Electronic Media Usage and Sugar Intake in Children

BY

PATRICK WHITTINGTON
B.A, The University of Texas, Austin, 2008
D.D.S., Baylor College of Dentistry, 2012

THESIS

Submitted as partial fulfillment of the requirements
for the degree of Master of Science in Oral Sciences
in the Graduate College of the
University of Illinois at Chicago, 2014

Chicago, Illinois

Defense Committee:
Shahrbanoo Fadavi, Chair and Advisor, Pediatric Dentistry
Anne Koerber, Pediatric Dentistry
Priscilla Chang, Restorative Dentistry
ACKNOWLEDGEMENTS

I would first like to thank my primary advisor, Dr. Shar Fadavi, for her continued guidance and support throughout this project. She helped me to understand and implement all of the necessary steps for this project, and enabled me to complete it in time for graduation. I would also like to thank my committee, Dr. Anne Koerber and Dr. Priscilla Chang, for their assistance. Without their help and input I would not have been able to complete this study.

I could not have completed this project without the love and help of my wife, Ashley Whittington. I would also like to thank my parents, Mark and Brenda Whittington, for supporting me throughout all of my efforts.

In addition, I am thankful for the help of my co-residents and faculty at the University of Illinois College of Dentistry who helped me through clinic, classes, and this research project.

PRW
# TABLE OF CONTENTS

1. INTRODUCTION ........................................................................................................... 1
   1.1 Background Information ......................................................................................... 1
   1.2 Electronic Media Usage, Diet, and Caries ................................................................. 1
   1.3 Purpose of the Study ................................................................................................. 2
   1.4 Hypothesis .............................................................................................................. 2

2. REVIEW OF LITERATURE ................................................................................................. 3
   2.1 AAP statements on Electronic Media ......................................................................... 3
   2.2 AAP and AAPD statements on Diet ........................................................................... 5
   2.3 Electronic Media Usage and Diet ................................................................................ 6
   2.4 Summary of Published Literature ............................................................................. 12

3. MATERIALS AND METHODS ....................................................................................... 14
   3.1 Overview .................................................................................................................. 14
   3.2 Sample Selection ...................................................................................................... 14
   3.3 Study Design ............................................................................................................ 15
   3.4 Statistical Analysis ................................................................................................... 16

4. RESULTS ..................................................................................................................... 18
   4.1 Sample ..................................................................................................................... 18
   4.2 Questionnaire Changes ............................................................................................ 20
   4.3 Comparing the Questionnaire to the Interview Responses ....................................... 23

5. DISCUSSION ............................................................................................................... 26
   5.1 Limitations and Strengths of the Study ..................................................................... 26
   5.2 Summary of Findings ............................................................................................... 28
   5.3 Results of this Study Compared to Previous Studies ................................................ 30
   5.4 Significance of the Study ........................................................................................ 31
   5.5 Implications for Future Research .............................................................................. 32

6. CONCLUSIONS .......................................................................................................... 34

CITED LITERATURE ........................................................................................................... 35

APPENDICES ..................................................................................................................... 37

APPENDIX A ..................................................................................................................... 38
# TABLE OF CONTENTS (continued)

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPENDIX B</td>
<td>41</td>
</tr>
<tr>
<td>APPENDIX C</td>
<td>42</td>
</tr>
<tr>
<td>APPENDIX D</td>
<td>46</td>
</tr>
<tr>
<td>APPENDIX E</td>
<td>47</td>
</tr>
<tr>
<td>APPENDIX F</td>
<td>49</td>
</tr>
<tr>
<td>APPENDIX G</td>
<td>52</td>
</tr>
<tr>
<td>VITA</td>
<td>55</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. DEMOGRAPHIC INFORMATION OF PARENTS RESPONDING TO ELECTRONIC MEDIA USAGE AND SUGAR INTAKE QUESTIONNAIRE</td>
<td>19</td>
</tr>
<tr>
<td>II. PEARSON CORRELATIONS OF FOOD SCORE, SUGAR SCORE, AND ELECTRONIC MEDIA TIME BETWEEN “SUBJECT” AND “INTERVIEW” QUESTIONNAIRES</td>
<td>24</td>
</tr>
<tr>
<td>III. DESCRIPTIVE STATISTICS FOR FOOD SCORE, SUGAR SCORE, AND ELECTRONIC MEDIA TIME BETWEEN “SUBJECT” AND “INTERVIEW” QUESTIONNAIRES</td>
<td>25</td>
</tr>
</tbody>
</table>
## LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAP</td>
<td>American Academy of Pediatrics</td>
</tr>
<tr>
<td>AAPD</td>
<td>American Academy of Pediatric Dentistry</td>
</tr>
<tr>
<td>DHHS</td>
<td>Department of Health and Human Services</td>
</tr>
<tr>
<td>EMTtime</td>
<td>Electronic Media Time</td>
</tr>
<tr>
<td>TV</td>
<td>Television</td>
</tr>
<tr>
<td>USDA</td>
<td>United States Department of Agriculture</td>
</tr>
</tbody>
</table>
SUMMARY

The purpose of this study was to create a questionnaire that assesses a child’s electronic media usage and sugar intake over a single day. The literature has established a connection between electronic media usage and unhealthy dietary habits, including increased snacking, high consumption of fast-food and sugar-sweetened beverages, and decreased consumption of fruits and vegetables. However, diet has not been investigated in a way that could directly apply to caries risk. The primary hypothesis of this study was that our questionnaire validation process would produce a valid questionnaire regarding media usage and sugar intake yielding results equivalent to an in-depth interview. This questionnaire could then be used in the future to further investigate the connection between electronic media and sugar intake.

The study began with a questionnaire that asked questions about electronic media usage and sugar intake over the previous day, which was given to 6 subjects (parents of children between the ages of 6 and 9). These subjects then participated in an in-depth interview on the same subject. By comparing the questionnaire and interview, weaknesses in the questionnaire were addressed. The questionnaire was changed to address these weaknesses and given to 6 more subjects. After these 6 subjects completed the interview, the questionnaire was changed again. The final version was then administered to 12 subjects, who also participated in the interview. Their questionnaire and interview answers were compared to assess the quality of the questionnaire tool.
SUMMARY (continued)

Data analysis determined that parents were able to consistently report the number of meals and snacks (including drinks) consumed by their children in both the questionnaire and the interview. However, subjects were unable to correctly identify the sugar-containing meals and snacks their children ate and drank. In addition, the amount of electronic media usage reported was inconsistent from the questionnaire to the interview.

Further research is needed to develop a tool that will accomplish the purpose. Additional work should be aimed at ways of properly identifying sugar-containing meals and snacks and eliminating under-reporting of electronic media usage. Once a questionnaire is completed and validated, it could be distributed in a subsequent study to assess the relationship between electronic media usage and sugar intake, which should allow for more accurate and informative oral hygiene instruction.
1. INTRODUCTION

1.1 Background Information

Dental caries is the most common chronic disease in children in the United States. It affects many children, and often begins at a very young age. In order for dental caries to initiate and progress there must be a susceptible host (teeth), bacteria-containing plaque, and fermentable carbohydrates. By eliminating one or more of these factors, dental caries can be prevented. One of the main goals of dentistry, in addition to treating existing decay, is to prevent future decay through patient education, particularly oral hygiene instruction and dietary counseling.

In order to give proper oral hygiene instruction and dietary counseling, dentists must understand the caries process and any risk factors that increase a patient’s caries-risk status. The AAPD lists multiple risk factors including low socioeconomic status, special health care needs, and white spot lesions among others (Council on Clinical Affairs, 2013). In order to allow dentists to educate patients in the most thorough way possible, any other potential risk factors should be explored.

1.2 Electronic Media Usage, Diet, and Caries

It has been hypothesized that there is a connection between electronic media usage and caries. It is known that a correlation exists between the frequency of sugar intake and caries risk, and if a correlation existed between electronic media usage and frequency of sugar intake, a connection between electronic media usage and caries would thus be likely.
1.3 **Purpose of the Study**

The purpose of this study was to create a questionnaire that assesses a child's electronic media usage and sugar intake over a single day. This study is a pilot study, and future studies should use the questionnaire created by this study to investigate the potential connection between electronic media usage and sugar intake.

1.4 **Hypothesis**

Hypothesis: Our questionnaire validation process will produce a valid questionnaire regarding media usage and sugar intake yielding results equivalent to an in-depth interview.

- Parents will consistently report the instances of food consumption.

- Parents will consistently report sugar intake when compared to the coder.

- Parents will consistently report electronic media usage.
2. REVIEW OF LITERATURE

2.1 AAP statements on Electronic Media

In today’s culture children are exposed to many different types of electronic media. Electronic media includes television, movies, video and computer games, and the Internet. In addition, these media can be accessed from more places than ever before with the advent of smart phones and tablets that children use to play games, access the Internet, or connect to social media from anywhere.

With electronic media available in so many ways, the amount of time that children spend on it has increased dramatically. To address this issue the AAP states that “Pediatricians should recommend the following guidelines for parents”:

“-Limit children’s total media time… to no more than 1 to 2 hours of quality programming per day.

-Remove television sets from children’s bedrooms.

-Discourage television viewing for children younger than 2 years…

-Monitor the shows children and adolescents are viewing…

-View television programs along with children, and discuss the content…

-Use controversial programming as a stepping-off point to initiate discussions about family values, violence, sex and sexuality, and drugs…

-Encourage alternative entertainment for children, including reading, athletics, hobbies, and creative play.” (Committee on Public Education, 2001)
It is clear that these recommendations are being exceeded by US children. It is estimated that 8 to 18 year olds spend an average of 7+ hours on electronic media. The same report also states that more homes in the United States have a television than indoor plumbing (Rideout, Foehr, & Roberts, 2010). Nearly two-thirds of children under two spend an hour and a half watching television on a typical day (Vandewater et al., 2007). By the age of 70, today’s young people will have spent an average of 7 to 10 years of their life using media (Strasburger, 2006). With this amount of time spent on electronics comes various adverse effects. Media violence has been reported to have an effect on aggressive behavior (Anderson, Berkowitz, & Donnerstein, 2003).

Research suggests that sexual content in the media may contribute to early sexual intercourse (Anderson et al., 2003; Collins et al., 2004). Also, media portrayal of tobacco, alcohol, and illicit drugs can influence children and teenagers to begin using these substances (Sargent et al., 2005; Stacy, Zogg, Unger, & Dent, 2004). Lastly, “increased TV viewing has been shown to be a contributing factor that may lead to obesity (Council on Communications and Media, 2010)

This relationship between media and obesity is addressed in depth in the AAP policy statement “Children, Adolescents, Obesity, and the Media”. Four main mechanisms are outlined as potential causes for this connection. They are:

-“Increased sedentary activity and displacement of more physical pursuits.

-Unhealthy eating practices learned from both the programming and the advertisements for unhealthy foods.

-Increased snacking behavior while viewing; and
-Interference with normal sleep patterns.” (Council on Communications and Media, 2011)

Of particular importance to this study is the 3rd mechanism, increased snacking while viewing, because it provides a logical potential connection between electronic media usage and caries. While it is mentioned as possible cause for the link to obesity, snacking behavior while viewing is not explored in this paper.

2.2 **AAP and AAPD statements on Diet**

The AAP policy statement, “Dietary Recommendations for Children and Adolescents: A Guide for Practitioners,” outlines the makeup of a healthy diet for children. In this policy statement it is recommended that children aged 2 years and older should have a diet that “primarily relies on fruits and vegetables, whole grains, low-fat and nonfat dairy products, beans, fish, and lean meat…[in addition to] low intakes of saturated and trans fat, cholesterol, and added sugar and salt…and adequate intake of micronutrients.” (Gidding et al., 2006) In terms of specifics, the AHA recommends that children eat vegetables and fruits daily while limiting juice intake, “eat whole-grain breads and cereals rather than refined-grain products, reduce the intake of sugar-sweetened beverages and foods, use nonfat (skim) or low-fat milk and dairy products daily, eat more fish, especially oily fish, broiled or baked, [and] reduce salt intake.” (Gidding et al., 2006) In the policy statement, however, it is noted that the diets of today’s children often do not fall within these recommendations. Adverse changes in children’s diets include “a reduction in regular breakfast consumption, an increase in consumption of foods prepared away from the home, an increase in the percentage of total calories from snacks, an increase in consumption of fried and nutrient-poor foods,
a significant increase in portion size at each meal, and an increase in consumption of sweetened beverages, whereas dairy product consumption has decreased, and a shift away from high-fiber fruits and vegetables as well as a general decline in fruit and vegetable consumption other than potatoes.” (Gidding et al., 2006)

The American Academy of Pediatric Dentistry has also released a policy statement on dietary recommendations. In the background section it is noted that caries is among the most prevalent health problems in US children, and that frequent consumption of sugar and carbohydrates is one of the strongest caries risk factors. In addition, other sets of guidelines are reviewed. The AAP recommends no more than four to six ounces of juice per day in children one through six years old. The USDA and DHHS guidelines are also summarized. These guidelines recommend a variety of nutrient-dense foods and beverages, a diet with plenty of vegetables, fruits and whole grains, and use sugars and salt in moderation. In the policy statement section, the AAPD encourages “educating the public about the association between frequent consumption of carbohydrates and caries” and “educating the public about other health risks associated with excess consumption of simple carbohydrates, fat, saturated fat, and sodium” (American Academy on Pediatric Dentistry Clinical Affairs Committee & American Academy on Pediatric Dentistry Council on Clinical Affairs, 2008)

2.3 Electronic Media Usage and Diet

A literature search was completed to answer the question, “Is there a connection between electronic media usage and sugar intake?” The only inclusion criterion was research papers that directly compared media usage to sugar intake. Exclusion criteria
were papers that studied television advertising but not viewing and papers that compared electronic media and sugar intake to obesity but not to each other.

A PubMed search was completed using the MeSH terms “Dietary Carbohydrates” and “Mass Media”. The search revealed 35 results. Of these results 6 met the inclusion and exclusion criteria. An Ovid Medline search revealed 11 results. Of these results, 1 met the inclusion and exclusion criteria. A Google Scholar search revealed approximately 26,000 results, of which 1 met the criteria. A search of the Cochrane Review Database revealed 0 results.

Gebreriam et al performed a cohort study with 908 Norwegian children between the ages of 11 and 13 to assess “associations between sedentary behaviors (TV/DVD use and computer/game use) and 1) dietary behaviors (intake of soft drinks with sugar, unhealthy snacks, fruits and vegetables) and 2) leisure-time physical activity between 2007 and 2009.” . The results demonstrated an inverse association between TV/DVD use and vegetable consumption and a positive association between TV/DVD use and soft drink consumption and snack consumption. In addition, the study found inverse associations between computer/game usage and fruit and vegetable consumption and positive associations between computer/game usage and snack and soft drink consumption. This study demonstrates small but important associations that suggest that soft drink and snack consumption increases and fruit and vegetable consumption decreases as television viewing and computer/game usage increases.

Honkala et al conducted a study with 1292 Kuwaiti schoolchildren “to determine the daily consumption of soft drinks, sweets, and cakes/pastries by schoolchildren and
the possible background factors associated with these habits.” The sample contained fifth and seventh graders from public intermediate schools in Kuwait. The subjects were given a questionnaire containing 84 questions pertaining to health and fitness, behaviors such as smoking, sedentary activity, and dietary habits, and demographic characteristics. Questions regarding diet were “How often do you drink or eat the following?” with five answer choices ranging from “never” to “more than once a day.” This question was asked about soft drinks, sweets, and cakes/pastries. The only question pertaining to electronic media was “How many hours per day do you usually watch TV?” The results demonstrated that the majority of subjects (72%) consumed soft drinks and ate sweets at least one time per day. In addition, TV watching of more than 4 hours per day was associated with daily consumption of sugary products (OR 1.6, 95% CI 1.12-2.43, P < 0.016). This study demonstrates that a large percentage of Kuwaiti schoolchildren consume sugary snacks and drinks daily. In addition, much like the previous study, it demonstrates a significant association between TV viewing and consumption of sweets. It is worth noting, however, the association was only to daily consumption of sweets. This study failed to specifically address the exact number of times/day that children ate or drank sweets, only that they ate or drank them daily.

(Honkala, Behbehani, & Honkala, 2012)

Lopez et al conducted a cross-sectional study comparing sugary beverage consumption with certain parenting practices. In this study sugary beverages included soda, noncarbonated sugary drinks, and sport drinks. 541 children between the ages of 5 and 8 from San Diego County were included in the study. The children’s parents completed a survey. Answers were tabulated to obtain mean daily servings. Parents
were also asked “On a typical weekday, how much time does your child spend… 1) Watching television/videos/DVDs, 2) Playing computer or video games (eg, Nintendo or Xbox), 3) Using the Internet, e-mail, or other electronic media for leisure.” These answers were summed to find total daily screen time. The results demonstrated a positive association between sugary beverage consumption and total screen time, with an average total screen time of 108.0 minutes/day. A strength of this study is its definition of screen time to include video games and computer usage in addition to television. The weaknesses as it pertains to our study are the lack of inclusion of sugary foods and the failure to differentiate between 2 sugary drinks per day and higher frequencies like 4 or 5 sugary drinks per day.

Kremer et al studied the association between adolescent screen-viewing behavior and consumption of sugar-sweetened beverages in Dutch children. Three hundred eighty three adolescent subjects participated in the study. Subjects completed a survey while at school. Screen-time included television viewing and computer usage. Subjects were asked about the number of days they engaged in screen-time in addition to the amount of screen-time on normal weekdays and normal weekend days. Sugar sweetened beverages included carbonated soft drinks, other non-carbonated sugar-sweetened drinks, and sport drinks. Two questions were asked pertaining to sugar-sweetened beverages: “On how many days per week do you drink sugar-sweetened (excluding ‘light’ or ‘diet’) beverages?” and “On day that you drink sugar-sweetened beverages, how many glasses, cans and/or bottles do you drink?” In addition, the Self-Report Habit Index (SRHI) was used to assess habit strength and perceived parental norms by asking subjects how that parents feel about their screen-time and sugar-
sweetened beverage consumption. The results demonstrated an association between screen-time and sugar-sweetened beverage consumption (.32, p<.001) and an association between habit strengths of both behaviors (.50, p<.001). Additionally, an association was found between perceived parental screen-viewing norms and screen-time. In addition to supporting the association between screen-time and sugary beverage consumption that was demonstrated by previous studies, this study demonstrates that habit strength is associated as well. As it pertains to our study, however, this study falls short by only measuring sugary drinks and not sugary foods as well. Furthermore, this study measures the quantity of daily sugary beverage consumption, not the frequency, which is the more important factor in determining caries risk. (Kremers, van der Horst, & Brug, 2007)

Lissner et al conducted a study to assess television habits in relation to overweight status in European children between 2 and 9 years old. In this study, questionnaires were completed by subjects’ parents. Television questions related to amount of time spent watching TV, videos, and DVDs per day, TV viewing with meals, and whether or not children had a TV in their bedroom. The questionnaire also asked questions about dietary habits like consumption of high-fat and sweet food and beverages. In addition to linking TV habits to weight status, this study found that TV viewing patterns were associated with dietary habits. Specifically, “Eating while watching TV was associated with a higher proportion of high-fat items and high-sugar items in the diet, in proportion to total number of food consumed.” Similar results were found for watching TV more than 60 min per day and having a TV in the bedroom. (Lissner et al., 2012)
Campbell et al conducted a study comparing family food environment and dietary behaviors in Australian children. Parents of 5-6 year olds were asked to complete and return a survey about their child’s dietary behaviors. Food was measured using an Index of energy intake that consisted of the total energy per day. Food was further divided into high-energy-density foods like non-dairy fluids, sweet snacks and savory snacks, and low-energy-density foods like vegetables. The authors found that “parental perception of a child’s dietary adequacy, parental pressure to encourage eating and the amount of TV viewed were associated with dietary outcomes”. However, a negative association was found between TV use during meals and energy intake, possibly due to children being too distracted by TV to eat. (Campbell, Crawford, & Ball, 2006)

Dubois et al conducted a study involving 1549 4-5 year olds from Quebec regarding television use during meals and snacks. In addition to completing a survey, parents participated in an interview during which they discussed their child’s food consumption from the previous 24 hours. The results demonstrated that “children who ate snacks in front of the television every day, or some times during the week, ate more carbohydrates (total), more fat and less protein, fewer fruits and vegetables, and drank soft drinks more often than children who never ate snacks in front of the television.” This study confirms the results of the previous studies, but has the added benefit of an interview in addition to the self-reported survey that was used in all of the other studies. (Dubois, Farmer, Girard, & Peterson, 2008)

Pearson and Biddle conducted a systematic review of literature on sedentary behavior and dietary intake. They stated that sedentary behavior “refers to very low
levels of energy expenditure through sitting and lying" and is most often consists of TV and computer use. Inclusion criteria stated that studies must measure at least one dietary factor and one sedentary behavior, and assess their association.

Fifty three studies qualified for the study. 19 pertained to children, 26 to adolescents, and 11 to adults. After reviewing these articles, the authors concluded that “Sedentary behavior in children, adolescents, and adults appears to be clearly associated with elements of a less healthy diet including lower fruit and vegetable consumption; higher consumption of energy-dense snacks, drinks, and fast foods; and higher total energy intake. Strengths of association were mainly in the small-to-moderate range.” (Pearson & Biddle, 2011)

2.4 Summary of Published Literature

A review of the literature conclusively demonstrates multiple associations between electronic media usage and sugar consumption.

Despite these findings, the need for further research still exists. All of the available literature ignores the fact that so-called “healthy” foods may be cariogenic. Foods like pasta, bread, and even fruits can cause tooth decay, but are not positively associated with electronic media usage in any of the reviewed studies. Furthermore, milk is cariogenic but was excluded from “sugar-containing beverages” in all of the reviewed studies.

Additionally the previously reviewed studies looked at total amount of foods consumed rather than singling out frequency of sugar exposure. For the purposes of caries risk assessment, the total amount of unhealthy foods eaten does not necessarily
directly relate to caries risk. In other words, although chips and soft drinks are both cariogenic, eating chips and drinking a soft drink in 2 separate instances is different in terms of caries risk than eating chips while drinking a soft drink. Frequency of fermentable carbohydrates is the most important dietary factor in assessing caries risk, and the available studies either assessed quantity or assessed frequency in a less than optimal manner.

Also, all of the reviewed studies used a survey/questionnaire tool to assess electronic media and diet. Further research is needed using other methods of analysis. One study did conduct an interview, but this only supplemented the findings in their survey. Additional studies using interviews or dietary journals would be useful in studying this topic.
3. MATERIALS AND METHODS

3.1 **Overview**

This was a pilot study with the main focus of questionnaire development. In the first phase, or questionnaire development phase, the questionnaire was changed after testing as needed to improve internal validity. The change of the instrument was performed after a team member listened to the taped interview and made notes about differences between the questionnaire and the information obtained from the interview. In the second phase, or questionnaire testing phase, the final version of the questionnaire was analyzed. This study was approved by the Institutional Review Board at the University of Illinois at Chicago, protocol #2013-0950 (Appendix A).

3.2 **Sample Selection**

Subjects were excluded if they were unable to speak and understand English because the Interviewer was limited to speaking English. Subjects who were not with their children on the previous day when diet was measured were excluded.

Subjects who met the inclusion and exclusion criteria were selected for the study based on their presence in the waiting room of the Pediatric Dentistry clinics at UIC on the scheduled data collection dates. All data was collected on Mondays. The primary investigator approached the subjects and informed them of the study using an IRB-approved Subject Recruitment Script (Appendix B). If the subjects agreed to participate in the study and signed the IRB-approved Consent Form (Appendix C) the subject’s child was then approached using the approved Child Verbal Assent Script (Appendix D).
The subjects participated in the study only after completion of subject consent and child assent.

Twenty-four parents of healthy (ASA 1) children in mixed dentition between 6 and 9 years old were enrolled. The first 12 parents participated in the questionnaire development phase of the study. The final 12 parents participated in the questionnaire testing phase of the study.

3.3 **Study Design**

After consent and assent was obtained, subjects were given a questionnaire to complete. (appendix E) The questionnaire had questions pertaining to their child’s electronic media usage and sugar intake the day before (Sunday). After completing the questionnaire, parents participated in a recorded in-depth interview about the same topics. After completion of the interviews, a coder listened to the recordings. Using the recorded interview, the coder completed a questionnaire for each participant. For each participant, there were 2 completed questionnaires: 1 completed by the parent and 1 completed by the coder.

After 6 participants completed the questionnaire and interview, the questionnaire was reviewed and modified (appendix F). This modification was based on the interviewer and coder’s review of each participant’s questionnaire and feedback from the interview, and attempted to identify common themes to improve the questionnaire, such as misinterpretation of questions, wording, etc. The questionnaire was modified to address these themes. Changes were made based on qualitative assessments. No statistical analyses were completed in this portion of the study.
The 2nd version of the questionnaire was then administered to 6 more participants. These 6 subjects also completed the recorded interview. After the coder filled out questionnaires for these 6 subjects, the questionnaire was modified again (appendix G). This 3rd and final version of the questionnaire was administered to 12 more subjects who also participated in the interview. After the coder completed questionnaires for these subjects, the twelve sets of questionnaires were analyzed to assess the validity of the questionnaire.

3.4 **Statistical Analysis**

For each of the final 12 subjects there were two questionnaires: one completed by the subject and one completed by the coder using the subject’s answers in the recorded interview. The answers to these 12 sets of questionnaires were entered into SPSS. The answers to the following questions were summed:

- How many of these snacks (before breakfast) contained sugar?
- Did your child’s breakfast contain sugar?
- How many of these snacks (between breakfast and lunch) contained sugar?
- Did your child’s lunch contain sugar?
- How many of these snacks (between lunch and dinner) contained sugar?
- Did your child’s dinner contain sugar?
- How many of these snacks (after dinner) contained sugar?
The sum of the answers to these questions was called the sugar score. The answers to the questions “Did your child have a snack before breakfast?”, “Did your child have breakfast?”, etc. were summed to make the food score. The answer to the question “Estimate the length of time your child used electronic media yesterday.” was considered the electronic media score.

Descriptive statistics were calculated for food score, sugar score, and electronic media time. Pearson’s Rho, comparing questionnaire answers to interview answers, was calculated for food score, sugar score, and electronic media time. These statistics were used to determine whether or not subjects were able to consistently answer the questionnaire questions.
4. RESULTS

4.1 Sample

47 potential subjects were present on the dates of data collection. Demographic data for subjects can be found in Table 1. Twenty-four participated in the study. Twenty-three were excluded from the study for the following reasons:

- 13 did not speak English.
- 6 were not with their child on the previous day.
- 3 had children that are not ASA 1.
- 1 declined the study.
TABLE I

DEMOGRAPHIC INFORMATION OF PARENTS RESPONDING TO ELECTRONIC MEDIA USAGE AND SUGAR INTAKE QUESTIONNAIRE

<table>
<thead>
<tr>
<th></th>
<th>%</th>
<th>(N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Child’s Age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>42</td>
<td>(5)</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>(1)</td>
</tr>
<tr>
<td>8</td>
<td>25</td>
<td>(3)</td>
</tr>
<tr>
<td>9</td>
<td>25</td>
<td>(3)</td>
</tr>
<tr>
<td><strong>Child’s Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>75</td>
<td>(9)</td>
</tr>
<tr>
<td>Female</td>
<td>25</td>
<td>(9)</td>
</tr>
<tr>
<td><strong>Child’s Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>17</td>
<td>(2)</td>
</tr>
<tr>
<td>Latino</td>
<td>33</td>
<td>(4)</td>
</tr>
<tr>
<td>Black or African American</td>
<td>25</td>
<td>(3)</td>
</tr>
<tr>
<td>Asian</td>
<td>25</td>
<td>(3)</td>
</tr>
<tr>
<td><strong>Parent’s Highest Level of Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some or no High School</td>
<td>8</td>
<td>(1)</td>
</tr>
<tr>
<td>Completed High School</td>
<td>17</td>
<td>(2)</td>
</tr>
<tr>
<td>Some College</td>
<td>58</td>
<td>(7)</td>
</tr>
<tr>
<td>College Degree or Greater</td>
<td>17</td>
<td>(2)</td>
</tr>
</tbody>
</table>
4.2 **Questionnaire Changes**

See Appendix E for the first version of the questionnaire. In the initial version of the questionnaire four questions pertained to diet. They were, “How many main meals did your child have yesterday?”, “How many of these meals contained sugar?”, “How many snacks (including drinks) did your child have yesterday?”, and “How many of these snacks (including drinks) contained sugar?”. Possible answer changes ranged from 0 to 10. There were three questions pertaining to electronic media. The first was, “Did your child use electronic media yesterday?”. Possible answers were yes or no. The second was “What types of electronic media did they use?”. Possible answers were Television, Movies/Videos, Video Games/Computer Games, and Internet (including social media) and parents were instructed to circle all that applied. The final question was “Estimate the length of time your child used electronic media yesterday”. Answer choices were 0-1 hours, 1-2 hours, 3-4 hours, and 5 or more hours. The final four questions of the questionnaire pertained to subject demographics like child’s age, gender, and ethnicity, and parent’s highest level of education.

The interview was structured chronologically. Subjects were first asked what their child had for breakfast yesterday and if it contained any sugar. They were then asked how many snacks (including drinks) their child had between lunch and dinner and how many contained sugar. This was repeated for lunch, snacks between lunch and dinner, dinner, and snacks after dinner. Parents were then asked what types of electronic media their child used the day before and asked to estimate the amount of time spent on electronic media before lunch, between lunch and dinner, and after dinner.
After completion of the first six questionnaires and interviews, the coder filled out a second questionnaire for each subject using the answers provided in the interview. The two versions of the questionnaire (one completed by the subject and one completed by the coder) were then compared in a qualitative fashion to identify potential discrepancies in the questionnaire.

There were three notable changes made to the questionnaire after the first round of subjects. The changes were:

- The meal and snack questions were changed so that they started with snacks before breakfast and proceed chronologically throughout the day. For example, the first question asked, “Did your child have breakfast yesterday?” The second question asked, “If yes, did your child’s breakfast (including drinks) contain any sugar?” This pair of questions was repeated for both lunch and dinner. The possible answers for these questions were yes and no. The next set of questions addressed snacks. The first question was changed to, “Estimate how many snacks your child had yesterday before breakfast”. The second question was changed to, “Estimate how many of these snacks (including drinks) contained sugar.” This sequence was repeated for snacks between breakfast and lunch, snacks between lunch and dinner, and snacks after dinner. The possible answers for each of these questions were 0, 1, 2, 3, and 4 or more.

- The answers to the question, “What types of electronic media did they use?” were changed to: “Television”, “Movies or Videos”, “Computer”, “Smart Phone or Tablet”, and “Video Games”
- The answers to the question, "Estimate the entire length of time your child used electronic media yesterday" were changed to “Less than 1 hour”, “1 hour or up to 2 hours”, “3 hours or up to 4 hours”, “4 hours or up to 5 hours”, and “More than 5 hours”.

Version 2 of the questionnaire (Appendix F) was then administered to 6 subjects. These subjects then participated in the interview. After the coder reviewed the recorded interviews, the coder’s findings were compared to the subjects’ questionnaire answers, and the questionnaire was changed again. The following changes were made:

- The order of the diet questions was changed. In version 2 all of the snack questions preceded the meal questions. This was changed so that the order of food questions became: snacks before breakfast, breakfast, snacks between breakfast and lunch, lunch, snacks between lunch and dinner, dinner, and snacks after dinner.

- The answers to the snacking questions were changed from “0-1, 1-2, 2-3, 3-4, and 4+” to “0, 1, 2, 3, and 4 or more”.

- The word “carbohydrates” was added after the word “sugar” so that the sugar score questions read, “Estimate how many of these snacks (including drinks) contained sugar/carbohydrates.”

After these changes were made the questionnaire was finalized. This version, or version 3 (Appendix G), was then administered to 12 other subjects. Like before, these 12 subjects first participated in the interview. The coder then listened to the recording and tabulated answers for each of the questionnaire questions. The 2 questionnaires, labeled “subject” and “interview” were then compared to assess the consistency of the
answers given and the ability of the subjects to comprehend and measure their children’s sugar intake and electronic media usage.

4.3 Comparing the Questionnaire to the Interview Responses.

The data from the final questionnaires was entered into SPSS. Food score and sugar score were tabulated for each subject. Food score equaled the total number of meals and snacks (including drinks) consumed by the child. Sugar score equaled the total number of sugar/carbohydrate-containing meals and snacks (including drinks) consumed by the child. The amount of time spent using electronic media was labeled “EMTime”.

Using Pearson’s Rho, food score, sugar score, and electronic media time were compared between “subject” and “interview”. The Pearson correlations are listed in Table 2. One subject (Subject 4-3) reported drastically different EMTimes in the questionnaire and interview. After the data on EMTime was analyzed, this subject was excluded, and the data was analyzed again. The means and standard deviations are reported in Table 3.
### TABLE II
PEARSON CORRELATIONS OF FOOD SCORE, SUGAR SCORE, AND ELECTRONIC MEDIA TIME BETWEEN “SUBJECT” AND “INTERVIEW” QUESTIONNAIRES

<table>
<thead>
<tr>
<th></th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Score Questionnaire vs. Food Score Interview</td>
<td>.864</td>
<td>.000</td>
</tr>
<tr>
<td>Sugar Score Questionnaire vs. Sugar Score Interview</td>
<td>.448</td>
<td>.144</td>
</tr>
<tr>
<td>EMTQuestionnaire vs. EMTInterview</td>
<td>.485</td>
<td>.110</td>
</tr>
<tr>
<td>EMTQuestionnaire vs. EMTInterview (Subject 4-3 excluded)</td>
<td>.831</td>
<td>.002</td>
</tr>
</tbody>
</table>
TABLE III
DESCRIPTIVE STATISTICS FOR FOOD SCORE, SUGAR SCORE, AND ELECTRONIC MEDIA TIME BETWEEN “SUBJECT” AND “INTERVIEW” QUESTIONNAIRES

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Score Questionnaire</td>
<td>6.7</td>
<td>2.1</td>
</tr>
<tr>
<td>Food Score Interview</td>
<td>6.2</td>
<td>1.7</td>
</tr>
<tr>
<td>Sugar Score Questionnaire</td>
<td>5.3</td>
<td>2.6</td>
</tr>
<tr>
<td>Sugar Score Interview</td>
<td>5.8</td>
<td>1.6</td>
</tr>
<tr>
<td>EMTTime* Questionnaire</td>
<td>1.7</td>
<td>1.4</td>
</tr>
<tr>
<td>EMTTime* Interview</td>
<td>2.5</td>
<td>1.6</td>
</tr>
<tr>
<td>EMTTime* Questionnaire (Subject 4-3 Excluded)</td>
<td>1.8</td>
<td>1.4</td>
</tr>
<tr>
<td>EMTTime* Interview (Subject 4-3 Excluded)</td>
<td>2.3</td>
<td>1.4</td>
</tr>
</tbody>
</table>

*EMTime represented in number of hours.
5. DISCUSSION

The purpose of this study was to create a questionnaire that assesses a child's electronic media usage and sugar intake over a single day. The discussion will address five issues: (1) limitations and strengths of the study, (2) summary of findings, (3) the results of this study compared to previous studies, (4) significance of the study, and (5) implications for future research.

5.1 Limitations and Strengths of the Study

One limitation of this study is the sample size. This was primarily a qualitative study aimed at understanding how subjects read and interpreted the questionnaire. Because the interview was a time consuming process the number of participants was limited. This small sample size means that the findings have a limited generalization.

Another limitation to the study is two potential sources of bias: recall bias and social desirability bias (Nederhof, 1985).

Recall bias means that the reported findings were limited to what the subjects could remember. Subjects were asked to report every instance of their child's food consumption electronic media usage over the previous day, and it is likely that some subjects were unable to remember all of the necessary information. This finding is supported by the fact that multiple parents mentioned during the interview that they had trouble remembering certain things. Several parents had to pause for a period of time to remember exactly what was eaten at a certain meal. Although the parents eventually produced an acceptable answer in each of these instances, it is plausible that something was left out or forgotten. In addition, the food items that these subjects
remembered during the interview were likely not considered during the questionnaire, which had been completed by the time they remembered what their children ate. It is expected that they gave more information during the interview component than they entered in the questionnaire.

Social desirability bias means that subjects may have been inclined to report what they thought was desirable rather than what was the truth. In other words, if parents were ashamed to report exactly how much junk food their child ate or exactly how much electronic media they used, there was nothing to prevent them from lying or under-reporting. One parent stated during the interview “I didn’t even realize that he watched that much TV yesterday” and another stated “It sounds so much worse when I say it out loud” in regards to their child’s diet. The fact that two different subjects verbalized their embarrassment makes it plausible to think that other subjects may have withheld information rather than reveal the truth.

In addition to the potential for social desirability bias, the study was limited by the lack of blinding. Because the study was completed at a Pediatric Dentistry clinic and the interviewer was required to identify himself as a Pediatric Dentistry resident, the parents knew that he was a dentist. This knowledge may have influenced the subjects to say what they thought the investigator wanted to hear rather than reporting all of the details accurately.

A strength of this study is that it provides a beginning upon which other studies can build. Because the study collected the first data on this specific subject it may serve as an impetus for future research. This study’s subject matter is in need of further
research, and there is the potential for future improvement. While there were several positive findings associated with this study, parents were unable to identify sugar/carbohydrate-containing foods when compared to the coder. With future studies, this finding could potentially be improved upon and lead to the creation of a questionnaire instrument that could be used to assess the relationship between electronic media usage and sugar intake in children.

Another strength of this study is that it allowed us to validate the questionnaire to the intensive interview. By using the recorded interview in addition to the questionnaire the researchers were able to speak with the subjects at length about their understanding of the questionnaire. During the first 2 rounds of the study, the subjects were able to ask questions of the interviewer and point out areas of confusion in the questionnaire. In addition, by comparing the subjects’ questionnaire answers to their interview answers, the researchers were able to identify and assess problem areas of the questionnaire. This interaction, and the ability to make changes to the questionnaire before finalizing it, allowed for the creation of a potentially better questionnaire instrument.

5.2 Summary of Findings

Subjects reported a higher mean Food Score in the questionnaire than in the interview. This finding is opposite of the expected finding, which was that parents would underreport food intake due to better recall in the interview than the survey. One possible explanation for this finding is that subjects have been more reluctant to recount their child’s entire food intake verbally to the examiner than to write it on the questionnaire. Another possible explanation is that the coder grouped snacks
differently than the subjects. For example, if a child had a snack and a drink at the same time, the coder would record it as one single instance of food intake. The subjects, however, may have incorrectly coded it as two separate intakes, possibly accounting for this finding.

Subjects reported a lower mean Sugar Score in the questionnaire than the interview. This finding is likely due to poor subject knowledge of nutritional information. Parents likely underreported the number of snacks and meals containing sugar or carbohydrates due to an inadequate ability to recognize which foods and beverages contain sugar or carbohydrates.

Subjects reported a lower mean EMTIme in the questionnaire than the interview. This finding is consistent with the expected finding. One possible explanation for this is that parents recalled more instances of electronic media usage when prompted by the interviewer in a chronological fashion.

The objective of the study was to come up with a questionnaire to assess electronic media usage and sugar intake of a child over a one day period. The main hypothesis was divided into three sub-hypotheses.

The first sub-hypothesis was that parents would consistently report food consumption in the questionnaire and interview. There was a strong correlation between questionnaire food score and interview food score. This hypothesis was supported.

The second sub-hypothesis was that parents would consistently report sugar intake when compared to the coder. Questionnaire sugar score was not associated with
interview sugar score, meaning that parents reported sugar intake that was inconsistent with the coder’s findings. This hypothesis was not supported.

The third sub-hypothesis was that parents would consistently report electronic media usage. Questionnaire EMTime was not associated with Interview EMTime. This means that parents reported electronic media usage inconsistently when comparing the questionnaire to the interview. This hypothesis was not supported. It is worth noting, however, that one subject (4-3) grossly misreported electronic media usage (less than 1 hour on questionnaire and greater than 5 hours in interview), and when this subject was excluded from the analysis, the remaining 11 parents did consistently report EMTime in the questionnaire and interview. It may be concluded that many parents can consistently report electronic media usage, but in at least one case the estimate was very poor.

5.3 **Results of this Study Compared to Previous Studies**

This study was a pilot study aimed at developing a questionnaire rather than comparing electronic media time to sugar intake. There are multiple studies that demonstrate an association between screen time and sugar intake, but this was not investigated in the present study.

The AAP reports that the average 8-10 year old spends nearly 8 hours per day with various media (Council on Communications and Media, 2010). The present study found that children watched a mean of 2.5 hours of television during the previous day. This discrepancy is possibly attributable to the fact that answer choices were capped at 5 hours, or possibly due to biases and under-reporting on the part of the parents. To
remedy this problem in future studies, the interview could be transcribed and the exact amount of electronic media time recorded as to remove the ceiling effect.

Eck et al conducted a study in which children were provided a lunch and parents were asked 24 hours later to recall what the children ate. They found that when mothers and fathers were questioned independently, they were unable to accurately recall what was eaten at the previous day’s meal (Eck, Klesges, & Hanson, 1989).

Livingstone et al discussed the issues of dietary recall in their 2004 paper. They stated that “validation studies of energy intake data have led to the widespread recognition that much of the dietary data on children and adolescents is prone to reporting error” and that “the assumption that parents are good surrogate reporters of their children’s food intake does not always hold in practice and this must be regarded as a limiting factor in studies using recall methodology for assessing the food intakes of young children.” (Livingstone, Robson, & Wallace, 2004). The present study suggests that parents were able to report consistent data about their children’s food consumption, but the available literature suggests that this data may not accurately represent what the children actually ate.

5.4 Significance of the Study

The goal of this study was to create a questionnaire that allowed parents to report their children’s sugar intake and electronic media usage. The goal of the study was to develop a questionnaire that obtained the same information as a more expensive intensive interview. Although the study was unsuccessful in this task, this study took steps in the right direction of addressing a potential link between sugar intake and electronic media. By interviewing parents and editing the questionnaire based on their
results, the researchers were able to improve the questionnaire. Although the results were not positive for sugar score and EMTime, the parents were able to consistently report their children’s food scores. Furthermore, this questionnaire could serve as a foundation for future questionnaires. If the appropriate changes were made to the questionnaire, it could potentially serve as a useful tool for further research.

In addition, this study, which was primarily qualitative in nature, demonstrated several findings of significance. First, it demonstrated that questionnaire development is an important step of research. It shows that it is inadequate to assume that a questionnaire accurately measures a desired topic without testing. In addition, this study highlights the issues with parental understanding of nutrition content. This study demonstrated that parents were unable to determine which of their children’s foods and drinks were cariogenic. In addition to posing a problem for studies like this one, this is also a problem that can contribute to children’s caries risk.

5.5 Implications for Future Research

This study was unable to produce a questionnaire with which parents could correctly self-report their children’s sugar intake. Future studies need to continue development of the questionnaire tool and investigate methods of improvement. Alternatively, further research could investigate other methods of dietary assessment such as a diet journal.

Furthermore, there is a need for future studies to investigate the connection between electronic media usage and sugar intake in a way that pertains to caries risk.
This can be completed after successful development of a questionnaire, or other tool, to assess electronic media and sugar intake.
6. CONCLUSIONS

1. Parents were able to consistently report the instances of food and drink consumption by their children during the previous day.

2. Parents were not able to report the instances of sugar/fermentable carbohydrate consumption by their children during the previous day.

3. Parents were not able to consistently report the amount of time their children spent using electronic media during the previous day. When one subject that demonstrated the largest inconsistency was excluded, the remaining 11 subjects were able to consistently report the amount of time their children spent using electronic media during the previous day.
CITED LITERATURE


APPENDICES
APPENDIX A

UNIVERSITY OF ILLINOIS
AT CHICAGO

Office for the Protection of Research Subjects (OPRS)
Office of the Vice Chancellor for Research (MC 572)
210 Administration Office Building
125 West Park Street
Chicago, Illinois 60612

Approval Notice
Initial Review (Response To Modifications)

December 2, 2013

Patrick Whittington, DDS
Pediatric Dentistry
801 S Paulina
M/C 850
Chicago, IL 60612
Phone: (214) 335-7109 / Fax: (212) 413-8006

RE: Protocol # 2013-0950
"Electronic Media Usage and Sugar Intake in Children"

Dear Dr. Whittington:

Your Initial Review (Response To Modifications) was reviewed and approved by the Expedited
review process on November 27, 2013. You may now begin your research.

Please note the following information about your approved research protocol:

Protocol Approval Period: November 27, 2013 - November 27, 2014
Approved Subject Enrollment #: 24

Additional Determinations for Research Involving Minors: The Board determined that this
research satisfies 45CFR46.404, research not involving greater than minimal risk. Therefore, in
accordance with 45CFR46.408, the IRB determined that only one parent/legal guardian’s
permission/signature is needed. Wards of the State may not be enrolled unless the IRB grants
specific approval and assures inclusion of additional protections in the research required under
45CFR46.409. If you wish to enroll Wards of the State contact OPRS and refer to the tip sheet.

Performance Site: UIC
Sponsor: None
PAF#: Not Applicable

Research Protocol(s):

  a) Electronic Media Usage and Sugar Intake in Children Protocol; Version 1.3; 11/13/2013

Recruitment Material(s):

  a) Subject Recruitment Script; Version 1.3; 11/13/2013

Informed Consent(s):

  a) Electronic Media Usage and Sugar Intake in Children; Version 1.3; 11/13/2013

Phone: 312-996-1711 http://www.uic.edu/depts/opr/ FAX: 312-413-2920
b) Waiver of informed consent granted [45 CFR 46.116(d)] for the identification of potential subjects in the recruitment phase of the research.

**Assent(s):**

a) Child Verbal Assent Script; Version 1.3; 11/13/2013

**HIPAA Authorization(s):**

a) Review Preparatory to Research acknowledged [45 CFR 164.512(i)(1)(ii)]

Your research meets the criteria for expedited review as defined in 45 CFR 46.110(b)(1) under the following specific category(ies):

(6) Collection of data from voice, video, digital, or image recordings made for research purposes,
(7) Research on individual or group characteristics or behavior (including but not limited to research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

**Please note the Review History of this submission:**

<table>
<thead>
<tr>
<th>Receipt Date</th>
<th>Submission Type</th>
<th>Review Process</th>
<th>Review Date</th>
<th>Review Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>09/27/2013</td>
<td>Initial Review</td>
<td>Expedited</td>
<td>10/03/2013</td>
<td>Modifications Required</td>
</tr>
<tr>
<td>10/21/2013</td>
<td>Response To Modifications</td>
<td>Expedited</td>
<td>10/28/2013</td>
<td>Modifications Required</td>
</tr>
<tr>
<td>11/20/2013</td>
<td>Response To Modifications</td>
<td>Expedited</td>
<td>11/27/2013</td>
<td>Approved</td>
</tr>
</tbody>
</table>

Please remember to:

→ Use your research protocol number (2013-0950) on any documents or correspondence with the IRB concerning your research protocol.


Please note that the UIC IRB has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

Please be aware that if the scope of work in the grant/project changes, the protocol must be amended and approved by the UIC IRB before the initiation of the change.

We wish you the best as you conduct your research. If you have any questions or need further help, please contact OPRS at (312) 996-1711 or me at (312) 355-0816. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.
Sincerely,

[Signature]

Alison Santiago, MSW, MJ
IRB Coordinator, IRB #2
Office for the Protection of Research Subjects

Enclosure(s):
1. UIC Investigator Responsibilities, Protection of Human Research Subjects
2. Informed Consent Document(s):
   a) Electronic Media Usage and Sugar Intake in Children; Version 1.3; 11/13/2013
3. Assent Document(s):
   a) Child Verbal Assent Script; Version 1.3; 11/13/2013
4. HIPAA Authorization(s):
   a) Review Preparatory to Research acknowledged [45 CFR 164.512(i)(1)(ii)]
5. Recruiting Material(s):
   a) Subject Recruitment Script; Version 1.3; 11/13/2013

cc: Marcio Da Fonseca, Pediatric Dentistry, M/C 850
    Shahrbano Fadavi (Faculty Advisor), Pediatric Dentistry, M/C 850
Subject Recruitment Script

"Hello, I am (name), a Pediatric Dentistry Resident at UIC. Your child has been identified as a possible research subject because he or she is between the ages of 6 and 9 years old. The study is about electronic media usage and sugar intake. It consists of a short survey that should last no more than 5 minutes and a recorded interview that should last no more than 15 minutes. After the interview we will compare the answers you gave in the survey to the answers you gave in the interview to assess the quality of the survey. If you are interested, please read the informed consent document. Feel free to ask me any questions you may have. You are free to refuse to participate in this study, and it will not affect your child’s treatment or your relationship with the UIC College of Dentistry."
University of Illinois at Chicago
Research Information and Consent for Participation in Biomedical Research
Electronic Media Usage and Sugar Intake in Children

You are being asked to participate in a research study. Researchers are required to provide a consent form such as this one to tell you about the research, to explain that taking part is voluntary, to describe the risks and benefits of participation, and to help you to make an informed decision. You should feel free to ask the researchers any questions you may have.

Principal Investigator Name and Title: Patrick Whittington, DDS; Resident
Department: Pediatric Dentistry, UIC College of Dentistry
Address and Contact Information: 801 S. Paulina St MC 850, Chicago, IL 60612, (312)970-0584; pwhittington@uic.edu
Emergency Contact Name and Information: Shahbanoo Fadavi, DDS, MS, Professor of Pediatric Dentistry, UIC College of Dentistry, (312)
Sponsor: None

Why am I being asked?

You are being asked to be a subject in a research study about electronic media usage and sugar intake in children.

You have been asked to participate in the research because you have a child between the ages of 6 and 9 who is present today for a dental appointment.

Your participation in this research is voluntary. Your decision whether or not to participate will not affect your current or future dealings with the University of Illinois at Chicago. If you decide to participate, you are free to withdraw at any time without affecting that relationship.

Approximately 24 subjects may be involved in this research at UIC.

What is the purpose of this research?

This research is being done to better understand the relationship between electronic media usage and sugar intake.

What procedures are involved?

Electronic Media Usage and Sugar Intake in Children, Version 1.3, 11/15/2013, Page 1 of 4
This research will be performed at the Pediatric Dentistry Clinic at the University of Illinois at Chicago.

You will not need to come to the study site any additional times. Your entire participation in this study will be completed today.

The research will take about 20 minutes.

You will be asked to complete a survey that will take approximately 5 minutes. The survey will include questions about your child's activity yesterday. The questions will ask about what they ate and drank yesterday and how much electronic media (television, video games, computers, etc) they used during the day. After completing the survey you will participate in an interview. This will take approximately 15 minutes. During the interview you will be asked more in depth questions about your child's electronic media usage and sugar intake yesterday. The interview will be audio-recorded. A coder will listen to the interview and compare the answers to the survey. The audio-recording will be destroyed at the end of the study and none of your personal information will be recorded.

**What are the potential risks and discomforts?**

The only likely risks of participating in this study are inconvenience, and that a possible breach of privacy (others will know that you are participating in research) and confidentiality (accidental disclosure of identifiable data) may occur.

**Are there benefits to taking part in the research?**

Taking part in this research study may not benefit you directly, but we may learn new things about electronic media and sugar intake that may help others.

**What other options are there?**

You have the option to not participate in this study.

**What about privacy and confidentiality?**

The people who will know that you are a research subject are Dr. Whittington and your child’s dentist. No information about you, or provided by you, during the research, will be disclosed to others without your written permission, except if necessary to protect your rights or welfare (for example, if you are injured and need emergency care or when the UIC Office for the Protection of Research Subjects monitors the research or consent process) or if required by law. All confidential data will be saved in a locked cabinet in the faculty sponsor's office during the study. All confidential data will be destroyed after completion of data analysis.

**What are the costs for participating in this research?**
There are no costs to you for participating in this research.

**Will I be reimbursed for any of my expenses or paid for my participation in this research?**

You will not be offered payment for being in this study.

**Can I withdraw or be removed from the study?**

If you decide to participate, you are free to withdraw your consent and discontinue participation at any time without affecting your future care at UIC.

**Who should I contact if I have questions?**

Contact the researcher Patrick Whittington, DDS at (312)970-0584 or email address pwh126@uic.edu or the research mentor Dr. Shar Fadavi, DDS, MS at (312)996-1985 or sfadavi@uic.edu

- if you have any questions about this study or your part in it,
- if you have questions, concerns or complaints about the research.

**What are my rights as a research subject?**

If you have questions about your rights as a research subject or concerns, complaints, or to offer input you may call the Office for the Protection of Research Subjects (OPRS) at 312-996-1711 or 1-866-789-6215 (toll-free) or e-mail OPRS at uicirb@uic.edu.

**Remember:**

Your participation in this research is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University. If you decide to participate, you are free to withdraw at any time without affecting that relationship.

**Signature of Subject**

I have read (or someone has read to me) the above information. I have been given an opportunity to ask questions and my questions have been answered to my satisfaction. I agree to participate in this research. I will be given a copy of this signed and dated form.

_____________________________  __________________
Signature                          Date

_____________________________
Printed Name

---

Signature of Person Obtaining Consent

Date (must be same as subject's)

Printed Name of Person Obtaining Consent
APPENDIX D

Child Verbal Assent Script

"Hello, I am [name], a Pediatric Dentistry Resident at UIC. I am studying to become a pediatric dentist. I am planning a study about electronic media usage and sugar intake in children, and would like to know if you want to participate. I will ask your parent some questions about how much electronic media you used and what you ate yesterday. You can say 'no', that you do not want to participate, and this will not affect your treatment or change your relationship with me. Do you have any questions? (Pause and address any questions or concerns). Is it OK with you that I ask you parent some questions about what you did yesterday?"
APPENDIX E

How many main meals did your child have yesterday? (Circle one)
- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

How many of these main meals contained sugar? (Circle one)
- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

How many snacks (including drinks) did your child have yesterday? (Circle one)
- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
How many of these snacks (including drinks) included sugar? (Circle one)
- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

Did your child use any electronic media yesterday? (Circle one)
- Yes
- No

What types of electronic media did they use? (Circle all that apply)
- Television
- Movies/Videos
- Video Games/Computer Games
- Internet (including social media)

Estimate the entire length of time your child used electronic media yesterday. (Circle one)
- 0-1 hours
- 1-2 hours
- 3-4 hours
- 5 or more hours

Child’s Age: ___

Is your child male or female? (circle one)
- Male
- Female

Child’s ethnicity (circle all that apply)
- Caucasian
- Latino
- Black or African American
- Asian
- Other: _______

YOUR highest level of education (circle one)
- Some or no High School
- Some College
- Completed High School
- College Degree or Greater

Electronic Media Usage and Sugar Intake in Children Survey Page 2 of 2
Version 1, 10/17/2013
APPENDIX F

Did your child have breakfast yesterday? (Circle one)
- Yes
- No

If yes, did your child’s breakfast (including drinks) contain any sugar? (Circle one)
- Yes
- No

Did your child have lunch yesterday? (Circle one)
- Yes
- No

If yes, did your child’s lunch (including drinks) contain any sugar? (Circle one)
- Yes
- No

Did your child have dinner yesterday? (Circle one)
- Yes
- No

If yes, did your child’s dinner (including drinks) contain any sugar? (Circle one)
- Yes
- No

Estimate how many snacks your child had before breakfast. (Circle one)
- 0
- 1
- 2
- 3
- 4 or more

Estimate how many of these snacks (including drinks) contained sugar. (Circle one)
- 0
- 1
- 2
- 3
- 4 or more
Estimate how many snacks your child had between breakfast and lunch. (Circle one)
- 0
- 1
- 2
- 3
- 4 or more

Estimate how many of these snacks (including drinks) contained sugar. (Circle one)
- 0
- 1
- 2
- 3
- 4 or more

Estimate how many snacks your child had between lunch and dinner. (Circle one)
- 0
- 1
- 2
- 3
- 4 or more

Estimate how many of these snacks (including drinks) contained sugar. (Circle one)
- 0
- 1
- 2
- 3
- 4 or more

Estimate how many snacks your child had after dinner. (Circle one)
- 0
- 1
- 2
- 3
- 4 or more

Estimate how many of these snacks (including drinks) contained sugar. (Circle one)
- 0
- 1
- 2
- 3
- 4 or more
What types of electronic media did your child use yesterday? (Circle ALL that apply)
- Television
- Movies or Videos
- Computer
- Smart Phone or Tablet
- Video Games

Estimate the entire length of time your child used electronic media yesterday. (Circle one)
- Less than 1 hour
- 1 hour or up to 2 hours
- 2 hours or up to 3 hours
- 3 hours or up to 4 hours
- 4 hours or up to 5 hours
- More than 5 hours

Child's Age: ___

Is your child male or female? (circle one)
- Male
- Female

Child's ethnicity (circle all that apply)
- Caucasian
- Latino
- Black or African American
- Asian
- Other: ______

YOUR highest level of education (circle one)
- Some or no High School
- Some College
- Completed High School
- College Degree or Greater
APPENDIX G

Estimate how many snacks (including drinks) your child had before breakfast yesterday. (Circle ONE)
- 0
- 1
- 2
- 3
- 4 or more

Estimate how many of these snacks (including drinks) contained sugar/carbohydrates. (Circle ONE)
- 0
- 1
- 2
- 3
- 4 or more

Did your child have breakfast yesterday? (Circle ONE)
- Yes
- No

If yes, did your child's breakfast (including drinks) contain any sugar/carbohydrates? (Circle ONE)
- Yes
- No

Estimate how many snacks (including drinks) your child had between breakfast and lunch yesterday. (Circle ONE)
- 0
- 1
- 2
- 3
- 4 or more

Estimate how many of these snacks (including drinks) contained sugar/carbohydrates. (Circle ONE)
- 0
- 1
- 2
- 3
- 4 or more
Did your child have lunch yesterday? (Circle ONE)

- Yes
- No

If yes, did your child’s lunch (including drinks) contain any sugar/carbohydrates? (Circle ONE)

- Yes
- No

Estimate how many snacks (including drinks) your child had between lunch and dinner yesterday. (Circle ONE)

- 0
- 1
- 2
- 3
- 4 or more

Estimate how many of these snacks (including drinks) contained sugar/carbohydrates. (Circle ONE)

- 0
- 1
- 2
- 3
- 4 or more

Did your child have dinner yesterday? (Circle ONE)

- Yes
- No

If yes, did your child’s dinner (including drinks) contain any sugar/carbohydrates? (Circle ONE)

- Yes
- No
Estimate how many snacks your child had after dinner yesterday. (Circle ONE)
- 0
- 1
- 2
- 3
- 4 or more

Estimate how many of these snacks (including drinks) contained sugar/carbohydrates. (Circle ONE)
- 0
- 1
- 2
- 3
- 4 or more

What types of electronic media did your child use yesterday? (Circle ALL that apply)
- Television
- Movies or Videos
- Computer
- Smart Phone or Tablet
- Video Games

Estimate the entire length of time your child used electronic media yesterday. (Circle ONE)
- Less than 1 hour
- 1 hour or up to 2 hours
- 2 hours or up to 3 hours
- 3 hours or up to 4 hours
- 4 hours or up to 5 hours
- More than 5 hours

Child’s Age: ___

Is your child male or female? (circle ONE)
- Male
- Female

Child’s ethnicity (circle ALL that apply)
- Caucasian
- Latino
- Black or African American
- Asian
- Other: ______

YOUR highest level of education (circle ONE)
- Some or no High School
- Completed High School
- Some College
- College Degree or Greater

Electronic Media Usage and Sugar Intake in Children
Survey
NAME: Patrick Whittington

EDUCATION:  
University of Illinois at Chicago, Chicago, Illinois  
Pediatric Dentistry Certificate  
MS, Oral Sciences  
July 2012 – June 2014  

Baylor College of Dentistry, Dallas, Texas  
Doctor Dental Surgery  
August 2008 – May 2012  

University of Texas at Austin, Austin, Texas  
Bachelor of Arts  
August 2004 – May 2008  

EXPERIENCE:  
Family Dental Care  
Pediatric Dental Associate  
January 2013 – July 2014  

Apple Dental Care  
Pediatric Dental Associate  
August 2013 – July 2014  

CERTIFICATION:  
Basic Life Support, June 2012  
Pediatric Advanced Life Support, August 2012  

PROFESSIONAL MEMBERSHIPS:  
American Academy of Pediatric Dentistry  
American Dental Association  
Illinois State Dental Society  
Illinois Society of Pediatric Dentistry  
Chicago Dental Society