The Association Between Television Viewing and
Caries Experience in Children

BY

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THESIS

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<tr>
<td>AAP</td>
<td>American Academy of Pediatrics</td>
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<td>AAPD</td>
<td>American Academy of Pediatric Dentistry</td>
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<td>BMI</td>
<td>body mass index</td>
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<tr>
<td>dmfs</td>
<td>decayed, missing, and filled primary tooth surfaces</td>
</tr>
<tr>
<td>DMFS</td>
<td>decayed, missing, and filled permanent tooth surfaces</td>
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<td>TV</td>
<td>television</td>
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Summary

The purpose of this pilot study was to evaluate the relationship between television viewing and dental caries experience in children. The literature has established the existence of a relationship between television viewing and cariogenic habits, including frequent snacking, soda intake, and poor dietary habits. However, no study to-date has been published exploring the possible relationship between television viewing and dental caries experience in children. The primary hypothesis of this study was that television viewing was positively correlated with caries experience in children.

This study was completed using a novel survey tool to evaluate television viewing. The survey included television viewing information as well as demographic and caries risk information. Subsequently, the child’s dental chart was reviewed and caries experience recorded. The survey was completed by parents of child dental patients aged six through ten years in public and private clinics.

A total of 295 subjects were asked to participate; 290 surveys were completed and 278 subjects met the inclusion criteria. Data analysis confirmed several findings from previously published studies. Television viewing was positively correlated with snacking (r=0.22, p<0.001). Additionally, television viewing was negatively correlated with parent education (r=-0.40, p<0.001). Both of these results confirmed the hypotheses of this study.

A preliminary analysis found no correlation between television viewing and primary tooth caries. A positive correlation was found between television viewing
and permanent tooth caries ($r=0.130$, $p<0.05$). However, when controlling for confounding variables including demographics and caries risk factors, no relationship between television viewing and primary or permanent caries was found.

In conclusion, this study confirmed several findings from previous research studies, but identified no significant relationship between television viewing and caries in children.
1. INTRODUCTION

1.1 Background Information

Dental caries is the most common chronic disease of childhood. Caries initiation and progression requires a non-shedding surface, bacteria, dietary carbohydrates, and time. Factors that modify dietary habits may affect the caries experience of children. Specifically, television viewing has previously been associated with increased consumption of a cariogenic diet. This study investigates the association between television viewing and dental caries in children.

Previous treatment models for the treatment of dental caries in children included the surgical removal of affected tissue followed by restoration of function. Current dental practice has evolved to recognize dental caries as a transmissible disease, and prevention of oral disease has become a cornerstone in pediatric dentistry. A thorough history, including risk factors for oral disease, followed by caries risk assessment and appropriate counseling is recommended practice in pediatric dentistry (American Academy of Pediatric Dentistry, 2011, a). Investigation of risk factors for caries will best guide practitioners in caries risk assessment.

1.2 Dental Caries and Diet

The American Academy of Pediatric Dentistry (AAPD) recognizes that frequent and prolonged contact of tooth surfaces to both sugars and
carbohydrates are risk factors for the development of dental caries. As a result, it is recommended that sugars be consumed in moderation for the prevention of dental disease. In addition, dietary intake should be balanced with the child’s level of physical activity in order to maintain a healthy body mass index. Finally, current recommendations include diet and nutritional counseling by pediatric dentists. (American Academy of Pediatric Dentistry, 2011, b)

While total sugar and carbohydrate consumption may contribute to obesity and other adverse health effects, dental caries is dependent on the pattern of consumption of dietary carbohydrates. The pattern of consumption, specifically the frequency and duration, is directly related to the development of dental caries (Bowen 1983). Behaviors influencing the pattern of consumption of dietary carbohydrates should be a topic of concern among health professionals.

1.3 **Television Viewing and Diet**

The AAP recommends at most one to two hours of quality television programming per day in children over two years of age. The average television, video, and computer usage time in children is higher than the time recommended by the AAP (Christakis 2004). In 2009, children age 2-5 years watched more than 32 hours of television per week, while children age 6-11 years spent over 22 hours watching television alone per week, and over 28 hours of television including previously recorded programs, movies, and gaming consoles (McDonough 2009). A recent report found that children are watching on average nearly four and a half hours of television per day, not including computer and
video game usage (Rideout 2010). As children are spending more time using

Television viewing has been associated with dietary practices and other activities in children. The AAP reports that many negative health effects are associated with television viewing in children, including violent and aggressive behavior, sexuality, school performance, body concept and self-image, nutrition, dieting, obesity, and substance abuse (American Academy of Pediatrics, 2001). Specifically, increased television viewing is associated with an increase in consumption of sugar-sweetened beverages, fast food consumption, and total energy intake (Miller 2008).

1.4 **Purpose of this Study**

The purpose of this pilot study was to assess any association between television viewing and dental caries experience in children using a parent-completed survey of television usage and caries data from the child’s dental record.
1.5 **Null Hypotheses**

1. There is no correlation between television viewing and frequency of snacking in children.

2. There is no correlation between parent education and television viewing in children.

3. There is no correlation between television viewing and dental caries in children.

1.6 **Alternative Hypotheses**

1. There is a positive correlation between television viewing and frequency of snacking in children.

2. There is a negative correlation between parent education and television viewing in children.

3. There is a correlation between television viewing and dental caries in children.
2. REVIEW OF LITERATURE

2.1 Previous Studies Regarding Television Viewing and Dental Caries

Studies published to date have not yet explored the relationship between television viewing and dental caries in children. However, there are several studies available that identify a relationship between television viewing and dietary practices in children. Evidence to support a correlation between diet, particularly a diet high in snacks and sugar-added foods, and television viewing may provide indirect evidence for a relationship between television viewing and dental caries in children.

2.2 Current AAP and AAPD Guidelines

According to a 2001 policy statement from the American Academy of Pediatrics, children’s total media time should be limited to one or two hours of quality programming per day. The AAP also recommended that televisions be removed from children’s bedrooms, and that television viewing be discouraged in children less than two years of age. Additionally, the programming should consist mostly of educational, informational, and non-violent content. (American Academy of Pediatrics, 2001). As television viewing and media usage is becoming a more prevalent problem among children and adolescents, the AAP released a new policy statement, “Media Education” (American Academy of Pediatrics, 2011). This new policy statement emphasizes the importance of educating children about the proper use of media. The AAP also indicates that
media usage may be related to attention-deficit/hyperactivity disorder, sleep disorders, and eating disorders in children.

In a policy statement, “Dietary Recommendations for Children and Adolescents: A Guide for Practitioners,” the AAP recommends that children should have a limited intake of calorie-dense foods and beverages with minimal nutritional content; these items should only be incorporated minimally into an otherwise balanced diet. Children aged 2 years and older should have a diet that “relies primarily on fruits and vegetables, whole grains, low-fat and non-fat dairy products, beans, fish, and lean meat.” To balance energy intake with energy expenditure, the AAP recommends that children engage in one hour of medium to vigorous physical activity most days of the week. This policy statement also recognizes the influence of television on dietary choices. Foods that are most often advertised are high-sugar breakfast cereals, fast food restaurant products, sweetened beverages, frozen dinners, cookies, and candy. (American Academy of Pediatrics, 2006).

In the “Policy on Dietary Recommendations for Infants, Children, and Adolescents”, the AAPD recognizes that frequent and prolonged exposure of teeth to sugar and carbohydrates are risk factors for increased caries activity as well as obesity. The AAPD also calls for food manufacturers to facilitate healthy food choices by making nutritional information printed on labels simple and easy to understand. (American Academy of Pediatric Dentistry, 2011).
2.3 **Television Viewing and Diet**

K. Coon in 2001 completed a prospective, cross-sectional study that investigated the association between television usage during meals and dietary intake in 4th, 5th, and 6th grade students. A total of 117 parent-student pairs began the survey, while 91 pairs were used in the analysis. Thirteen pairs were excluded due to missing dietary survey data, while 13 were excluded due to missing socioeconomic data. Parents were surveyed regarding their child’s dietary habits. Data was collected on three separate non-consecutive days, and consisted of an interview with the parent and child to determine the food intake for the past 24 hours. The children and parents were also asked how many meals were consumed while watching television in the past 24 hours. The days were then separated into high television viewing (television during two or more meals per day) and low television viewing (television during fewer than two meals per day). Individual t-tests were used to make statistical comparisons between groups. Televisions were more likely to be on during meals in families with lower incomes, less-educated mothers, or single parents. Children who watched television during two or more meals per day were found to have derived fewer calories from grains, fruit, vegetables, potatoes, beans, and nuts; they derived more calories from pizza, salty snacks, and soda. However, children who watched television for two or more meals per day consumed slightly fewer sweets and fruit juice than the low-television group. This study demonstrates a significant difference in dietary choices between children who eat meals while watching television. Specifically, increased television is associated with a
decrease in healthy food consumption and an increase in pizza, salty snacks, and soda consumption (Coon, 2001).

Liang conducted a study in 2009 to examine the relationship between television usage during meals, dietary habits, and overweight in children, regardless of the total amount of time viewing television. This retrospective, cross-sectional study was completed in Canada using the 2003 Children’s Lifestyle and School Performance Study, a survey that involved both parents and children. The overall return rate for the survey was 51.1%. A total of 4966 surveys of 5th grade students were included in the study. The survey asked questions regarding total television usage and television usage while eating, and incorporated the Harvard Youth/Adolescent Food Frequency Questionnaire. The authors applied random effects models to compare television viewing time and television viewing while eating meals with diet and body weight. Additionally, multivariable linear or logistic random effects models were applied to continuous variables. As television viewing time and television while eating increased, the percentage of students consuming two or more soft drinks weekly, the percentage of energy from sugar out of total carbohydrate energy, the percentage of energy from dietary fat, the percentage of energy from snack foods and the prevalence of overweight all demonstrated gradual increases. Despite its retrospective nature, the large magnitude of this study demonstrates the significance of television viewing time and television viewing while eating on dietary choices in children (Liang, 2009).
A prospective, cross-sectional study completed by Miller in 2008 explored the association between television viewing and diet in three-year-old children. A total of 1414 subjects participated in Project Viva, a cohort study of children and their mothers. 211 subjects were excluded due to missing data, leaving 1203 subjects for analysis. At the three-year visit, Mothers were asked, “In the past month, on average, how many hours a day does your child spend sitting still watching TV/videos?” Mothers also completed a previously-validated questionnaire regarding their child’s diet. Multiple linear regression models were used to assess television viewing and selected diet quality indicators. Children who spent more time watching television had higher intakes of sugar-sweetened beverages, fruit juice, whole or 2% milk, fast food, snack food, and red and processed meats, as well as lower intakes of fruit and vegetables. This study supports an association between television viewing times and a cariogenic diet in three-year-olds (Miller, 2008).

Campbell et al. explored the association between dietary behavior and fatness in children. This prospective, cross-sectional study included 560 families from three socio-economically distinct areas in Australia. Surveys were mailed to parents of 5-6 year old children, with a response rate of 33.7%. Predictor variables included television viewing as well as seven other predictors. The outcome variable was the child’s dietary intake, including vegetable, snack, high-energy, sweet snack, and total energy intake per day. Bivariate and multiple linear regression analyses were used to assess the relationship between the predictor variables and the outcomes. For each additional 10 minutes of
television viewing, predicted energy intake increased by 82kJ/day. Television viewing was inversely related to vegetable consumption, while it was positively related to total energy intake, savory snack intake, sweet snack intake, and high-energy beverage intake (Campbell, 2006).

A randomized controlled clinical trial conducted by Epstein et al. in 2008 demonstrates the effect of reducing television viewing on body mass index in children aged four to seven years. Seventy children at or above the 75th BMI percentile for age and sex and who watched television or used the computer for at least 14 hours per week completed the study. The experimental group reduced its television and computer usage by 50% versus a control that was free to use the television and computer ad lib. Television and computer usage was monitored in both groups and limited in the experimental group using a device called TV Allowance. Baseline viewing rates were collected over a 3-week period. Television and computer usage budgets were reduced by 10% of baseline each month for 5 months in the experimental group. BMI, physical activity using an accelerometer, and energy intake using a survey were measured at baseline, 6, 12, 18, and 24 months. T-tests and χ² tests were used to compare groups, and mixed-effects regression models were used to assess BMI, television viewing, energy intake, and physical activity over time. Energy intake was reduced in the experimental group from baseline to 18 months and 24 months. There was no significant change in physical activity over time in either group. BMI change was mediated by television and computer use. This study demonstrates that a reduction in television and computer usage may reduce BMI
in children, and that this change may be related more to a decrease in energy intake rather than an increase in physical activity (Epstein, 2008).

A retrospective, cross-sectional study by Feldman in 2007 explored the association between television viewing during meals and dietary intake among adolescents. This study used data collected from Project Eating Among Teens, a survey designed to assess factors that are related to adolescent nutrition, as well as the Youth/Adolescent Questionnaire food frequency study. The survey was administered during the 1998-1999 school year. 4746 surveys were completed, and 4064 were included in the study due to incomplete data. Family meals were assessed with the question “During the past seven days, how many times did all, or most, of your family living in your house eat a meal together?” Television viewing was assessed with the statement “In my family, we often watch TV while eating dinner.” Participants were also asked how many hours per day they watch television. Dietary intake was measured using the Youth/Adolescent Questionnaire. General linear modeling was used to test whether television viewing during mealtimes was associated with differing intakes of each individual food group. After adjusting for sociodemographics, weekly hours spent watching TV, and caloric intake, boys reporting regular family meals without TV had a higher quality diet with significantly lower intakes of soft drinks than those watching TV during family meals. In unadjusted analyses, girls reporting family meals without TV had a higher quality diet with lower intake of soft drinks and snack food compared to girls who watched TV during family
meals. This study strengthens the association between television viewing during family meals and diet quality (Feldman, 2007).

Jackson performed a prospective, cross-sectional study in 2009 to investigate the association between television viewing, body fatness, and total energy expenditure in children. Eighty-nine white children aged 2-6 years and their parents were recruited for this study. Measures included body composition, energy expenditure, physical activity monitoring, and a lifestyle questionnaire. A general linear model was used to examine the association between television viewing and body fatness, physical activity, and total energy expenditure. Each hour spent watching TV per day was associated with a 1kg increase in body fatness, but there was no significant association with physical activity or total energy expenditure. This study indirectly supports the statement that television viewing is associated with increased dietary intake. It also demonstrates that television viewing has no effect on physical activity or total energy expenditure (Jackson, 2009).

A prospective longitudinal study by Pagani in 2010 investigated the association between television viewing and academic, psychosocial, and physical wellness. The parents of 2120 infants aged 5 months were included at the start of the study, and 1314 participants completed the final follow-up when the child was in fourth-grade. At both the 29 and 53 month follow-ups, parents were surveyed about their child’s television viewing habits with the question “How much time per day does your child spend watching TV?”. Subjects were then evaluated by their teachers while in the fourth-grade. Teachers rated academic
performance and psychosocial adjustment. Parents reported on the child’s sedentary behaviors, total video game usage, physical fitness, and dietary habits. BMI was also measured for each subject. Linear regression analysis was used to determine if early television exposure was associated with any of the outcomes. Early television exposure predicted lower fruit and vegetable intake by 16%, and higher consumption of soft drinks and snacks by 9% and 10% respectively. This study provides insight regarding television exposure at an early age and its association with dietary habits later in life (Pagani, 2010).

Weicha et al. completed a prospective longitudinal study in 2006 investigating the association between television viewing and dietary intake of different food groups. Data were collected as part of the Planet Health Intervention and Evaluation, a randomized controlled trial that studied other aspects of diet. Subjects were obtained from the control group; none of the participants in the experimental group were included in the study. A total of 548 students completed the entire study; 780 originally had enrolled. Subjects were excluded due to lack of follow-up data. The average age was 11.70 ± 0.75 years. Measurements were taken at two time points approximately 18 months apart. Data collection included BMI, assessment of diet, physical activity assessment, and a measure of television viewing. Linear regression analysis was used to analyze the data. Each hour increase in television viewing was associated with a 167kcal increase in total energy intake. Increased viewing time was also associated with increased intake of foods commonly advertised on television, including baked sweet snacks, candy, fast food, and sugar-sweetened
beverages. Excluding french fries, the baseline television viewing time was positively associated with higher intake of all foods. Additionally, the change in television viewing between measurements was positively associated with a change in intake of all food categories (Weicha 2006).

There are many studies that have explored the relationship between television viewing and parent education. A descriptive semi-quantitative review of the literature was conducted by Gorely et al in 2004. Sixty-eight studies were reviewed, and the conclusions were tabulated. Factors that were consistently correlated with television and video viewing were ethnicity (non-white +), parent income (-), parent education (-), body weight (+), between meal snacking (+), number of parents in the house (-), parents TV viewing habits (+), weekend (+), and having a TV in the bedroom (+). The authors also concluded that factors including physical activity, aerobic fitness, and body fatness were not associated with television viewing (Gorely 2004).

2.4 **Schematic of Published Literature**

A model based on associations reported in the literature is found in Figure 1. Alternatively: Figure 1 summarizes the associations found in the literature among various covariates related to television viewing and caries. Parent education is negatively associated with television viewing (Coon 2001, Gorely 2004). Television viewing is positively correlated with poor diet (Campbell 2008, Feldman 2007, Liang 2009, Miller 2008, Pagani 2010, Weicha 2006), snacking (Campbell 2008, Gorely 2004, Liang 2009, Miller 2008, Weicha 2006),

Poor diet and snacking are correlated with caries (American Academy of Pediatric Dentistry, 2011, b) and weight/BMI (Barlow 2007). Television has also been directly associated with an increase in weight/BMI (American Academy of Pediatrics, 2011). There are no studies published investigating the relationship between television viewing and dental caries in children.

Figure 1: Schematic representation of published literature regarding the relationship between television viewing, parent education, diet, snacking, weight, and physical activity. Also shown is the proposed mechanism by which television viewing influences dental caries in children.
3. MATERIALS AND METHODS

3.1 Source and Number of Subjects

Subjects were recruited from three locations. The first location was the University of Illinois at Chicago Department of Pediatric Dentistry, a public dental clinic serving primarily Medicaid patients. The second two locations were private dental offices in the suburbs of Chicago serving primarily private insurance and fee-for-service patients. A total of 295 parent-child pairs were approached to participate in the study. Five subjects refused participation; 290 parent-child pairs were enrolled in the study.

3.2 Sample Selection

Inclusion Criteria:

- Subjects included children between six and ten years of age and their parent/guardian.

- A legal guardian provided informed consent and signed the consent and Health Information Portability and Accountability Act authorization forms. The legal guardian also provided permission for the child to participate in the study. The child provided verbal assent for participation.

- The child had a Comprehensive Oral Evaluation or a Periodic Oral Evaluation within the past 18 months, including the day of the survey.
Exclusion Criterion:

- Children whose guardians did not speak and read in English were excluded.

3.3 **Study Design**

A cross-sectional convenience sample study design was implemented for this investigation. Subjects who met the inclusion criteria were identified by reviewing the daily clinic schedule. Then, during a short interview with the parent and child, the study was explained verbally and parents received a short written description of the study (Appendix A and B, Private Office and Public Clinic Recruitment Scripts; Appendix C and D, Private Office Parent Information). Informed consent was obtained from the parent (Appendix E). Following informed consent, verbal assent was sought from the child (Appendix F and G). After informed consent and assent were obtained and documented, the guardian was asked to complete a survey that requested sociodemographic, television viewing, and caries related information (Appendix H).

Approval of the study was obtained from the University of Illinois at Chicago Institutional Review Board, protocol #2011-0410 (Appendix I, J, and K).

3.4 **Survey Tool**

A questionnaire was distributed to parents (Appendix H). Three questions were developed to assess the amount of television viewed by the subjects. These questions were, “On a school day, how many hours does your child watch television?”, “On a weekend day, how many hours does your child watch television?”,
television?”, and, “How many hours did your child watch television yesterday?” Television viewing was defined as the use of a television to view live television programs, previously recorded programs, or movies (excluding video games). Parents were also asked “Does your child watch television while eating meals? If so, how many times per day?” As measurement error would be likely if the parent or guardian completing the questionnaire did not normally observe the child’s television viewing, parents were asked “How sure are you about your child’s television viewing habits?”

Because dental caries is a multi-factorial disease, several questions were asked to evaluate the child’s caries risk independent of television viewing. These questions were, “How many snacks does your child have per day?”, and “How many times per day does your child clean his/her teeth?” Frequency of snacking has been identified as a risk factor for caries, and frequency of cleaning the teeth is a protective factor (Featherstone 2007). However, there are a variety of risk factors that may contribute to dental caries in children; a more involved investigation regarding additional risk factors was beyond the scope of this pilot study.

3.5 Dental Chart Review

The patient’s name and date of birth were used as identifiers to match the parent survey with the patient’s dental chart. Using the child’s dental record, caries experience was documented on the data collection sheet by either the principal investigator or the child’s dentist (Appendix H). Caries experience was
recorded as decayed, missing, and filled surfaces (dmfs) for primary teeth and as decayed missing, and filled surfaces (DMFS) for permanent teeth.

Missing teeth in the primary dentition may either be indicative of premature loss due to caries or normal exfoliation. As a result, teeth that were missing but followed the normal exfoliation sequence were not counted toward the dmfs score. Missing teeth that did not follow the appropriate sequence of exfoliation and teeth that had a record of dental extraction were counted as missing toward the dmfs score. Similarly with DMFS, permanent teeth that were missing but followed the normal pattern of eruption were not counted as missing. Permanent teeth were counted as missing if there was a record of dental extraction.

After collecting data from the child’s dental record, all identifiers were removed from the data set and destroyed.

3.6 **Statistical Analysis**

Statistical analysis was completed using SPSS 16.0 for Windows (SPSS, Chicago, IL). Statistical analyses used in this study included reliability analysis, correlation analysis, and linear regression.
4. RESULTS

4.1 Number of Respondents and Response Rate

A total of 295 parents were approached regarding the study. Five subjects refused participation, and 290 parent-child pairs were enrolled in the study. The response rate was 98%.

When the inclusion and exclusion criteria were applied to the data, 12 subjects were excluded (5 due to age, 5 due to no recent exam, and 2 due to missing data). In all, 278 subjects were included in the data analysis. A total of 84 surveys were included from a public dental clinic and 194 from the private dental offices.

4.2 Descriptive Data for Respondents

Demographic data for the respondents are found in Table I. The median child age at the public clinic was 8, which corresponded to the median child’s age at the private offices. At the public clinic, the median level of parent education was some college, while at the private offices the median level of parent education was college degree or greater. The median dmfs at the public clinic was 18; at the private offices the median dmfs was 4. The median DMFS at the public clinic was 2; at the private offices the median DMFS was zero.
### TABLE I

DEMOGRAPHIC INFORMATION AS REPORTED BY PARENTS RESPONDING TO TELEVISION VIEWING AND CARIES SURVEY (N = 278)

<table>
<thead>
<tr>
<th>Child’s Race/Ethnicity</th>
<th>Public % (N)</th>
<th>Private % (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caucasian</td>
<td>26% (22)</td>
<td>73% (142)</td>
</tr>
<tr>
<td>Latino</td>
<td>37% (31)</td>
<td>13% (25)</td>
</tr>
<tr>
<td>AA</td>
<td>37% (31)</td>
<td>6% (11)</td>
</tr>
<tr>
<td>Asian</td>
<td>2% (2)</td>
<td>13% (25)</td>
</tr>
<tr>
<td>Other</td>
<td>2% (2)</td>
<td>3% (5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Public % (N)</th>
<th>Private % (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>49% (41)</td>
<td>46% (89)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Public % (N)</th>
<th>Private % (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>20% (17)</td>
<td>21% (40)</td>
</tr>
<tr>
<td>7</td>
<td>26% (22)</td>
<td>26% (50)</td>
</tr>
<tr>
<td>8</td>
<td>23% (19)</td>
<td>22% (42)</td>
</tr>
<tr>
<td>9</td>
<td>15% (13)</td>
<td>15% (30)</td>
</tr>
<tr>
<td>10</td>
<td>15% (13)</td>
<td>16% (32)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parent Education</th>
<th>Public % (N)</th>
<th>Private % (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some HS</td>
<td>12% (10)</td>
<td>1% (2)</td>
</tr>
<tr>
<td>Completed HS</td>
<td>31% (26)</td>
<td>2% (4)</td>
</tr>
<tr>
<td>Some College</td>
<td>36% (30)</td>
<td>14% (28)</td>
</tr>
<tr>
<td>Completed College</td>
<td>14% (12)</td>
<td>80% (155)</td>
</tr>
</tbody>
</table>
4.3 **Construction of a Television Viewing Score**

In order to determine a value for television viewing, the questions regarding television viewing were examined. An inter-item reliability analysis was completed using the four television viewing-related questions (Appendix H). Cronbach’s Alpha for these 4 items was 0.79. Therefore, the scores for each of the four television-related questions were summed to a value labeled “Television Score”.

4.4 **Analysis of Hypothesis #1: Television Viewing and Snacking**

The “Television Score” was correlated with responses to the question, “How many snacks does your child have per day?”. Television viewing was significantly correlated with snacking \(r=0.22, p<0.001\).

4.5 **Analysis of Hypothesis #2: Television Viewing and Parent Education**

It was hypothesized that television viewing was negatively correlated with parent education. Television viewing was significantly correlated with parent education \(r=-0.40, p<0.001\). The correlation was negative; increased television viewing was associated with decreased parent education.

4.6 **Analysis of Hypothesis #3: Television Viewing and Dental Caries**

A preliminary analysis of television viewing and dental caries was conducted. Television viewing was not correlated with caries (dmfs) in primary
teeth \((r=0.98, \ p>0.05)\). Television viewing was correlated with caries (DMFS) in permanent teeth \((r=0.130, \ p<0.05)\).

To further investigate this relationship, the demographic data were used to determine if any confounders may modify the relationship between television viewing and caries. A linear regression model was built using the potential confounders of the demographic data significantly associated with caries in either the permanent or the primary dentition. For primary teeth caries (dmfs), the significant confounding variables were the location of the survey \((\beta=6.68, \ p<0.001)\), snacks per day \((\beta=1.73, \ p<0.05)\), child’s age \((\beta=-1.82, \ p<0.001)\), and African American ethnicity \((\beta=-4.71, \ p<0.05)\). When controlling for location, snacks per day, age, and African American ethnicity, there was no significant relationship between television viewing and primary tooth caries (dmfs) (Table 2).

For permanent tooth caries (DMFS), a linear regression model was built in the same manner as that for primary teeth caries. The significant confounding variables were the location of the survey \((\beta=0.93, \ p<0.001)\), child’s age \((\beta=0.48, \ p<0.001)\), and African American ethnicity \((\beta=1.19, \ p<0.05)\). When controlling for these, there was no significant relationship between television viewing and caries in permanent teeth (DMFS).

In summary, the third hypothesis was neither supported nor refuted. Television viewing was positively associated with dental caries in permanent teeth (DMFS). However, when controlling for demographic variables there was no association between television viewing and dental caries in primary or permanent teeth.
TABLE II

RESULTS OF REGRESSION OF SIGNIFICANT DEMOGRAPHIC COVARIATES AND TELEVISION VIEWING SCORE ON CARIES EXPERIENCE IN PRIMARY TEETH

<table>
<thead>
<tr>
<th></th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>Snacks</td>
<td>1.73</td>
<td>.83</td>
</tr>
<tr>
<td>Location</td>
<td>6.68</td>
<td>.82</td>
</tr>
<tr>
<td>African American</td>
<td>-4.71</td>
<td>1.96</td>
</tr>
<tr>
<td>Age</td>
<td>-1.82</td>
<td>.47</td>
</tr>
<tr>
<td>TV Score</td>
<td>-.39</td>
<td>.24</td>
</tr>
</tbody>
</table>

Demographic variables entered in step one: location (public vs private), African American race, Hispanic ethnicity, White race, snacking, parent education, child’s age; the non-significant variables were removed in a backwards, stepwise manner; then TV score was entered to create the above model. N=278.

TABLE III

RESULTS OF REGRESSION OF SIGNIFICANT DEMOGRAPHIC COVARIATES AND TELEVISION VIEWING SCORE ON CARIES EXPERIENCE IN PERMANENT TEETH

<table>
<thead>
<tr>
<th></th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>Location</td>
<td>0.93</td>
<td>0.24</td>
</tr>
<tr>
<td>African American</td>
<td>1.19</td>
<td>0.57</td>
</tr>
<tr>
<td>Age</td>
<td>0.48</td>
<td>0.14</td>
</tr>
<tr>
<td>TV Score</td>
<td>-0.07</td>
<td>0.07</td>
</tr>
</tbody>
</table>

Demographic variables entered in step one: location (public vs private), African American race, Hispanic ethnicity, White race, snacking, parent education, child’s age; the non-significant variables were removed in a backwards, stepwise manner; then TV score was entered to create the above model. N=278.
5. DISCUSSION

The American Academy of Pediatrics has set guidelines for the amount of television and total screen time per day for children over age two years. Despite these recommendations, many children continue to overuse television and other electronic media. Television viewing has been associated with increased dietary intake of cariogenic foods. To date, no studies have explored the possible relationship between television viewing and dental caries in children. The purpose of this study was to investigate the relationship between television viewing and dental caries in children. 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 study, and (5) implications for future research.

5.1 Limitations and Strengths of the Study

A limitation of this study was the measure of television viewing. The gold standard for measurement of television viewing is direct measurement (Bryant 2006), which was beyond the scope of this study. A one-time parent survey of the child’s television viewing habits was employed, which was likely not as accurate as direct measurement. Furthermore, the questionnaire was not previously tested or validated. Other than direct measurement, no method of television viewing measurement has been validated. Also, our definition of television viewing included viewing that may have excluded commercials, which
might be important in the relation between television viewing and eating while viewing.

Another limitation is that dental caries is a chronic and multifactorial disease. The comparison of a one-time measure of television viewing with history of a chronic disease poses a challenge for analysis. The exfoliation of primary teeth makes it difficult to measure caries experience in children in mixed dentition.

This study was completed at three locations: one university-based pediatric dental clinic serving primarily Medicaid patients, and two private offices serving primarily fee-for-service patients, in order to examine as diverse a sample as possible. However, the patients in this study may still not represent a true cross-section of the US population, and may not be representative of other populations. Also, the caries data were extracted from dental examinations completed by a variety of dental providers. As the chart review was retrospective, there was no standardization of dental providers.

There are also several strengths of this study. As a pilot study, this investigation observed previously unreported relationships, and may be an impetus for future research. This study is reproducible, and may be modified and improved to further investigate a relationship between television viewing and caries. This study included participants from three separate locations and of different socioeconomic backgrounds, which increases the ability to generalize across subjects with different backgrounds. Additionally, the 98% participation rate minimized any selection bias.
5.2 **Summary of Findings**

The first hypothesis was that television viewing is associated with frequency of snacking in children. This hypothesis was supported.

A second hypothesis was that a child’s television viewing is associated with the level of parent education. This hypothesis was also supported.

The final hypothesis was that children who watch more television have a higher rate of dental caries than those who watch less television. Television viewing was positively correlated with dental caries in permanent teeth (DMFT) in children six to ten years old. However, when controlling for demographic and other caries risk factors, a significant relationship was not supported in either the primary or permanent dentition.

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

Several previous studies have examined the relationship between television viewing and snacking in children. Campbell et al in 2006 found that increased television viewing was associated with increased sweet snack intake in children. This cross-sectional study used a linear regression analysis and controlled for predictor variables including maternal education (Campbell 2006). Another study by Coon et al in 2001 found a positive relationship between television viewing and consumption of snack foods (Coon 2001). Additionally, a study investigating outcomes of television viewing found that for each additional hour of television viewing per day, there was a 10% increase in the amount of snacking by the child (Pagani 2010). The present study found a positive
relationship between television viewing and snacking, confirming the results of previous studies.

In 2004, Gorely et al conducted a review of the literature regarding predictors of television viewing, as well as outcomes of television viewing. Of 20 studies that reported on the relationship between parent education and television viewing, 65% of these studies reported a negative relationship (Gorely 2004). The present study found a negative relationship between television viewing and parent education, which is consistent with most of the published studies.

There have previously been no published studies that have examined the relationship between television viewing and dental caries. Previous studies focused on television viewing, diet and obesity.

5.4 **Significance of the Study**

Despite a significant amount of research regarding the effects of television on diet and obesity, there is a gap in the literature related to oral health. Clinicians are continually looking for risk factors for dental disease in order to identify those patients at greatest risk for developing disease. Identifying high risk patients allows for resources to be allocated in a more appropriate and efficient manner.

This study found that television viewing was positively associated with snacking. Frequent snacking, specifically more than three between-meal snacks per day, is considered a risk factor for dental caries. With knowledge that television viewing is associated with snacking, clinicians may be able to ask
questions about television viewing in order to indirectly evaluate the patient’s dietary and snacking habits.

Parent education was associated with television viewing. The AAP currently recommends at most two hours of television viewing and media usage per day in children age two years and older. Clinicians should continue to educate parents regarding the AAP’s media usage recommendations, with an emphasis toward less educated parents.

A preliminary analysis revealed that television viewing was associated with dental caries in permanent teeth (DMFS). However, television viewing was not significantly associated with dental caries in either the primary or permanent dentition when controlling for other predictor variables. Despite the findings of this study, there remains evidence in the literature that television viewing is associated with cariogenic activities, particularly increased snacking, increased soda intake, and poor diet quality. As a result, healthcare professionals should continue to support the AAP’s guidelines for media usage, and should educate parents and patients regarding appropriate usage of television and other media and the possible implications for oral and overall health.

5.5 **Implications for Future Research**

Future studies need to validate a low-cost method of accurately measuring television viewing habits in children. To date, direct observation is the gold-standard for measuring television viewing; a method involving a questionnaire,
diary, or other process should be validated in order to accurately and efficiently measure television viewing habits in children.

Additionally, future research should include longitudinal studies evaluating the association between television viewing and dental caries.

Finally, research regarding which effect of television viewing may be responsible for development of dental caries should be conducted. Television viewing may influence children’s snacking habits, including frequency and duration. Further, exposure of children to television advertisements, including advertisements for unhealthy, cariogenic foods, may influence children’s dietary choices.
6. CONCLUSIONS

1. Television viewing as measured by a questionnaire was positively associated with frequency of snacking in children age six through ten years.

2. Parent education was negatively associated with television viewing in children.

3. When controlling for demographics and caries risk factors, no significant relationship between television viewing and dental caries was found in either primary or permanent dentition of children age six through ten years.
Cited Literature


APPENDIX A

Private Office Subject Recruitment Script

"Hello, I am (name), your child's dentist. Your child has been identified as a possible research subject because he or she is between 6 and 10 years old. The study is about television viewing and cavities. It consists of a short survey that should last no more than 5 minutes. After the survey, we will look in your child's dental chart and count how many cavities he or she has. We will use this information, along with the information from the survey, to help us learn more about television viewing and cavities in children. 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 me or my office."

STARTS APPROVAL EXPIRES
AUG 09 2011 TO AUG 07 2012

UNIVERSITY OF ILLINOIS AT CHICAGO
INSTITUTIONAL REVIEW BOARD
APPENDIX B

UIC Subject Recruitment Script

"Hello, I am (name), your child’s dentist. Your child has been identified as a possible research subject because he or she is between 6 and 10 years old. The study is about television viewing and cavities. It consists of a short survey that should last no more than 5 minutes. After the survey, we will look in your child’s dental chart and count how many cavities he or she has. We will use this information, along with the information from the survey, to help us learn more about television viewing and cavities in children. 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."
Dear Parent/Guardian:

As a faculty member at the University of Illinois at Chicago, I am helping a resident complete his Master’s research about television viewing and cavities in children. The purpose of this study is to learn more about why some children are more prone to cavities. You and your child have been identified as potential research subjects because your child is between 6 and 10 years old. Participation in this research is voluntary, and if you refuse to participate this will not affect your relationship with me or my office. I will also ask your child if he or she is willing to participate in the study, and to allow us to access information about his or her cavities.

If you and your child agree to participate, you will be asked to complete a brief survey about your child’s television viewing habits, as well as demographic information. I will ask that you write your child’s name and date of birth on the front page so that I can match your survey with information about your child’s cavities. After I have linked the survey to your child’s dental chart, I will personally remove and destroy the front page with your child’s name and date of birth. I will then return the remaining de-identified information to Dr. Richard Facko at the University of Illinois at Chicago (UIC) to be compiled with data from other offices and used for analysis.

I do not anticipate any risks to participation in this study, as I will be removing your child’s personal information before giving any information to Dr. Richard Facko at UIC. While there are no direct benefits to you or your child, the information that we learn from this study may be helpful to society, as it will allow us to understand more about cavities in children.

Again, participation in this study is voluntary. Should you have any questions, please feel free to ask me. Thank you.

Sincerely,

[Signature]

Shar Fadavi, DDS, MS
Dear Parent/Guardian:

As a faculty member at the University of Illinois at Chicago, I am helping a resident complete his Master's research about television viewing and cavities in children. The purpose of this study is to learn more about why some children are more prone to cavities. You and your child have been identified as potential research subjects because your child is between 6 and 10 years old. Participation in this research is voluntary, and if you refuse to participate this will not affect your relationship with me or my office. I will also ask your child if he or she is willing to participate in the study, and to allow us to access information about his or her cavities.

If you and your child agree to participate, you will be asked to complete a brief survey about your child's television viewing habits, as well as demographic information. I will ask that you write your child's name and date of birth on the front page so that I can match your survey with information about your child's cavities. After I have linked the survey to your child's dental chart, I will personally remove and destroy the front page with your child's name and date of birth. I will then return the remaining de-identified information to Dr. Richard Facko at the University of Illinois at Chicago (UIC) to be compiled with data from other offices and used for analysis.

I do not anticipate any risks to participation in this study, as I will be removing your child's personal information before giving any information to Dr. Richard Facko at UIC. While there are no direct benefits to you or your child, the information that we learn from this study may be helpful to society, as it will allow us to understand more about cavities in children.

Again, participation in this study is voluntary. Should you have any questions, please feel free to ask me. Thank you.

Sincerely,

Lance Lambert, DDS
APPENDIX E

University of Illinois at Chicago
Research Information and Consent for
Participation in Social Behavioral Research
Television Viewing and Dental Caries
Experience 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: Richard Facko, DDS; Resident
Department and Institution: Pediatric Dentistry, UIC College of Dentistry
Address and Contact Information: 801 S. Paulina Street MC 850, Chicago, IL 60612;
(312)432-1290; rfacko2@uic.edu

Faculty Advisor: Shahrbanoor Fadavi, DDS, MS, Professor of Pediatric Dentistry
Department and Institution: Pediatric Dentistry, UIC College of Dentistry
Address and Contact Information: 801 S. Paulina Street, MC 850, Chicago, IL 60612;
(312)996-7531; sfadavi@uic.edu.

Why am I being asked?

You have been asked to participate in the research because you have a child between the ages of
6 and 10 years of age who is attending a dental clinic for treatment.

What is the purpose of this research?

Researchers are trying to learn more about what contributes to cavities in children. Since
television viewing is associated with increases in snacking and weight, we think it may also be
associated with children getting cavities.

What procedures are involved?

This research will be performed at the University of Illinois at Chicago College of Dentistry,
Department of Pediatric Dentistry, the private practice of Dr. Shar Fadavi, and the private
practice of Dr. Lance Lambert.

You will be asked to fill out a survey about your child’s television viewing time. The survey
should take no longer than 5 minutes to complete. We will ask for your child’s name and date of
birth in order to get information from your child’s chart about his or her experience with tooth
cavity (cavities). After the survey is matched with the child’s dental record, your child’s name
and date of birth will be removed from our research records. Approximately 400 guardian/child
pairs may be involved in this research at UIC and two private dental clinics.
APPENDIX E (CONTINUED)

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, or the offices of Drs. Fadavi or Lambert. **If you decide to participate, you are free to withdraw at any time without affecting that relationship.**

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

A risk of this research is a loss of privacy (revealing to others that you are taking part in this study) or confidentiality (revealing information about you to others to whom you have not given permission to see this information).

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

Taking part in this research study may not benefit you personally, but we may learn new things that will help others about TV viewing and cavities.

**What other options are there?**

You have the option to not participate in this study without consequence.

**What about privacy and confidentiality?**

The people who will know that you and your child are research subjects are Dr. Facko and your child’s dentist. Identification information will be destroyed after the survey is linked to your child’s dental record, and data will be coded to protect confidentiality.

**Will health information about you be created, used or shared with others during this study?**

State and federal laws, including the Health Insurance Portability and Accountability Act (HIPAA), require researchers to protect your child’s health information. This section of this form describes how researchers, with your authorization (permission), may use and release (disclose or share) your child’s protected health information in this research study. By signing this form you are authorizing Richard Facko, DDS, and Shar Fadavi, DDS, to create, get, use, store, and share protected health information that identifies your child for the purposes of this research.

The health information includes all information on the survey you will fill out, and your child’s name, date of birth and experience with tooth decay (cavities) taken from his or her dental chart.

During the conduct of the research, the researchers may use or share your child’s health information with each other and with other researchers involved with the study. However, your child’s name and birth date will not be shared with anyone other than Dr. Facko or your child’s dentist.
Can I withdraw or be removed from the study?
As soon as we have collected the information from your child’s dental chart, we will erase his or her name and birth date from our research records. After that time, you can no longer withdraw permission for us to use the data, because we will be unable to tell which is associated with your child. However, until that point, you may change your mind and cancel this Authorization (permission) for us to use the information from the chart or the survey.

To cancel this Authorization, you must write to:
Richard Facko, DDS
Department of Pediatric Dentistry
University of Illinois at Chicago
801 S. Paulina Street
M/C 850
Chicago, Illinois 60612

If you cancel this Authorization, you may no longer be allowed to take part in the research study. Even if you cancel this Authorization, the researchers may still use and disclose health information they have already obtained as necessary to maintain the integrity and reliability of the research.

How will your health information be protected?
The researchers agree to protect your health information and will only share this information as described within this research consent/authorization form. The final form of the information will not include any identifiers or any way of tracing the information about your child’s cavities or other health information back to your child. Your child’s identifying information will not be shared with anyone except Dr. Facko and your child’s dentist.

Who should I contact if I have questions?
Contact the researcher Richard Facko, DDS at (312)432-1290 or email address: rfacko2@uic.edu; or Shar Fadavi, DDS, MS at 312 996 7531 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 feel you have not been treated according to the descriptions in this form, or if you have any questions about your rights as a research subject, including questions, 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.

If you have questions or concerns regarding your privacy rights under HIPAA, you should contact the University of Illinois at Chicago Privacy Officer at Ph: (312) 996-2271.
APPENDIX E (CONTINUED)

Remember:

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

Signature of Subject or Legally Authorized Representative

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 and I agree to allow my child’s dental chart to be reviewed for information about his or her cavities or prior cavities. I will be given a copy of this signed and dated form.

If you have not already received a copy of the Notice of Privacy Practices, you should ask for one.

Your signature below indicates that you are providing both consent to participate in the survey research study and authorization for the researcher to use your child’s health information for the research.

______________________________  ________________________
Signature of Parent / Guardian  Today’s Date

______________________________
Printed name of Parent / Guardian

Describe relationship to subject including the legal authority this individual has to act on behalf of the child. (Check one below)

☐ Parent
☐ Legal guardian

______________________________  ________________________
Signature of Person Obtaining Consent  Today’s Date

______________________________
Printed Name of Person Obtaining Consent
APPENDIX E (CONTINUED)

I have sought the assent of the potential child subject by reading the standardized assent script to him/her. I have given the child the opportunity to ask questions, and have addressed all questions and concerns.

☐ The child verbally assents to participation in this study.
☐ The child declines to participate in this study.

Signature of Person Obtaining Assent ________________

Today’s Date ________________

Printed Name of Person Obtaining Assent
APPENDIX F

Private Office Verbal Assent Script

“I am helping one of my students with a study about TV viewing and cavities in children, and would like to know if you want to participate. I would like to look in your dental chart to get information about your cavities. I will also ask your parent or guardian some questions about how much TV you watch. 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 look in your chart to get information about your cavities?”

STARTED APPROVAL EXPIRES
AUG 09 2011 TO AUG 07 2012
UNIVERSITY OF ILLINOIS AT CHICAGO
INSTITUTIONAL REVIEW BOARD
APPENDIX G

UIC Child Verbal Assent Script

"Hello, my name is Dr. (name). I am studying to become a pediatric dentist. I am planning a study about TV viewing and cavities in children, and would like to know if you want to participate. I would like to look in your dental chart to get information about your cavities. I will also ask your parent or guardian some questions about how much TV you watch. 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 look in your chart to get information about your cavities?"
APPENDIX H

Television Viewing and Caries Experience in Children

Parent/Guardian Survey

Child’s name: ________________________________
Child’s date of birth: __ / __ / ___
APPENDIX H (CONTINUED)

Television viewing is use of a television to view live television programs, previously recorded programs, or movies.

On a school day, how many hours does your child watch television?

0 hours  1 hour  2 hours  3 hours  more than 3 hours

On a weekend day, how many hours does your child watch television?

0 hours  1 hour  2 hours  3 hours  more than 3 hours

How many hours did your child watch television yesterday?

0 hours  1 hour  2 hours  3 hours  more than 3 hours

Does your child watch television while eating meals? If so, how many times per day?

0 meals  1 meal  2 meals  3 meals  more than 3 meals

How sure are you about your child’s television viewing habits?

very sure  somewhat sure  not at all sure

How many snacks does your child have per day?

0 snacks  1 snack  2 snacks  3 snacks  more than 3 snacks

How many times per day does your child clean his/her teeth?

less than one  1  2  3  more than 3

Child’s age: ______

Is the child male or female?

Male  Female

Child’s Ethnicity (circle any that apply):

Caucasian  Latino  African American  Asian  Other________

YOUR Highest Level of Education:

some or no high school  completed high school

some college  college degree or greater

Television Viewing and Caries
Parent Survey and Data Extraction Sheet
For Office Use Only

Has the subject been seen for a Comprehensive Oral Evaluation or a Periodic Oral Evaluation in the past 18 months, including the date of the survey?

Yes  No

Record the number of decayed, extracted/missing, and filled SURFACES:

defs: ________

DMFS: ________
APPENDIX I

UNIVERSITY OF ILLINOIS
AT CHICAGO

Office for the Protection of Research Subjects (OPRS)
Office of the Vice Chancellor for Research (MC 672)
203 Administrative Office Building
1737 West Polk Street
Chicago, Illinois 60612-7227

Approval of Request for Waiver or Alteration of Individual Authorization
For Disclosure of Protected Health Information

The University of Illinois at Chicago Institutional Review Board (IRB) #2 hereby approves a waiver or alteration of the requirements for individual authorization for the use or disclosure of protected health information regarding:

UIC Protocol Number: 2011-0410

Research Protocol Title: Television Viewing and Dental Caries Experience in Children

Principal Investigator: Richard Facko, DDS

The IRB has determined that the request for a waiver of authorization satisfies the criteria for a waiver of authorization in accordance with 45 CFR Part 164.512, such that:

1) The use or disclosure of protected health information involves no more than minimal risk to the individuals;
   a) There is an adequate plan to protect the identifiers from improper use and disclosure;
   b) There is an adequate plan to destroy the identifiers at the earliest opportunity consistent with the conduct of the research, unless there is a health or research justification for retaining the identifiers, or such retention is otherwise required by law;
   c) There are adequate written assurances that the protected health information will not be reused or disclosed to any other person or entity, except as required by law, for authorized oversight of the research project, or for other research for which the use or disclosure of protected health information would be permitted;
2) The research could not practicably be conducted without the alteration or waiver; and
3) The research could not practicably be conducted without access to and use of the protected health information.

The type of protected health information (PHI) to be used in the research includes: Child’s name and age to screen for possible participants and child’s name and date of birth to link the parent/guardian survey with the child’s dental record.
APPENDIX I (CONTINUED)

Additionally, the IRB has determined that the requested PHI is the minimum necessary for the investigator to reasonably conduct the research.

This waiver of authorization has been reviewed under Expedited review procedures on August 9, 2011.

Susan Labott, PhD
Chair, IRB #2

Date
APPENDIX J

UNIVERSITY OF ILLINOIS
AT CHICAGO

Office for the Protection of Research Subjects (OPRS)
Office of the Vice Chancellor for Research (MC 872)
203 Administrative Office Building
1737 West Polk Street
Chicago, Illinois 60612-7227

Approval Notice
Initial Review (Response to Modifications)

August 15, 2011

Richard Facko, DDS
Pediatric Dentistry
801 S Paulina St
M/C 850
Chicago, IL 60612
Phone: (708) 280-9234 / Fax: (312) 413-8006

RE: Protocol # 2011-0410
“Television Viewing and Dental Caries Experience in Children”

Dear Dr. Facko:

Your Initial Review (Response to Modifications) was reviewed and approved by the Expedited review process on August 9, 2011. You may now begin your research.

Please note the following information about your approved research protocol:

Protocol Approval Period: August 9, 2011 - August 7, 2012
Approved Subject Enrollment #: 800

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/parent's/legally 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 Sites: UIC, Webster Dental Care North Suburban, Glen Ellyn Pediatric Dentistry, PC

Sponsor: None

PAF#: Not Applicable

Research Protocol(s):

a) Television Viewing and Caries Experience in Children

Recruitment Materials:

a) UIC Subject Recruitment Script; Version 1.2; 07/28/2011
b) Private Office Recruitment Script; Version 1.2; 07/28/2011
c) Dear Parent/Guardian Letter (Webster Dental Care)
d) Dear Parent/Guardian Letter (Glen Ellyn Pediatric Dentistry)

Phone: 312-996-1711 http://www.uic.edu/depts/over/oprs/ FAX: 312-413-2929
APPENDIX J (CONTINUED)

Page 2 of 3

Informed Consent(s):
 a) UIC Informed Consent and Authorization; Version 1.2; 06/30/2011
 b) Waiver of Signed Consent Document granted under 45 CFR 46.117 for child assent

Assent(s):
 a) Verbal Assent Script; Version 1.2; 06/30/2011
 b) Private Office Verbal Assent Script; Version 1.2; 06/30/2011
 c) Waiver of Informed Consent, Assent, and Parental Permission granted under 45 CFR 46.116(d) for Recruitment Purposes Only

HIPAA Authorization(s):
 a) HIPAA - Waiver of Authorization for Recruitment Purposes Only

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

(5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

(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:

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<th>Submission Type</th>
<th>Review Process</th>
<th>Review Date</th>
<th>Review Action</th>
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<td>Response to Modifications</td>
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Please remember to:

→ Use your research protocol number (2011-0410) on any documents or correspondence with the IRB concerning your research protocol.

→ Review and comply with all requirements on the enclosure, "UIC Investigator Responsibilities, Protection of Human Research Subjects"

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) 996-9299. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.
APPENDIX J (CONTINUED)

Sincerely,

[Signature]

Marissa Benni, M.S.
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) UIC Informed Consent and Authorization; Version 1.2; 06/30/2011
3. Assent Document(s):
   a) Verbal Assent Script; Version 1.2; 06/30/2011
   b) Private Office Verbal Assent Script; Version 1.2; 06/30/2011
4. HIPAA Authorization(s):
   a) HIPAA - Waiver of Authorization for Recruitment Purposes Only
5. Recruiting Material(s):
   a) UIC Subject Recruitment Script; Version 1.2; 07/28/2011
   b) Private Office Recruitment Script; Version 1.2; 07/28/2011
   c) Dear Parent/Guardian Letter (Webster Dental Care)
   d) Dear Parent/Guardian Letter (Glen Ellyn Pediatric Dentistry)

cc: Indru C. Punwani, Pediatric Dentistry, M/C 850
    Shahranoo Fadavi, Pediatric Dentistry, M/C 850
    Privacy Office, Health Information Management Department, M/C 772
APPENDIX K

UNIVERSITY OF ILLINOIS
AT CHICAGO

Office for the Protection of Research Subjects (OPRS)
Office of the Vice Chancellor for Research (MC 672)
203 Administrative Office Building
1727 West Polk Street
Chicago, Illinois 60612-7227

Approval Notice

Amendment to Research Protocol and/or Consent Document – Expedited Review
UIC Amendment # 1

October 13, 2011

Richard Facko, DDS
Pediatric Dentistry
801 S Paulina St
M/C 850
Chicago, IL 60612
Phone: (708) 280-9234 / Fax: (312) 413-8006

RE: Protocol # 2011-0410
“Television Viewing and Dental Caries Experience in Children”

Dear Dr. Facko:

Members of Institutional Review Board (IRB) #2 have reviewed this amendment to your research under expedited procedures for minor changes to previously approved research allowed by Federal regulations [45 CFR 46.110(b)(2)]. The amendment to your research was determined to be acceptable and may now be implemented.

Please note the following information about your approved amendment:

Amendment Approval Date: October 7, 2011
Amendment:
Summary: UIC Amendment #1 dated October 4, 2011 (received 10/5/2011) is an investigator-initiated amendment to add Taras Martyniouk as key research personnel. Appendix P included.

Approved Subject Enrollment #: 800

Performance Sites: UIC, Webster Dental Care North Suburban, Glen Ellyn Pediatric Dentistry, PC

Please note the Review History of this submission:

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<td>Approved</td>
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Please be sure to:

⇒ Use your research protocol number (2011-0410) on any documents or correspondence with the IRB concerning your research protocol.

Phone: 312-996-1711  http://www.uic.edu/depts/ovcr/oprs/  FAX: 312-413-2929
Appendix K (Continued)

Review and comply with all requirements on the enclosure, "UIC Investigator Responsibilities, Protection of Human Research Subjects"

Please note that the UIC IRB #2 has the right to ask further questions, seek additional information, 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 the OPRS at (312) 996-1711 or me at (312) 355-2764. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely,

Betty Mayberry, BS  
IRB Coordinator, IRB #2  
Office for the Protection of Research Subjects

Enclosures:

1. UIC Investigator Responsibilities, Protection of Human Research Subjects  
2. Data Security Enclosure

cc: Shahroo Fadavi, Faculty Sponsor, M/C 850  
Indru C. Punwani, Pediatric Dentistry, M/C 850  
Privacy Office, Health Information Management Department, M/C 772
VITA

Richard Facko, D.D.S.
12321 South 70th Court
Palos Heights, IL 60463
Phone (708)280-9234
Email rfacko@gmail.com

EDUCATION:

University of Illinois at Chicago, Chicago, Illinois
Pediatric Dentistry Certificate
July 2010 – June 2012

University of Illinois at Chicago, Chicago, Illinois
Doctor of Dental Surgery
September 2006 – May 2010

University of Illinois at Chicago, Chicago, Illinois
Bachelor of Science in Dentistry
September 2006 – May 2008

Indiana University, Bloomington, Indiana
Bachelor of Arts in Biochemistry
September 2002 – December 2005

EXPERIENCE:

Glen Ellyn Pediatric Dentistry
Pediatric Dental Associate
January 2012 – June 2012

Apple Dental Care
Pediatric Dental Associate
January 2011 – June 2012

The Children’s Clinic
Volunteer Dentist
May 2009 – May 2010

CERTIFICATION:

Basic Life Support, June 2010
Pediatric Advanced Life Support, August 2010

PROFESSIONAL MEMBERSHIP:

American Academy of Pediatric Dentistry
American Dental Association
Illinois State Dental Society
Illinois Society of Pediatric Dentistry
Chicago Dental Society