Learning from caries-free children in a high-caries American Indian population

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Abstract

Objective: We aimed to identify salutogenic patterns of parental knowledge, behaviors, attitudes, and beliefs that may support resistance to early childhood caries (ECC) among a high caries population of preschool American Indian (AI) children.
Method: Participants were 981 child–parent dyads living on a Southwestern reservation who completed baseline assessments for an ongoing randomized clinical trial. T-tests were used to assess differences between reported knowledge, behaviors, and beliefs of parents whose children were caries-free (10.7 percent) and those whose children had caries (89.3 percent). Chi-square analyses were used for categorical variables.
Results: Although there were no socio-demographic differences, parents of caries-free children viewed oral health as more important and reported more oral health knowledge and adherence to caries-preventing behaviors for their children. Parents of caries-free children were more likely to have higher internal locus of control, to perceive their children as less susceptible to caries, and to perceive fewer barriers to prevention. These parents also had higher sense of coherence scores and reported lower levels of personal distress and community-related stress.
Conclusions: Effective interventions for ECC prevention in high-caries AI populations may benefit from approaches that support and model naturally salutogenic behaviors.

Introduction

In this report, we have sought clues to the prevention of early childhood caries (ECC) in a high-risk American Indian (AI) population. We took a salutogenic approach by looking at variables associated with those few children, and their parents/families/caregivers, who have avoided the disease – rather than using the more common pathogenic approach of describing variables associated with disease experience.

Nationally, the rates of ECC are highest among low socioeconomic groups and indigenous and ethnic minorities. AI/Alaska Native (AN) children have higher prevalence of ECC than any other population group in the United States (1-3). The most recent Indian Health Service report

concerning AI/AN preschool children estimated prevalence of caries at 68.4 percent, prevalence of untreated dental decay at 45.8 percent, and a mean decayed and filled teeth that is three times greater than for non-Natives (1). Dental caries among preschool children in the Navajo Nation is especially severe; a recent survey reported a mean decayed, missing, and filled teeth of 6.5 for 2- to 5-year-olds (1), the highest reported in any AI or other population group. The oral health literature includes many studies that identify risk factors for the onset or progression of ECC. Less common, however, are attempts to study *resistance* to, or avoidance of, dental caries – research that is focused on learning how and why some children manage *not* to develop dental caries, despite being at high risk. In working with AI children where we observed extremely high dental caries rates, we became interested in those few "unusual" children in the study populations who have excellent oral health. These children have been overlooked in most caries research – probably because identifying *protective* factors, rather than *risk* factors, requires looking at ECC through a different lens. To understand the oral health of these caries-free children, it is important to seek the positive factors and influences that are already available in the community – including behaviors practiced by parents/caregivers/families, and the knowledge and beliefs that may be related to those behaviors. This is not the approach usually taken with dental caries research in high-risk populations, however.

As we pursued this attempt to understand protective factors, or resistance to dental caries, we learned from a few studies that had looked more carefully at variables associated with caries-free status in children. Duany *et al.* (4) followed a cohort of 56 caries-free and 40 caries-active high school children between the ages of 12 and 14 years in Miami to analyze the differences in diet, oral hygiene scores, and dental plaque accumulation in the oral cavity. They concluded that frequency of eating and the characteristics of the diet consumed by the two groups were distinctly different, and their data showed dental plaque accumulation in caries-free children was significantly less than in caries-active children. Habibian *et al.* (5) studied a group of toddlers (6, 12, and 18 months) who were caries-free. The study was carried out in a nonfluoridated area near London, and most participants were relatively affluent. Ninety percent of children in this cohort started tooth brushing by the age of 12 months, or had them brushed by their parents, and at 18 months of age, 96 percent of these children were brushing their own teeth. Although none of the children in the study developed dental caries, the accumulation of plaque varied with frequency of eating and drinking episodes and tooth brushing without parental assistance. Higher parental income, mother's education, knowledge and attitudes, and biological factors (time of acquisition of *Streptococcus mutans*) have been identified as protective factors against dental caries developments by other investigators (6-11).

The constructs known as sense of coherence (SOC) and locus of control have been associated with oral health of adults and adolescents by some researchers. High SOC scores have been related to better oral health-related quality of life in adolescents (12) and to consumption of fewer snacks and drinks between meals (13), less gingivitis (14) and dental caries in adults (15), regular tooth brushing (16), and regular dental attendance (17). Lencova *et al.* reported that higher internal parental locus of control is associated with better control of both untreated caries and caries experience in their preschool children and is advantageous in the prevention of dental caries (18). Reisine and Litt (19) found that mothers who had higher external locus of control had children with greater risk of having caries.

The purpose of this article is to describe parent/caregiver characteristics associated with the absence of ECC, or caries-free status, in AI children who were 3-5 years of age and living on the Navajo Nation. Because dental caries is so prevalent in this population, and because the disease frequently is so severe, we were especially interested in learning about characteristics of the parents/caregivers of children who have not experienced dental caries, in the hope that this would give us clues to developing better prevention strategies for this high-risk population. Fewer than 8 percent of caregivers were guardians other than parents; therefore, the term "parent" will be used henceforth in referring to both participating parents and caregivers.

Methods

In 2008, the Center for Native Oral Health Research at the University of Colorado Anschutz Medical Center was funded by the National Institute for Dental and Craniofacial Research (U54DE019259) to conduct a cluster randomized clinical trial in Navajo Nation Head Start Centers (HSC) to evaluate the effects of an intervention to slow the development of ECC (20). The intervention trained tribal people as Community Oral Health Specialists to deliver fluoride varnish to Head Start children and oral health education to both these children and their parents. The intervention activities were provided over a 2-year period, with follow-up data collection planned for 1 year and 2 years after completion of interventions. The study was approved by the Navajo Nation Human Research Review Board, governing bodies at tribal and local levels, the tribal departments of Head Start and Education, Head Start parent councils, and the University of Colorado Multiple Institutional Review Board.

At the inception of the study, there were approximately 100 classrooms in 82 HSC in the Navajo Nation across five Navajo Nation agencies. The HSCs first were stratified based on the

number of Head Start classrooms (1 versus 2-3) in each building location and by Navajo Nation Agency. They were then randomized into intervention or usual care groups within those strata. Fifty-two Head Start classrooms were enrolled into the study, 26 in each treatment and control arm. Navajo Nation Head Start serves all income-eligible AI and non-AI families living on the reservation and AI families living in nonreservation areas approved as part of the Tribe's service area. Eligible children are at least 3 years old at the beginning of the school year. The HSC may enroll more than 10 percent of its children from families whose incomes exceed the low-income guidelines as long as the income-eligible families who are interested are served by the program.

Parents aged 15 and older, or other legal guardians, provided consent for participating children. Participating adults, whether parents or other primary caregivers, consented for themselves if age 18 or older; parents age 15-17 needed the consent of their parents to participate.

The primary outcome variable was dental caries experience, as measured by decayed, missing, and filled surfaces (dmfs) at baseline and then annually for 3 years. Noncavitated lesions were not identified as decay for the purpose of this research. Cavitated lesions were defined as clinically visible lesions with irreversible loss of enamel structure or break in the enamel surface. A cavitated lesion involving a smooth surface was defined as demonstrable loss of enamel structure and for proximal smooth surfaces, undermining with discoloration under a marginal ridge and either direct extension onto the proximal surface, or evidence of a break in the proximal enamel surface. A cavitated lesion involving pits/fissures was defined as demonstrable loss of enamel structure on visual examination revealing active decay, such as demineralization or undermining of enamel. Only lesions with evidence of tooth structure loss were included when calculating dmfs.

Study-trained and calibrated licensed dental hygienists blinded to the study condition conducted visual screenings of the children's teeth to count dmfs at baseline and after 1, and 2 years; trained study personnel recorded the observations. Examinations were conducted using a head lamp (SurgiTel, Ann Arbor, MI, USA) and lighted mouth mirror (Defend MirrorLite Illuminated Mouth Mirror, Hauppauge, NY, USA). Teeth to be examined were brushed to remove debris, dried with gauze, and systematically evaluated for presence of decayed and filled surfaces. Dental caries detection and measurement criteria, as described by Pitts (21), were used to visually evaluate and score lesions. The findings were charted using an electronic dental research record designated as CAries Research Instrument (CARIN) (22), which was specifically designed for research documentation involving dmfs. Caries-free children were those whose dmfs scores at baseline were equal to 0, and children with dental caries had dmfs scores greater than or equal to 1.

All examining hygienists completed calibration training with a gold standard examiner prior to and during the study. Calibration training was conducted in accordance with a designated protocol and criteria used by the National Institute for Dental and Craniofacial Research and the Centers for Disease Control and Prevention/(NHANES) examinations and scoring. Two study investigators served as gold standard examiners for calibration of the study hygienists (these two individuals conducted all training). The study investigators serving as gold standard examiners completed calibration training, and annual recalibration, with an independent gold standard examiner (the same independent examiner has conducted all training) Kappa scores were calculated from a minimum of 13 examinations. Calibration scores were independently analyzed to determine when kappa scores met or exceeded target thresholds; specifically, for demineralized lesions, examiners had to achieve surface level kappa values of 0.40 or greater; for cavitated decayed lesions, examiners required surface level kappa values of 0.75 or greater. Overall surface level kappa values for all types of decay had to be 0.70 or higher.

Parents completed the Basic Research Factors Questionnaire (BRFQ) at the same time points when children received baseline and subsequent annual dental screenings (20). The BRFQ is a 190-item questionnaire for the assessment of dental-related knowledge, attitudes, and behaviors of the parents of young children; it includes demographic information and psychosocial measures (Table 1), such as oral health locus of control, health beliefs, self-efficacy, importance, sense of coherence, personal distress, chronic stress, community family dysfunction, community risky behaviors, community economic distress, perceived discrimination, oral health behavior, oral health knowledge, alcohol use, social support, and financial stability (20).

Child and parent socio-demographic characteristics and parent psychosocial measures were compared for the children who were caries-free and those who had dental caries experience. Chi-square tests were used for categorical variables, and two-tailed *t*-tests were used for continuous variables. A multiple logistic regression analysis was performed with caries-free status of the child (yes or no) as the dependent variable and child and parent/caregiver socio-demographics, and parent BRFQ scale scores as the independent variables. All analyses were conducted in SAS version 9.3® (SAS Institute, Cary, NC, USA).

Results

A total of 1,016 Head Start children and their parents (92.1 percent) or primary caregivers (7.9 percent) in 52 Head Start classes were enrolled. The dmfs data were collected at baseline for 981 of the 1,016 preschool children recruited into the study. Children with dental caries (89.3 percent of the 981)

Table 1 Explanation of Measures in the Basic Research Factors Questionnaire (BRFQ)

Measure	Description	Range (indicates the range of the computed scale/subscale)
Oral health locus of control Three subscales: Internal locus of control (3) External locus of Control – powerful others (3) External locus of control – chance (3)	Locus of control (LOC) measure captures a person's attitudes about who or what has control over their child's oral health outcomes (i.e., the parent themselves, other people, or chance). Each subscale represents the average score for all items within the subscale and represents the extent to which participants believe control for their child's oral health outcomes lies with the parent (internal LOC), the dentist (powerful other LOC), or is up to chance (chance LOC).	1-5 1 = strongly disagree 5 = strongly agree
Health belief model Four subscales: Perceived susceptibility (3) Perceived seriousness (3) Perceived barriers (5) Perceived benefits (5)	The health belief model is one of the major models intended to explain health behavior. The model predicts that behavior is a function of the subscales. Perceived susceptibility – How susceptible does a parent feel his/her child is to poor oral health outcomes? Perceived seriousness – How serious does the parent think developing caries would be? Perceived barriers – Does the parent perceive many barriers to following recommended oral health behavior? Perceived benefits – Does the parent perceive many benefits to following recommended oral health behavior?	1-5 1 = strongly disagree 5 = strongly agree
Self-efficacy (14)	Self-efficacy represents a person's confidence that he/she can successfully engage in a specific health behavior. The overall self-efficacy score represents how sure participants are that they can engage in recommended behavior to take care of their children's teeth.	1-5 1 = not sure at all 5 = extremely sure
Importance (14)	The overall importance score represents how important it is to participants that they engage in specific oral health behaviors (the same behaviors as mentioned above, for self-efficacy).	1-5 1 = not at all important 5 = extremely important
Sense of coherence Three subscales, and overall score: Comprehensibility (5) Meaningfulness (4) Manageability (4) Overall sense of coherence (13)	Sense of coherence (SOC) is a construct intended to assess the degree to which participants feel the world makes sense and has meaning.	1-7 Higher numbers indicate stronger coherence
Distress (6)	The overall distress score represents the amount of distress participants have experienced in the last 30 days.	1-5 1 = none of the time 5 = all the time
Chronic stress Five subscales: Expectations (3) Location hassles (5) Community family dysfunction (2) Community risky behaviors (5) Community economic distress (2)	Chronic stress captured ongoing stress related to personal expectations, hassles associated with the local community, and community dysfunction.	1-4 1 = strongly disagree 4 = strongly agree
Perceived discrimination (9)	The perceived discrimination measure represents the amount of discrimination participants feel they are subject to, on account of being American Indian.	1-4 1 = never 4 = often
Oral health behavior (9)	The overall behavior score represents the percentage of oral health behavior items that were answered with an "adherent" response. Adherent means the participant is following the recommended oral health behavior.	0-100%
Oral health knowledge (14)	The overall knowledge score represents the percentage of oral health knowledge items answered correctly.	0-100%
Alcohol use (3)	A shortened version of the Alcohol Use Disorders Identification Test (AUDIT). Because the shortened version includes only the three consumption items, it is referred to as the AUDIT-C. The alcohol score provides an indication of the degree to which a participant drinks excessively.	0-12 Large numbers represent greater alcohol use
Social support (4)	The social support score represents the average score for items within the Instrumental Social Support section of the Oral Health Survey. This overall score indicates the degree to which participants believe they have others available to help them when needed	0-1 0 = no available support 1 = support available
Financial stability (4)	The financial stability score is a measure of the degree to which participants feel they have adequate access to the basic things people need, such as food and clothing.	0-1 0 = financially unstable 1 = financially stable

In the first column, numbers in parentheses represent the number of items in the scale/subscale.

had a mean dmfs of 23.9. Of these children, 41 percent were 3 years old, 57 percent were 4 years old, and 2 percent were 5 years old. There were 105 (10.7 percent) caries-free children among the group recruited and for whom exams were completed. Of these children, 51 percent were 3 years old, 47 percent were 4 years old, and 2 percent were 5 years old ($P = 0.10$ for comparison of the age distributions between the caries-free and caries-active status of the children). Of the caries-free children, 59 percent were female compared with 49 percent of the caries-active children ($P = 0.06$). Fifty-eight percent of the parents of caries-free children had attended at least some college or postsecondary vocational schooling, compared with 45 percent of the parents of children with caries; this difference approached significance at $P = 0.0501$. There was no statistically significant difference ($P = 0.70$) in incomes of households with caries-free versus carious children (Table 2).

Parents of caries-free children differed significantly ($P \leq 0.05$) from parents of children with caries on several BRFQ variables reflecting oral health-related behaviors, knowledge, and attitudes (see Table 3). These parents reported placing a higher importance on oral health of their children than did parents of children with caries. They also viewed their children's oral health and oral health quality of life more positively. Parents of caries-free children were more likely to perceive their children as less susceptible to caries and to perceive fewer barriers to prevention. These parents also reported more oral health knowledge and adherence to caries-preventing behaviors for their children. Parents of caries-free children had higher Internal oral health locus of control scores, indicating they were more likely to believe they had some control over their children's oral health. They also scored lower on both scales of external Oral Health Locus of Control, suggesting that they were less likely to believe that others, such as dental professionals, control their children's oral health or to attribute their children's oral health to chance, or fate. Parents of caries-free children had higher SOC scores, a measure described by Antonovsky as reflecting a life approach that creates more salutogenic, or health-focused, behaviors as a result of finding challenges to be comprehensible, manageable, and meaningful (23). Finally, these parents reported lower levels of personal distress and stress related to disruptive issues in the community. Parents of caries-free children also were more likely to have access to a working vehicle (96.1 percent compared with 86.6 percent, $P = 0.006$).

Although the small number of children in the caries-free group presented challenges related to statistical power, we nonetheless conducted multiple logistic regression analyses in an attempt to explore the relationship of the variables in the study to the caries status criterion. Only three independent variables showed an association with the caries-free

Table 2 Demographic Summary for Caries-Free versus Caries-Active Children

Demographics	Caries free ($n = 105$) Frequency (%)	Caries present ($n = 876$) Frequency (%)	*P* value
dmfs by age, mean (SD)			
3	N.A.	21.0 (19.3)	
4	N.A.	25.1 (19.3)	
5	N.A.	40.8 (20.9)	
Overall	N.A.	23.9 (19.7)	
Child age			0.10
3	54 (51.4)	354 (40.5)	
4	49 (46.7)	497 (56.9)	
5	2 (1.9)	23 (2.6)	
Child gender (male)	43 (41.0)	445 (50.8)	0.06
Parent/caregiver gender (male)	20 (19.1)	139 (15.9)	0.40
Education			0.0501
Less than HS grad	10 (9.6)	143 (16.5)	
HS grad/GED	34 (32.7)	330 (38.2)	
Some college/vocational	42 (40.4)	298 (34.5)	
College degree or more	18 (17.3)	94 (10.9)	
Income			0.70
Refused, don't know, missing	13 (12.4)	140 (16.0)	
Less than $10k	40 (38.1)	371 (42.4)	
$10k to <$20k	20 (19.1)	149 (17.0)	
$20k to <$30k	13 (12.4)	77 (8.8)	
$30k to <$40k	8 (7.6)	60 (6.9)	
Greater than or equal to $40k	11 (10.5)	79 (9.0)	

Table 3 Parent Characteristics for Caries-Free and Caries-Active Children

Continuous measures	Caries free Mean (SD)	Caries present Mean (SD)	*P* value
Socio-demographics			
Parent age	33.1 (10.8)	31.7 (9)	0.20
Number of family members living in household	5.3 (1.9)	5.6 (2.2)	0.16
Pediatric oral health quality of life (POHQoL)			
Overall score*	0.6 (2.6)	4.4 (9.4)	<0.0001
Behavior			
Overall score	58.1 (21.1)	50.0 (22.2)	0.0004
Knowledge			
Overall score	76.5 (10.5)	74.1 (13.7)	0.04
Psychosocial measures			
Oral health locus of control (three subscales)			
Internal	4.2 (0.8)	4.0 (1.0)	0.01
External others	2.1 (1.0)	2.3 (1.1)	0.05
External chance	2.2 (1.0)	2.5 (1.1)	0.0008
Health belief model (four subscales)			
Perceived susceptibility	3.2 (1.0)	3.4 (0.8)	0.002
Perceived seriousness	4.4 (0.8)	4.3 (0.8)	0.21
Perceived barriers	1.9 (0.7)	2.2 (0.7)	<0.0001
Perceived benefits	4.3 (0.8)	4.3 (0.8)	0.66
Self-efficacy (overall score)	4.5 (0.5)	4.4 (0.6)	0.11
Importance (overall score)	4.8 (0.3)	4.7 (0.4)	0.04
Sense of coherence (three subscales and an overall score)			
Comprehensibility	5.3 (1.3)	5.0 (1.3)	0.05
Manageability	5.3 (1.2)	5.1 (1.2)	0.26
Meaningfulness	5.9 (1.0)	5.5 (1.2)	0.0004
Overall score	5.5 (1.0)	5.2 (1.1)	0.01
Distress (overall score)	1.5 (0.6)	1.7 (0.7)	0.01
Stress (five subscales)			
Expectations	2.4 (0.9)	2.4 (0.9)	0.80
Location hassles	1.9 (0.6)	2.1 (0.7)	0.05
Community family dysfunction	2.5 (1.1)	2.5 (1.1)	0.85
Community risky behavior	2.4 (1.0)	2.3 (1.1)	0.77
Community economic distress	3.2 (0.9)	3.1 (1.0)	0.29
Perceived discrimination (overall score)	1.9 (0.7)	1.8 (0.6)	0.33
Health literacy			
Overall score	4.1 (0.7)	4 (0.8)	0.20

* Lower score means higher POHQoL. Pediatric oral health quality of life.

status; however, those were oral health status as rated by the parent/caregiver, pediatric oral health quality of life score, and parent/caregiver alcohol use. Other variables were not significantly predictive of caries-free status in this analysis. Because of the limitations indicated above, we have not presented these data in tabular form.

Discussion

In this study, we have taken a new approach to understand determinants of ECC within a high caries population of AI children attending Head Start. Rather than looking at factors associated with high levels of ECC, we looked instead at the characteristics of the parents of children who managed *not* to develop ECC, although living within a high-caries population. Parent characteristics associated with having caries-free children included more oral health knowledge, adherent oral health behaviors, and internal oral health locus of control, lower perceived susceptibility to caries, fewer perceived barriers to prevention, and higher SOC scores. Taken together, these findings suggest a pattern of behaviors that may reflect parenting and home environments that are more supportive of oral health and dental caries prevention.

According to the Navajo Nation Head Start community assessment report (2011-2012), 17,364 children were under the age of 5 in Navajo; 7,301 of these children were eligible for enrollment in HSC, and 2,105 were enrolled (24). This study enrolled 1,016 children during 2011-2012, thereby comprising a large and representative sample of the Navajo Nation HSC population. Nonetheless, only 10.7 percent of these

children were caries-free. Both those with and those without caries experience came from similar socioeconomic environments, as income requirements determine eligibility for HSC enrollment. Participants had access to similar, albeit varied, water sources. Municipal water on Navajo Nation is fluoridated; however, many families lived in rural areas and used well water for eating and cooking, which has variable levels of fluoride. They also were exposed to similar food choices, and access to dental care was similar for both caries-free and caries-active children. In the Navajo Nation, the dentist-to-population ratio is roughly 32.3 dentists per 100,000 people (25), and those providers serve a population scattered over an area of 27,425 square miles (equivalent to the state of West Virginia).

Describing the differences between the two groups of parents, we found that the parents of those children who are caries-free had, on average, completed slightly more formal education, although this did not rise to the level of statistical significance ($P \leq 0.0501$). Nonetheless, more of the parents of caries-free children had completed high school and more had completed some postsecondary education. Although there were no differences in mean oral health literacy scores, one could speculate that with additional education, parents may have had more opportunity to learn about oral health and the prevention of ECC. However, these results do not appear robust enough alone to explain the differences in caries experience – particularly within the context of a close-knit tribal community where so much information about daily life, presumably including health issues, is communicated less formally. The more important differences here seem to be those that describe patterns of oral health behaviors, attitudes toward oral health, and personal beliefs about the ability to manage and influence the oral health of their children. Parents of caries-free children reported a significantly stronger belief in the importance of oral health, and they also perceived their children to be less susceptible to oral disease while believing there were fewer barriers to the prevention of oral disease. They also reported significantly more engagement in oral health behaviors, such as oral hygiene maintenance for their children, use of fluoridated toothpaste, supervision while tooth brushing, and reduced frequency of consuming sugary foods and drinks.

This pattern of oral health-specific beliefs and behaviors in the parents of caries-free children appears to be supported by the positive psychological attitudes that are reflected by an internal oral health locus of control and a strong sense of coherence. Antonovsky (23) defined sense of coherence as the capacity to respond constructively to life events, or the ability to understand a variety of life challenges, to incorporate them into one's overall approach to life, to manage them, and to find meaning in doing so. He asserted that the most important component of sense of coherence was the one labeled "meaningfulness," and it should be noted that the difference in sense of coherence scores for the two sets of parents was most striking with respect to the meaningfulness component.

In the context of Navajo Nation families, the overall score for sense of coherence and internal oral health locus of control were higher in parents of caries-free children. Parents in Navajo Nation have limited access to oral health care, a situation exacerbated by formidable challenges related to low incomes and rural lifestyles. It seems possible that a strong sense of coherence would reflect the ability to understand and manage these challenges within the constraints of life in their communities. Sources of stress also are inextricably related to the ability of individuals to manage ongoing life issues, and parents of caries-free children reported both less personal distress and also less stress related to problems in the community – although parents in both groups were exposed to the same potential for community disruption. It is possible that the parents of the caries-free children simply had the good fortune both to enjoy an unusual level of hardiness in some important psychological characteristics, such as locus of control and sense of coherence, and that they also had fewer problems, or stress, in their lives. In any case, these are differences that certainly could have enabled them to focus more on the oral health of their children and to carry out the recommended behaviors that they have learned. Achieving full understanding of these parents and the ways in which they support their children's oral health may require more tailored efforts, such as individual interviews and/or focus groups aimed at key variables.

This paper has attempted to look at ECC from a different perspective than has been common in most studies of AI children; rather than emphasizing risk factors, the data reported here identify a number of psychosocial and behavioral factors that are associated with, and may protect against, caries development. Moreover, we believe the data suggest that we would be well served by paying more attention to those Native parents who seem to be succeeding in helping to keep their children healthy and free from dental caries. Rather than assuming prevention will depend on changing the knowledge, attitudes, and behaviors of the group of parents and their children who have experienced high rates of dental caries, perhaps we need to learn more about the parents of those individual children who are caries-free. It might then be possible to harness the wisdom already available within the culture for the greater benefit of all tribal children.

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