices, and eating practices and parent intention to change practices; as well as questions targeting respondent demographics.

Results from the study indicated that 83% of parents across the sample believed it was important for health care providers to share information with them about their child’s weight and physical activity, diet, and sedentary practices (Kubik et al., 2008). Significantly more parents attending the intervention, compared to the control clinic,
reported receiving information from their health care provider about their child’s weight and BMI. Among parents who were provided this information, 80% stated they were not at all or only slightly uncomfortable with the information. Parents attending the intervention clinic were greater than three times more likely to report health care providers asking about their child’s physical activity and fruit and vegetable consumption. They were five times more likely to report providers asking about their child’s sweetened beverage intake, and almost eight times more likely to report a provider asking about screen time practices, compared to parents attending the control clinic. Across the clinics, questioning was more likely to occur during a well child visit than a non-well child visit. The researchers stated that “results from this pilot study support the potential of primary prevention strategies and suggest parents regard the take-home messages they receive from health care providers about their child’s weight and physical activity and eating practices as relevant and, therefore, a potential motivating factor when considering behavior change that supports healthy weight” (Page 1905, Kubik et al., 2008).

Polacsek et al. (2009) used a quasi-experimental design of nonrandomized intervention and control sites in urban and rural area of Maine to evaluate the effect of a pediatric primary care-based intervention. The study examined both improved clinical decision support and family management of risk behaviors that could impact childhood overweight. Longitudinal data was collected from chart audits of 600 patients age 5-18 years. The intervention materials were designed to follow the conceptual framework of the chronic-care model, which states that changes in primary care, designed to produce
functional patient outcomes, require change for all members of the practice team. Within the clinical practice, the researchers focused on two features of the chronic care model: improved clinical decision support and family management of risk behaviors. Family management of risk included counseling of families and patients on 5-2-1-0 behavioral goals: consuming 5 or more servings of fruits and vegetables daily; limiting screen time to 2 hours or less daily; being physically active for 1 hour or more daily, and; avoiding SSB. Improvements in clinical decision support included tracking BMI percentiles on growth charts, identifying of overweight patients, and using behavioral screening tools. Staff at the sites reviewed charts for the last 70 well-child visits in each site for patients aged 5-19, including at least 10 charts per provider. Data included assessment of weight and height, BMI, BMI percentile, overweight weight classification, and blood pressure, and diagnosis of overweight. A baseline parent survey was created to assess parents’ awareness of hearing the lifestyle messages around the 5-2-1-0 theme from their child’s provider or nurse in the office. The same survey was used during the intervention to parents at both intervention and control sites. The provider surveys were completed before and during to measure provider knowledge, attitudes, self-efficacy and practice around the objectives.

The results of this study showed no significant increase in assessments of blood pressure or height and weight (Polacsek et al., 2009). However, there were large changes observed in assessment of BMI, BMI percentile for age and gender, and weight classification. Before the intervention, between 54% and 78% of parents reported hearing someone in the pediatric office talk to them about nutrition, physical activity or
exercise, TV or screen time, and/or SSB. During the intervention, the rates significantly improved. The percent of parents who reported someone talking to them about nutrition and SSB intake was approximately four times greater, discussing screen time almost three times greater, and talking about physical activity about two times greater. Parents who attended the intervention sites, compared with those at the control sites, also reported higher rates of counseling during the last visit. The intervention site parents reported someone discussing fruits and vegetables and physical activity to be about two times greater, and discussing screen time and SSB intake was found to be almost three times greater. Among the providers there was an increase from pre- to post regarding knowledge of BMI interpretation, specifically, the criteria for overweight. More providers also reported behavioral goal setting with overweight patients, and the use of motivational interviewing. Awareness of specific community resources also increased. Lastly, providers stated the 5-2-1-0 behavioral screening tool was useful. This evaluation documented the success of changing practices within the primary care setting that may potentially help in identifying, preventing, and treating childhood obesity.

A cluster randomized control trial by Taveras et al. (2011) aimed to examine the effectiveness of a primary care-based obesity intervention, specifically the prevention and treatment of childhood obesity among pre-school aged children. The findings reported here represent the first year of the planned two-year study. The participants were aged 2-6 years with a) a BMI greater than the 85th percentile for age, but less than the 95th percentile, with an overweight parent, or b) a BMI greater than the 95th percentile. The intervention was based on the chronic care model and involved primary care
restructuring, and the use of motivational interviewing by clinicians with families. Educational modules targeted SSB, fast food intake, and television viewing. The primary outcome of the study was a measure of BMI change from baseline to one year. The study results showed a small, insignificant change in BMI from baseline to one year in comparison to usual care participants overall. However, statistically significant changes in BMI were seen among girls (-0.38) but not boys (+0.04), and among participants in households with annual incomes of $50,000 or less (-0.93) but not in higher-income households (0.02). The secondary purpose of the study was to examine changes in behavioral goals for the participants in the intervention group. These behavioral changes were assessed by validated questions by clinicians and by validated semi-quantitative child food frequency questionnaires. Reductions in SSB intake, fast food intake, and television viewing were observed between the intervention and usual care groups, although, only decreases in fast food intake and television viewing were statistically significant. The first year of this planned two-year study saw some positive effects in reducing unhealthy behaviors associated with childhood obesity.

As previously noted, limited studies have been conducted on the prevention of childhood obesity in the primary care setting. The previously discussed studies applied various methods, which resulted in mixed results. Two additional pediatric primary care-based obesity prevention efforts studies are currently on-going (Sherwood et al., 2013; Gorin et al., 2014). While prevention is imperative, researchers have tried to identify active interventions for overweight and obesity in children to create change. Multiple studies have looked at the treatment of childhood obesity in the primary care setting to
determine the effectiveness of this unique environment (e.g., Sargent, Pilotto, & Baur, 2010). In a review written by Vine, Hargreaves, Briefel, and Orfield (2013), they examined the role of primary care providers for the prevention and treatment of childhood obesity. They found that an average of 10 articles were published yearly from 2005 to 2011 and almost twice that number was published in 2012, showing an increased interest in the role primary physicians play in the interventions of childhood obesity. Three of the most recent obesity treatment studies are discussed below.

McCallum et al. (2007) conducted a randomized controlled trial in the primary care setting aimed at reducing an increase in BMI among overweight and mildly obese children, 5-10 years-old. The intervention consisted of four sessions delivered by a general practitioner over 12-weeks. The intervention addressed nutrition, physical activity, and sedentary behavior. Mean follow-up times among participants were 9-months and 15-months. At both the 9-month and 15-month follow-up, no significant changes in BMI were observed among the intervention group in comparison to the control. There were significant improvements observed in the nutrition score among intervention participants. The researchers also found that this brief intervention resulted in greater expense to both the families and health care sector in comparison to the control group. The authors hypothesized that the intervention was not intensive enough and/or the general practitioners training was inadequate to create significant change.

A prospective, cohort study by Wald, Moyer, Eickhoff, and Ewing (2011) aimed to assess an intervention delivered in primary care to obese children, 9-12 years old, and their families. Due to slow accrual of participants, recruitment was conducted throughout
the year. Children enrolled but who were required to wait until the next intervention program became available, were assigned to the quasi-control group. The intervention was a family-based, weight management program that was comprised of 11 sessions over a 15-week period. It included modules focusing on healthy lifestyles, with a concentration on dietary and physical activity behaviors and parental coaching to help support behavior changes. There were 78 children enrolled in the intervention group, starting within two to four weeks after signing consent, and 23 children enrolled in the quasi-control group, due to a minimum 15-week waiting period before starting the intervention. The researchers found participants in the intervention group achieved significant reductions in BMI z score compared to those in the quasi-control group at 15-weeks. Significant reductions in BMI z score were also observed among those who completed the program at 12-months and 24-months compared to their own baseline. Results also showed at 15-weeks, those who completed the program lost 2.40 pounds (±5.24) compared to a weight gain of 3.45 pounds (±4.31) among the quasi-control participants.

A retrospective cohort study by Dolinsky, Armstrong, Walter, and Kemper (2012) evaluated the effectiveness of a primary care-based childhood obesity treatment program at Duke University. The 282 participants were obese 2-19 year olds. The treatment program used motivational interviewing to produce changes in dietary and physical activity behaviors with the goal to generate improvements in the severity of overweight or obesity and obesity-related comorbidities. Physicians, registered dietitians, physical therapists, and mental health professionals were all included in the treatment program.
The primary phase included six visits, which were completed at intervals of four to six-weeks. Upon completion of the primary phase participants entered the maintenance phase with visits every six-months until the participant reached 23 years. Although the intervention produced little change in the reduction in obesity severity, mean reduction in BMI of 0.10, and significant improvements in obesity-related comorbid health conditions were observed – including total cholesterol, triglycerides, insulin resistance, and blood pressure. The researchers stated that these obesity-related conditions might have changed without treatment. Compared to other studies, this investigation included measures other than BMI, which provided insights into possible health related outcomes given similar interventions.

Adding to the studies described previously, a review article by Sargent et al. (2010) examined the effectiveness of treating childhood obesity in the primary care setting. Twenty-two papers describing 17 studies were included, with 12 of these studies reporting at least one significant intervention effect. The intervention outcomes included measurements of change in BMI, dietary intake, physical activity, and sedentary practices. The authors of this review concluded, “the evidence indicates that the primary care setting can be effective in treating childhood overweight and obesity” (Page e232, Sargent et al., 2010). The primary care setting is a unique environment that has the capability of reaching a large proportion of the population across lifespan, thus, providing opportunities for interventions that may benefit overweight and obese children.

Last, a qualitative study by Sealy, Zarcadoolas, Dresser, Wedemeyer, Short, and Silver (2012) conducted provider interviews and parent focus groups to develop the
“Obesity in Children Action Kit.” They then evaluated the Obesity in Children campaign and clinical tools within the Action Kit among a sample of targeted pediatric and family physician practices in New York City. The clinical tools applied within the Action Kit included a My Plate planner, healthy portion size flip charts, food and fitness facts quiz, health bulletin about making better food and physical activity choices, and tips to reaching a healthy weight. The campaign reached 161 practices with 2,049 patient contacts, including one-on-one interactions and group presentations. Specific tools to help reduce consumption of SSB were well received, including a soda bottle nutrition teaching tool that showed the amount of sugar consumed in a 20-ounce bottle of regular soda. A significant improvement in the percent of practitioners who reportedly counseled all patients on SSB was observed, from 63% to 78%. When speaking to patients and families about reaching and maintaining a healthy body weight 62% of healthcare providers reported using the soda bottle showing sugar content. While impacts on obesity were not measured in this study, the researchers concluded that the Obesity in Children campaign and Action Kit was well received by clinicians and their staff and the Action Kit materials were commonly requested, addressing the need for clinical tools in obesity education and prevention.

In summary, this chapter has provided background information that will serve as the basis of this thesis study. Consumption patterns of SSB among children have significantly increased over the past decades, paralleling obesity rates. Research has noted positive associations among SSB consumption, excessive weight gain and health risks. Consequently, reductions to decrease SSB intake have been recommended by
multiple health organizations. Parents and guardians have been identified as the most significant influence of a child’s consumption of food and beverages and researchers have tried to identify ways to influence parent’s behaviors regarding SSB. The primary care setting has been used for both prevention and treatment strategies of childhood obesity, and could potentially influence parental beliefs and behaviors regarding SSB consumption.
Chapter 3

Methods

This chapter describes the theoretical basis, purpose, aims, and methods used for this thesis study. Details on research participant recruitment and data collection are also explained in this section.

Context

This thesis study was one component of the *Rethink Your Drink* investigation led by Dr. Jamie Benedict. The goal of this larger investigation is to identify community-based strategies that will effectively reduce the intake of SSB among young, school-aged children. The current target audience is parents/guardians of children aged 6-12 years living in households participating in SNAP within Washoe County, NV. The current *Rethink Your Drink* campaign focuses on reducing home availability of SSB by educating parents/guardians about sugary drinks, developing their ability to identify these drinks, and enhancing self-efficacy in choosing healthful beverage alternatives. Thus far, strategies developed and evaluated have included a direct-mail intervention, a media campaign, an educational website, and collaboration with health professionals. Regarding the latter, this most recent effort included inviting health professionals to distribute *Rethink Your Drink* brochures to parents/guardians of young school-age children. This thesis study represented a continuation of this collaboration, specifically exploring health professional’s opinions regarding the types and characteristics of additional educational resources that may be used in primary and dental care settings.
As part of the *Rethink Your Drink* effort, primary care providers and dentists in Washoe County who treat children from low-income households have been surveyed twice. In 2012, a survey was conducted of 218 primary care providers and dentists (Benedict, Gilmore, & Freed, 2013). The purpose of the survey was to assess their concerns about sugary drink intake among pediatric patients; to characterize how this issue was addressed within their practice; and to identify barriers to addressing this concern with parents/guardians. Ninety health professionals responded, including 57 physicians, 17 nurse practitioners and physician assistants, and 16 dentists. The results indicated that nearly all of the health professionals (99%) agreed or strongly agreed that sugary drink consumption among their pediatric population was a concern and presented a significant health risk. Seventy-seven percent regularly assessed patients’ intake and 68% provided education on the topic. In addition, 42% regularly set goals, 26% discussed barriers, and 7% referred patients to a registered dietitian. The two most significant barriers identified were patients’ unwillingness to reduce intake and the perceived lack of concern among parents. Respondents reported having access to some resources but indicated an interest in additional materials if made available (Benedict, Gilmore, & Freed, 2013).

Approximately one-year later, health professionals within Washoe County who treat children from low-income households were then mailed an invitation to receive free copies of educational materials, herein referred to as the *Rethink Your Drink* brochures. Following the distribution of these brochures (n≈10,000), the 56 professionals who received the materials were surveyed on the perceived usefulness and effectiveness of
these resources. From the 25 surveys returned it was noted that the brochures were generally well received, with health professionals finding the materials helpful, relevant, and appropriate for the target audience. Providers also expressed interest in additional resources on sugary drinks, as described in Table 1 (Benedict, 2014).

These quantitative survey findings have provided useful information regarding the types of resources that local primary care providers and dentists prefer. It was proposed by Dr. Jamie Benedict that these resources, and perhaps others, be assembled together as a tool-kit for use within the primary and dental care settings. This thesis study employed qualitative methods to obtain in-depth information from this audience to determine ways to improve existing educational resources, desired characteristics/features of other educational resources, preferences regarding the inclusion of resources in a tool-kit, and differences between preferences of primary care providers and dentists in regards to educational resources. The findings will be used to develop resources for the Rethink Your Drink effort, pending funding.
Table 1

*Health Professionals’ Interest in Receiving Resources on Sugary Drinks (n=25)*

<table>
<thead>
<tr>
<th>Resource</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional copies of Rethink Your Drink brochures</td>
<td>68.0</td>
</tr>
<tr>
<td>Posters about sugary drinks</td>
<td>44.0</td>
</tr>
<tr>
<td>DVD about sugary drinks for parents</td>
<td>16.0</td>
</tr>
<tr>
<td>DVD about sugary drinks for children</td>
<td>24.0</td>
</tr>
<tr>
<td>Educational displays about sugary drinks</td>
<td>36.0</td>
</tr>
<tr>
<td>Tool to assess children’s intake of sugary drinks</td>
<td>40.0</td>
</tr>
</tbody>
</table>
Theoretical Basis

The theoretical basis for this thesis study was the Social Cognitive Theory (SCT), which addresses the methods of promoting behavioral change and the psychosocial dynamics influencing health behavior (Bandura, 1986; Glanz, Lewis, & Rimer, 1997). The SCT suggests that behavior is the result of personal, behavioral, and environmental factors that influence each other and shape behaviors (Contento, 2011). Personal factors consist of an individual’s opinions and thoughts. As described by Contento (2011), behavioral factors incorporate their health-, nutrition-, and food-related knowledge and skills. And, environmental factors include both social and physical factors that affect a person’s behavior.

Albert Bandura proposed and developed the SCT as a way to understand human thought, motivation, and action. Bandura believed self-efficacy was the most important motivator for behavior change, needed to overcome barriers and adopt healthful behaviors (Bandura, 1986). Self-efficacy is a personal factor of the SCT. It is the confidence an individual has about performing a given behavior to produce the desired outcomes (Contento, 2011). Self-efficacy has been shown to be of particular importance in the initiation, modification, and maintenance of complex behaviors, such as healthful eating and physical activity. Research has shown that a higher level of perceived self-efficacy is associated with greater effort in learning a new behavior and over-coming barriers. For example, Nickelson, Lawrence, Parton, Knowlden, and McDermott (2014) used cross-sectional data from parents of children 5 years old or younger to examine sugar-sweetened beverage consumption and associated factors. Reviewing psychosocial
factors associated with intake of SSB, the researchers found self-efficacy was the only factor related to intake. Parents who could list other types of drinks to give their child if they did not allow SSB, and who believed they could tell friends and family members not to give their child SSB when they are not present, were more likely to report a lower intake of SSB among their children.

Methods for enhancing self-efficacy include but are not limited to personal mastery, social modeling, social persuasion, and modification of emotional or physical responses to the behavior (Bandura, 1986). Observational and interactive learning techniques can be used in health education to help enhance self-efficacy and promote the targeted behavior (Contento, 2011). In 2000, Baranowski et al. used a multi-component intervention (Gimme 5) within schools, based on the SCT, to impact fourth- and fifth-grade children’s fruit, juice, and vegetable consumption. The intervention included a school-based curriculum, newsletters, videotapes, and point-of-purchase education. They used learning techniques that focused on how to make changes to their food choices, in addition to allowing children to practice these behaviors by preparing new recipes and tasting the prepared dishes and drinks. The researchers found increased self-efficacy positively influenced children’s consumption and preference towards choosing fruit, juice, and vegetables.

An additional goal of health education is bringing the health behavior under the control of the individual through behavioral factors (Bandura, 1986). Behavioral factors include food-related knowledge and skills that are needed to engage in the behavior, with self-regulation skills required for initiation and maintenance of the behavior long-term.
Self-regulation is the ability to direct and influence behavior through skills; it includes identifying the behaviors that need to change and setting goals to achieve the new skill or action. Goal setting is a way to monitor progress and reinforces behaviors through positive rewards and incentives (Contento, 2011). Self-efficacy plays a role in self-regulation through affecting the behavior an individual selects to change and increasing their confidence in practicing that behavior (Glantz et al., 1997). While the actual skill is different than self-efficacy, individuals need to be able to learn and practice behavioral skills to achieve their goals (Contento, 2011). The environment in which the behavioral skill takes place also influences its outcome.

Bandura explained that human behavior is constructed through observational learning, with the environment providing models for behavior within the context of social interactions and experiences (Bandura, 1986). Behavior is a function of a shared environment with others that exists within a larger environment. The environment can influence and guide behavior without a person being aware of the influence. A child’s eating behavior can be the result of their food preferences, prompts from parents, food availability in the home and availability in their geographical region. While health behavior change efforts have increasingly become focused on modifications to the environment, it is important that all three factors of behavior change are examined: personal, behavioral, and environmental (Glantz et al., 1997; Contento, 2011).

The SCT has been used as a framework for understanding and incorporating both individual and organizational approaches to behavior change. It has been found to be especially useful in designing public health and nutrition education programs that address
both skills and motivation in the individual and the environment (Contento, 2011; Baranowski et al., 2000). The Rethink Your Drink campaign is based on SCT as was this thesis study.

**Research Purpose and Aims**

The purpose of this thesis study was to conduct formative research regarding the development of additional educational resources for use in primary and dental care settings, to reinforce the importance of limiting sugary drinks and to promote more healthful choices. These resources may eventually be organized in a tool-kit intended to benefit parents/guardians of young children. Health professionals were used as key informants here, specifically to provide information about the types of resources and desired characteristics for use in their practice.

The following research questions were addressed from the perspective of primary care providers and dentists:

1) In what ways can the existing educational resources, provided by the Rethink Your Drink campaign, be improved?

2) What are the desired characteristics/features of other educational resources that may serve to reinforce the importance of limiting sugary drinks and promote more healthful choices?

3) What educational resources are most preferred for a tool-kit designed to reinforce the importance of limiting sugary drinks and promote more healthful choices?
4) How do the opinions and preferences of primary care providers differ from dentists in regards to other educational resources that reinforce the importance of limiting sugary drinks and promote more healthful choices?

**Methods Employed**

Prior to the initiation of this thesis study, a protocol was submitted for approval to the University of Nevada, Reno Social Behavioral Institutional Review Board (IRB), through the Research Integrity Office. Approval was granted on March 3, 2015 and recruitment of participants began following this approval. Approval of a protocol modification was also granted on April 14, 2015 that added a new member to the research team, who served as a second coder for the purpose of measuring intercoder agreement.

Qualitative methods were used in this formative research study. Formative research (aka formative assessment and formative evaluation), as defined by Contento (2011) is the basis for developing effective strategies for influencing behavior change. It is often used to assess the target audience’s interests, needs, and characteristics (Contento, 2011). It is an integral part of program development, and can also be used to improve existing programs. Researchers are able to evaluate the program while it is being conducted and determine the relevant interests of the target audience in relation to the public health issue (Cottrell & McKenzie, 2011).

Formative research includes both qualitative and quantitative methods for program development and intervention implementation, utilizing feedback from the target audience (Rice & Atkin, 2013; Contento, 2011). Researchers use qualitative methods to
understand human behavior; they investigate why individuals engage in certain behaviors or have certain opinions. Researchers utilize in-depth interviews, focus groups, and participant observations to gather qualitative data. Quantitative methods result in empirical data from surveys and questionnaires. Qualitative methods utilize open-ended questions and result in richer data. Quantitative methods generally employ closed-ended questions with little or no opportunity to explain responses (Rice & Atkin, 2013). The method used, qualitative or quantitative is dependent on the research aims (Siegal & Doner, 1998).

Multiple formative research methods are employed by nutrition researchers, including in-depth interviews. In-depth interviews are useful to discover feelings and attitudes an individual has concerning a specific issue (Cottrell & McKenzie, 2011). In-depth interviews are typically longer in duration and utilize open-ended questions generating more depth and detail. These are best used when the topic is complex and the respondents are knowledgeable about the topic of interest. They are also useful to draw upon experiences of the individual being interviewed (Cottrell & McKenzie, 2011).

Sample. The populations of interest were primary care providers and dentists who treat young, school-aged children from low-income households. Primary care providers see individuals that have common medical problems and are often involved in a patient’s care for a long period of time, providing preventative care and education on healthful lifestyle choices (Vorvick, 2013). Primary care providers include pediatricians, family practitioners, physician assistants, and nurse practitioners. Dentists are the
primary dental care providers that take care of oral health needs crucial to total health (Academy of General Dentistry, 2012).

In order to obtain relevant information regarding the perceptions and opinions of the target population, a purposive sampling design was employed for this thesis study. Purposive sampling is a deliberate non-random method of sampling, typically used in qualitative research designs, that aims to sample a group of people with a particular characteristic (Bowling, 2009). The sample was health professionals, specifically primary care providers and dentists in Washoe County, who provide care to children from low-income households. This sample consisted of key informants, those knowledgeable about the subject and able to provide detailed information on what additional resources would be of benefit (Weiss, 1994). Research participants were recruited from a list of professionals who ordered *Rethink Your Drink* brochures in 2014, as discussed below.

In 2014, health professionals within Washoe County who treat children from low-income households were invited to receive free copies of the *Rethink Your Drink* brochures. Eligibility of these health professionals was determined by 1) a provider accepting insurance through Medicaid or Nevada Check Up, 2) providing care to children less than 18 years, and 3) being a primary care provider (i.e. family medicine or pediatrics) or dentist within Washoe County. To construct the sampling frame, providers who accepted insurance from either Medicaid or Nevada’s Children’s Health Insurance Program (CHIP), otherwise known as Nevada Check Up (NCU) for the state of Nevada were identified. NCU provides health insurance to children, ages 6-18, whose family income is less than 133% of the Federal Poverty Level and who are not eligible for
Medicaid. Separate CHIP eligibility is available for those families whose income is less than 200% of the Federal Poverty Level (Medicaid, 2014). In the state of Nevada, both Medicaid and NCU services are administered by: Amerigroup (AG) and Health Plan of Nevada (HPN). The list of primary care providers under AG and HPN were obtained through the Nevada Department of Health and Human Services website and the Division of Health Care Financing and Policy website. The list of dentists was obtained through Insure Kids Now for Nevadans (Nevada Department of Health and Human Services, 2014; InsureKidsNow.gov, 2014). Providers were excluded from this list if they specified “18 and over” or if they were listed as any other specialty besides “Family Medicine” or “Pediatrics”.

Once the sampling frame was constructed, a letter was sent to eligible health professionals within Washoe County inviting them to participate in the 2014 *Rethink Your Drink* campaign by requesting related materials. For larger establishments with multiple health professionals, the facility was contacted for the name of the medical or dental director. These establishments only received one letter, which was addressed to the specified contact.

**Participant recruitment.** As noted previously, those professionals who responded positively to the invitation to order *Rethink Your Drink* materials became the population of interest for this thesis study. Health professionals who requested materials in 2014 (n=35) were first identified. Due to the small number of physician assistants and nurse practitioners on this list it was decided to not include these health providers in the sampling frame, and to interview only physicians and dentists (n=27) for this study.
While a sample size could not be determined before the start of this thesis project, a sufficient sample size in qualitative research is reached once the same themes, stories, topics, and issues emerge from the study subjects (i.e., saturation) (Bowling, 2009).

To recruit research participants for this study a two-step process was employed. The primary care providers and dentists were each sent a letter thanking them for their involvement and interest in the Rethink Your Drink effort (Appendix A). The letter explained that interviews would be conducted in an effort to develop additional resources for use in the primary and dental care settings. The letter also informed them that they would be contacted by phone regarding their potential participation in these interviews. Each letter was printed on University of Nevada, Reno stationary and was hand-signed. Last, a $50 gift card token of appreciation was mentioned.

Approximately one-week after the letters had been mailed, each of the health professionals was contacted by phone to personally invite them to participate in the study. A phone script was used for this purpose (Appendix B). If the health professional agreed to participate in the study, the time and location were confirmed and a follow-up letter was sent (Appendix C).

Data collection. Semi-structured in-depth interviews are commonly used in qualitative research and were used for this thesis study (Bowling, 2009). Semi-structured interviews allow the interviewer to ask a fixed-question while the participant can respond freely and answer in their own words, providing a fuller development of information (Weiss, 1994). Prompting from the interviewer using reflection techniques and follow-up questions encourages the participant to elaborate on their responses to gain a full
understanding of their insights (Bowling, 2009). Interviewing also allows researchers to learn about an individual’s interior experiences and perceptions (Weiss, 1994). The data obtained from the in-depth interviews were gathered to provide insight rather than assume representativeness.

An interview guide was developed for the purpose of obtaining the opinions and insights of health professionals about additional resources that may be useful as part of the Rethink Your Drink campaign (Appendix E). It was a guide however and was meant to provide some flexibility allowing the respondent to concentrate discussion on an area they were able to report on, even if other interview topics were not discussed in great detail (Weiss, 1994). In-depth interviews gather answers to questions and corroborate opinions; they are not designed to test hypotheses (Seidman, 2006). The interview guide was pre-tested prior to use with both a primary care provider and dentist of young school-aged children, not from the sample for this study. From these pre-test interviews it was determined that no changes to the interview guide were needed.

Prior to starting the interview, the researcher provided the participant with an information sheet (Appendix D) that explained the study. One researcher conducted the in-depth interviews (Aimee Brock). The interviews took place at the health professionals’ practices, in a quiet and private room of their choice, allowing for the privacy of the participants responses. Interviews lasted between 20-35 minutes. A digital audio recorder was used to record the health professional’s responses, with their permission. This allowed the researcher to carefully listen to the participant, rather than manually record the responses. Audio recorders are rarely intrusive as many individuals
forget about them once the interview is underway (Bowling, 2009). In addition, the interviewer took note of key words and phrases to keep account of the topics discussed and in case of failed recordings. Once the interview was complete, a token of appreciation (a gift card) was given to the participant and they were asked to sign an acknowledgement of receipt (Appendix F). Immediately after the interview had ended, the interviewer took a few minutes to write down any impressions and observations that may not have be captured by the notes of the audio-recording.

**Data management and analysis.** Within 24-hours after the interview, the researcher transcribed the audio recording verbatim using Microsoft Word. As a quality control measure, following the first four interview transcriptions, another research member of the team listened to the audio-recordings and made note of any discrepancies found between the recordings and the transcriptions. Only minor discrepancies were found, and none changed the meaning of the responses in any way. This provided evidence of the accuracy of the transcriptions.

The verbatim transcripts were then analyzed and coded using the phases of coding described by Strauss and Corbin (1990): open coding, axial coding, and selective coding. The open coding phase is the first stage of coding described by Strauss and Corbin, which identifies categories in the data by items mentioned by the study participants. The second coding phase is axial coding, where data is analyzed to find connections between categorizes found in the open coding phase. In the final phase of coding, selective coding, a story is constructed that tries to explain the experiences of the study participants through the connections that have been drawn between categories. With the more
detailed responses obtained from a qualitative study, categorizing the data is not an easy task. Analysis relies more on interpretation, summary, and integration, and less on counting and correlating, with findings presented more by quotations and case descriptions (Weiss, 1994).

To analyze the data a computer software system NVivo 10® was employed, to manage the data during the coding process. Bazeley (2007) describes NVivo as a supportive tool for researchers in the coding process of qualitative data analysis. While qualitative analysis software does not perform the analysis for the researcher, it assists in five aspects of analysis: (a) managing data, (b) managing ideas, (c) querying data, (d) graphically modeling data, and (e) reporting the data.

In the first phase of coding, open coding, the transcripts were reviewed and categories were identified based on the data provided by the research participants. A coding framework, codebook, was developed from these categories identifying their relationship to the specific questions from the interview guides. NVivo 10® was then used to develop a “node” for each identified category. Bazeley (2007) explained that a node “serves as a container for what is known about, or evidence for, one particular concept or category”.

Reliability of the coding process was established through use of intercoder agreement, using two coders to confirm the accuracy and coding of categories. Intercoder agreement as defined by Creswell (2007) is “when two coders assign the same code word to a passage of text.” Intercoder agreement was achieved by evaluating if the same nodes were given to the categories based on the definitions in the codebook. If the
same node was coded to the same category between the two coders, the node was counted as a “yes”. If not, it was counted as a “no”. The percentage of agreement was calculated by dividing the total number of “yes” codes by the total number of nodes coded.

Creswell (2007) recommends an 80% agreement should be achieved, or the investigators should go back and reassess the coding rules and reanalyze the data. The intercoder agreement was assessed with 25% of the interviews (n=3), randomly chosen. The reliability assessment results are presented in Chapter 4.

Following the completion of the coding process, the nodes were organized into categories that reflected the topics addressed in the interview guide. The categories were then organized into tables. Next, the hand written notes were reviewed and compared to the tables to determine if any data was missed. No differences were noted between the hand written notes and the tables. One aim of the study was to compare how the opinions and preferences of primary care providers differ from dentists in regards to other educational resources that reinforce the importance of limiting sugary drinks and promote more healthful choices. Therefore, one important aspect of data analysis was comparing the opinions and preferences of these two groups of health professionals. In addition, the researcher compared data across the questions and identified themes. These findings and others are described in Chapter 4 of this thesis. The implications of these findings, and their correspondence to the existing literature are described in Chapter 5.

This chapter described the theoretical basis, purpose, aims, and methods used for this thesis study. Additionally, details on participant recruitment, data collection and analysis were explained.
Chapter 4

Results

This chapter describes the results of the semi-structured interviews conducted with health professionals in Washoe County between March 16, 2015 and April 3, 2015. First, the sample characteristics are described, next the findings from the reliability assessment are reported, and finally, the qualitative findings are presented.

Sample Characteristics

As noted in Chapter 3, study participants represented a purposive sample of health professionals, specifically physicians and dentists in Washoe County, who provided care to children from low-income households. They were recruited from a list of professionals who ordered Rethink Your Drink brochures in 2014 (n=27). Per IRB protocol, recruitment of individuals ceased after five attempts to reach them by phone, resulting in a 41% participation rate. It should be noted that saturation had been reached by that time.

The study participants included six physicians and five dentists (n=11); 36% were females (n=4). Among the physicians, 50% were primary care providers (n=3) and 50% were pediatricians (n=3). Among the dentists, all but one practiced in a pediatric specialty clinic.

It should be noted that of the eleven health professionals interviewed, only one was not aware of the Rethink Your Drinks brochures provided to their practice stating, “I must apologize, I’ve never been aware that we had access to these”. However, this
participant reviewed the brochures prior to the interview and was equipped to provide
detailed responses regarding ways to improve the brochures, to identify desired
characteristics/features of other educational resources, and to express his preferences with
regard to the inclusion of educational resources within a tool-kit. The other participants
were generally familiar with the brochures.

**Reliability Assessment**

Following the coding of all eleven transcripts, 25% of the interviews (n=3) were
chosen at random for the assessment of intercoder agreement. After reviewing the coded
nodes between the primary and secondary coder, an intercoder agreement of 69% was
noted. Of the coded data, 59 were coded the same and 27 were not. In reviewing results
provided by the two coders, it was determined that the discrepancies were primarily from
the responses resulting from two closely related to questions that were subsequently
coded separately according to the codebook guidelines. For example, the interview
questions that related to suggestions to improve the brochures overall effectiveness and
suitability generated a variety of responses. The coding dictionary did not provide
enough distinction between questions and responses to clearly identify correct coding,
creating confusion between similar categories. In addition, one of the two coders coded
“no” responses, while the other one did not, leading to inconsistencies in data being
reported. After discussions between the second coder and Dr. Jamie Benedict, it was
decided to collapse closely related codes and not to code “no” responses as part of the
dataset. Once these changes were made, intercoder agreement was recalculated, resulting
in an intercoder agreement of 81%. From the coded data, 61 items were coded the same and 14 were not.

**Qualitative Findings**

Once the coding was completed, the data were organized into tables corresponding to the research questions as noted in Chapter 3. Unique tables were constructed for each of the educational resources of interest. These tables were organized by the specific probes used during the interviews, and included representative quotes from the study participants. Additional tables were constructed to show categories about other suggested educational resources (beyond the resources of interest), preferences for educational resources to be included within a tool-kit, and additional comments regarding the *Rethink Your Drink* campaign. Interview responses that resulted in a “no” (e.g., “Is there any content that you think should be included and/or deleted?”, “…is there anything else you think is important for us to consider?”, “…are there any barriers you foresee occurring in using the provided tool-kit?”) are not listed as findings within the tables, but are discussed within this chapter.

The first research question, “In what ways can the existing educational resources, provided by the *Rethink Your Drink* campaign, be improved?”, was answered by questions within the interview guide that identified participants’ opinions about ways the brochures could be improved, and how they were previously distributed. Participants’ responses about the *Rethink Your Drink* brochures were organized as follows: additional content to be included, content to be deleted, and ways to improve suitability. With
regard to distribution of the brochures, responses were organized by methods of
distribution and the effectiveness/ease of distribution.

Additional content to be included in the brochures as suggested by the study
participants, included: breastfeeding, oral health, greater emphasis on energy drinks, and
the addition of a quick response (QR) code (Table 2). The only content suggested for
deletion from the brochures was content that encouraged consumption of 100% fruit juice
and milk. Participants reported a variety of suggestions for ways to improve suitability of
the brochures. These included, keeping the content at a third grade reading level or
below, translating them into multiple languages, and making sure the information
provided is accurate.

Regarding distribution, study participants reported multiple methods in which
they had distributed the brochures including: a display in exam rooms, distribution during
nutrition classes, and posted on an informational poster display in the lobby (Table 3).
Participants reported it was easy to distribute the brochures and found them useful to send
home with families.

The second research question: “What are the desired characteristics/features of
other educational resources that may serve to reinforce the importance of limiting sugary
drinks and promote more healthful choices?”, was answered by questions within the
interview guide that identified participants’ opinions about additional educational
resources that may be useful within the primary and dental care setting. Per the interview
guide, the specific educational resources that were discussed included posters,
display/model, digital versatile disc (DVD), and a screening tool. Each of these
educational resources were explored individually during the interview resulting in rich data.

For the poster and display/model, the participants’ responses were organized into the following categories: content and characteristics, most important message to convey, target audience, size, challenges of use, and benefits of use. For the DVD, participants’ responses were organized into the following categories: content and characteristics, likelihood of use, challenges of use, and benefits of use. Similarly, for the screening tool participants’ responses were organized into the following categories: content and characteristics, likelihood of use, likelihood findings would be noted in medical record, and anticipated value if it provided immediate feedback for parents/guardians.

Posters were the first educational resource discussed during the interviews (Table 4). In general, these were perceived as useful since health professionals may not have time to discuss SSB consumption during their patient appointments. In addition, it was noted that posters could easily be placed on a wall for patients and their parents/guardians to view. Several suggestions were made about the visual appeal of the posters; such as making them simple, bright, fun, and eye-catching. Important poster messages that were recommended by participants included, 1) reduce the amount of sugary drinks consumed, 2) show the amount sugar found in drinks, 3) encourage consumption of water, 4) discourage consumption of sports drinks, and 5) convey oral health effects of SSB. Some participants reported the poster should target parents or children individually, while majority of participants stated they should be aimed at both children and their parents.

Size recommendations for a poster varied greatly, from the smallest at eight by eleven
inches to one that is larger than 24 by 36 inches. The only challenge provided by participants was other items on the walls within their office that might leave them limited space for a poster. Benefits included a poster could be passively posted to provide education, if the provider did not have time to discuss SSB intake, and a poster could be more useful than brochures.

A display/model was the second educational resource discussed (Table 5). Content and characteristics commonly recommended by participants included the display providing a “shock value”, show more common drink sizes, not just a 12-ounce drink, and making sure the model is not breakable. Important messages to convey via a display/model included, but was not limited to, 1) show the amount of sugar in various beverages and 2) show the oral health consequences, such as cavities, decay, and erosion associated with SSB. It was commonly recommended that a display/model should be something the child or parent could touch and hold. While size recommendations varied, the majority of health professionals stated the model should be something they could place on the counter in an exam room or in the waiting room. The question addressing which audience should be targeted provided mixed results. For example, some participants stated that the model should target the child or parent individually, while others recommended targeting both groups.

Size recommendations varied greatly for a display/model, from the smallest being the size of a soda can to one that is large enough that the children could go inside of it and interact with the model. Majority of providers stated a display/model should be something that could easily be placed on an exam room counter. Challenges reported
included providers covering other topics, being mindful of those who are sight impaired, and making sure that a display/model does not get lost in the mass of materials. The only benefit stated was it can be useful for patients to look at while waiting on the provider.

During the interviews, study participants were asked about a potential model that would show the actual amount of sugar in a variety of beverages. These results are not previously presented in Table 5. Prior to being asked about this potential model, five participants mentioned that this concept might be a useful idea. Two dentists reported already using a similar model in their practice. All participants responded positively to the potential model as reflected in these select excerpts, “That would be helpful…absolutely” and “…it would be pretty useful especially for the waiting room time.”

A DVD was the third educational resource discussed during the interviews (Table 6). The participants commented that a DVD should reach a diverse population; reporting it should be multi-cultural, in both English and Spanish, and engage all age groups. In general, participants stated it would be minimally useful within their practice. The biggest challenges to using a DVD were not having a DVD player in their practice and the extra work and time a DVD may require by staff to manage. While benefits of use included it can play the message and parent would not have to read materials and it could be playing while waiting on a provider.

A screening tool was the fourth educational resource discussed during the interviews (Table 7). Participants commonly suggested that a screening tool be short and simple given there are already multiple other forms a parent and provider must complete.
All participants reported that results would be noted within the medical record if a screening tool were used. A majority of the participants reported a screening tool would be of limited or no use. However, a screening tool that provides immediate feedback for parents/guardians regarding SSB intake was perceived as a valuable characteristic.

Table 8 presents general suggestions for the Rethink Your Drink campaign as described by study participants. The participants’ responses were organized into three categories: additional locations, tools/resources, and approaches. A common suggestion provided by both primary care providers and dentists was to incorporate the use of media more often, using tools such as Internet resources, phone applications, and text messages.

The third research question, “What educational resources are most preferred for a tool-kit designed to reinforce the importance of limiting sugary drinks and promote more healthful choices?”, was answered by questions within the interview guide that provided participants’ preferences of which educational resources should be included in a tool-kit. The results were displayed in Table 9. The top three ranked educational resources, as reported by the participants, were: brochures, poster, and display/model. The participants also commented on barriers they anticipated in using the free tool-kit. These barriers included not having enough time and making sure the resources were relevant for their particular practice.

The fourth research question, “How do the opinions and preferences of primary care providers differ from dentists in regards to other educational resources that reinforce the importance of limiting sugary drinks and promote more healthful choices?”, was answered by the researcher examining the data across the questions between the
responses by primary care providers and dentists. The most notable difference was that dentists more often discussed the need for greater emphasis on the oral health effects of SSB. Their suggestions included pictures of “rotty” teeth, comparisons of different drinks and their impact on teeth (e.g., milk vs. energy drinks), and a visual of the amount of sugar and acid in a variety of beverages. Also, most stated that the screening tool would be of limited or no use because the routine oral exam findings reflect what the patient is consuming. Outside of the oral health effects of SSB, primary care providers and dentists had similar preferences about the educational resources including the characteristics and content to be used, the target audience, and the benefits and challenges to using them within their practice. In addition, no major differences were reported between primary care providers and dentists in regards to the specific educational resources preferred for inclusion in a tool-kit, also presented in Table 9.

Table 10 summarizes additional comments regarding the Rethink Your Drink campaign reported by participants during the interviews. The participants’ responses are organized into the following categories: campaign brochures, value, and reach.

When the data were compared across questions, the researcher identified four themes. One theme illustrated the participant’s excitement toward the campaign and the important role they can play. A second theme expressed attitudes about ways to provide “shock value” with the resources to influence health behaviors. An additional theme highlighted the need to target both children and parents/guardians. And the last theme was a perception that resources need to be developed so they do not require a lot of time
or effort from the health professional or their staff to educate or manage. These themes will be discussed more thoroughly in the next chapter.

In summary, this chapter has presented the results of the semi-structured interviews conducted with primary care providers and dentists in Washoe County. The results from the eleven interviews were rich in content providing details regarding suggestions for the development of additional educational resources for use in primary and dental care settings, to reinforce the importance of limiting sugary drinks and to promote more healthful choices. In the next chapter, the themes will be discussed and compared to other related research, the limitations of the study will be described, and suggestions for future research will be provided.
Table 2

Ways to improve the Rethink Your Drink campaign brochures as described by participating primary care providers and dentists during semi-structured interviews

<table>
<thead>
<tr>
<th>Probes</th>
<th>Findings</th>
<th>Representative quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Additional content to be included</strong></td>
<td>Breastfeeding</td>
<td>“I would like to see some pictures …before and after pictures, like a child with braces who drank a bunch of pop, that has all the white spots and cavities.”</td>
</tr>
<tr>
<td></td>
<td>Barcode that attaches to mobile website (QR code)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cultural drinks (e.g., horchata)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What happens to their health or their teeth</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Before and after photos (cavities, white spots)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discuss frequency of consumption</td>
<td></td>
</tr>
<tr>
<td></td>
<td>More emphasis on energy drinks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discuss acid levels and erosion with oral health</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vegan alternatives for milk (cashew or almond milk)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Sometimes just words alone aren’t enough, pictures mean way more.”</td>
</tr>
<tr>
<td><strong>Content to be deleted</strong></td>
<td>Not encourage consumption of juice</td>
<td>“…juice in general is not recommended for children, so the whole brochure was about don’t drink artificial juice, drink real juice. I think you should completely do away with that brochure and not even encourage consumption of juice.”</td>
</tr>
<tr>
<td></td>
<td>“tone down” milk consumption (i.e., encourage cheese and yogurt)</td>
<td></td>
</tr>
<tr>
<td><strong>Ways to improve suitability</strong></td>
<td>3rd grade reading level or below</td>
<td>“Make sure the language is not very complex…reading comprehension has to be a little bit lower…keep the colors very bright…tri-fold is a good size…and just make them simple and lots of pictures and diagrams.”</td>
</tr>
<tr>
<td></td>
<td>Translate into Spanish, Tagalog, Portuguese, Russian</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have available more frequently</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No complex language</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bright colors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Simple message</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lots of pictures and diagrams</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enhance accuracy of information</td>
<td></td>
</tr>
</tbody>
</table>
### Table 3

**Methods used to distribute Rethink Your Drink brochures as described by participating primary care providers and dentists during semi-structured interviews**

<table>
<thead>
<tr>
<th>Probes</th>
<th>Findings</th>
<th>Representative quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Methods of distribution</strong></td>
<td>Displayed in exam rooms</td>
<td>“We would…have the stand with all four of them in the exam rooms, and then with the parents they would either grab them on their own or at their well-child visits I would give it to them.”</td>
</tr>
<tr>
<td></td>
<td>On wall clearly visible</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Handout during initial exam or follow-ups</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Distributes during nutrition class</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shared with colleagues in office</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Posted on informational poster display in lobby – passive posting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Posted on clinic website</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Displayed in common areas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Put in new patient package</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Given by nurses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provided to overweight or obese kids</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provided to kids with the most cavities</td>
<td></td>
</tr>
<tr>
<td><strong>Effectiveness/ease of distribution</strong></td>
<td>It was great</td>
<td>“I think it’s always helpful to send it home with people to get some thinking about how hugely caloric and not nutritionally valuable these drinks are…I only get 15 minutes with a patient and I love having something to send home with them.”</td>
</tr>
<tr>
<td></td>
<td>Generated discussions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wasn’t an imposition</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Didn’t take any extra work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gives them something to take home</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hard to fit into routine</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Step in the right direction</td>
<td></td>
</tr>
</tbody>
</table>
Table 4

*Desired characteristics and features of posters for use in the Rethink Your Drink campaign as described by participating primary care providers and dentists during semi-structured interviews*

<table>
<thead>
<tr>
<th>Probes</th>
<th>Findings</th>
<th>Representative quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content and characteristics</strong></td>
<td>Not too busy</td>
<td>“Should not have too much information in one…something people see in one glance…and anything that is visual, doesn’t have to be wordy at all. Being visually effective is the most important thing in a poster.”</td>
</tr>
<tr>
<td></td>
<td>Simple message, one or two main ideas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Doesn’t have to be wordy</td>
<td>“If you had a display of all the different drinks on a poster…you could have little sugar cubes for sugars and maybe little batteries for amount of acid.”</td>
</tr>
<tr>
<td></td>
<td>Visually effective</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Big picture with (sports drinks) in trash can, encourage water</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Different ways to get water</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lots of colors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bright</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fun</td>
<td></td>
</tr>
<tr>
<td></td>
<td>English and Spanish</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Also include the caregivers, part of children’s health</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pictures to see what you are describing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oral health consequences</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sugar packets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pictures of rotty teeth</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Easy ways to lose weight</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Batteries representing amount of acid in drinks</td>
<td></td>
</tr>
<tr>
<td><strong>Most important message to convey</strong></td>
<td>Reduce amount of sugary drinks</td>
<td>“The biggest problem (we) have with our patients is that they really don’t realize how much sugar they are in taking with their drinks.”</td>
</tr>
<tr>
<td></td>
<td>Avoid cola all together</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increase consumption of water</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Water is free</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discourage use of sports drinks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Preventing obesity and diabetes</td>
<td></td>
</tr>
</tbody>
</table>
Preventing cavities
Sugar packet picture – amount in drinks, comparisons
Why not to drink sugary drinks
What to drink in place of sugary drinks
Juices are also sugar is disguise
Do this, not this
If you make healthy choices, health conditions that won’t happen
To change the habit of kids, change parents habits
Amount of acid in drinks and relation to oral health
Teach how to read the nutrition labels

“If you make healthy choices and...drink choices, then these things aren’t going to happen to you. And if you don’t make healthy choices, these things could happen to you.”

<table>
<thead>
<tr>
<th>Target audience</th>
<th>Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depends on age group, under age 10 towards the parents, adolescents towards the kids</td>
<td></td>
</tr>
<tr>
<td>Both kids and parents</td>
<td></td>
</tr>
<tr>
<td>Kids</td>
<td></td>
</tr>
<tr>
<td>3rd grade level, kid and parent will understand</td>
<td></td>
</tr>
</tbody>
</table>

“If overall it’s to the parents, whether they’re a teenager or a child. But you can have some influence on the teenagers since they’re young adults and they can make decisions for themselves.”

<table>
<thead>
<tr>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 x 24 inches</td>
</tr>
<tr>
<td>A little bigger than 24 x 36 inches</td>
</tr>
<tr>
<td>18 x 11.5 inches</td>
</tr>
<tr>
<td>8 x 11 inches</td>
</tr>
<tr>
<td>17 x 11 inches</td>
</tr>
<tr>
<td>2 x 2 feet</td>
</tr>
<tr>
<td>At least 12 x 14 inches</td>
</tr>
<tr>
<td>20 x 16 inches</td>
</tr>
<tr>
<td>24 x 36 inches</td>
</tr>
</tbody>
</table>

“There’s two places to put posters up, in the patient room would be more of a small poster...but if you had it in a hallway you’d want it to probably be bigger so...it might catch their attention from somewhere down the hall.”
<table>
<thead>
<tr>
<th>Challenges of use</th>
<th>Other stuff on wall</th>
<th>“We do have so much stuff on the wall…if it’s too small people aren’t going to see it.”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits of use</td>
<td>Don’t have enough time with them, why of benefit</td>
<td>“To show it to the kids in the rooms we just don’t have enough time with them to do that. That’s why something like…the posters are a greater benefit at least in this setting.”</td>
</tr>
<tr>
<td></td>
<td>Probably better than brochures</td>
<td></td>
</tr>
</tbody>
</table>
Table 5

**Desired characteristics and features of a display/model for use in the Rethink Your Drink campaign as described by participating primary care providers and dentists during semi-structured interviews**

<table>
<thead>
<tr>
<th>Probes</th>
<th>Findings</th>
<th>Representative quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content and characteristics</strong></td>
<td>Relative shock value</td>
<td>“Showing the actual destruction that happens because of sugary drinks, not only how much sugar is in things but also what happens…getting that icky picture is really good…it’s pretty motivational.”</td>
</tr>
<tr>
<td></td>
<td>Not too big</td>
<td>“You wouldn’t want it easily broken, pretty durable stuff…whatever your plan is on that.”</td>
</tr>
<tr>
<td></td>
<td>Not breakable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Showing actual destruction of teeth</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Model of teeth with cavities and white spots</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Next to a Big Gulp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>More visual</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Don’t just show 12-ounce, show 32-ounce</td>
<td></td>
</tr>
<tr>
<td><strong>Most important message to convey</strong></td>
<td>Relative shock value</td>
<td>“Put the bottles of Gatorade and Pedialyte over here and there’s a little money left over for you. Tap water over here and there’s this big stack of dollar bills…more money…for you to do the things that you really want to do.”</td>
</tr>
<tr>
<td></td>
<td>Visual amounts in sugary drinks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Model of a disease heart</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Model of a fatty liver</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Make it realistic and graphic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cost saving, water vs. sugary drinks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cavities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Obesity and diabetes prevention</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Comparison of teeth (sugary drinks vs. water and milk)</td>
<td></td>
</tr>
</tbody>
</table>
Benefits of fluoridated water and re-mineralizing lesions
Sugar packets or sugar stacks
How drinking water could lead to some kind of success, reduce health conditions
How sugar reacts with environment in mouth and effects on oral health
(Baby) bottle decay
pH levels in drinks

Target Audience
Parents
Parents and children
Children
3rd grade education, parent and kid will understand

“IT’ll be geared towards the kids…however it’s really the parents that are picking up on the message…the parent will be more engaged if the kids are playing with the model.”

Size
No more than a foot wide
Size of a soda can
Small toy the kids could play with
Large scale structure (2-3 feet)
6-10 inches
10-12 inches
The bigger the better
5 feet by 5 feet by 5 feet
5 inches
8-10 inches high and 6-8 inches wide
No bigger than 8.5 x 11 inches
18 inches squared max

“Something small that…a 4 or 5 year old could easily handle.”
“If you had something that’s even the size where the younger kids can interact with the 3-D model…they can actually go inside of it…and there can be some message in the inside of the model.”

Challenges of use
Already covering other topics
Don’t forget those hard of seeing or blind
Lost in the mass of materials

“Most exam rooms are filled with stuff and…during our well-child exams…we are not merely talking on one subject, we are talking about sometimes ten subjects.”
| Benefits of use | On the counter for patients to look at while waiting | “To show it to the kids in the rooms we just don’t have enough time with them to do that. That’s why something like the displays…are a greater benefit at least in this setting.” |
Table 6

*Desired characteristics and features of a DVD for use in the Rethink Your Drink campaign as described by participating primary care providers and dentists during semi-structured interviews*

<table>
<thead>
<tr>
<th>Probes</th>
<th>Findings</th>
<th>Representative quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content and characteristics</td>
<td>Short message</td>
<td>“…have one that is kind of kind friendly too, so that the kid is getting some education from it too, not just the parents.”</td>
</tr>
<tr>
<td></td>
<td>English and Spanish</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kid friendly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 to 5 minutes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Multi-cultural</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Language at 5th grade level</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Very simple messages</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engaging across all age groups</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cartoon characters</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nice colors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lot of figures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have link to website with video</td>
<td></td>
</tr>
<tr>
<td>Likelihood of use</td>
<td>Fairly useful</td>
<td>“We download…educational videos to a…main server and then everybody in all of the operatories, where ever the patients are, can open up any DVD and show it.”</td>
</tr>
<tr>
<td></td>
<td>DVD player in waiting room</td>
<td>“In our practice we don’t have any media.”</td>
</tr>
<tr>
<td></td>
<td>Patients don’t wait very long</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pretty minimal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Would use it all the time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Could use it in nutrition classes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No media in practice</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rarely use DVD type materials anymore</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time consuming and only have a limited amount of time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have TV everywhere</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Limited to moderate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Something to watch while waiting on providers</td>
<td></td>
</tr>
<tr>
<td>Challenges of use</td>
<td>Don’t wait long, have to be short message</td>
<td>“My only concern then with the DVDs is that (it) may take a little longer and requires a little more input…to actually get it started.”</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Don’t have time</td>
<td>“DVD models even the most engaging ones don’t have as much power as a poster type.”</td>
</tr>
<tr>
<td></td>
<td>DVDs are a lot of work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No DVD player</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If on a loop it points out how long waiting for provider</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Has to be on a loop or someone is having to restart it</td>
<td></td>
</tr>
<tr>
<td>Benefits of use</td>
<td>Can play a good role model as a visual without having the patient or parent read materials</td>
<td>“One of the things that’s really good is to have things available while patients are waiting…like (a) video is a good example of having. An interactive video, that might be good.”</td>
</tr>
<tr>
<td></td>
<td>Have them watch while provider is seeing another patient</td>
<td></td>
</tr>
</tbody>
</table>
Table 7

*Desired characteristics and features of a screening tool for use in the Rethink Your Drink campaign as described by participating primary care providers and dentists during semi-structured interviews*

<table>
<thead>
<tr>
<th>Probes</th>
<th>Findings</th>
<th>Representative quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content and characteristics</td>
<td>Short, Not too detailed, Asking amounts and frequency, How often go to a convenience store, Easy for parents to fill out, Fairly detailed but quick, Yes/no questions, Questions about snacking, Template for electronic medical records, Targeted questions about certain drinks, One-page, English and Spanish, Discussion with the family about drinks regularly purchased to determine how much their consuming, Make sure asking in a way to get accurate and truthful responses, Income level, cause poor kids are most likely to get the sugary drinks in their bottle, Cultural considerations, Hispanic population will put (sugary drinks) in their kids bottles, Has to be more than just assessing one day</td>
<td>“It has to be short. It can’t be too detailed, because most parents…are tired of sitting in the waiting room or in the exam room, and filling out paperwork…diet is just one aspect of it.” “…it would be important to have the family…discuss drinks that they regularly purchase…average amounts they might purchase per month, and number of people in the household. And that will kind of give us a rough guesstimate of who and what is drink, and how much their consuming.”</td>
</tr>
</tbody>
</table>
Asking questions about milk and dairy intake
Addition of BMI, weight, growth charts, blood work in addition to nutrition and current diet
Gear screening towards a certain age group, 2 to 4 year olds since that’s where the habits are established

Likelihood of use

Limited
Might be useful
Parent questionnaires not always accurate
Shock value could help
It depends if it’s been substantiated
We could review it and they take it home
It would have to be very short to be useful
We have so many other screening tools/items to review
Screening process is the exam – kids with cavities
Wouldn’t be helpful
Want to have discussion about sugary drinks with everybody, especially children with elevated BMIs
If could template into our electronic medical record then would benefit
What would we do with the information it provides and everything else we have to address

“…a parent questionnaire…I don’t know you always got to take those with a grain of salt. I think they always underestimate how much sugar their kids actually get.”
“…we are going to see the results in the younger kids very, very quickly. They come in and we can immediately see that…they’ve got something in their bottle that they shouldn’t…it’s a very easy diagnosis.”
Likelihood findings would be noted in medical record

Charting that already
Always put screening tools in medical records
50/50 the screening tool would go in, but if it was discussed it would be charted
Probably be noted
Chart whatever we do

“If I’m going to screen…the medical would reflect that.”
“50/50, cause the other thing that’s commonly happening at the same time, cause I’m a physician, is that were dealing with a ton of other stuff all at the same time.”

Anticipated value if provided immediate feedback for parents/guardians

If it allowed parent/grandparent to think about it
Limited value
It would be useful
Need some shock value
Very helpful
Classifies a patient as a certain risk
More of an identifier but then turns into an educational tool
Provides a rough guesstimate
Gives more awareness
Screening tool on electronic media or app
Instant gratification is important

“It might be of limited value….something that is quick and simple, a one-page left in the waiting room or an exam room where while they’re waiting for us a parent (could) just peruse through it.”
“If it classifies a patient as a certain risk, maybe it could print out a sheet that talks about things that they can do to change or do differently in order to benefit themselves.”
Table 8

**Suggestions for the Rethink Your Drink campaign as described by participating primary care providers and dentists during semi-structured interviews**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Findings</th>
<th>Representative quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional locations</td>
<td>Messages at school&lt;br&gt;Locations outside of physician and dentist office (schools, market)</td>
<td>“Some of the decisions a child makes is in the absence of a pediatrician or a parent, for example in the cafeteria and that’s something to think about….drink this, don’t drink that…and have just the images next to each other.”</td>
</tr>
<tr>
<td>Tools/ resources</td>
<td>YouTube videos&lt;br&gt;Texting older patients (teens)&lt;br&gt;In-house healthcare provider that only addresses diet/beverage intake with families&lt;br&gt;Information going home in “blue bag” at hospital postpartum&lt;br&gt;Games for kids on website/app&lt;br&gt;Calendar</td>
<td>“…have the web address on the back of one of the pamphlets…kids and parents might be more likely to look at…their cell phone while they’re waiting versus…a DVD.”&lt;br&gt;“…poster contest….calendar has some of our poster winners.”</td>
</tr>
<tr>
<td>Approaches</td>
<td>Facebook page&lt;br&gt;Radio messages&lt;br&gt;Aim internet resources at cell phones</td>
<td>“…a lot of people they don’t have computers at home but they do have cell phones…coding on the website is optimized for use on a cell phone.”</td>
</tr>
</tbody>
</table>
Table 9

Number of primary care providers and dentists that ranked educational resources as their top 3 preferences for inclusion in a tool-kit as part of the Rethink Your Drink campaign

<table>
<thead>
<tr>
<th>Educational resources</th>
<th>Primary care providers (n=6)</th>
<th>Dentists (n=5)</th>
<th>All participants (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brochures</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Poster</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Display/model</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>DVD</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Screening tool</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Website/app</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Toy to reinforce the point</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>In-house healthcare provider for dietary change</td>
<td>0</td>
<td>1</td>
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</tbody>
</table>
**Table 10**

*Additional comments regarding the Rethink Your Drink campaign as described by participating primary care providers and dentists during semi-structured interviews*

<table>
<thead>
<tr>
<th>Findings</th>
<th>Representative quotes</th>
</tr>
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</table>
| Campaign brochures     | “…it’s nice to have something to be able to…(have) something to start the conversation with the patient, something to give them. So I was really excited when I saw the brochures.”  
“I actually like the content of the brochures…it definitely included all the stuff that I like to talk about.”  
“I think they (brochures) were really good and well laid out, very simple. I like that…and there wasn’t a lot of reading and extra content that wasn’t really pertaining to what point was trying to get across.”  
“We were very happy when we got (the brochures) and we actually ran out of them pretty quick.” |
| Value                  | “I think it’s a good program (and) helpful.”  
“I was excited because somebody is…understanding what we can do and how to make changes and that they’re trying to do that, and trying to tackle that.”                                                                                                                                                                                                 |
| Campaign reach         | “I saw the billboard on the highway as well and I thought that was very clever, that must of impacted a lot of people.”  
“I think this is a big effort…and I think it could be a costly effort to pursue, but we all know how critical and what we’re seeing with kids and obesity, changes in diet, what’s happening dietary wise, that there’s a disconnect there…so (we’ve) got to find a way how can we reach those people and how can we provide more of an educational resource or how do we have a behavior change.” |
Chapter 5

Discussion and Conclusions

The purpose of this thesis study was to conduct formative research regarding the development of educational resources for use in primary and dental care settings, to reinforce the importance of limiting sugary drinks and promote to more healthful choices. These resources may eventually be organized into a tool-kit intended to benefit parents/guardians of young, school-aged children as part of the Rethink Your Drink campaign. In-depth interviews were conducted with health professionals, specifically primary care physicians and dentists in Washoe County who provide care to children from low-income households and who had previously used materials from the Rethink Your Drink campaign. The following were the research questions that guided this study:

1) In what ways can the existing educational resources, provided by the Rethink Your Drink campaign, be improved?

2) What are the desired characteristics/features of other educational resources that may serve to reinforce the importance of limiting sugary drinks and promote more healthful choices?

3) What educational resources are most preferred for a tool-kit designed to reinforce the importance of limiting sugary drinks and promote more healthful choices?
4) How do the opinions and preferences of primary care providers differ from dentists in regards to other educational resources that reinforce the importance of limiting sugary drinks and promote more healthful choices?

As noted in Chapter 4, the interviews provided rich data pertaining to the research questions. This chapter describes the findings and captured themes from the semi-structured interviews with health professionals and is related to the existing literature. Next, the strengths and limitations of this study are reviewed. Last, recommendations for future research are provided.

Use of Primary and Dental Care Settings to Reduce Intake of SSB

The following phrase captures one theme that was identified from the qualitative data, “We are excited about the Rethink Your Drink campaign efforts and we have an important role to play.” The participants were all actively engaged in the interviews while providing their perspective and opinions regarding the characteristics and content of additional educational resources that they preferred for use with their patients. They further provided suggestions about the messages that are of the most importance and how to actively engage the audience. Suggestions to improve the campaign were discussed, however, nearly all comments were positive relative to the campaign. No participants commented that this effort should not be continued or stated that this topic was not of importance. The participants were all actively engaged in the interviews and appeared eager to provide their personal insights. This reaction is supported in the literature that states that primary care providers can play an impactful role, and are willing to participate in the process (e.g., Rader et al., 2014).
Behavioral interventions for youth have been found to result in beneficial outcomes for both diet and weight status. These benefits were reinforced in the Scientific Report of the 2015 Dietary Guidelines Advisory Committee, who recommended the development of multifaceted interventions that include the pediatric primary care setting to assist in improving children’s diet (USDA & USDHHS, 2015). This corresponds to the suggestion that primary care physicians and pediatricians have a crucial role in the prevention of childhood obesity; specifically identifying risks of overweight/obesity and counseling patients on behaviors associated with excess weight gain, including SSB consumption (Doymaz & Neuspiel, 2009). Health care providers are perceived to be the experts in regard to reducing health risks and promoting preventive behaviors. They also have the potential to assume a leadership role in the prevention of unhealthy weight gain (Sherwood et al., 2013).

The resources that were preferred by health professionals may eventually be organized in a tool-kit intended to benefit parents/guardians of young children. The need to provide health professionals with educational resources for use in their practice is supported by the findings by Sealy et al. (2012), who concluded that the Obesity in Children campaign and Action Kit was well received by clinicians and their staff.

“Shock Value” as Means to Influence Health Behavior

This particular phrase captured a second theme that was identified; “In order to get their attention, you need to show materials that have ‘shock value’.” This theme was reflected among participants in many ways as they discussed potential educational resources. Ways to provide this “shock value” included presenting the amount of sugar
and acid in a variety of beverages; showing the oral health effects from consumption of SSB displaying the monetary savings by switching to water both short term and long-term; and increasing parents’ awareness about the actual amounts of SSB their children are consuming.

Researchers have examined the effectiveness of shock advertising among public health campaigns (e.g., Dahl et al., 2003). Shock advertising can be used to get people’s attention through startling and/or offending its audience, causing them to just see the message through “the clutter” (Dahl et al., 2003). Dahl et al., (2003) compared shock advertising to information and fear advertising and found that among University students, shock advertising significantly increased the audiences’ attention, positively influenced behavior, and encouraged the audience to retain the overall message.

Additional studies have examined how consumer awareness campaigns can influence food choices (e.g., Sutherland, Edwards, Shankar, & Dangour, 2013). A study by Sutherland et al. (2013) used large cross-sectional datasets to analyze trends in adults who added salt to food at the table between 1997 and 2007. In 2003 the UK Food Standards Agency and the Department of Health began running awareness campaigns about the negative health impacts of ingesting salt. The researchers found while salt use at the table started to decline prior to the campaign, there was a significantly greater reduction following the introduction of the salt reduction campaign. The researchers concluded that future programs and research efforts might benefit from targeting specific populations groups, similar to this thesis study and the efforts of the Rethink Your Drink campaign.
Target Audience of Interest

“You want to get the kids attention but ultimately parents make the decisions.”

This phrase summarizes another theme that was identified. While some study participants reported the need for the educational resources to target parents or children individually, a majority stated the need for materials to target both children and their parents. Multiple study participants commented that you must first catch the children’s attention, in order for the parent to take notice. Children might become aware of the message but ultimately the parents need to take action to change behavior. Others stated that to target the audience strategies would need to focus on the specific age groups. For example, with younger kids (e.g., under 10 years), it would be more important to target the parents. Among teenagers, education targeting both the kids and their parents was suggested. A few participants commented that while children want to make the decisions, it is the parents that shop for groceries and determine what beverages are purchased and are consumed at home.

As seen in other studies, multiple factors influence children’s consumption of food and beverages, including socioeconomic, interpersonal, and policy influences. However, for young children, parents have been identified as one of the most significant (Larson & Story, 2009). Because of this, studies have been conducted to identify specific ways to influence parents’ behaviors regarding SSB (e.g., Rader et al., 2014). Multiple studies have noted that parents rely on health professionals for information regarding their children’s health, including appropriate amounts of SSB for children (Rader et al.,
2014; Beck et al., 2013; Tipton, 2014). These findings are consistent with the first theme presented.

Research has also shown that children themselves can influence the purchases made by their parents. For instance, in a study examining children’s consumption of SSB and fruit juices, parents stated the most common reason their child was allowed SSB was as a treat or due to the child’s request (Rader et al., 2014). Another study noted that while many caregivers believed that SSB caused hyperactivity and negative health problems, they used SSB as rewards and as a means to prevent the child from “acting out” (Tipton, 2014).

**Time Constraints**

The last identified theme was, “We are pressed for time.” Study participants commonly stated that in order for health professionals to effectively use the resources, they cannot require a lot of their time. Both primary care providers and dentists commented about having limited time with patients; and that other topics compete for their time in addressing SSB. A few study participants stated SSB consumption is just one small part of the overall picture. Therefore in order for an educational tool to be useful within the primary and dental care setting it must be quick and easy to use, with a simple message that parents/guardians can pickup on without much discussion or input from the health professional or their staff.

Research studies support that a health professionals’ time is limited when it comes to patient care. The 2010 National Ambulatory Medical Care Survey reports the mean
time spent with a physician across specialties was 20.8 minutes, with greater than half of the appointments averaging 15 minutes or less (CDC, 2010). A study by Tai-Seale, McGuire, and Zhang (2007) set out to examine how time is spent during primary care visits and to identify factors that influence time allocations for appointments. This particular study found the median appointment length was 15.7 minutes, with the providers covering a median of six topics per appointment. Additionally the researchers found that even if there were multiple topics to cover during an appointment, the length of the appointment did not vary much, leaving less time for each topic. Another study found that due to the lack of time during appointments, many physicians cannot comply with preventive service recommendations (Yarnall, Pollak, Ostbye, Krause, & Michener, 2003). These time constraints should be carefully considered in the development of educational resources.

**Limitations and Strengths**

There are several limitations to this study; some of these are inherent to qualitative research. Findings reported within this study cannot be generalized to health professionals other than those primary care providers and dentists that participated in the interviews. The key informants were purposively chosen and were limited to physicians and dentists in Washoe County, who provided care to children from low-income households, and who had previously ordered *Rethink Your Drink* brochures. Additionally, the sample size was small with 41% of those who were eligible actually participating in the study.
This study had several strengths. Key informants are those knowledgeable about the subject and able to provide detailed information on what additional resources would be of benefit. The physicians and dentists purposively sampled for the interviews were health professionals in Washoe County who have previously or currently worked with the target audience. Despite the small sample size, this data was sufficient to achieve saturation for specific themes. After the first five interviews were conducted, common themes were identified. These themes provided valuable insights into common perceptions that provide useful information for program development. Last, there is limited literature on this specific topic; therefore this study will make a unique contribution.

**Conclusion and Future Research**

In conclusion, the qualitative approach used for this study gathered relevant information regarding a group of health professionals’ opinions about the types and characteristics of additional educational resources that may be used in primary and dental care settings to reduce SSB. As a result, ways to improve the existing brochures as part of the *Rethink Your Drink* campaign were identified; and perceptions about the characteristics and features of additional educational resources to reduce sugary drinks and promote more healthful choices were revealed. In addition, these results indicated that a tool-kit might be of value in primary and dental care settings.

The findings from this thesis study also provided implications for further research. First, a cross-sectional design using quantitative survey methods would be valuable in measuring the opinions and perspectives revealed in this study among a larger more
generalizable population. Second, eventually the findings from this study may be used to develop new educational materials and evaluated for their effectiveness in the primary and dental care settings. Ultimately these efforts may help to limit children’s intake of sugary drinks and promote more healthful choices by children themselves and their parents/guardians.
References


Appendix A
Recruitment Letter to Health Professionals

Date

Health Professional’s Name
Practice Name
Street Address
City, State Zip Code

Dear Dr. (Health Professional’s Last Name):

Thank you for your participation in the on-going *Rethink Your Drink* campaign to reduce children’s intake of sugary drinks. Your support of this community-based project has been very valuable. Because of the involvement of health professionals such as you, we have been able to reach more families. In the past year, approximately 10,000 brochures were distributed by health professionals, an additional 5,000 households were reached by mail, and approximately 2.7 million impressions were made through our media campaign.

Due to the generous support of the U.S. Department of Agriculture’s Supplemental Nutrition Assistance Program, we have the opportunity this year to develop additional materials about sugary drinks, including those for use by health professionals. Previous surveys of local primary care providers and dentists were helpful in providing general information regarding the opinions and preferences of professionals such as you. During this next phase, we are planning to complement these surveys with personal interviews to gain a greater understanding about the resources that would be most helpful in educating parents, guardians and children about healthful beverage choices. The results of these interviews will guide the development of additional resources to be distributed as part of the *Rethink Your Drink* campaign.

We will be calling you within the week to invite you to participate in an interview. If you do not wish to be contacted, please let us know by calling 775-682-7959 or sending an e-mail to rethinkyourdrink@unr.edu. We know your time is very valuable. As a small token of our appreciation, each interview participant will receive a $50 gift card.

Thank you again for your support of the *Rethink Your Drink* campaign.

Sincerely,

Aimee Brock, RD, LD

Jamie Benedict, PhD, RD, LD
Appendix B
Phone Call Script

Introduction

Good afternoon (fill-in health professional’s name). My name is Aimee Brock and I am a Nutrition Graduate Student and Registered Dietitian working with Dr. Jamie Benedict on UNR’s Rethink Your Drink campaign. The purpose of this call is to follow up on the letter that we sent you a few days ago. Do you recall receiving this letter?

“Yes” Response: Great! As you know we are interested in developing additional resources to strengthen this campaign. Because you previously used the Rethink Your Drink brochures, I am contacting you to personally invite you to participate in a study to gain information regarding the resources and/or materials you might be interested for use with your patients.

“No” Response: No worries. Let me summarize the letter briefly. We wanted to thank you for supporting the Rethink Your Drink campaign last year by sharing the brochures with your patients. Your support of this campaign is truly valuable. We are interested in developing additional resources this next year to strengthen this campaign and are reaching out to healthcare professionals, such as yourself, who have used the Rethink Your Drink brochures. I am contacting you to personally invite you to participate in a study to gain information regarding the resources you might be interested in for use with your patients.

For the study, we will be conducting interviews with physicians and dentists in Washoe County to learn how we may be able to improve existing educational resources, the desired characteristics/features of other educational resources, and preferences regarding the inclusion of resources in a tool-kit.

The study findings will be used to guide the development of additional resources for the Rethink Your Drink campaign.

The interview should only take 30-45 minutes and I would be happy to come to your office for the meeting. Can we schedule an interview for this next week?

“Yes” Response: Great!

“No” Response: Is there a better time for you?

“Yes” Response: We can work around that.

“No” Response: Well thank you for your time today and I hope you find the educational brochures useful in your practice. If you do change your mind and would like to participate please do not hesitate to contact me, my
contact information is on the letter sent to you. Also, if you need any additional brochures please let us know.

Is there a certain day or time that is better for you? I will come to your practice to complete the interview.

(Schedule appointment day and time)

Thank you for welcoming this opportunity to help with the *Rethink Your Drink* investigation. I will be sending you a letter of confirmation in the next day or so. I look forward to meeting you on (insert appointment date and time).
Appendix C
Follow-up Letter

Date

Health Professional’s Name
Practice Name
Street Address
City, State Zip Code

Dear Dr. (Health Professional’s Last Name):

Thank you for your agreeing to participate in our study about patient educational resources regarding sugary drinks.

Per our conversation, your interview will take place at (insert location), on (insert day, day) at (insert time).

I also wanted provide you with additional information about the interview topics we will be discussing. They include:

- Ways to improve the existing *Rethink Your Drink* brochures you have already received
- Your opinions about additional educational resources that may be developed, including:
  - posters
  - educational displays
  - DVDs
  - screening tools

I look forward to meeting with you. If you have any questions or need to change your interview time please let me know by calling 775-682-7959 or sending an e-mail to rethinkyourdrink@unr.edu.

Thank you again for your support of the *Rethink Your Drink* campaign.

Sincerely,

Aimee Brock, RD, LD
Appendix D
Rethink Your Drink Study
Information Sheet

We are conducting a research study to learn what resources would be most helpful in educating parents, guardians and children about healthful beverage choices. The results of these interviews will guide the development of additional resources to be distributed as part of the Rethink Your Drink campaign.

If you volunteer for this research study, you will be asked to participate in an interview. The interview will take about 30-45 minutes to complete.

This study is considered to be minimal risk of harm. This means the risk level is typical to those encountered during your daily activities. Although we don’t anticipate it, some questions might make you feel uncomfortable. If this occurs, please let us know and we can skip the question or you can withdraw from the study completely.

Benefits of doing research are not definite; but we hope to learn how to more effectively reduce children’s intake of sugary drinks and to promote more healthful beverage choices. This in turn, may lead to better health outcomes for children. There are no direct benefits to you however. We would like to give you a $50 gift card as a small token of our appreciation for your time and effort. Please note that you will be asked to sign a receipt for the gift card and this receipt will be provided to the UNR Controller’s Office for accounting purposes only.

The researchers; the University of Nevada, Reno; U.S. Department of Agriculture’s Supplemental Nutrition Assistance Program and the Nevada Division of Welfare and Supportive Services will treat your identity and the information we collect about you with professional standards of confidentiality and protect it to the extent allowed by law. To ensure your confidentiality in today’s interview we will be using made-up names so your actual name will not be on the resulting audio-recording or in the written notes. You will not be personally identified in any reports or publications that may result from this study. The researchers, the Department of Health and Human Service (HHS), the University of Nevada, Reno Social Behavioral Institutional Review Board, U.S. Department of Agriculture’s Supplemental Nutrition Assistance Program and Nevada Division of Welfare and Supportive Services may look at your study records.

You may ask questions of the researchers at any time using the contact information listed below:
Jamie Benedict, PhD, RD, LD: email jamieb@cabnr.unr.edu or call 775-784-6445
Aimee Brock, RD, LD: email albrock@medicine.nevada.edu or call 775-682-7959

The University of Nevada, Reno Research Integrity Office oversees all human research conducted by University researchers. If you have questions or concerns about the conduct
of the study, call this office at 775-327-2367.

Your participation in this study is completely voluntary. You may stop at any time. Declining to participate or not answering specific interview questions will not have any negative effects on your opportunity to receive materials in the future as a part of the *Rethink Your Drink* Campaign.

Thank you for your participation in this study!
Appendix E
Interview Guide

Introduction

To ensure your confidentiality in today’s interview we will be using made-up names so your actual name will not be on the recording or in the written notes. What name would you like to be called today?

The interview should take approximately 30-45 minutes. During the interview I will be using an audio-recorder in addition to jotting down a few items throughout the interview to help keep myself organized.

Please do not take offense if I ask you for more information about your answer. I just want to make sure I understand what you mean. There are no “right” or “wrong” answers to these questions – we are interested in your opinions.

I will now be turning on the recorder to begin the interview. Do you have any questions before we get started?

Questions:

As part of the Rethink Your Drink campaign, this past year you were provided with brochures about sugary drinks written for parents/guardians of young, school-aged children. This coming year, we plan to update these brochures and develop additional resources about healthful beverage choices that may benefit your young patients. First, I would like to start our discussion with a few questions about the brochures. Then, move on to other kinds of resources.

1. We will be updating the brochures this year and translating them to Spanish. As we make these changes, what, if any, suggestions do you have for ways we can improve their overall effectiveness?

   Possible probe as needed:
   a. Is there content that you think should be included and/or deleted?

2. May I ask how the brochures were distributed to your patients previously?

   Possible probe as needed:
   a. To what extent did this work for you and your staff?

3. Do you have any other suggestions for improving the suitability of the brochures as an educational resource for your patients?
Thank you. Now let’s move on to other types of resources. In previous surveys of local health professionals, we gathered some general information about what additional resources may be helpful. During our time today, I would like to ask you some questions about these proposed items, but I do not want to limit our conversation to just these in the event that you have other suggestions.

4. If we were to create a poster about healthful drink choices for children for use in medical and dental care settings, what do you think would be the most important point to convey?

5. Are there any other points that are important for us to think about?

6. In your opinion, who should the poster be directed to – parents or their children?

7. How about size? What would be an ideal size for a poster that may potentially be placed in a medical or dental setting?

8. In regard to creating a poster, is there anything else you think is important for us to consider?

Next, I have some questions about educational displays. These are often used in medical and dental care settings for patient education, some examples include blood cholesterol displays and gum disease models.

9. If we were to create a three-dimensional educational display that would effectively encourage healthful drink choices and discourage sugary drinks, what do you think would be the most important point to convey?

10. Are there any other points that are important for us to consider?

11. How about size? What would be an ideal size for a display that may potentially be placed in a medical or dental office?

12. In your opinion, who should the display be directed to – parents or their children?

13. A potential model that we are considering is a one that would show the actual amount of sugar in a variety of beverages. To what extent would something like this be of use in your practice?

14. In regard to creating a display/model, is there anything else you think is important for us to consider?
Next, I would like to talk with you about a DVD on children’s drink choices. While we don’t have the resources to produce this type of resource, these are available from private companies.

15. If we were able to purchase copies of DVDs for use in medical and dental care settings, to what extent would something like this be of use in your practice?

    Possible probe as needed:
    a. In regard to selecting a DVD, what characteristics do you think are important for us to consider?

There is just one more item I would like to ask you about, and that is a screening tool to identify children who are at risk for having a high intake of sugary drinks.

16. If we were to develop such a tool, what characteristics or features do you think are important for us to consider?

17. To what extent would something like this be of use in your practice?

    Possible probes as needed:
    a. What is the likelihood that the findings from this screening tool would be noted in the medical record?
    b. To what extent would it be useful if the tool provided immediate feedback for parents/guardians about their child’s intake of sugary drinks?

We have discussed several items that may be useful in medical and dental care settings to promote healthful drink choices.

18. In your opinion, have we missed anything? In other words, are there other resources/tools that you suggest we develop?

    Possible probes as needed:
    a. Can you tell me more about how and when such a tool or resource may be helpful in your practice?

We are considering assembling a tool-kit for use in medical and dental care settings. Included in this tool-kit would be a collection of educational resources about sugary drinks and more healthful beverage choices, like those we have discussed today, including brochures, posters, displays, DVDs, and a screening tool.

19. If we could only include three items in this tool-kit, what do you think should be included?
20. If the tool-kit was mailed to your office free of charge, are there any barriers you foresee occurring in using the provided tool-kit?

**Ending Question:**

21. Are there any other thoughts you would like to add before we finish today?

**Closing:**

Those are all the questions I have. Thank you again for sharing your time, insights, and opinions with me. Please accept this small gift as a token of our appreciation for your time and participation in this interview.

(Ask participant to sign acknowledgment)
Appendix F
Rethink Your Drink Study
Receipt of Participant ‘Thank You’ Gift

Instructions: To show receipt of your gift certificate, please print and sign your name below. This information will be provided to the UNR Controller’s Office for accounting purposes only.

Name (please print): __________________________________________

Signature: ______________________________ Date ____________

Gift Card # ______________________________