

## **Oral Health Needs and Parental Attitudes, Behavior, and Knowledge of Lower SES Children**

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### **Abstract**

Despite the declining prevalence of dental caries over recent decades, caries remain the most common chronic childhood disease, especially in high-risk (low socio-economic status) populations. This appears to be true even when parents are aware of good oral health habits. The purpose of this study was to gather oral hygiene data on high-risk children in Nevada and to assess parental attitudes and education concerning their children's oral health. Using visual examinations and a dmft (decayed, missing, filled, teeth) severity index, 235 lower SES children were screened and given treatment recommendations. The screenings showed larger than expected prevalence in both caries experience and untreated decay. Following the screenings, all the elementary school parents (754) were surveyed concerning their knowledge and attitudes toward oral health. A total of 386 surveys were completed and returned for a 55% response rate. Surprisingly, results from the parental survey showed positive attitudes and educational knowledge of oral health related to their children's dentition. Based upon the findings, the authors suggest that future programs, designed to educate parents/guardians concerning childhood oral health, may not be as effective as previously thought in controlling childhood caries. However, future investigations of programs designed to better motivate parents/guardians, as well as create better access to oral health care for their children's dental needs may find these programs to be more useful in improving the oral hygiene of Nevada's children.

#### **KEY WORDS**

Behaviors, Attitudes, Children, Caries.

Over the last 50 years the prevalence of dental decay has been dramatically reduced (American Dental Association, 2002). However dental caries still remain the most common chronic childhood disease, with a rate five times more common than asthma (U. S. Department of Health and Human Services, 2000). Overall childhood caries in the United States have been estimated at 1-5%, however among the prevalence among high-risk children populations, as identified by their eligibility for free or reduced-priced school meals, has been estimated to be as high as 60% (Ripa, 1988). According to Ripa (1988), Reisine and Psoter, (2001) and a report published by the U. S. Department of Health and Human Services (2000) the major risk factor for childhood caries is a low-income level and a low socio-economic status. It has been further reported that approximately 70% of all dental caries are found in 20% of our nation's children (Kaste, et.al., 1996). A review of the epidemiology of childhood caries showed that disadvantaged children, regardless of race, ethnicity or culture, are most vulnerable to childhood caries (Milnes, 1996). In fact infants who are of low socioeconomic status,

whose mothers have low education levels, and who consume sugary foods are 32 times more likely to have caries at the age of 3 1/2 than children without these risk factors (Ripa, 1988). Studies have further indicated that decay from childhood caries can affect growth and development and school attendance. They can also lead to malocclusion (the abnormality in the coming together of teeth), eating problems, speech problems, present greater risk of lesions on permanent dentition, cause significant pain leading to life threatening swelling, and lead to very expensive treatments often requiring general anesthesia (U. S. Department of Health and Human Services, 2000; Almeida and Roseman, 2000; American Academy of Pediatrics, 2003).

The Burden of Oral Disease summarized data collected from numerous sources and found that 54% of preschoolers in Nevada have caries experience (treated or untreated cavities), while 38% of all preschoolers have untreated dental decay (Nevada State Health Division, 2004). Note that the Healthy People 2010 (United States Department of Health and Human Services, 2001) target is 11% and 9% respectively. Unfortunately

Nevada's preschool children fall well above these targeted goals. Similar figures were found in third grade children, as well as adolescents (Nevada State Health Division, 2004). While providing important data on caries experience, untreated decay, and dental sealants, the 2004 Burden of Oral Disease in Nevada Report lacks further diagnostic data such as severity of decay, urgency of need, and visible plaque index. Plaque is an important indicator of a child's oral health status, since dental plaque is a precursor to the development of dental caries (National Committee for Oral Health, 1999). Studies have shown that children with visible plaque are more likely to have dental caries compared to those who were plaque free (Habibian, et al, 2001; Mathewson, Primosch, & Robertson, 1987).

In addition to the lack of diagnostic data on childhood caries in Nevada's children, limited information has been previously collected on the attitudes and knowledge of Nevada's parents/guardians concerning their children's oral health. Therefore, the purpose of this study was to (1) provide oral health screenings of lower socio-economic children utilizing a dmft (decayed, missing, filled teeth) severity index and, (2) gather information regarding the oral health attitudes and knowledge of their parents/guardians, thus providing better diagnostic data for Nevada's oral health agencies and programs.

#### Method

In February of 2004, oral health screenings were conducted among Pre-K (39), Kindergarten (95), and First grade (101) children at an elementary school in North Las Vegas. The school utilized in this study was identified as a high-risk school by the Clark County School District since 100% of the enrolled children were eligible for the free lunch program. Screening examinations were conducted on all children who returned the parental permission forms. A total of 235 children (127 males and 108 females) were screened by four examiners (one dentist and three dental students). This represented 31.2% of the student population within the grades of children examined.

Data collected for each child included visible plaque index (VPI), dmft (decayed, missing, filled teeth) severity index, number of active decay sites, untreated decay, severity of decay and the dental needs (urgency of treatment) for each child. The VPI was assessed by looking for visible plaque (a thin film of bacteria adhering on the tooth

surfaces) on six different teeth in each child's dentition, the child's first molar in each quadrant and the right central maxillary incisor along with the right central mandibular incisor. A VPI of 6 indicated that all six teeth had visible plaque and a VPI of 2 indicated that two of the six teeth had visible plaque. Each child was also given a severity score of 0 to 3, with 0 indicating no caries, 1 indicating pit and fissure caries of posterior teeth, 2 indicating caries of proximal surfaces of posterior teeth and 3 indicating the most severe of caries on the proximal or labial surfaces of anterior teeth. In addition, each child was given a treatment recommendation based on the severity of decay. This treatment recommendation included one of four possible choices: prophylaxis (cleaning) needed, restorative (fillings) needed, immediate restorative needed, and emergency or serious treatment (pain, infection and or swellings) needed. Once all 235 children had been screened, the data was compiled and arranged using descriptive statistical analysis.

Following the screening, surveys (written in English and Spanish) were distributed to all pre-K, Kindergarten and First grade children to be answered by their parents/guardians. Of the 754 surveys distributed, a total of 386 surveys were completed and returned for a 55% response rate. It should be noted that parents responding to the survey were not necessarily parents of any of the children screened. Using seven previously developed questionnaires, including questions derived from the National Institute of Health Survey, 13 questions were chosen and provided on each survey (National Institute of Dental Craniofacial Research, nd; Deinard, nd; Washington Dental Service Foundation, 2003; ABCD Survey, 2001; Northern Health Authority, 2001; Weber, nd; Wolfe, 2003). The data gathered from the questionnaires were analyzed using descriptive statistics.

#### Results

##### Screening Results

The results from the screening (Table 1) show one out of seven (VPI 0 = 13%) children screened had entirely clean, plaque free teeth. Conversely almost one out of four of the children screened presented with plaque on all teeth (VPI 6 = 23%). Statistically there was no difference between the 127 boys and the 108 girls screened. The Kindergarten children statistically showed a slight difference between the Pre-K and First graders, both of which had lower plaque indexes.

Table 1.  
Visible Plaque Index (VPI) of Children Screened (N=235)

VPI	Number of Children	Percentage of Children
0	32	13%
1	15	7%
2	35	15%
3	24	11%
4	38	16%
5	37	15%
6	54	23.0%
	235	100%

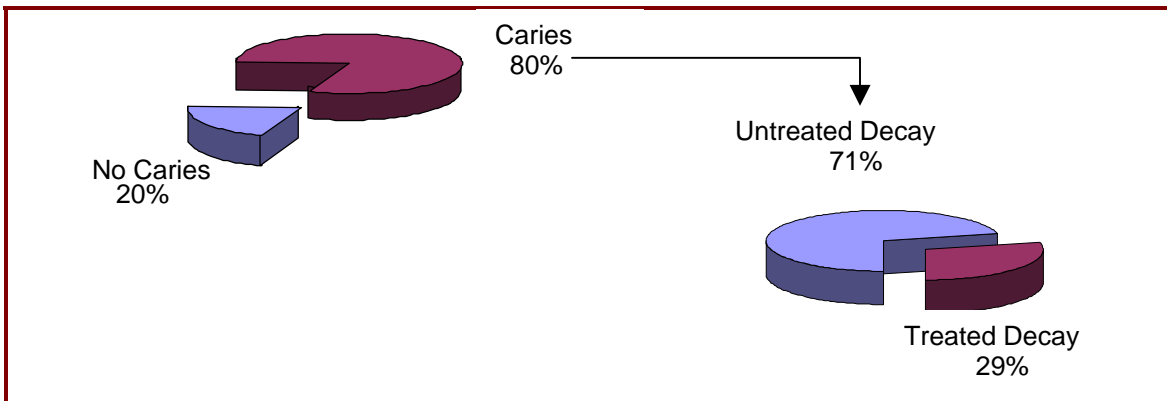


Figure 1. Caries Experience and Untreated Decay

Of the 235 children screened, 87% had caries experience. Over 70% of the students had two or more caries, while over 20% of the students had six or more caries. The statistical mean was 3.876 caries experiences per child and the standard deviation was 3.238 caries experiences per child. Although not statistically significant the boy's did show a higher average number of caries ( $x = 4.047$ ) versus the girl's ( $x = 3.676$ ). When comparing grades, the Kindergartener's again showed the higher mean of 4.232 caries compared to the First grader's mean of 3.812 and the Pre-K's 3.179. These differences were thought to be related to changes as the First grade children grow older and shed (loose) their primary dentition (baby teeth).

Amongst the 80% of children who did show caries experience (figure 1), only 29% had been treated with restorations. Seventy-one percent of all recorded caries experiences were recorded as active and untreated. The active, untreated caries experience per child showed a mean of 2.609. The severity of untreated decay

included pit and fissure (32%), proximal surfaces (15%), and proximal and labial (37%). The Pre-K and Kindergarten children showed the majority of decay on the proximal and labial anterior teeth, with 77% of this type of decay coming from the younger children. Additionally, 80% of the First grader's had proximal posterior decay. Almost half of the children screened needed immediate restorative treatment and nearly one out of five needed emergency or serious treatment due to pain, infection and or swellings. Using the Chi-Square statistic, there were found to be no significant differences in gender or grade ( $p < .02$ ) concerning the children's caries experiences.

Parental Survey Results

Following the dental screening, surveys (written in English and Spanish) were distributed to all pre-K, Kindergarten and First grade children to be answered by their parents/guardians. Of the 754 surveys distributed, a total of 386 surveys were completed and returned for a 55% response rate. These surveys were designed to ascertain the attitudes, knowledge and behaviors of the school's

Table 2.  
Parental Attitude and Behavior

Statement	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
It is easier to put my child to bed with milk or juice rather than water. (N=375)	76 20.2%	45 12%	31 8.2%	82 21.7%	141 37.6%
My child is more cooperative throughout the day when I give juice or soda pop instead of water. (N=373)	39 10.4%	46 12.3%	26 6.9%	111 29.7%	151 40.4%
My child will not drink water even when there are no alternatives. (N=373)	29 7.7%	29 7.7%	17 4.5%	109 29.2%	189 50.6%
My child can become unhappy, if I give water instead of a sugary drink. (N=371)	42 11.3%	52 14%	38 10.2%	101 27.2%	138 37.1%
It is mean to give my child water instead of juice. (N=378)	42 11.1%	28 7.4%	22 5.8%	77 20.3%	209 55.2%
The taste of local tap water keeps me from giving my child water to drink. (N=364)	30 8.2%	34 9.3%	40 10.9%	94 25.8%	166 45.6%
To avoid a conflict with my child, I give them whatever they want to eat or drink. (N=379)	22 5.8%	33 8.7%	28 7.3%	110 29%	186 49%
When I am busy it is easier to give my child juice instead of water. (N=379)	23 6%	46 12.1%	19 5%	124 32.7%	164 43.2%
If my child's teeth are brushed with fluoride toothpaste, it does not matter what they drink. (N=380)	38 10%	33 8.6%	51 13.4%	94 24.7%	164 43.1%

parents and guardians regarding the oral health care of their children. Parents/guardians responding to the survey were not necessarily parents of any of the children screened.

When parents/guardians were asked how important “baby” teeth are, 85% of 386 parents/guardians responded that they were important or extremely important. When parents/guardians were asked to circle all liquids that may cause cavities in teeth, the vast majority chose the obvious answers in soda pop and sweetened drinks, however only 31% circled 100% juice and only 19% circled milk as possible contributors of cavities. To further ascertain parental attitudes, knowledge, and behaviors, school parents/guardians were asked to respond to the statements provided in Table 2. As can be seen in the table, over 50% of the parents/guardians returning the survey either disagreed or strongly disagreed with all of the statements. Only the first

statement dealing with milk at bedtime received a sizeable (20.2%) number of strongly agree responses. Taken together, the responses of the school’s parents and guardians would suggest knowledge and behaviors conducive with good oral hygiene.

Discussion

Since the elementary school chosen for the screenings was identified as being located in a lower socioeconomic area of North Las Vegas, it was assumed to be at high-risk for childhood caries. Taking this into account, and after reviewing the numbers from the most recent Burden of Oral Disease in Nevada Report (2004), we expected to see a high number of caries experience as well as significant untreated decay. However, our screening showed even larger than expected numbers in both caries experience and untreated decay. Table 3 below shows how this elementary school compares to the most recent Burden of Oral Disease in Nevada Report (2004).

Table 3.  
Comparison of Study School to State of Nevada Average

	2004 Nevada Report	Study Elementary School
Caries Experience	54%	80%
Untreated Decay	38%	70%

With the oral health of the children screened so deficient, it was expected that the parents/guardians surveyed would exhibit limited oral health knowledge and/or casual attitudes toward oral health. Surprisingly, results from the parent survey indicated just the opposite. As Table 2 denotes, parental responses to the survey indicated a very positive attitude and high knowledge level regarding oral health and their children's dentition. In this screening and survey, oral health of the children screened did not correspond with oral health attitudes and oral health knowledge of the surveyed parents/guardians. Although the parents/guardians displayed very positive results from the survey, the mean caries experience per child was 3.876, while the mean untreated decay per child was 2.601.

From this information one might conclude that oral health education, alone, does not necessarily impact the incidence of dental caries in at-risk populations of children.

There are a number of studies' showing that oral health education programs did not significantly improve the prevalence of dental caries ( Berkowitz, 2003; Vanobbergen, Declerck, Mwalili, Martens, 2004). In fact, Kay and Locker found that although dental health education programs showed small and short-lived positive effects on attitude, they did not show any effects on caries experience (Kay & Locker, 1996; Kay & Locker, 1998).

Nevertheless, many state and nationally funded programs continue to focus on increased oral health education as part of the solution to the high occurrence of caries seen in lower socio-economic populations (Frencken, Borsum-Anderson, et. al., 2001; Carino, Shinada, & Kawaguchi, 2003). The State of Nevada's Oral Health Plan mission statement, for example, is, "To improve oral health of Nevadans through education and prevention." Additionally, the 2004 Burden of Oral Disease in Nevada concluded that public education and media campaigns would be required to improve Nevada's oral health (Nevada State Health Division, 2004). Although the majority of data concludes that oral health education does not affect the prevalence of caries, some studies have concluded that an increase in oral education can reduce the prevalence of childhood caries if the educational program is accompanied by supervised tooth brushing or some kind of preventive oral

health activity (Rong, Bian, et. al., 2003; Pakhomov, 1999).

While the data suggests that the vast majority of parents/guardians know what dietary habits will be beneficial to their children's oral health, some misconceptions may exist. For example, in the survey given, 85% of parents/guardians answered that both soda pop and sweetened drinks will contribute to dental caries; however, only 31% answered that 100% juice drinks would contribute to dental caries. This is a good example of how some misconceptions may still exist concerning certain foods that are considered healthy but which still contribute to dental disease. Although foods such as milk or 100% juice are generally healthy foods for children, given in ways that promote prolonged durations of exposure, such as sippy cups, the otherwise healthy foods become very harmful to oral health. Despite a misconception that may exist regarding 100% juice or milk, the data from this survey, as well as from other sources, support the idea that parents/guardians are aware of the types of feeding practices associated with childhood caries, such as prolonged exposure from bed time bottles or sippy cups (Johnsen, 1982; Weinstein, Domoto, Wohlers, & Koday, 1992).

#### Conclusions

The results from the current study indicate that, though the school's parents/guardians surveyed showed an awareness of good oral health, the sample of the school's children were found to have a prevalence of dental caries. This study supports the need for more oral health care for Nevada's lower SES children. . The results from this study can be used to plan oral health campaigns, develop models, and organize and promote oral health programs. The data also suggests that future programs designed to better educate parents/guardians may not be as effective in controlling childhood caries as once thought. Though not specifically investigated in this study, it could be hypothesized that programs designed to better motivate parents/guardians or programs designed to create accessible and/or affordable dentistry for at-risk children may be more effective in meeting the dental needs of Nevada's children. The oral health status of Nevada's children requires that significant improvements be made if we are to reach the goals of Healthy People 2010.

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