

University of Nevada, Reno

**The Usefulness of Social Media as a Means to
Promote Healthful Beverage Choices Among
Households Enrolled in the Supplemental Nutrition
Assistance Program**

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

by

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THE GRADUATE SCHOOL

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Abstract

The purpose of this descriptive study was to determine the potential usefulness of social media for the promotion of healthful beverage choices among households enrolled in the Supplemental Nutrition Assistance Program (SNAP) that included one or more children between the ages of 6 and 12 years-old. This was accomplished through a mail survey of 587 SNAP parents/guardians from a Nevada county that had previously been included in a direct-mail campaign designed to reduce children's intake of sugar-sweetened beverages. For the purpose of this thesis study, the survey instrument included questions to assess the use of social media, the relative use of specific social media sites, interest in obtaining specific content via social media, and perceived barriers regarding the use of social media. The survey also included questions about the direct-mail intervention that were not included in this thesis study. Several steps were taken to enhance the likelihood that the survey would be completed and returned. These steps included a personalized letter of invitation, a small incentive, inclusion of a pre-addressed postage-paid envelope, and a reminder postcard. Each household was sent a second survey packet approximately two weeks following the first. The number of surveys returned was 58; representing a 10% response rate. A high proportion of survey respondents were female (89%), white (79%), and not Hispanic (77%). The mean age of the parent/guardian was 37.4 ± 8.7 years and the average number of children in the household was 2.6 ± 1.0 . The survey results indicated that most respondents reportedly used social media (75.9%) and among those, 75% had been doing so for more than three years. The social media sites most frequently used (% daily) were Facebook (79.5%),

YouTube (31.85) and Google+ (29.5%). Social media sites that were used the least frequently (% daily) included Twitter (2.3%), LinkedIn (0.0%), and Tumblr (0.0%). Over 50% of the survey respondents were interested in learning about ideas for healthy recipes, meals, and snacks, ways to save money when buying food/drinks; and strategies to help kids stay healthy. They were not as interested in learning about ways to identify health food and drink products at the grocery store (22.7%). Regarding barriers to using social media, a high proportion of respondents agreed or strongly agreed that they had concerns about privacy protection (70.0%) and the trustworthiness of information (57.5%). A relatively low proportion (7.5%) reported limited access to social media because of their data plan. The results of this study highlight the high usage of social media by parents/guardians enrolled in SNAP as well as their high interest in learning about select nutrition topics. Although the findings have limited generalizability, it does suggest that social media may be a useful means to promote healthful beverage choices among SNAP households. Future research should be conducted among a larger more representative sample in order to generalize to all SNAP households in Nevada.

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Chapter 1

Introduction

In this thesis, the first chapter is an introduction to the research problem followed by the research aims and a description of the methods employed. The second chapter is a manuscript suitable for submission to a peer-reviewed journal that describes the thesis study, including the results. The last chapter, Chapter 3, is the thesis conclusion

In Chapter one, the research regarding the consumption of sugar-sweetened beverages and the potential usefulness of social media as a nutrition education tool is described. This begins with an introduction to sugar-sweetened beverages (SSB) and is followed by the rates of consumption by age and race/ethnicity in the United States (US). Next, the health consequences of SSBs are explored. The following section characterizes interventions to lower SSB consumption. Lastly the context of this study, the *Rethink Your Drink* campaign, and the methods used to develop the social media survey questions are presented.

Consumption of Sugar-Sweetened Beverages

Sugar-sweetened beverages (SSBs) are often defined as a liquid beverage with added caloric sugars or sweeteners that contain little to no nutritional value.^{1,2} Some examples include fruit-flavored drinks, soda, flavored milk, sweetened coffee drinks, sweet tea, and sports drinks.

The popularity of SSBs has increased steadily in the United States (US) since the 1960s.³ Currently, at least half of the US population consumes a SSB on any given day.⁴ Among the variety of SSB options, the biggest leap over the last 50 years in consumption

of a single beverage has been soda.⁵⁻⁷ For example, the authors of one study found a 500% increase in consumption of soda per capita between 1951 and 2001.⁵ In two different studies, each found that the consumption of SSBs had almost doubled among the US population between the late 1970s and late 1990s.^{6,7} To conclude, a rise in the consumption of SSBs has been documented in the literature since the late 1960s.

Overall, the consumption of SSBs among the US population has increased. However, when examined by age alone, the rates of consumption have begun to decline among adults 18 years and older.^{8,9} The authors of one study analyzed data from the National Health and Nutrition Examination Survey (NHANES) which used 24-hour diet recalls to examine the intake of SSBs between 1999-2000 and 2009-2010. In 1999-2000, the percentage consuming at least one SSB per day was approximately 57.6% but by 2009-2010, the rate had decreased to 50.6%.⁸ In addition, an author of another study noted a decrease in SSB consumption among adults living in New York City between 2007 and 2013. The authors performed a random-digit-dial phone survey and assessed consumption by first defining a SSB for the study participants. In this study, a SSB was defined as any beverage that contained more than 25 calories per 8 ounces, but the authors excluded milk and 100% fruit juices. Next, the researchers asked about the number of these beverages consumed in a typical day. In 2007, 35.9% of the adults consumed at least one SSB per day. The second time the survey was administered in 2013, the percentage was 23.3%.⁹ Both of the above studies provide evidence that consumption of SSBs among adults in the US may be declining.

Other studies have examined SSB consumption by age as well as race and ethnicity.^{10,11} Data from NHANES was analyzed and collected between 1999 and 2008. The authors reported that Hispanic and non-Hispanic black adults consumed SSBs more often compared to the non-Hispanic white adults.¹⁰ Similarly, another study examined those of Hispanic ethnicity and used proxies of acculturation such as language of interview, birthplace, and the number of years lived in the US. The authors reported that the adjusted odds of consuming one SSB per day was significantly greater among those who chose Spanish as their interview language as well as having already been living in the US for more than 5 years.¹¹ In conclusion, there may be a relationship between culture, ethnicity, and race and the consumption of SSBs.

There are also a number of studies in the literature that discuss SSB consumption among children and adolescents. Within these studies, the majority concluded that children continue to consume SSBs at higher rates compared to their adult counterparts as previously discussed. One author used data from the Nationwide Food Consumption Survey, Continuing Surveys of Food Intake by Individuals (CSFII) and NHANES to determine the consumption rates of children between 1977 and 2001. These authors found a 10% increase in the number of children who drank SSBs during this time period.¹² In addition, in a cross-sectional study using a survey to gain information from the parents of adolescents, another author reported that not only was the SSB consumption increasing among children but the total number of consumed SSBs was increasing with age.¹³ Another study found similar results in their study with adolescents. They conducted semi-structured interviews with adolescents between the

ages of 12 and 19 years-old. The authors reported that Mexican-American adolescents had a higher, significant consumption of SSBs in comparison to their white counterparts.¹⁴

As noted previously, SSBs consist of many different types of beverages. Soda is one type of SSB that has been studied extensively. For example, data was analyzed from the 1994 CSFII survey. From this information the authors reported that among the preschool-aged children (2-5 years old), 12% drank an average of 9 ounces of soda or more per day. Among the school-aged children (6-12 years old), more than 33% consumed 9 ounces of soda or more per day. Among the adolescents (13-18 years old), approximately 25% drank more than 2 times a 9 ounce serving per day.¹⁵

Similar to adults, more recent research suggests that SSB consumption among children may be declining. For example, a group of researchers analyzed the changes in consumption rates among children under the age of 17 living in Los Angeles County between 2007 and 2011. The authors conducted random digit dial telephone surveys selecting one child from each household. One parent/guardian of the adolescents completed the survey on their behalf. From this information, the authors noted that the frequency of SSB consumption decreased from 43.3% to 38.3% between 2007 and 2011 among this population.¹⁶ It was also reported by another author that a decrease in consumption among children was documented. As part of a nationally representative sample of US youth (NHANES), the authors analyzed the consumption of SSBs in 22,367 subjects aged 2 to 19 years-old. They reported that the calories consumed from SSBs decreased by 45 calories per day among this population between 1999-2000 and

2009-2010. They concluded that a decrease in consumption of SSBs had been identified in this population.⁸

Despite, this documented recent decrease in consumption of SSBs among children and adults, the intake remains high. Approximately 66% of US children and 50% of adults consume a SSB on any given day.^{17,18} Purchases from grocery stores mirror this finding. A 2016 report from the US Department of Agriculture (USDA) described point-of-sale data (POS) from the leading grocery stores in the US. SNAP households were identified if more than 50% of their purchases were paid using SNAP benefits. Food and beverage purchases were then categorized into subcommodities, commodities, and summary categories. At the commodity level, soft drinks ranked first out of 238 other commodities for SNAP and second for non-SNAP household purchases.¹⁹

Another study examined the relationship between dietary quality and SNAP participation among low-income children ($\leq 130\%$). This study used 24-hour diet recalls gathered by NHANES between 1999 and 2008. From this they noted that both SNAP eligible (non-participants) and SNAP participants consume large quantities of SSBs (i.e. more than two SSB servings per day). After further analysis and adjustment for multiple variables, the authors found that children residing in households that participate in SNAP consumed 43% more SSBs compared with non-participants. In conclusion, the diets of SNAP children include more SSBs than non-SNAP children.²⁰

Due to the high consumption of SSBs among SNAP participants many have argued that SNAP benefits should not be used to purchase these beverages. For example, the state of New York petitioned the USDA to allow for a trial period in which

SSBs were excluded from SNAP eligible purchases. In the USDA response, concerns about embarrassment, stigma, and reduced SNAP participation were mentioned. In addition, the USDA expressed a preference for education and incentives rather than exclusions. The authors of “Impact and Ethics of Excluding Sweetened Beverages from the SNAP Program” refuted these objections stating that previous pilot studies eliminating other food and drink options has led to some success. They maintained that the elimination of SSBs may lead to decreased consumption among the SNAP households.²¹ This debate is likely to continue.

Negative Health Conditions Associated with Sugar-Sweetened Beverages

Decreased nutrient intake, obesity, cardiovascular disease, type 2 diabetes, dental caries, tooth loss, and dental erosion have all been associated with high consumption of SSBs. The following studies briefly explain this association between SSB consumption and negative health impacts.

Among adolescents, the consumption of soda, one type of SSB, has been associated with lower intakes of calcium, riboflavin, vitamin A, and vitamin C.²² The root cause of this association for some nutrients may be due to the decreased consumption of milk in recent years in comparison with the increased consumption of soda.^{23,24} If this is accurate, the replacement of milk for soda essentially removes a nutrient-dense beverage from the diet and has the potential to contribute to health problems later in adulthood, such as osteoporosis.^{15,25}

It has been stated that the prevention of osteoporosis starts during adolescence.^{26,27} During this stage of life, bone mass is increasing due to the ongoing

storage of calcium from the diet.^{28,29} The authors of one study analyzed data collected from the Nationwide Food Consumption Survey between 1977 and 1978. The participants completed 24-hour diet recalls. The authors noted an inverse relationship between the consumption of soda and calcium intake.³⁰ Even though 14 other nutrients were examined in this study; calcium had the highest negative correlation with the consumption of soda at -0.11. However, the statistical significance of this value was not cited within the study.

Obesity is another serious health condition that may be related to SSB intake. Obesity has become a global epidemic affecting over 600 million people.³¹ Since 1990, obesity among children has increased globally by 54%. It is estimated that 42 million children worldwide have excess body weight.³² In the US, obesity is a significant public health challenge.¹⁰ In 2004, the American Academy of Pediatrics Committee on School Health stated that childhood obesity was the most pervasive medical condition for this age group.³³ Also, the US has one of the highest rates of adult obesity compared with all other countries.³² According to one research study, data collected from NHANES between 2011 and 2014 assessed the prevalence of obesity in adolescent and adult populations. The authors noted that 36% of adults and 17% of adolescents were obese.³⁴ The following is a description of studies that demonstrate the relationship between child and adult obesity and the consumption of SSBs.

A study set in Canada reported an association between the consumption of SSBs between meals and the likelihood of a child becoming obese. A research team enrolled a representative sample of 2,103 children born in 1998. The participants were followed

until 2002 and assessed at ages two, three, and four using 24-hour dietary recalls along with height and weight measurements. From this data, they reported that 6.9% of the children who did not consume SSBs between meals were obese while 15.4% of the children who consumed SSBs between meals were obese. In conclusion, the authors found that the children who consumed a SSB between meals were more likely to be overweight by the age of four compared to children who did not consume SSBs between meals.³⁵

Similarly, another study examined the relationship between children who were overweight/obese and the consumption of calories from SSBs. They used data obtained from NHANES between 2003 and 2010 which comprised 14,092 children aged 2-19 years-old. The authors found that the number of calories consumed from SSBs decreased significantly among all children of each body weight category except overweight and obesity children between the ages of 6 and 11 years-old. The calories consumed from SSBs among overweight and obese children were higher compared to the children who were at a healthy weight (2003-2006: 234 vs. 203 calories; 2007-2010: 220 vs. 176 calories), respectively. The authors concluded that although other research has noted a decrease in SSB consumption among children; this study noted that other authors conclusions may be different when participants are examined by subgroups such as body weight.³⁶

One study assessed the relationship between SSB introduction during infancy and the risk of obesity at six years of age. The study included 1,189 children who participated in the Infant Feeding Practices Study II and then were assessed again six

years later. The authors noted that the prevalence of obesity at six years of age (17%) was twice as high among those who consumed SSBs during infancy compared to those who did not consume any SSBs (8.6%). The authors stated that the odds of becoming obese was much higher (63%) among those who consumed SSBs during infancy and may be an early risk factor in a child's life.³⁷

Also, similar conclusions were found among adults. The authors of another study used data collected from the 2005 California Health Interview Survey and analyzed SSB consumption among the residents of California according to their county of residence. They reported that the adult participants who drank at least one or more SSBs per day were at a 27% greater risk of becoming obese in their lifetime compared with the participants who drank less than one SSB per day.³⁸

Finally, from the Nurse's Health Study (NHS) II, data was used to analyze the relationship between the consumption of SSBs and weight gain between 1991-1999. There were 51,603 female participants who provided complete dietary and weight information from the beginning to end of the study. The authors noted that women who increased their SSB consumption from less than one beverage per week to more than one beverage per day had the highest weight gain. The authors concluded that the increased consumption of SSBs lead to greater weight gain, and ultimately the potential to develop obesity.³⁹ Because obesity is related to several co-morbidities these will be briefly described as well.

According to the American Heart Association, cardiovascular disease comprises different conditions affecting the heart and blood vessels including: coronary heart

disease, hypertension, and stroke. Cardiovascular disease is the number one cause of death in the US affecting nearly one million people each year.^{40,41} There are many factors that influence the development of cardiovascular disease, including dietary characteristics. The following is a summary of literature regarding SSB consumption and the risk for coronary heart disease (CHD), hypertension, and stroke.

Using NHS data, authors from one study reported an association between the consumption of SSBs and CHD. The study included 88,520 women aged 34 to 59 years-old who were followed from 1980 to 2004. During this time period, they completed food frequency questionnaires and reported any incidences of CHD. In their analysis, the authors controlled for age, smoking, alcohol intake, parental history of myocardial infarctions below the age of 60, physical activity, aspirin use, menopausal status, postmenopausal hormone use, history of hypertension and high blood cholesterol levels. In further analysis, they adjusted for risk factors associated with major cardiac disease as well as the frequency of food intakes associated with good health such as high intake of fruits, vegetables, and cereal fiber; high polyunsaturated-to-saturated fat ratio; moderate alcohol intake; multivitamin use; high white-to-red meat ratio; legumes and soy intake; and low trans-fat intake. The authors reported that participants who consumed one SSB per day had an increased relative risk of CHD of 23%. Those who consumed more than two SSBs per day had an increased relative risk of 35%. The authors concluded that higher SSB consumption increases the risk of having CHD among women.⁴²

The authors of one study analyzed data from a prospective cohort study, the Health Professionals Follow-Up which included 42,883 men who were followed for 22

years. Food frequency questionnaires were mailed out to participants every four years and were used to assess SSB consumption. Over the course of the study, 3,683 cases of CHD were reported by the participants. They controlled for age, smoking, physical activity, alcohol, multivitamin use, family history, diet quality, energy intake, BMI, and pre-enrollment weight change and dieting. They reported that the participants who consumed the greatest amount of SSBs had a 20% greater relative risk of developing CHD. The authors concluded that SSB consumption was associated with the development of CHD among this male population.⁴³

In contrast to the previous studies that found a link between SSBs and CHD, one research study did not. This prospective study was set in Japan and included 39,786 men and women between the ages of 40 and 59 years-old. The participants completed food frequency questionnaires throughout the 18 year follow up period which resulted in 453 cases of CHD. They controlled for history of hypertension, history of diabetes, age, smoking status, alcohol intake, physical activity, job status, BMI, and energy intake. The authors did not find a relationship between soda consumption and the occurrence of CHD among these study participants. They speculated that one reason for this may be the variation in portion sizes between the US and Japan. The US has much larger portion sizes of sodas in comparison to Japan.⁴⁴

Hypertension is a prominent condition affecting approximately 75 million people; about one in three adults over the age of 20 in the US.⁴⁵ Several studies have been completed to assess hypertension risk and consumption of SSBs. The authors used participants from the Framingham Heart Study to examine the association between soda

consumption and various health outcomes. Specifically, they found a positive relationship between hypertension and soda consumption. In the study, high blood pressure was defined as being greater than 135/85 mmHg and high soda consumption as those who consumed a soda beverage more than once per day. The odds of developing hypertension were greater among the participants who were classified as high consumers of soda.⁴⁶

Also, a study conducted in Spain using 8,157 participants free of all health concerns related to metabolic syndrome, including hypertension. Food frequency questionnaires were used to assess SSB consumption and the incidence of hypertension was documented at the beginning of the study (baseline) and after a six-year follow-up. The participants who increased their consumption of SSBs from baseline to follow-up were more likely to develop hypertension in comparison to those who lowered their SSB consumption. The authors concluded that the increase in consumption of SSBs increased their risk for hypertension.⁴⁷

Hypertension and SSB consumption was also assessed using three large prospective cohorts which included men and women. The Nurses' Health Study I and II, which included only women, and the Health Professionals' Follow-Up Study, which included only men, were used by to analyze an association between high SSB consumption and hypertension. The authors did not find an association between the consumption of SSBs and an increased risk of hypertension among these participants. Although previous studies had found a relationship, in this study it was noted that there

may be multiple factors associated with SSBs that were not accounted for such as the variation in ingredients used to produce them.⁴⁸

Lastly, data from NHANES (2003-2006) was used to assess the association between high blood pressure and consumption of SSBs. The data included 3,044 participants over the age of 19 who did not currently have high blood pressure. The authors found that the individuals who consumed more than three SSBs per day were at a greater risk for developing high blood pressure than those who drank less than one SSB per month. The authors of this study concluded that higher consumption of SSBs was related to an increased risk of hypertension among the adult population.⁴⁹

Stroke, the final CVD risk factor to be discussed here, along with SSB consumption has also been studied. According to the CDC, strokes are the fifth cause of death and leading cause of disability in the US. Strokes occur when the blood vessels leading to the brain are obstructed or burst causing lack of oxygen in the brain. Strokes are a serious health concern due to the nature of their consequences which gave rise to the importance of studying the association between SSBs and their occurrence. Strokes are also the most preventable cause of disabilities in the US.⁴¹

From the Nurse's Health Study, the relationship between the consumption of SSBs and strokes was examined. This prospective cohort study included 84,085 women and followed the subjects for 28 years from 1980 to 2008. They also monitored the risk of stroke in men from the Health Professionals Follow-Up Study which included 43,371 male participants who were followed for 22 years from 1986 to 2008. The authors recorded 2,938 strokes among female participants and 1,416 strokes among the male

participants. The male and female participants who consumed one serving or more of SSBs per day were at a higher relative risk of stroke compared to those who did not consume any SSBs (1.16).⁵⁰

Although a previous study, as stated earlier, did not report a relationship between CHD and soda; an association between soda and the risk of stroke among those same participants was noted. The authors stated that 1,922 cases of stroke occurred among the participants; however, they noted a positive relationship between the consumption of soda and stroke only among the female participants. They concluded that the consumption of SSBs, specifically soda increased the risk for stroke among Japanese females.⁴⁴

According to the CDC, 29 million adults (over 20 years-old) in the US have type 1 or type 2 diabetes and 208,000 adolescents (under 20 years-old) had type 1 or type 2 diabetes in 2014.⁵¹ One of the potential risk factors for, type 2 diabetes may be SSB consumption. The development of type 2 diabetes was studied in a cohort of 4,304 men and women between the ages of 40 and 60 years-old. The participants did not have type 2 diabetes at the start of the study and completed food and beverage consumption interviews to assess food intake. The participants were followed for 12 years and during that time 177 incidents of type 2 diabetes occurred in this population. They controlled for previous and current illnesses, medication use, smoking habits, physical activity, body weight, height, and blood pressure. Diets were assessed using interviews to examine previous diet patterns and current diet patterns. From this data, the authors found that the

high consumption of SSBs was associated with an increased relative risk for developing type 2 diabetes (1.69), in comparison to those who did not.⁵²

A study of type 2 diabetes and SSBs was also studied among women enrolled in the Nurse's Health Study II (1991-1999) who were free of diabetes and other chronic diseases. They also controlled for age, alcohol intake, physical activity, smoking, and BMI. The authors followed up with the participants in 1991, 1995, and 1999 assessing dietary intake and the occurrence of type 2 diabetes. From these assessments, they found that the women who increased their SSB consumption over the course of analysis from less than one drink per month to at least one drink per day had an increased relative risk of developing type 2 diabetes (83%). They concluded that the consumption of SSBs increased the risk of type 2 diabetes among women potentially due to the readily available sugars in the beverages.³⁹

This last study to be described here examined a similar relationship but focused on African-American women in the Black Women's Health Study. The authors assessed the relationship between SSBs and type 2 diabetes among African-American women. This study followed 59,000 African-American women from 1995 to 2001. In those years, the authors documented food and beverage consumption of these participants. They controlled for age, questionnaire cycle, family history or diabetes, cigarette smoking, physical activity, years of education, glycemic index of the diet, intake of coffee, red meat, processed meat, and cereal fiber. After the analysis of beverage consumption and the incidence of type 2 diabetes, the authors concluded that consuming higher amounts of SSBs posed a greater risk for being diagnosed with type 2 diabetes.

Specifically, these women who consumed two or more SSBs per day had an increased incidence rate ratio of 24%. In conclusion, the consumption of SSBs appears to increase the risk of development of type 2 diabetes among African-American women.⁵³

In addition to osteoporosis, obesity, and its co-morbidities, the association between SSBs and dental caries has also been studied. Dental caries, also known as tooth decay, is caused by the breakdown of tooth enamel due to oral bacteria feeding on the fermentable sugars present in SSBs.^{54,55} Tooth enamel can also be worn down by high levels of acidity in different foods and beverages. Some SSBs, like sodas and sports drinks, have high sugar and acid levels that can begin the destruction of tooth enamel.⁵⁶ Dental caries occurs in both adult and adolescent populations however, for adolescents it is the leading common chronic disease.⁵⁴ SSBs have also been associated with the loss of teeth and dental erosion in adults and adolescents, respectively. The following is a brief discussion of the relationship between SSB consumption and dental caries, tooth loss, and dental erosion.

A research group gathered participants from the Iowa Fluoride Study which included 642 newborn subjects who were followed from birth until five years of age. The authors assessed the occurrence of dental caries in young children in relation to their SSB consumption. Their rate of consumption was assessed using three-day diet records which were recorded by parents at one, two, three, four, and five years of age. Two dentists examined the subject's teeth for dental caries formation beginning at the age of four. They found that children who had more caries form in their mouth also drank SSBs, specifically soda more often at the ages of two, three, four, and five compared to those

who consumed less soda at those ages.⁵⁵ Another study set in Australia reported an association between the consumption of SSBs and dental caries among a random sample of 14 to 15 year-olds. The authors used data collected from clinical and questionnaire aspects of a Teen Dental Survey administered in 2010 to teens living in New South Wales. From this information, the authors found that consuming two or more servings per day of a SSB significantly increased prevalence of caries among this age group.⁵⁷

The association between dental caries among adults and consumption of SSBs has also been noted. For example, a four-year prospective study in Finland noted an association between the consumption of SSBs and dental caries in their adult study population. Data was used from a 2000 Health Survey and a follow-up Oral Health Survey distributed to Finnish adults (n=939). After analysis, the authors noted a positive association between those who drank more than one SSB per day and the occurrence of dental caries. The risk increased over the four-year time period by 31% for those who drank one to two SSBs per day and by 33% for those who drank more than three SSBs per day. The findings of this study suggested that daily consumption of SSBs was related to a greater risk of dental caries among this adult population.⁵⁸

SSBs are associated with child and adult dental caries as well as tooth loss. A cross-sectional study examined the link between tooth loss and the consumption of SSBs among a young adult population in the US. The authors of one study used data from the 2012 Behavioral Risk Factor Surveillance System (BRFSS) that included the Sugar Drink Module (questionnaire assessing consumption). The authors found that approximately 26% of young adults reported losing at least one permanent tooth. The odds ratio of

losing one to five teeth were highest among those who drank a SSB more than two times per day (OR=1.97) compared with non-SSB consumers. In addition, the odds ratio of losing more than six teeth was also higher among those who drank more than two SSBs per day (OR=2.81). In conclusion, there is an association between the frequency of SSBs consumed and tooth loss among adults.

Another oral health condition associated with SSB consumption is dental erosion. The relationship between SSB consumption and dental erosion was examined among 12 year-olds with a two-year follow-up at the age of 14 in the 1993 Survey of Children's Dental Health. There were 1,753 participants and 1,149 completed the required questionnaires to assess SSB consumption. The authors stated that participants who had high consumption rates of SSBs, specifically soda, increased their odds of dental erosion at 12 years-old; it was a strong predictor of erosion among the same participants at age 14. The authors concluded that the frequency at which the SSBs were consumed, such as more than once per day, was a strong indicator of how much dental erosion could occur overtime.⁵⁹

In summary, the literature suggests that the consumption of SSBs in excess has many negative health outcomes including low nutrient intake, obesity, type 2 diabetes, cardiovascular disease, and poor oral health. These health outcomes are prominent among US adults, adolescents, and young children.

Public Health Recommendations Regarding Sugar-Sweetened Beverages

The high consumption of SSBs among adults and children in the US and the associated health concerns has led to related recommendations by many government and

non-government organizations. The Dietary Guidelines for Americans 2015-2020 included a recommendation limiting added sugar to less than 10% of daily calories. For example, one who consumes 2,000 daily calories per day should consume no more than 200 calories from added sugars per day. This includes added sugars from all sources (i.e. foods and beverages). The American Academy of Pediatrics recommends that children's diets be monitored for the amount and type of fruit juice consumed. Per their recommendation, young children between the ages of six months-old and six years-old should not consume more than four-six ounces of 100% fruit juice per day and adolescents between the ages of seven and 18 should consume no more than eight-12 ounces of 100% fruit juice per day.^{60,61} Many more organizations have also made recommendations regarding added sugars such as: American Dental Association, American Heart Association, American Academy of Pediatric Dentistry, and American Academy of Family Practitioners. The documented increase in SSB consumption and related health consequences, have led to research on the effectiveness of interventions to achieve recommendations for curbing intake.

Interventions to Address Sugar-Sweetened Beverage Consumption

Many research studies have been conducted on developing and testing strategies to reduce the consumption of SSBs. These interventions have been initiated in a variety of settings including the primary and dental care,⁶²⁻⁷⁰ school,⁷¹ communities,⁷² grocer-retail⁷³, and social media⁷⁴. Only one study was found that utilized primarily social media as a means of persuading the audience to limit their SSB consumption. The authors employed a marketing campaign entitled, "Sugar Pack." They used outdoor

media on transit and billboards, and messaging on social media (Twitter, Facebook, YouTube, and send-able e-cards). The campaign resulted in more than 515 million impressions. The authors concluded that employing health marketing to engage the public may increase knowledge and intentions to reduce the consumption of SSBs. Although, a limitation of this study was the lack of measurements of SSB consumption. To conclude, many of these interventions have seen small successes; but only one has examined social media and SSBs.⁷⁴

Use of social media has increased greatly in the last decade. Perrin and the Pew Research Institute analyzed social media usage using a compilation of 27 surveys, approximately 47,000 interviews with adult Internet users, and 62,000 interviews with all adults regardless of their Internet usage. These surveys were conducted and analyzed between March 2005 and July 2015. They combined all surveys which allowed for the comparison of trends among different demographic groups. The participants of these combined samples included adults aged 18 and older, different racial/ethnic groups, and a variety of education and socioeconomic status levels.⁷⁵ The results showed that between 2005 and 2015, 66% more adults began using the Internet and 58% more adults began using at least one social networking site. By 2015, adults between the ages of 18 and 29 were the highest users of social media (90%). Adults between the ages of 30 and 49 were the second highest (77%); adults between the ages of 50 and 64 were third highest (51%); and fourth (i.e. the lowest) were adults over the age of 65 with 35% using social media.⁷⁵ The users were also analyzed by education level.

By 2015, those who had graduated from college were the highest users with 76% having used social media at least once prior to this survey. The second highest were those who had some college education (70%). The lowest category was those who had a high school education or less (54%). Across all levels of education, the percentage of users was consistently above 50% in 2015 compared with 2005 when less than 12% were users of social media.⁷⁵

Some differences in social media and household income was observed. By 2015, those with a household income above \$75,000 were the highest users of social media (78%). The second highest were those with household incomes between \$50,000 and \$74,999 (72%). The third highest were those with a household income between \$30,000 and \$49,000 (69%). The fourth (lowest) amount of users were those with household incomes less than \$30,000 with 56% having used social media before.⁷⁵

Lastly, Perrin and the Pew Research Institute examined for differences among social media users based on their race and ethnicity. Sixty-five percent of adults who identified themselves as Hispanic or White were using social media in 2015. Black, non-Hispanics were the second highest social media users accounting for 56%. The use among all three of these racial/ethnic groups had grown by at least 50% since 2005 displaying an increase in use of social media.⁷⁵

This notable increase in Internet and social media use has been the impetus for many studies including those using social media to promote health. One such study surveyed patients (n=111) at a rural Southern Utah family medicine clinic with an 11-item questionnaire that assessed the patient use of and preferences with using social

media for their health care. From this survey, the authors found that 83% of patients used social media and wanted health care providers to begin using social media for providing health information. The authors concluded that many patients were interested in social media and it could be a potential way to strengthen communication while optimizing health outcomes.⁷⁶

The authors of another study recruited English-speaking, low-income, parents from a central Texas school district. Nineteen participants attended focus groups to discuss their current use of social media and potential for providing information about their child's health. The authors used prompted questions such as: "Are you familiar with social media?", "Do you use social media websites?", "What do you like to do on them?", "Would you consider using social media applications, such as a Facebook fan page or blog as a way to get information about your child's health?", "Why or why not?", "What if these social media sites were from a university, government agency, or nonprofit organization?", and "Would you use them to get information about your child's health?" Most has used some form of government assistance, and had access to the Internet. The top used social media site was Facebook, but the participants stated that their use was low due to the lack of time. Some participants, however, were open to exploring a new option for health education but a majority complained about the lack of credibility associated with social media. The participants stated that they preferred "face-to-face from someone they trusted, particularly when the information concerned the health of their children." Although, when asked if the information was provided by a scholarly source, they seemed more interested in receiving health information from social

media. The authors concluded that when using social media to deliver health messages to low-income parents, they need to perceive the information as coming from a credible source in order to overcome the barrier of trust and credibility.⁷⁷

Social media may also be helpful as a method to reach more people. For example, the following study used social media in an attempt to reach nutrition professionals. The authors aimed to find a timely, accessible means of sharing outcomes and resources with all school nutrition professionals among schools enrolled in Team Nutrition. As a part of Ohio's Team Nutrition program initiative designed to increase the consumption of fruits, vegetables, low-fat milk products, and whole grains in school-aged children, a blog was developed that was frequently updated with original content, resources, and school nutrition research. Over a period of seven months the blog had 897 visitors, 2,546 views, and 574 resource downloads. The authors concluded that the blog was growing and they were looking to add even more content to help grow their program. Social media, specifically blogs, may have potential for nutrition education.⁷⁸

The authors of another study developed a Twitter prompt intervention for use by Division I collegiate student-athletes to assess the feasibility and efficacy of a social-media based nutrition intervention. Seventy-four student-athletes were recruited to participate and were asked to follow and respond to study-related prompts using Twitter for six weeks. The Twitter prompts were created using the Health Belief Model and MyPlate and tweeted by a member of the research team. The authors measured feasibility by enrollment, participation, and intervention perceptions. The efficacy was measured using anthropometrics, and a pre/post survey that included: The National

Cancer Institute fat screener and nutrition knowledge questions. Among the 47% of recruited athletes (n=35) that participated in the intervention, they sent an average of 14 tweets per person and 71% indicated high satisfaction with this intervention method. After the six-week intervention, the athletes had a significant increase in nutrition knowledge scores, consumed a significant lower percentage of calories from fat, and a significant decrease in BMI. From these results, the authors concluded that social media has the potential as an effective platform for nutrition education due to its large reach with a diverse audience.⁷⁹

Finally, the authors of one commentary wrote that social media can be used by nutrition educators to reach a broader audience with the intended health message due to its ability to be quick, low-cost, and direct. In order to have success with social media and nutrition education, guidelines should be followed to fully grasp “the educational venue of social media.” Guidelines were created from their own social media campaign experience with the program, The Food Hero Experience. This multichannel social marketing campaign was created in 2009 to increase the amount and variety of fruits and vegetables consumed by Oregonians. The Food Hero Experience was targeted to limited-income mothers with young children, who speak English and/or Spanish, and who use the Internet. The secondary targeted audience was the children of these mothers.⁸⁰ From the research and experiences learned from The Food Hero Experience, the authors shared the five key practice-based suggestions. The first was to conduct a needs assessment. Their needs assessment included an extensive review of literature and focus groups that were attended by the members of the target population. A major finding from these focus

groups was that 53% wanted information via the Internet about health and eating and they were currently using the Internet to find useful information for cooking tips and ideas for their families.⁸⁰

The second suggestion was to select an appropriate social media site to help reach the target audience and build effective, accessible online communities. In The Food Hero Experience campaign, they selected Facebook, Twitter, and Pinterest based on what was most commonly used and what would be most effective for their campaign. Their Facebook community grew by 47% and the Pinterest referrals increased by 98% within one year of the release of their campaign.⁸⁰

The third suggestion was to create a theory-based posting plan in order to have meaningful interactions with the target population. The authors posted friendly and engaging information and monitored what people talked about in order to learn what topics the participants may want to read about most often. The time of the post was also a key determinant of social media success. They tracked when each site had the highest activity and posted information around the time a majority of the participants would be able to engage with it. Their aim was to increase participation with The Food Hero Experience topics and increase engagement with the participants.⁸⁰

The fourth suggestion was to create a social media team. Their team was composed of a coordinator, campaign recipe manager, a recipe testing group, graphic designer/photographer, Web designer, an advertiser negotiator, and students who posted content. All members played a role in sharing content and interactions on the Food Hero Facebook page. They understood the goals of the project and the role that each of the

team members played in order to achieve success with the project. Both of these steps can help keep everyone focused and in unison which can be seen by perfected social media posts with high engagements.⁸⁰

The fifth and final step of creating a successful social media campaign was to regularly collect, track, and use social media measurement data. The Food Hero team discovered the wants and needs of their participants by examining the most liked or most “pinned” recipes and content. For example, their broccoli, chicken, and cheese skillet meal was “pinned” over a thousand times reaching more users than previously anticipated. From this success, they gathered that this information would be best shared on all platforms of social media. In support of this finding, the chicken-based recipe folder was the most frequently visited and the most popular recipe folder on Facebook. All of these successes with various posts helped create long term planning within The Food Hero Experience team.⁸⁰

For future research and implications, they recommend, “understanding how nutrition educators can use social media as a new and creative mechanism for connecting with their target audience.”⁸⁰

To provide the target audience (SNAP households) with materials they are interested in previous research studies have been conducted. One of these studies used cross-sectional telephone and face-to-face interviews to determine which nutrition topics SNAP participants wanted to learn about the most. From the use of scripted telephone and in-person cognitive interviews, this study determined that SNAP households were most interested in “which food are best for kids” and “how to eat more healthy foods.”

The authors also noted that the participants highly rated the use of online delivery for nutrition education.⁸¹

Context

The current efforts to explore social media represents one aspect of the on-going *Rethink Your Drink Nevada* campaign. The purpose of this campaign is to promote healthful beverage choices and to decrease the intake of sugary drinks among children. This campaign was initiated in 2011 by Dr. Jamie Benedict. The target audience is households enrolled in the Supplemental Nutrition Assistance Program (SNAP) that include one or more children between the ages of six and 12 years-old. Households are reached by direct-mail, a print media campaign, and through medical and dental professionals. In addition, there is a website, Facebook page, and electronic newsletter for parents. Recently, materials were also distributed in select grocery stores in Washoe County.

In 2016, Dr. Benedict was granted funds to expand beyond Washoe County. With this funding, the expansion to six additional counties including Carson City/Carson County was possible. Along with this expansion was an interest in understanding social media use as a potential way to increase the reach, effectiveness, and efficiency of the campaign.

Thesis and Methods

The purpose of this descriptive thesis study was to determine the potential usefulness of social media for the promotion of healthful beverage choices among SNAP

households with children between the ages of six and 12 year-olds. A survey was used to address the following objectives:

- 1) To assess social media use among adults in SNAP households.
- 2) To determine the relative use of social media sites among adults in SNAP households.
- 3) To explore the perceptions of social media as a nutrition education tool to promote healthful beverage choices among adults in SNAP households.
- 4) To identify potential barriers regarding the use of social media to promote healthful beverage choices among adults in SNAP households.

To develop questions for the survey, the literature on social media was examined carefully. After reading numerous research articles about social media surveys, individual questions within the surveys were aligned with the research objectives. Questions from several authors, as stated previously, were then adapted. The details are shown in Figure 1.

Figure 1

Literature Sources Used to Develop the Social Media Survey Questions and Responses		
Sources	Original Content	Thesis Social Media Survey Questions
Adilman et al ⁸²	Do you use social media? <ul style="list-style-type: none"> • Yes • No 	1. Do you currently use social media (For example: Facebook, Instagram, Twitter)? <ul style="list-style-type: none"> • No • Yes
Kazley et al ⁸³	How long have you been on social media? <ul style="list-style-type: none"> • <1 month • 1-6 months • 6-12 months • 1-2 years 	2. How long have you been using social media? <ul style="list-style-type: none"> • Less than 1 year • 1-3 years • More than 3 years

	<ul style="list-style-type: none"> • 2-4 years • ≥ 5 years • Missing • Total 	
Adilman et al ⁸²	<p>Which social networking sites do you use?</p> <ul style="list-style-type: none"> • ASCO • Facebook • Google+ • LinkedIn • OncEd.com • Twitter • WinC/AlinC • Other 	<p>4. Which, if any, social media do you use <u>at least once a month?</u></p> <p>5. Which, if any, social media do you use <u>at least once a week?</u></p> <p>6. Which, if any, social media do you use <u>at least once a day?</u></p> <ul style="list-style-type: none"> • Facebook • Instagram • Twitter • Pinterest • LinkedIn • Tumblr • YouTube • Snapchat • Google+ • Other: _____ (Please specify) • None of the above
Collins, Shiffman, Rock ⁸⁴	<p>Which of the following social media services do you use?</p> <ul style="list-style-type: none"> • Facebook • Twitter • Google+ • LinkedIn • MySpace • Research Gate • Pinterest • Instagram • Tumblr • Reddit • FourSquare • Wordpress • Blogger • Mendeley • Other (please specify) 	
Hamade ⁸⁵	<p>Account in</p> <ul style="list-style-type: none"> • Twitter • Facebook • Flickr • MySpace • Others 	
Hanson et al ⁸⁶	<p>Social media type</p> <ul style="list-style-type: none"> • Facebook • MySpace • LinkedIn 	

	<ul style="list-style-type: none"> • Blogs • Online group discussions • Twitter • YouTube • Email • Cell phone for texting • Cell phone apps 	
Kazley et al ⁸³	<p>Social media site used</p> <ul style="list-style-type: none"> • Facebook • Google+ • Tumblr • Twitter • Instagram • Pinterest • Reddit • Vine • LiveJournal • FourSquare • LinkedIn • Myspace • Snapchat • Other 	
Neier et al ⁸⁷	<p>What social media tools do you use at least once a week?</p> <p>What social media tools do you use at least once a day?</p>	
Whiting and Williams ⁸⁸	<p>Responses for using social media</p> <ul style="list-style-type: none"> • Social interaction • Information seeking • Pass time • Entertainment • Relaxation • Expression of opinions • Communicatory utility • Convenience utility • Information seeking • Surveillance/knowledge about others 	<p>7. People use social media for a number of reasons. Please tell us why you use social media by checking the reasons that are true for you. (Check all that apply).</p> <ul style="list-style-type: none"> • To keep in touch with friends and family • To post photos, updates, or videos • To view photos, update, or videos • To catch-up on news • To get information about health, fitness, and/or nutrition • To find inspiration for a project • To entertain myself • Other: _____
Adilman et al ⁸²	Why do you use social media?	

	<ul style="list-style-type: none"> • To network with colleagues and professionals • To interact with patients • Leadership skills development • To share research • Other 	(Please specify)
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In addition to this table, the perceived barrier items on the survey were developed from a number of related studies.^{85,87,89-96}

Once a draft of the survey questions was completed, they were subjected to a content validity evaluation. Experts in the field of nutrition and survey research were recruited and asked to evaluate how well the survey questions corresponded to the purpose as articulated in the thesis objectives (i.e. content validity).⁹⁷ After interviewing five content experts, the survey was edited to reflect their suggestions.

With these changes, the survey was pre-tested with a population similar to those living in Carson City receiving the survey, Head-Start parents with young school-aged children. Twelve individuals pre-tested the survey by completing it and ten answered questions about their experience. However, the feedback was less helpful than expected because some participants did not have time for an in-depth discussion. The survey was modified slightly as a result.

The 19 formatted social media survey questions were inserted in the *Rethink Your Drink Nevada* (RYD) Family Drink Survey and it was mailed to all households in Carson

City that received the RYD direct-mail intervention in May and June, 2017. Data from these returned surveys was used to address the research objectives listed previously.

In conclusion, the purpose of this chapter was to explain the research problem, cite the study aims, and briefly explain the methods. The next chapter of this thesis (Chapter 2) is a manuscript prepared for the submission to the *Journal of Health Care for the Poor and Underserved* that includes a description and discussion of the study. The last chapter (Chapter 3) includes the conclusions of this thesis.

Chapter 2

Study Manuscript: The Potential Usefulness of Social Media as a Means to Promote Healthful Beverage Choices Among Households Enrolled in the Supplemental Nutrition Assistance Program (SNAP)

The following manuscript will be submitted to the *Journal of Health Care for the Poor and Underserved*.

Abstract

The purpose of this descriptive study was to determine the potential usefulness of social media for the promotion of healthful beverage choices among households enrolled in the Supplemental Nutrition Assistance Program (SNAP) that included one or more children between the ages of 6 and 12 years-old. This was accomplished through a mail survey of 587 SNAP parents/guardians from a county in Nevada that had previously been included in a direct-mail campaign designed to reduce children's intake of sugar-sweetened beverages. Among the survey respondents (n=58), results indicated that most reportedly used social media (75.9%) and among those, 75.0% had been doing so for more than three years. The social media sites most commonly used on a daily basis were Facebook (79.5%), YouTube (31.8%), and Google+ (29.5%). Participants were most interested in learning about healthy recipe ideas (81.8%) and healthy meal and snack ideas (75.0%). Relative to using social media, the barriers most often conveyed were privacy protection (70.0%) and trustworthiness of information (57.5%). The results of this study highlight the high usage of social media by parents/guardians enrolled in SNAP as well as their high interest in learning about nutrition topics. Although the

findings have limited generalizability, it does suggest that social media may be a useful means to promote healthful beverage choices among SNAP households.

Introduction

Sugar-sweetened beverages (SSBs) are most often defined as a beverage with added sugar.¹ Some examples of SSBs include: fruit-flavored drinks, soda, flavored milk, sweetened coffee drinks, sweet tea, and sports drinks. Sugar-sweetened beverages have been increasing steadily in popularity since the 1960s which paralleled higher rates of consumption.³ Currently, approximately 66% of youth and 50% of adults in the US consume a SSB on any given day.^{17,18}

Purchases from grocery stores mirror this finding. USDA used point-of-sale (POS) data from the leading grocery stores in the US to characterize food and drink purchases by SNAP and non-SNAP households. Per the report, out of a total 238 commodities, soft drinks were ranked first among SNAP and second among non-SNAP household purchases.¹⁹ These household purchases influence children's diets. One study of National Health and Examination Survey (NHANES) data reported that children living in SNAP households consumed 43% more SSBs than non-SNAP children.²⁰ Finally, high rates of SSB consumption have been associated with health risks including decreased nutrient intake,³⁰ obesity,^{35,37-39} cardiovascular disease,^{42-44,46-50} type 2 diabetes,^{39, 52,53} dental caries,^{55,57,58} tooth loss,⁹⁸ and dental erosion.⁵⁹

The documented increase in SSB consumption and related health concerns have led to a variety of interventions in multiple settings all aiming to address this health risk.

These settings have included primary care,⁶²⁻⁶⁷ dental care,⁶⁸⁻⁷⁰ school,⁷¹ community,⁷² grocery-retail,⁷³ and social media.⁷⁴ In these settings, education, motivational interviewing, counseling, and community events have been used to lower SSB consumption. Some of these studies have noted small successes in reducing consumption and other related factors such as obesity.^{62-65,71}

Policy efforts to curb the consumption of SSBs among SNAP participants have also been proposed and some have been implemented. For example, the taxation of SSBs⁹⁹, limiting the available size of soda containers for purchase¹⁰⁰, and restricting SNAP purchases have all been discussed or implemented.²¹ The state of New York proposed SSBs should not be allowed to be purchased with SNAP benefits. However, this proposal was met with multiple objections from the USDA including further stigmatizing SNAP participants.²¹

Food and Nutrition Service of USDA advocates for a combination of education and public health approaches (i.e. policy) to improve diets of SNAP participants.¹⁰¹ Toward that end, social media may be an alternative option. Only one study was located that included social media as a means of persuading their audience to limit SSB consumption. The authors described a marketing campaign entitled, “Sugar Pack” that used outdoor media on transit and billboards, and messaging on social media (Twitter, Facebook, YouTube, and send-able e-cards). The campaign resulted in 515 million impressions. The authors concluded that health marketing may be beneficial to increase knowledge and intentions to reduce the consumption of SSBs. However, there was no measurement of SSB intake per se.⁷⁴

The use of social media has been increasing in the last decade. The Pew Research Institute compiled 27 surveys, including 47,000 interviews with adult Internet users and 62,000 interviews with adults regardless of their Internet usage, to assess social media use. The data was collected between March 2005 and July 2015 during which some significant changes were observed. For example, between 2005 and 2015, 66% more adults began using the Internet and 58% began using at least one social networking site. The highest users of social networking sites or social media were those between the ages of 18-29, those with a college degree, those from households whose income was above \$75,000, and those who were Hispanic and White. However, 50% of adults with an education level of “high school or less” or a household income below \$30,000 also used social media.⁷⁵ From this collection of surveys, the conclusion can be drawn that a significant proportion of adults in the US are using social media among all of levels of education and income.

In regards to health promotion, several research studies have noted opinions of social media. The authors of one study surveyed patients (N=111) and noted that 83% wanted health care providers to begin using social media to provide health information.⁷⁶ Another group of authors recruited English-speaking, low-income parents with children (N=19) for focus groups during which participants were asked about social media. The most commonly used social media site was Facebook, but it was noted that many participants did not use it frequently due to time constraints and the lack of credible information.⁷⁷ Lastly, authors of “Food Hero” reported success using social media. As a result, they recommended five strategies to help create a successful social media

campaign. These strategies included: 1) conduct a needs assessment, 2) choose the appropriate type of social media to reach the targeted audience, 3) create a theory-based posting plan, 4) create a social media team, and finally 5) regularly collect, track, and use social media measurement data.⁸⁰

Because of the widespread use of social media and the evidence suggesting it may be a useful health communication tool, it warrants closer examination. The purpose of this descriptive study was to gain information regarding the potential usefulness of social media as a means to promote healthful beverage choices among Supplemental Nutrition Assistance Program (SNAP) households with young, school-aged children. The objectives of this study were to assess social media use; to determine the relative use of select social media sites; to explore the perceptions of social media as a nutrition education tool to promote healthful beverage choices; and to identify potential barriers regarding the use of social media.

Methods

A descriptive design was employed to address the research objectives. Questions about social media were included in a mail survey of SNAP households. Details regarding the survey and its implementation are discussed below.

As part of a community-based campaign (*Rethink Your Drink Nevada*), SNAP households with children between the ages of six and 12 years-old living in a Nevada community were mailed two brochures (one for the parent/guardian and one for the child) on four different occasions. The purpose of the brochures was to promote healthful beverage choices and to decrease the intake of sugary drinks. Following this direct-mail

intervention, the households were mailed a survey packet (N=587). The survey packet was prepared using methods described by Dillman, Smyth, and Christian¹⁰² and included: 1) the Family Drink Survey (Appendix A) that incorporated 19 questions about social media in addition to other questions pertaining to the *Rethink Your Drink* intervention, 2) a personalized letter explaining the study and inviting them to participate (Appendix B), 3) a self-addressed, stamped envelope, and 4) a refrigerator magnet (Appendix C) included as a small incentive to complete the survey.

Approximately one week later, households were sent a reminder postcard (Appendix D). Two weeks later a replacement survey packet was mailed with another letter of invitation (Appendix E) in the event that the first survey was misplaced. Surveys were collected over the course of four weeks.

Survey questions. The research team conducted a thorough search of multiple databases for literature pertaining to the research aims. Previous studies using surveys to explore social media were carefully examined. Selected survey content (including questions and responses) from these studies was adapted for this study; other survey questions were developed.^{82,83,87,88} The results were organized into two survey parts. The first focused on general use of social media, the frequency of visiting various sites, how social media was currently used, and their interest in topics that relate to healthful food and beverage choices. The second part assessed perceived barriers to using social media. With the exception of space to explain an “other” response, all questions were close-ended. For the purpose of constructing a summated-rating scale, 11 items were included to assess

perceived barriers. The responses to these items were “strongly agree”, “agree”, “no opinion”, “disagree”, and “strongly disagree.”

Prior to mailing the survey, the social media survey questions were reviewed by experts (N=5) to assess content validity.⁹⁷ Next it was pretested with a sample of individuals who were similar to the target population (N=10). Suggestions for improvement were incorporated to strengthen the survey prior to mailing.

The contact information for the SNAP households was provided by the Nevada Division of Welfare and Supportive Services (NDWSS). The study was approved by the Social-Behavioral Institutional Review Board at the University of Nevada, Reno. Identification numbers, rather than participant names, was used to keep their responses confidential.

The data from the surveys was entered and analyzed using SPSS (2016) Version 24 software. The level of significance was set at $\alpha < 0.05$.

Results

Of the 587 households surveyed, 16 surveys were returned as non-deliverable resulting in 571 potential participants. The overall response rate was 10.1% with 58 returned surveys. One participant returned both the first and second survey; the second survey was discarded. Of the returned surveys, some of the participants did not answer all questions. Therefore, throughout the presentation of results, percentages do not always add up to 100%.

The demographic characteristics of the survey respondents are shown in Table 1. The sample was predominately female (89.7%), white (79.3%), and not Hispanic

(77.6%). Seventy-six percent had a high school degree or higher. The mean number of children in the house was 2.6 ± 1.0 with a mean age of 9.0 ± 4.4 years. When this demographic data is compared with all of the SNAP households with children between the ages of six and 12 residing in this Nevada county, it has some variation. For example, among those living in this Nevada county who are female (87%), White (60%), and Hispanic (30%). This study sample has higher rates of White, Non-Hispanic survey respondents when compared with overall county demographic data.

Table 1.

DEMOGRAPHIC CHARACTERISTICS OF SURVEY RESPONDENTS (N=58)			
		n	%
Gender	Female	52	89.7
	Male	3	5.2
Highest Level of Education	1 st to 8 th Grade	0	0.0
	9 th to 11 th Grade	11	19.0
	High School Diploma or a GED	10	17.2
	Some College	15	25.9
	Associates Degree	12	20.7
	Baccalaureate Degree	7	12.1
Race	American Indian/Alaskan Native	5	8.6
	Asian	0	0.0
	Black or African American	0	0.0
	Native Hawaiian or other Pacific Islander	1	1.7
	White	46	79.3
Ethnicity	I am Hispanic	9	15.5
	I am not Hispanic	45	77.6
		M	SD
Respondent Age (n=53)		37.47	8.7
Children in the Household (n=56)		2.6	1.0
Child's Age (n=56)		9.0	4.4

M = Mean

SD = Standard Deviation

Nearly all respondents indicated that they decide what food and drinks are available in their home and are responsible for buying these food and drinks all or most of the time (89% and 86% respectively).

Most respondents reportedly used social media (75.9%, n=44). The participants who indicated they did not (17.2%, n=10) were asked to select among several reasons as to why this was true (note that they were instructed to check all that were true for them). The responses were as follows (in descending order): 1) "I have no interest in social media" (50.0%), 2) "I don't have enough time to use social media" (40.0%), 3) "I have concerns about my privacy" (20.0%), 4) "I don't own a smartphone, tablet, or computer" (20.0%), and 5) "I don't have Internet connectivity (WiFi)" (10.0%).

Among the survey respondents who indicated that they used social media (n=44), 75% had been doing so for more than 3 years. Another 9.0% of survey respondents had been using social media for 1-3 years and 6.8% had been users of social media for less than one year. In addition, 34.0% used social media for less than one hour daily; over one-third of the users spent 1-2 hours daily (38.6%); and 18.1% used social media for more than 2 hours daily.

Table 2.

RESPONDENTS' REPORTED USE OF SELECT SOCIAL MEDIA SITES (N=44)			
Site	% Use at least once a month	% Use at least once a week	% Use at least once a day
Facebook	88.6	86.3	79.5
Instagram	31.8	25.0	13.6
Twitter	6.8	2.2	2.3
Pinterest	27.2	22.7	13.6
LinkedIn	4.5	2.3	0.0
Tumblr	2.3	0.0	0.0
YouTube	68.2	45.4	31.8
Snapchat	31.8	22.7	13.6
Google+	40.9	31.8	29.5

As shown in Table 2, Facebook was the most frequently used social media site among the survey respondents. YouTube and Google+ were also used frequently. The least frequented sites among this sample were Tumblr, LinkedIn, and Twitter. Moderate use was reported for Instagram, Pinterest, and Snapchat.

The Pew Research Institute has also gathered data on social media use. From their survey data, an estimated 84% of all online adults with an income level of less than <\$30,000 per year use Facebook, 38% use Instagram, 23% use Twitter, 21% use LinkedIn, and 30% use Pinterest. Using a Fischer's Exact Test, the use of Facebook and Pinterest between their study sample and ours were not significantly different ($p\text{-value}>0.05$). However, the usage of Twitter ($p\text{-value}=0.000$), LinkedIn ($p\text{-value}=0.003$), Instagram ($p\text{-value}=0.008$) was significantly lower in our study sample.¹⁰³

The most common reasons for using social media was, “to keep in touch with friends and family” (86.3%). Other reasons endorsed by respondents (in descending order) were as follows: 1) “to view photos, updates, or videos” (56.8%), 2) “to post photos, updates, or videos” (54.5%), 3) “to catch up on news” (54.5%), 4) “to entertain myself” (50.0%), 5) “to get information about health, fitness, and/or nutrition” (45.5%), 6) “to find inspiration for a project” (38.6%).

To learn how respondents’ perceived social media as a tool to promote healthful food and beverage choices, they were asked to indicate their level of interest in several topics. The proportion of respondents who endorsed specific topics are listed in Table 3. More than 50% of the survey respondents were interested in healthy recipe ideas, healthy meal and snack ideas, ways to save money when buying food/drinks, and strategies to help kids stay healthy. Much fewer were interested in ways to identify healthy food and drink products at the grocery store.

Table 3.

RESPONDENTS' INTEREST IN USING SOCIAL MEDIA TO LEARN ABOUT SELECT TOPICS THAT RELATE TO HEALTHFUL FOOD AND BEVERAGE CHOICES (N=44)

Topic	% Indicating Interest
Healthy recipe ideas	81.8
Healthy meal and snack ideas	75.0
Ways to save money when buying food/drinks	63.6
Strategies to help kids stay healthy	54.5
Ways to encourage kids to choose healthy foods and drinks	47.7
Nutrition and health events in my community	45.4
Ways to identify healthy food and drink products at the grocery store	22.7
None of the above	6.8

As described previously, 11 survey items were constructed to assess perceived barriers to using social media. These items were articulated as either positive or negative statements. Next, a five-point Likert response set was provided for each statement. Numerical ratings were assigned to each response such that when responses to items were summed, a high score indicated greater perceived barriers regarding the use of social media. The responses to each statement are shown in Table 4.

Internal consistency reliability of the perceived barriers summated-rating scale was estimated using Cronbach's Alpha. Four items were removed due to low item to total correlations ($\leq .20$). Cronbach's was 0.76 using seven of the 11 original items indicating fair internal consistency reliability.

The mean score on the perceived barriers scale was 18.1 ± 4.1 ($n=40$). The observed range was 11 to 31 (compared to the minimum score of 7 and a maximum of 35 if responses to all items was provided). Scale means were compared to select

demographic characteristics using Pearson’s Correlation Coefficient (for age), Analysis of Variance (for level of education), and independent t-tests (for race—white versus all other races, gender, and ethnicity—Hispanics versus non-Hispanic). The results indicated that education, age, ethnicity, and race were unrelated to perceived barriers scale scores ($p>0.05$). Gender was unable to be analyzed for comparison due to there being too few cases to examine.

Table 4.

RESPONDENTS’ OPINIONS OF POTENTIAL BARRIERS REGARDING THE USE OF SOCIAL MEDIA (N=40)

Survey Statements	% SA & A	% NO	% D & SD
In general, I find social media easy to use.	90.0	75.0	2.5
Compared with other methods, I prefer to use social media to get news and information.	57.5	20.0	22.5
It takes time to learn how to use social media.	37.5	25.0	37.5
Many of my friends and family use social media. ²	100.0	0.0	0.0
In general, I find it difficult to find what I am looking for on social media.	5.0	15.0	80.0
It’s easy to explore the options available on most social media sites.	82.5	15.0	2.5
Having to create an account on social media keeps me from using some sites. ²	30.0	25.0	45.0
There are much better ways to keep in touch than social media. ²	18.5	36.8	44.8
I have concerns about protecting my privacy when using social media.	70.0	20.0	10.0
Information posted on social media is often not trustworthy.	57.5	35.0	7.5
I have limited access to social media because of my data plan. ²	7.5	17.5	75.0

¹SA= Strongly Agree, A= Agree, NO= No Opinion, D= Disagree, SD= Strongly Disagree

²Item was omitted from the summated-rating scale.

A closer examination of the responses to the individual statements included in the scale indicate that perceived barriers most often agreed or strongly agreed by survey respondents with were privacy protection and trustworthiness of information. Although many agree and strongly agree that it takes time to learn how to use social media, most find social media easy to use; can find what they are looking for and can easily explore the options on most social media sites. Per the respondents, social media appears to be the preferred way to get news and information.

Discussion

The overall purpose of this study was to gain information regarding the potential usefulness of social media as a means to promote health beverage choices among SNAP households with school-age children. The results of this survey of SNAP households in a Nevada county indicated that social media was widely used. Compared with a 2016 report, which noted that 76% of Internet-using adults in the US use at least one social networking site, the SNAP participants usage social media from this study does not differ from a nationally representative sample.⁷⁵ The lack of time and interest in social media were the top two reasons for not using social media among the survey respondents here. It is noteworthy that only two respondents indicated that they did not own a personal device (i.e. smartphone) and one did not have Internet connectivity.

As previously mentioned, a comparison between the use of specific social media sites in this study and another national representative sample was conducted.¹⁰³ The only notable difference was the relatively low use of LinkedIn and Twitter by our respondents. The three most noted reasons for using social media sites by respondents were to keep in

touch with friends and family; to view photos, updates, and videos; to post photos, updates, and videos; and to catch-up on news. This is consistent with the three most often used sites among respondents, which were, in descending order, Facebook, YouTube, and Google+. The activities offered on each of these sites is similar to the respondents' stated reasons for using social media.¹⁰⁴

In general, with respect to the promotion of healthful food and beverage choices via social media, the respondents were most interested in ideas for healthy recipes, meals, and snacks; and ways to save money buying food and drinks. A smaller but still relatively high proportion of respondents were interested in topics that related to their children specifically. Although there are no other studies that are comparable to these results; one study did determine from their sample of male SNAP participants that they were most interested in learning about "how to eat more healthy foods." Additionally, online delivery of nutrition education was among the preferred methods, ranked second, indicated by these participants.⁸¹

Among the potential barriers to using social media, the concern for privacy and the trustworthiness of information was noteworthy. Many other studies have noted similar findings.^{85,87,89-96} For example, in one study that recruited low-income families with school-age children to participate in focus groups; they found that perceived credibility and concerns about privacy were consistent among their target population.⁷⁷ A systematic review of social media use for health communication noted that there were 12 limitations when using this method. Among these limitation two worth noting were reliability and privacy.¹⁰⁵ For educators who may be interested in using social media, the

privacy concerns and perceived credibility of information should be addressed. Overall, in this study, the extent of perceived barriers was not associated with age, level of education, race, or ethnicity.

Additionally, to use social media to its fullest advantage, a paper published by the Academy of Nutrition and Dietetics outlined a number of methods for using social media effectively. For example, identifying social media goals, being selective of social media sites, knowing the target audience, learning from others, and being responsive to those interacting on any chosen social media sites were among those listed. This paper also addressed steps to maintain privacy and confidentiality of users and to ensure that the content credible. One way to address the privacy concern, they noted, is to understand the privacy settings on all social media sites selected for use. To maintain credibility, they recommend a number of strategies including citing the sources for studies and claims.¹⁰⁴

Limitations. One limitation of this study was the low response rate and the small sample size. In addition, the study population was limited to households with children between the ages of six and 12 year-old children. Therefore, the results from this study cannot be generalized to all SNAP households in Nevada. Another limitation of the study was the use of a mail survey. Although this is a convenient method, it eliminates the opportunity to clarify questions as/if needed.

Implication for research and practice.

The results of this study, if confirmed with more generalizable samples, may be useful for shaping nutrition interventions that promote healthful beverage choices by

using social media. This includes the development of the content, and the social media sites selected. Additionally, an on-going evaluation of the use of social media (as/if employed) may potentially contribute to a more responsive campaign that can quickly modify content and jump to different social media sites in order to reach the intended target audience. It may also be important to continue more traditional communication channels since not everyone has the time and interest in social media. In addition, the social media use among SNAP households consisting of older adults, households without children, and men remains unknown.

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Chapter 3

Conclusions

The purpose of this thesis study was to gain information regarding the potential usefulness of social media as a means to promote healthful beverage choices among SNAP households with school-age children. The results of this study will be used to expand and direct future *Rethink Your Drink* social media efforts for this target population. In this study, a 19-question survey was developed and inserted into the previously developed Family Drink Survey. The surveys were mailed to SNAP households with children six to 12 years-old in a Nevada county. This study was guided by the following research objectives:

1. To assess social media use among adults in SNAP households.
2. To determine the relative use of social media sites among adults in SNAP households.
3. To explore the perceptions of social media as a nutrition education tool to promote healthful beverage choices among adults in SNAP households.
4. To identify potential barriers regarding the use of social media to promote healthful beverage choices among adults in SNAP households.

This concluding chapter describes social media's future expansion into the *Rethink Your Drink* campaign and possible future research.

***Rethink Your Drink* Campaign**

The *Rethink Your Drink* (RYD) campaign reaches a large number of SNAP households in Nevada with children between the ages of 6 and 12 years-old each year.

From this thesis, it appears that a significant proportion in one Nevada county use social media. For example, four out of five respondents used Facebook on a daily basis. In addition to Facebook, the RYD campaign may be further enhanced by expanding to other social media sites such as: YouTube, Instagram, and Google+. Content that was of most interest was healthy recipe ideas; healthy meal and snack ideas; and ways to save money when buying food/drinks. This content could be emphasized on social media sites in the future. Since there are some that are not using social media, it is also important to continue to use other approaches. Lastly, the information presented on these social media sites should be easily identifiable as material developed at the University of Nevada, Reno to demonstrate credibility.

Future Research

This study included only a small sample of households from one county in Nevada. Further research is needed to learn about all counties. In the future, a larger sample size including a representative sample from the entire state would be best to generalize the results and help make changes to the *Rethink Your Drink* campaign. From previous literature and information learned from this thesis, social media has great potential as a nutrition education tool to communicate with SNAP participants living in the state of Nevada.

References

1. Dodd AH, Briefel R, Cabili C, Wilson A, Crepinsek MK. Disparities in consumption of sugar-sweetened and other beverages by race/ethnicity and obesity status among United States schoolchildren. *J Nutr Educ Behav.* 2013;45(3):240-249.
2. Mullie P, Aerenhouts D, Clarys P. Demographic, socioeconomic and nutritional determinants of daily versus non-daily sugar-sweetened and artificially sweetened beverage consumption. *Eur J Clin Nutr.* 2012;66(2):150-155.
3. Popkin BM. Patterns of beverage use across the lifecycle. *Physiol Behav.* 2010;100(1):4-9.
4. Kristal RB, Blank AE, Wylie-Rosett J, Selwyn PA. Factors associated with daily consumption of sugar-sweetened beverages among adult patients at four federally qualified health centers, Bronx, New York, 2013. *Prev Chronic Dis.* 2015;12:E02.
5. Ludwig DS, Peterson KE, Gortmaker SL. Relation between consumption of sugar-sweetened drinks and childhood obesity: a prospective, observational analysis. *Lancet.* 2001;357(9255):505-508.
6. Grimm GC, Harnack L, Story M. Factors associated with soft drink consumption in school-aged children. *J Am Diet Assoc.* 2004;104(8):1244-1249.
7. French SA, Lin BH, Guthrie JF. National trends in soft drink consumption among children and adolescents age 6 to 17 years: prevalence, amounts, and sources, 1977/1978 to 1994/1998. *J Am Diet Assoc.* 2003;103(10):1326-1331.
8. Kit BK, Fakhouri TH, Park S, Nielsen SJ, Ogden CL. Trends in sugar-sweetened beverage consumption among youth and adults in the United States: 1999-2010. *Am J Clin Nutr.* 2013;98(1):180-188.
9. Kansagra SM, Kennelly MO, Nonas CA, et al. Reducing sugary drink consumption: New York City's approach. *Am J Public Health.* 2015;105(4):e61-64.
10. Han E, Powell LM. Consumption patterns of sugar-sweetened beverages in the United States. *J Acad Nutr Diet.* 2013;113(1):43-53.
11. Park S, Blanck HM, Dooyema CA, Ayala GX. Association Between Sugar-Sweetened Beverage Intake and Proxies of Acculturation Among U.S. Hispanic and Non-Hispanic White Adults. *Am J Health Promot.* 2016;30(5):357-364.
12. Nielsen SJ, Popkin BM. Changes in beverage intake between 1977 and 2001. *Am J Prev Med.* 2004;27(3):205-210.
13. Nickelson J, Lawrence JC, Parton JM, Knowlton AP, McDermott RJ. What proportion of preschool-aged children consume sweetened beverages? *J Sch Health.* 2014;84(3):185-194.
14. Bogart LM, Cowgill BO, Sharma AJ, et al. Parental and home environmental facilitators of sugar-sweetened beverage consumption among overweight and obese Latino youth. *Acad Pediatr.* 2013;13(4):348-355.
15. Harnack L, Stang J, Story M. Soft drink consumption among US children and adolescents: nutritional consequences. *J Am Diet Assoc.* 1999;99(4):436-441.

16. Simon PA, Lightstone AS, Baldwin S, Kuo T, Shih M, Fielding JE. Declines in sugar-sweetened beverage consumption among children in Los Angeles County, 2007 and 2011. *Prev Chronic Dis*. 2013;10:E131.
17. Rosinger A, Herrick K, Gahche J, Park S. Sugar-sweetened Beverage Consumption Among U.S. Youth, 2011-2014. *NCHS Data Brief*. 2017(271):1-8.
18. Rosinger A, Herrick K, Gahche J, Park S. Sugar-sweetened Beverage Consumption Among U.S. Adults, 2011-2014. *NCHS Data Brief*. 2017(270):1-8.
19. Garasky S, Mbwana K, Romualdo A, Tenaglio A, Roy M. Foods Typically Purchased by Supplemental Nutrition Assistance Program (SNAP) Households. In. *Nutrition Assistance Program Report*. <https://www.fns.usda.gov/ops/research-and-analysis: United States Department of Agriculture>.
20. Leung C, Blumenthal SJ, Hoffangle EE, et al. Associations of Food Stamp Participation With Dietary Quality and Obesity in Children. In. Vol 131. DOI: 10.1542/peds.2012-0889: Pediatrics; 2013.
21. Barnhill A. Impact and Ethics of Excluding Sweetened Beverages From the SNAP Program. In. Vol 101. doi: 10.2105/AJPH.2011.300225: American Journal of Public Health; 2011:2037-2043.
22. Rampersaud GC, Bailey LB, Kauwell GP. National survey beverage consumption data for children and adolescents indicate the need to encourage a shift toward more nutritive beverages. *J Am Diet Assoc*. 2003;103(1):97-100.
23. Fiorito LM, Marini M, Mitchell DC, Smiciklas-Wright H, Birch LL. Girls' early sweetened carbonated beverage intake predicts different patterns of beverage and nutrient intake across childhood and adolescence. *J Am Diet Assoc*. 2010;110(4):543-550.
24. Bachman CM, Baranowski T, Nicklas TA. Is there an association between sweetened beverages and adiposity? *Nutr Rev*. 2006;64(4):153-174.
25. US Department of Health and Human Services, US Department of Agriculture. Dietary Guidelines for Americans 2005. 2005.
26. Heaney RP. Optimal calcium intake. *Jama*. 1995;274(13):1012-1013.
27. Matkovic V, Ilich J, Hsieh L. Influence of age, sex and diet on bone mass and fracture rate. *Osteoporos Int*. 1993;3 Suppl 1:20-22.
28. Matkovic V, Kostial K, Simonovic I, Buzina R, Brodarec A, Nordin BE. Bone status and fracture rates in two regions of Yugoslavia. *Am J Clin Nutr*. 1979;32(3):540-549.
29. Sandler RB, Slemenda CW, LaPorte RE, et al. Postmenopausal bone density and milk consumption in childhood and adolescence. *Am J Clin Nutr*. 1985;42(2):270-274.
30. Guenther PM. Beverages in the diets of American teenagers. *J Am Diet Assoc*. 1986;86(4):493-499.
31. World Health Organization (WHO). Obesity and Overweight. In. www.who.int/mediacentre/factsheets/fs311/en: World Health Organization; 2016.
32. Caballero B. Focus on sugar-sweetened beverages. *Public Health Nutr*. 2015;18(7):1143-1144.

33. Harrington S. The role of sugar-sweetened beverage consumption in adolescent obesity: a review of the literature. *J Sch Nurs.* 2008;24(1):3-12.
34. Ogden CL, Carroll MD, Fryar CD, Flegal KM. Prevalence of Obesity Among Adults and Youth: United States, 2011-2014. *NCHS Data Brief.* 2015(219):1-8.
35. Dubois L, Farmer A, Girard M, Peterson K. Regular sugar-sweetened beverage consumption between meals increases risk of overweight among preschool-aged children. *J Am Diet Assoc.* 2007;107(6):924-934; discussion 934-925.
36. Bleich SN, Wolfson JA. Trends in SSBs and Snack Consumption Among Children by Age, Body Weight, and Race/Ethnicity. In. Vol 23. doi:10.1002/oby.21050: Obesity; 2015:1039-1046.
37. Pan L, Li R, Park S, Galuska DA, Sherry B, Freedman DS. A longitudinal analysis of sugar-sweetened beverage intake in infancy and obesity at 6 years. *Pediatrics.* 2014;134 Suppl 1:S29-35.
38. Babey SH, Jones M, Yu H, Goldstein H. Bubbling over: soda consumption and its link to obesity in California. *Policy Brief UCLA Cent Health Policy Res.* 2009(Pb2009-5):1-8.
39. Schulze MB, Manson JE, Ludwig DS, et al. Sugar-sweetened beverages, weight gain, and incidence of type 2 diabetes in young and middle-aged women. *Jama.* 2004;292(8):927-934.
40. Association AH. What is Cardiovascular Disease? 2017. Accessed June 23, 2017, 2017.
41. Centers for Disease Control and Prevention. Stroke Facts. 2016.
42. Fung TT, Malik V, Rexrode KM, Manson JE, Willett WC, Hu FB. Sweetened beverage consumption and risk of coronary heart disease in women. *Am J Clin Nutr.* 2009;89(4):1037-1042.
43. de Koning L, Malik VS, Kellogg MD, Rimm EB, Willett WC, Hu FB. Sweetened beverage consumption, incident coronary heart disease, and biomarkers of risk in men. *Circulation.* 2012;125(14):1735-1741, s1731.
44. Eshak ES, Iso H, Kokubo Y, et al. Soft drink intake in relation to incident ischemic heart disease, stroke, and stroke subtypes in Japanese men and women: the Japan Public Health Centre-based study cohort I. *Am J Clin Nutr.* 2012;96(6):1390-1397.
45. Centers for Disease Control and Prevention. Know the Facts About High Blood Pressure. In. Division for Heart Disease and Stroke Prevention: National Center for Chronic Disease Prevention and Health Promotion; 2016:1-2.
46. Dhingra R, Sullivan L, Jacques PF, et al. Soft drink consumption and risk of developing cardiometabolic risk factors and the metabolic syndrome in middle-aged adults in the community. *Circulation.* 2007;116(5):480-488.
47. Barrio-Lopez MT, Martinez-Gonzalez MA, Fernandez-Montero A, Beunza JJ, Zazpe I, Bes-Rastrollo M. Prospective study of changes in sugar-sweetened beverage consumption and the incidence of the metabolic syndrome and its components: the SUN cohort. *Br J Nutr.* 2013;110(9):1722-1731.

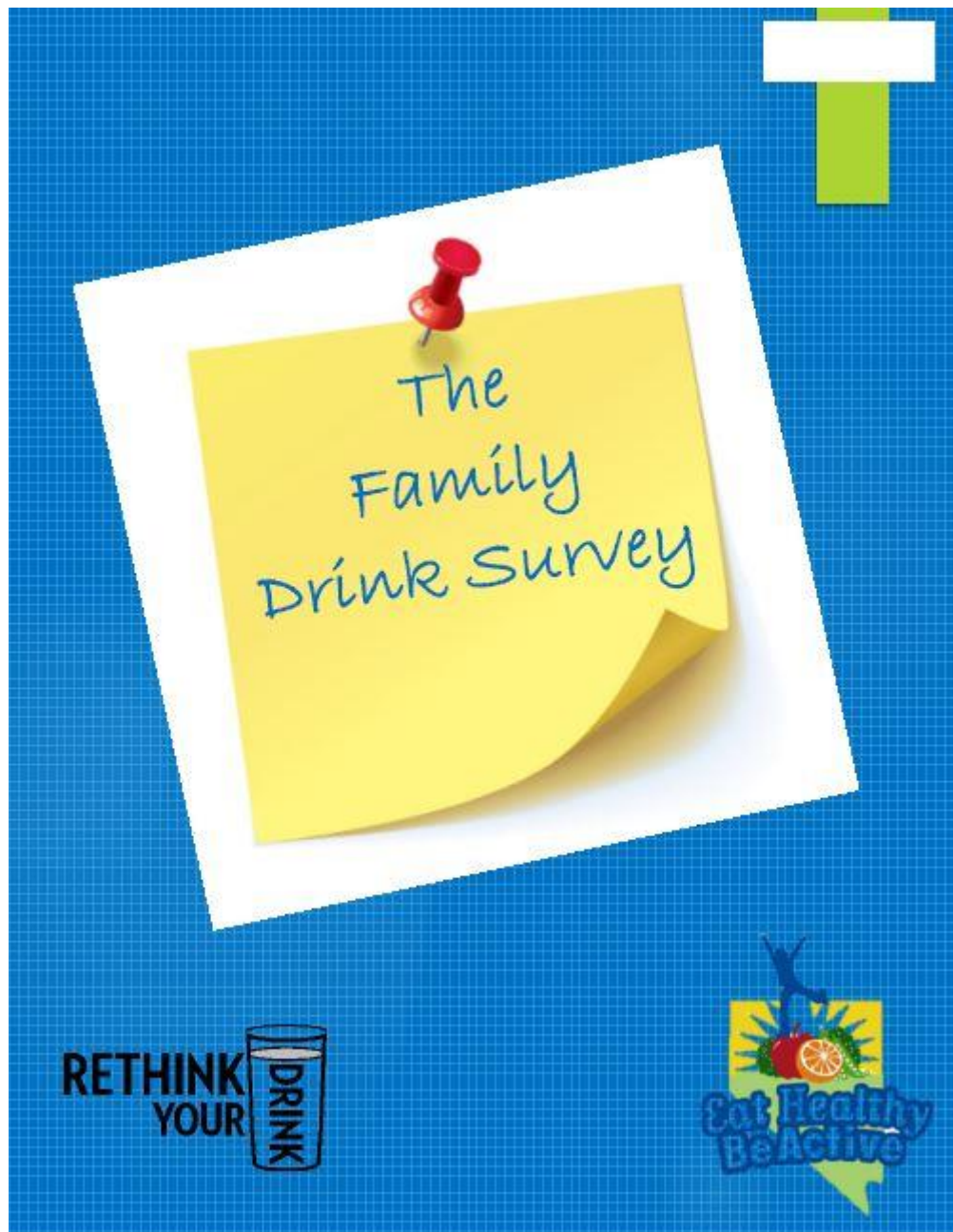
48. Cohen L, Curhan G, Forman J. Association of sweetened beverage intake with incident hypertension. *J Gen Intern Med.* 2012;27(9):1127-1134.
49. Kim YH, Abris GP, Sung MK, Lee JE. Consumption of sugar-sweetened beverages and blood pressure in the United States: the national health and nutrition examination survey 2003-2006. *Clin Nutr Res.* 2012;1(1):85-93.
50. Bernstein AM, de Koning L, Flint AJ, Rexrode KM, Willett WC. Soda consumption and the risk of stroke in men and women. *Am J Clin Nutr.* 2012;95(5):1190-1199.
51. Centers for Disease Control and Prevention. 2014 National Diabetes Statistics Report: Estimates of Diabetes of Its Burden in the United States. In. Atlanta, GA: US Department of Health and Human Services; 2014.
52. Montonen J, Jarvinen R, Knekt P, Heliovaara M, Reunanen A. Consumption of sweetened beverages and intakes of fructose and glucose predict type 2 diabetes occurrence. *J Nutr.* 2007;137(6):1447-1454.
53. Palmer JR, Boggs DA, Krishnan S, Hu FB, Singer M, Rosenberg L. Sugar-sweetened beverages and incidence of type 2 diabetes mellitus in African American women. *Arch Intern Med.* 2008;168(14):1487-1492.
54. Prevention CfDca. Hygiene-related Diseases. 2016.
55. Marshall TA, Levy SM, Broffitt B, et al. Dental caries and beverage consumption in young children. *Pediatrics.* 2003;112(3 Pt 1):e184-191.
56. von Fraunhofer JA, Rogers MM. Effects of sports drinks and other beverages on dental enamel. *Gen Dent.* 2005;53(1):28-31.
57. Skinner J, Byun R, Blinkhorn A, Johnson G. Sugary drink consumption and dental caries in New South Wales teenagers. *Aust Dent J.* 2015;60(2):169-175.
58. Bernabe E, Vehkalahti MM, Sheiham A, Aromaa A, Suominen AL. Sugar-sweetened beverages and dental caries in adults: a 4-year prospective study. *J Dent.* 2014;42(8):952-958.
59. Dugmore CR, Rock WP. A multifactorial analysis of factors associated with dental erosion. *Br Dent J.* 2004;196(5):283-286; discussion 273.
60. Pediatrics AAO. American Academy of Pediatrics Recommends No Fruit Juice for Children Under 1 Year. 2017. Accessed May 22, 2017, 2017.
61. US Department of Health and Human Services, US Department of Agriculture. Dietary Guidelines for Americans 2015-2020. In: USDA, ed. 8th ed. DietaryGuidelines.gov.
62. Dolinsky DH, Armstrong SC, Walter EB, Kemper AR. The effectiveness of a primary care-based pediatric obesity program. *Clin Pediatr (Phila).* 2012;51(4):345-353.
63. Taveras EM, Gortmaker SL, Hohman KH, et al. Randomized controlled trial to improve primary care to prevent and manage childhood obesity: the High Five for Kids study. *Arch Pediatr Adolesc Med.* 2011;165(8):714-722.
64. Polacsek M, Orr J, Letourneau L, et al. Impact of a primary care intervention on physician practice and patient and family behavior: keep ME Healthy---the Maine Youth Overweight Collaborative. *Pediatrics.* 2009;123 Suppl 5:S258-266.

65. Doymaz S, Neuspiel DR. The influence of pediatric resident counseling on limiting sugar-sweetened drinks in children. *Clin Pediatr (Phila)*. 2009;48(7):777-779.
66. Schwartz RP, Hamre R, Dietz WH, et al. Office-based motivational interviewing to prevent childhood obesity: a feasibility study. *Arch Pediatr Adolesc Med*. 2007;161(5):495-501.
67. Sherwood NE, Levy RL, Langer SL, et al. Healthy Homes/Healthy Kids: a randomized trial of a pediatric primary care-based obesity prevention intervention for at-risk 5-10 year olds. *Contemp Clin Trials*. 2013;36(1):228-243.
68. Tavares M, Chomitz V. A healthy weight intervention for children in a dental setting: a pilot study. *J Am Dent Assoc*. 2009;140(3):313-316.
69. Murphy M, Porter J, Yusuf H, et al. Considerations and lessons learned from designing a motivational interviewing obesity intervention for young people attending dental practices: a study protocol paper. *Contemp Clin Trials*. 2013;36(1):126-134.
70. Arrow P, Raheb J, Miller M. Brief oral health promotion intervention among parents of young children to reduce early childhood dental decay. *BMC Public Health*. 2013;13:245.
71. van de Gaar VM, Jansen W, van Grieken A, Borsboom G, Kremers S, Raat H. Effects of an intervention aimed at reducing the intake of sugar-sweetened beverages in primary school children: a controlled trial. *Int J Behav Nutr Phys Act*. 2014;11:98.
72. Wang ML, Lemon SC, Clausen K, Whyte J, Rosal MC. Design and methods for a community-based intervention to reduce sugar-sweetened beverage consumption among youth: H2GO! study. *BMC Public Health*. 2016;16(1):1150.
73. Minaker LM, Olstad DL, MacKenzie G, et al. An evaluation of the impact of a restrictive retail food environment intervention in a rural community pharmacy setting. *BMC Public Health*. 2016;16:586.
74. Barragan NC, Noller AJ, Robles B, et al. The "Sugar Pack" Health Marketing Campaign in Los Angeles County, 2011-2012. In. Vol 15. doi: 10.1177/1524839913507280: Health Promotion Practice; 2014:208-216.
75. Perrin A. Social Media Usage: 2005-2015. In: Pew Research Center; 2015.
76. Fisher J, Clayton M. Who gives a tweet: assessing patients' interest in the use of social media for health care. *Worldviews Evid Based Nurs*. 2012;9(2):100-108.
77. Stroeve SJ, Mackert MS, McAlister AL, Hoelscher DM. Using social media to communicate child health information to low-income parents. *Prev Chronic Dis*. 2011;8(6):A148.
78. Susan Patton M, RD, LDN. Using Social Media to Educate School Nutrition Professionals. In. Vol 48. USDA FNS Poster Abstracts: Journal of Nutrition Education and Behavior; 2016.
79. Mihaly S. Feasibility and Efficacy Outcomes of a 6-Week Social Media-Based Nutrition Education Intervention for Student-Athletes. In: Altit J, ed. Vol 115: Journal of the Academy of Nutrition and Dietetics; 2015.

80. Tobey LN, Manore MM. Social media and nutrition education: the food hero experience. *J Nutr Educ Behav.* 2014;46(2):128-133.
81. Krall JS, Wamboldt P, Lohse B. Telephone and Face-to-Face Interviews with Low-Income Males with Child Care Responsibilities Support Inclusion as a Target Audience in SNAP-Ed. *J Community Health.* 2015;40(3):448-456.
82. Adilman R, Rajmohan Y, Brooks E, et al. Social Media Use Among Physicians and Trainees: Results of a National Medical Oncology Physician Survey. *J Oncol Pract.* 2016;12(1):79-80, e52-60.
83. Kazley AS, Hamidi B, Balliet W, Baliga P. Social Media Use Among Living Kidney Donors and Recipients: Survey on Current Practice and Potential. *J Med Internet Res.* 2016;18(12):e328.
84. Collins K, Shiffman D, Rock J. How Are Scientists Using Social Media in the Workplace? *PLoS One.* 2016;11(10):e0162680.
85. Hamade SN. Perception and Use of Social Networking Sites among University Students. In. Vol 62. DOI 10.1108/LR-12-2012-0131: Library Review; 2013:388-397.
86. Hanson CL, West J, Thackeray R, Barnes MD, Downey J. Understanding and predicting social media use among community health center patients: a cross-sectional survey. *J Med Internet Res.* 2014;16(11):e270.
87. Neier S. Students' Perceptions and Experiences of Social Media in Higher Education. In: Zayer LT, ed. Vol 37: Journal of Marketing Education; 2015:133-143.
88. Whiting A. Why people use social media: a uses and gratifications approach. In: Williams D, ed. Vol 16: Qualitative Market Research: An International Journal; 2013:362-369.
89. Blank G. Why do some people not use the Internet? In. <http://oxis.oii.ox.ac.uk/blog/why-do-some-people-not-use-internet/>: Oxford Internet Surveys; 2013.
90. Sprague K, Manyika J, Chappuis B, et al. Offl ine and falling behind:Barriers to Internet adoption. In. <http://www.mckinsey.com/industries/high-tech/our-insights/offline-and-falling-behind-barriers-to-internet-adoption>: McKinsey and Company; 2014.
91. Antheunis ML, Tates K, Nieboer TE. Patients' and health professionals' use of social media in health care: motives, barriers and expectations. *Patient Educ Couns.* 2013;92(3):426-431.
92. Clan-Olmsted SM, Cho M, Lee S. User Perceptions of Social Media: A Comparative Study of Perceived Characteristics and User Profiles by Social Media. In. Vol 3. <http://www.ojcm.net/articles/34/349.pdf>: Online Journal of Communication and Media Technologies 2013.
93. Kitchakarn O. How Students Perceived Social Media as a Learning Tool in Enhancing their LanguageLearning Performance. In. Vol 15. <https://eric.ed.gov/?id=EJ1117631>: TOJET: The Turkish Online Journal of Educational Technology; 2016.

94. Luchman JN, Bergstrom J, Krulikowski C. A motives framework of social media website use: A survey of young Americans. In. Vol 38. <https://doi.org/10.1016/j.chb.2014.05.016>: Computers in Human Behavior; 2014:136-141.
95. Ngonidzashe Z. Challenges and perceptions towards use of social media in higher education in Zimbabwe: a learners' perspective. In. Vol 4. ISSN 2229-5518: International Journal of Scientific and Engineering Research; 2013:242-249.
96. Rosen LD, Whaling K, Carrier LM, Cheever NA, Rokkum J. The Media and Technology Usage and Attitudes Scale: An empirical investigation. *Comput Human Behav.* 2013;29(6):2501-2511.
97. Carmines EG, Zeller RA. *Reliability and Validity Assessment*. Sage Publications: Sara Miller McCune; 1979.
98. Kim S, Park S, Lin M. Permanent tooth loss and sugar-sweetened beverage intake in U.S. young adults. *J Public Health Dent.* 2017;77(2):148-154.
99. Silver L, Ng S, Ryan-Ibarra S, et al. Changes in prices, sales, consumer spending, and beverage consumption one year after a tax on sugar-sweetened beverages in Berkeley, California, US: A before-and-after study. In. Vol 14. <https://doi.org/10.1371/journal.pmed.1002283>: PLoS Med; 2017.
100. Grynbaum MM. New York's Ban on Big Sodas is Rejected by Final Court. *The New York Times* 2014.
101. United States Department of Agriculture. Supplemental Nutrition Assistance Program Education: Plan Guidance FY 2018. In. *Nutrition Education and Obesity Prevention Program*. <https://snaped.fns.usda.gov/administration/snap-ed-plan-guidance-and-templates>: United States Department of Agriculture; 2017.
102. Dillman DA, Smyth JD, Christian LM. *Internet, Mail, and Mixed-Mode Surveys The Tailored Design Method*. 3rd ed. Hoboken, New Jersey: John Wiley & Sons, Inc.; 2009.
103. Greenwood S, Perrin A, Duggan M. Social Media Update 2016. In. *Facebook usage and engagement is on the rise, while adoption of other platforms holds steady*. <http://www.pewinternet.org/2016/11/11/social-media-update-2016/>: Pew Research Center; 2016.
104. Dietetics TAoNa. Practice Paper of the Academy of Nutrition and Dietetics: Social Media and the Dietetics Practitioner: Opportunities, Challenges, and Best Practices In. Vol 116: Journal of the Academy of Nutrition and Dietetics; 2016:2212-2672.
105. Moorhead SA, E HD, Harrison L, Carroll JK, Irwin A, Hoving C. A New Dimension of Health Care: Systematic Review of the Uses, Benefits, and Limitations of Social Media for Health Communication In. Vol 15. 85 ed. <http://www.jmir.org/2013/4/e85/>: Journal of Medical Internet Research: 1-16.

Appendix A



Instructions

We are sending you this survey to learn about family drink choices and to gain your opinions about the brochures that were recently mailed to your address. It should take no longer than 10 minutes to answer the questions in this survey. When you are done, please use the enclosed, stamped envelope to return it to us.

There is an ID number on your survey. This number lets us know that you have returned the survey. The results of the study, however, will never include your name.

Part 1. This part of the survey is about the features that are important to you when choosing a non-alcoholic drink for yourself. For each question, please check one answer.

1. How important is taste when choosing a drink for yourself?

- Not important
- Somewhat important
- Very important

2. How important is price when choosing a drink for yourself?

- Not important
- Somewhat important
- Very important

3. How important is convenience when choosing a drink for yourself?

- Not important
- Somewhat important
- Very important

4. How important is nutrition when choosing a drink for yourself?

- Not important
- Somewhat important
- Very important

1

Part 2. This part of the survey is about sugary drinks. Sugary drinks have sugar added to make them taste sweet. For each drink, please check the answer that best matches your understanding of sugary drinks.

1. Regular soda (not diet)
 - This is a Sugary Drink
 - This is Not a Sugary Drink
 - I don't know
2. Chocolate milk
 - This is a Sugary Drink
 - This is Not a Sugary Drink
 - I don't know
3. Energy drink (not diet)
 - This is a Sugary Drink
 - This is Not a Sugary Drink
 - I don't know
4. 100% fruit juice
 - This is a Sugary Drink
 - This is Not a Sugary Drink
 - I don't know
5. Sports drink
 - This is a Sugary Drink
 - This is Not a Sugary Drink
 - I don't know
6. Fruit-flavored drink (such as fruit punch)
 - This is a Sugary Drink
 - This is Not a Sugary Drink
 - I don't know
7. Unflavored, fat-free milk
 - This is a Sugary Drink
 - This is Not a Sugary Drink
 - I don't know
8. Fruit nectar
 - This is a Sugary Drink
 - This is Not a Sugary Drink
 - I don't know

2

Part 3. This part of the survey is about the drink choices of you and your children. When you answer these questions, think about the child (or children) in your home that is between 6 and 12 years-old. Please check the response that best describes what you do.

1. I offer my child (or children) a sugary drink when they are thirsty.
 - Never
 - Rarely
 - Sometimes
 - Often
 - Always
2. I keep track of the amount of fruit-flavored drinks my child (or children) drinks.
 - Never
 - Rarely
 - Sometimes
 - Often
 - Always
3. I serve my child (or children) milk with meals.
 - Never
 - Rarely
 - Sometimes
 - Often
 - Always
4. When we leave our home, I bring sugary drinks along for my child (or children).
 - Never
 - Rarely
 - Sometimes
 - Often
 - Always
5. I limit the number of sugary drinks my child (or children) can have.
 - Never
 - Rarely
 - Sometimes
 - Often
 - Always
6. I limit the number of energy drinks my child (or children) can have.
 - Never
 - Rarely
 - Sometimes
 - Often
 - Always
7. I keep track of the amount of soda my child (or children) drinks.
 - Never
 - Rarely
 - Sometimes
 - Often
 - Always

3

8. There are sugary drinks in our refrigerator.
- Never
 - Rarely
 - Sometimes
 - Often
 - Always
9. When my child (or children) has a sugary drink, I limit them to a small amount.
- Never
 - Rarely
 - Sometimes
 - Often
 - Always
10. I keep track of the amount of sports drinks my child (or children) drinks.
- Never
 - Rarely
 - Sometimes
 - Often
 - Always
11. I avoid bringing sugary drinks home from the grocery store.
- Never
 - Rarely
 - Sometimes
 - Often
 - Always
12. I read the ingredients list on product labels to avoid buying sugary drinks.
- Never
 - Rarely
 - Sometimes
 - Often
 - Always
13. I limit the sugary drinks I consume.
- Never
 - Rarely
 - Sometimes
 - Often
 - Always
14. I serve my child (or children) water with meals.
- Never
 - Rarely
 - Sometimes
 - Often
 - Always

4

15. I keep track of the amount of sugary drinks my child (or children) drinks.

- Never
- Rarely
- Sometimes
- Often
- Always

Part 4. This part of the survey is about the mailings on healthy drink choices that were recently sent to you. Included in each mailing were two brochures, one for you (as parent/guardian) and one for the young child (or children) in your household. For each question, please check the response that best describes you and your child (or children).

1. In the past several weeks, do you recall receiving brochures in the mail that were about healthy drink choices?

- No → If you answered "No", please skip to Part 6 on page 8 of the survey.
- Yes → If "Yes", please answer questions 2 to 13, and then continue to Part 5.

2. How many mailing did you receive?

- One
- Two
- Three
- Four
- Don't know

3. About how much of the parent/guardian brochures did you read?

- None or very little
- Some
- Nearly everything
- No opinion

4. Were the parent/guardian brochures difficult to read?

- Yes
- Somewhat
- No
- No opinion

5. Were the parent/guardian brochures interesting to read?

- Yes
- Somewhat
- No
- No opinion

5

6. Did you learn something new as a result of reading the parent/guardian brochures?
- Yes
 - Somewhat
 - No
 - No opinion
7. About how much of the children's brochures did your child (or children) read?
- None or very little
 - Some
 - Nearly everything
 - No opinion
8. Did your child (or children) seem to enjoy reading the brochure?
- Yes
 - Somewhat
 - No
 - No opinion
9. Did your child (children) find the brochures difficult to read?
- Yes
 - Somewhat
 - No
 - No opinion
10. Did your child (or children) prepare any of the recipes that were included in the brochures?
- Yes
 - No
 - No opinion
11. Did your child (or children) do any of the activities that were included in the brochures?
- Yes
 - No
 - No opinion
12. Did your child (or children) talk with you about what they read in the brochures?
- Yes
 - No
 - No opinion
13. Would you recommend the brochures to other families with young children?
- Yes
 - Somewhat
 - No
 - No opinion

6

Part 5. This part of the survey is about suggestions included in the brochures that were sent to your home. For each question, please check the responses that best describe you and your child (or children).

1. What suggestions from the brochures did you try? (Please check all that apply)

- Keep a pitcher of water in the refrigerator
- Make sugar-free flavored waters at home
- Buy 100% frozen juice concentrate when buying juice
- Talk to my kids about why it's important to limit sugary drinks
- Talk to others who care for my kids about why it's important to limit sugary drinks
- Buy a reusable water bottle for my kids
- Store and serve milk, very cold
- Set goals for reducing sugary drinks
- Other _____
(Please explain)
- None of the above

2. What suggestions from the brochures did your child (or children) try?
(Please check all that apply)

- Drink water when he/she is thirsty
- Substitute fruit for fruit juice or fruit-flavored drinks
- Save flavored milk (for example, chocolate milk) for a special time
- Ask for drinks with no added sugar
- Drink milk with meals more often
- Drink water with meals more often
- Carry a reusable water container with him/her when they leave home
- Read the ingredients list on drink labels
- Avoid drinks that contain caffeine
- Drink water in place of sugary drinks more often
- Other _____
(Please explain)
- None of the above

Part 6. This part of the survey is about the other *Rethink Your Drink* Community activities and resources. For each question, please check the answer that best matches your experience.

1. In the past few months, have you visited the Nevada's *Rethink Your Drink* website?
 Yes
 No
 Don't know
2. In the past few months, have you visited the Nevada's *Rethink Your Drink* Facebook page?
 Yes
 No
 Don't know
3. Do you remember seeing advertisements about healthy drink choices for kids in the Carson City newspaper, "Nevada Appeal?"
 Yes
 No
 Don't know
4. Recently, has a dentist or dental hygienist talked to you or your child about healthy drink choices?
 Yes
 No
 Don't know
5. Recently, has a physician or nurse talked to you or your child about healthy drink choices?
 Yes
 No
 Don't know

6. Please use the space below to share your comments or suggestions to encourage healthy drink choices.

8



Part 7. This part of the survey is about your use of social media. These questions are included to help us develop new ways to share information about healthy drink choices with families in the future.

1. Do you currently use social media (For example: Facebook, Instagram, Twitter)?

- No → If you answered "No", which of the following best describe the reason(s) you don't use social media? (Check all that apply)
- I have concerns about my privacy
 - I don't own a smartphone, tablet, or computer
 - I don't have Internet connectivity (WiFi)
 - I don't have enough time to use social media
 - I have no interest in social media
 - I don't know how to use social media
 - Other: _____

(Please specify)

Please continue to Part 9 on page 13.

- Yes → If you answered "Yes", please continue below.

2. How long have you been using social media?

- Less than 1 year
- 1-3 years
- More than 3 years

3. In a typical day, about how much time do you spend using social media?

- Less than 1 hour
- 1-2 hours
- More than 2 hours

4. Which, if any, social media do you use at least once a month? (Check all that apply)

- Facebook
- Instagram
- Twitter
- Pinterest
- LinkedIn
- Tumblr
- YouTube
- Snapchat
- Google+
- Other: _____

(Please specify)

- None of the above

9

5. Which, if any, social media do you use at least once a week? (Check all that apply)

- Facebook
- Instagram
- Twitter
- Pinterest
- LinkedIn
- Tumblr
- YouTube
- Snapchat
- Google+
- Other: _____
(Please specify)
- None of the above

6. Which, if any, social media do you use at least once a day? (Check all that apply)

- Facebook
- Instagram
- Twitter
- Pinterest
- LinkedIn
- Tumblr
- YouTube
- Snapchat
- Google+
- Other: _____
(Please specify)
- None of the above

7. People use social media for a number of reason(s). Please tell us why you use social media by checking the reason(s) that are true for you. (Check all that apply)

- To keep in touch with friends and family
- To post photos, updates, or videos
- To view photos, updates, or videos
- To catch-up on news
- To get information about health, fitness, and/or nutrition
- To find inspiration for a project
- To entertain myself
- Other: _____
(Please specify)

10



8. Social media can be used to communicate information about many different topics. Which, if any, of the topics listed below are you interested in learning about on social media? (check all that apply)

- Healthy recipe ideas
- Healthy meal and snack ideas
- Ways to save money when buying food/drinks
- Ways to identify healthy food and drink products at the grocery store
- Strategies to help kids stay healthy
- Ways to encourage kids to choose healthy foods and drinks
- Nutrition and health events in the my community
- Other: _____
(Please specify)
- None of the above

Part 8. This part of the survey is about your opinions of social media. For each statement, please check the box that best corresponds to you.

9. In general, I find social media easy to use.

- Strongly agree
- Agree
- No opinion
- Disagree
- Strongly disagree

10. Compared with other methods, I prefer to use social media to get news and information.

- Strongly agree
- Agree
- No opinion
- Disagree
- Strongly disagree

11. It takes time to learn how to use social media.

- Strongly agree
- Agree
- No opinion
- Disagree
- Strongly disagree

12. Many of my friends and family use social media.

- Strongly agree
- Agree
- No opinion
- Disagree
- Strongly disagree

13. In general, I find it difficult to find what I am looking for on social media.
- Strongly agree
 - Agree
 - No opinion
 - Disagree
 - Strongly disagree
14. It's easy to explore the options available on most social media sites.
- Strongly agree
 - Agree
 - No opinion
 - Disagree
 - Strongly disagree
15. Having to create an account on social media keeps me from using some sites.
- Strongly agree
 - Agree
 - No opinion
 - Disagree
 - Strongly disagree
16. There are much better ways to keep in touch than social media.
- Strongly agree
 - Agree
 - No opinion
 - Disagree
 - Strongly disagree
17. I have concerns about protecting my privacy when using social media.
- Strongly agree
 - Agree
 - No opinion
 - Disagree
 - Strongly disagree
18. Information posted on social media is often not trustworthy.
- Strongly agree
 - Agree
 - No opinion
 - Disagree
 - Strongly disagree
19. I have limited access to social media because of my data plan.
- Strongly agree
 - Agree
 - No opinion
 - Disagree
 - Strongly disagree

12

Thank You!

Please return the survey in
the enclosed, stamped
envelope.



When we receive your survey, you will be
entered in a drawing for a \$100 gift card.

This material was funded by the Allen Foundation and the USDA's Supplemental Nutrition Assistance Program - - SNAP. SNAP provides nutrition assistance to people with low income. It can you buy nutritious foods for a better diet. To find out more, contact (800) 992-0900.

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University of Nevada, Reno

— Department of —
Agriculture, Nutrition & Veterinary Sciences
SUSTAINABLE SCIENCE FOR LIFE.

Appendix B

UNR Letterhead

Date

Name

Address

Dear _____,

During the past several weeks, brochures about children's drinks were mailed to your address. These brochures are one part of the *Rethink Your Drink* program funded by the Allen Foundation and the Supplemental Nutrition Assistance Program (SNAP).

I am writing to ask you to volunteer for a research study by answering questions in the enclosed survey. The survey is about drink choices and the brochures sent to your address. Your answers will help us improve the *Rethink Your Drink* program. It should take no more than 10 minutes. To make it easy for you to mail it back, a stamped, addressed envelope is also enclosed.

Your participation in this study is completely voluntary. You may skip any questions you do not want to answer and may quit at any time without penalty by not returning your survey to us. The study poses very little risk of harm and there is no direct benefit to you. Your survey answers will be kept confidential. Your name will never be included in any reports. The number written on the survey cover lets us know who has returned a survey to avoid unneeded mailings. Please do not write your name on the survey.

Your participation is very important to us since only a small number of households in Carson City were mailed the survey. Therefore, we will send you a reminder postcard in about a week. A few weeks later, we will send a replacement survey to anyone that we haven't heard from – just in case their survey was lost. We know your time is valuable. As a way of saying thanks, we have enclosed a punch-out refrigerator magnet that may be used as a frame for a picture of your child. In addition, everyone who returns a survey will be entered in a drawing for a \$100 gift card. If you are chosen, you will be asked to sign a paper showing that you have received this gift card for accounting purposes only.

We will keep the completed surveys in a secure location for no more than five years after the study has ended. During that time, only study staff, members of the University of Nevada, Reno Social Behavioral Institutional Review Board, and representatives from

our funding agency may see them. Once the surveys are no longer needed, they will be shredded and any computer files will be destroyed. If you have questions regarding the study, please call me (775) 784-6445 or send a note to jamiieb@cabnr.unr.edu. There is an office that provides oversight called the Office of Human Research Protection. You may call them if you have any concerns on the conduct of the study at 775-327-2367.

Thank you for considering this invitation.

Sincerely,

Jamie Benedict, Ph.D., R.D., L.D.
Associate Professor & Rethink Your Drink Project Director

(version 6-2017)

Appendix C

I don't need sugary drinks.

RethinkYourDrinkNevada.com

RETHINK YOUR DRINK

When Kids Are Thirsty
THEY NEED WATER...
Not Sugary Drinks.

I'm sweet enough already!

RETHINK YOUR DRINK

University of Nevada, Reno

Eat Healthy Be Active

Appendix D

Front of Post Card



Appendix D

Back of Post Card

DATE

Last week a survey about the *Rethink Your Drink* program was mailed to you. Your survey is very important to us since only a small number of households in Carson City were chosen for this study.

If you have already returned your completed survey, please accept my sincere thanks. If you haven't returned your survey, please do so today. We will be completing this study very soon.

You can call me at (775) 784-6450 if you did not receive a survey, or if it was misplaced. I will send you another one right away.

Thank you in advance for your help.

Sincerely,

Jamie Benedict
Project Director



Department of Agriculture,
Nutrition & Veterinary Sciences
University of Nevada, Reno/MS 1202
Reno, Nevada 89557

Address Service Requested

Nonprofit Org.
U.S. Postage
PAID
Reno, Nevada
Permit No. 26

Appendix E

Appendix D-2017-i
(Letter Head Stationary)
Date

Name
Address

Dear _____,

About four weeks ago, we sent you a survey about drink choices and the *Rethink Your Drink* brochures. As far as we know, your survey has not been returned.

I am writing again because your survey is important to us. Hearing from as many people as possible will help us improve the *Rethink Your Drink* program for other families. If you have returned your survey, please accept my sincere thanks and ignore this information. If you have not returned your survey, I hope you will do so today. Only a small number of households in Carson City were chosen for this study.

Let me remind you about our survey procedures. You are being asked to participate because brochures about children's drinks were previously sent to your address. Your participation in this study, however, is completely voluntary. There is no penalty for not participating. Your responses are confidential. Please do not write your name on the survey.

It should take about 10 minutes to answer the survey questions. A stamped, addressed envelope is enclosed to make it easy for you to return your completed survey.

We know your time is valuable. As a way of saying thanks, we have enclosed a refrigerator magnet. In addition, everyone who returns a survey will be entered in a drawing for a \$100 gift card. If you are chosen, you will be asked to sign a paper showing that you have received this gift card for accounting purposes only.

If you have questions regarding the study, please call me 775-784-6445 or send a note to jamieb@cabnr.unr.edu. There is an office that provides oversight called the Research Integrity Office. You may call them if you have any concerns on the conduct of the study at 775-327-2367. Thank you in advance for helping with this important study.

Sincerely,

Jamie Benedict, Ph.D., R.D., L.D.
Associate Professor & Rethink Your Drink Project Director

(version 6-2017)