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Parental Perception of Oral Health Status of Children in Mainstream and Special Education Classrooms

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Abstract

The aim of this study was to compare parental perceptions of oral health status and access to dental services by children in 34 special education and 16 mainstream public elementary school classes in San Mateo County, CA. A self-administered parental survey was utilized and included questions about demographics, oral health and dental utilization. The overall response rate was 58.8%. After adjusting for age and gender of the child, compared to mainstream, parents of special education students were significantly more likely to report their child to have: worse oral health (OR= 2.4, 95% CI 1.54, 3.67) lacking a past year dental visit (OR= 1.96, 95% CI 1.01, 3.84), and missed school days due to dental reasons (OR = 2.5, 95% CI 1.55, 4.17). Both groups rated the child's oral health inferior to overall health rating ($p<0.001$). The authors concluded that disparities exist between the two groups in parental perceptions of their children's oral health status and dental service utilization.

Keywords

Dental care; health status; health care disparities; parental perception; special education; child

INTRODUCTION

The federal Maternal and Child Health Bureau defines children with special health care needs (CSHCN) as "those who have or are at increased risk for a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a type or amount beyond that required by children generally" [1]. Using this definition, over 9 million (13%) of all U.S. children less than 17 years old are estimated to have been diagnosed with some special health care need [2].

The limited literature on oral health status of CSHCN suggests that they have worse oral health outcomes than their counterparts and dental care has been reported as their most common unmet health care need [3]. They are almost twice as likely to have unmet oral health care needs as their peers without SHCN across all income groups [4]. Reasons for

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poor oral health among the CSHCN are multi-fold and not limited to the child's disability alone. Some of the reasons for worse oral health status are:

1. Children with special healthcare needs may have compromised immunity that makes them vulnerable to the effects of oral diseases. [5]
2. Children with mental, developmental or physical impairments do not always have the ability to understand and assume responsibility for their own oral hygiene activities [6].
3. Children with physical, mental and developmental disability are often dependent on a parent or care provider for daily oral hygiene activities [6].
4. These children often take medications or are on special diets that can exacerbate oral health problems [7].
5. Many general dentists are not willing to treat these children in their practices because they have behavior management issues or have government-sponsored dental insurance or no insurance at all leading to limited access to care [3, 6, 8–10].

Information on oral health status and barriers for seeking care for CSHCN is very limited in the dental research literature. CSHCN have been reported to be more likely to see a physician than a dentist [11]. Analysis of data from National Survey of Children with Special Needs (2000)[12] shows that approximately 78% of CSHCN needed dental services in the past year [12]. In addition, some data are available from state-level studies that analyze Medicaid data [8, 9]. However, reports by Slayton et al (2001)[8] and Agili et al (2004)[9] lack a control group having access to similar community resources and instead report the performance of the state Medicaid programs in serving this group.

This study was a pilot investigation with the objectives to compare parental perceptions of their children's oral health status and determinants of dental service use among public elementary school enrollees from special education and mainstream classes in San Mateo County, CA. For this purpose, the authors tested the following null hypotheses:

1. There are no differences in parent perception of the oral health status of children in mainstream and special education classrooms.
2. There are no differences in parental reports on patterns of annual use and frequency of dental services for children in mainstream and special education classrooms.

Study Location: San Mateo County

San Mateo County, California, in the San Francisco Bay area, is located 15 miles south of San Francisco, California. The 2005 US Census estimates approximately 700,000 people reside in this county. Asians and Hispanics are among the largest minority groups (23% and 22% respectively). Approximately, 15% of the overall population has some form of disability and 7% of the population lives below the federal poverty level [13].

Dental disease is the most common health problem among low-income children in the County. According to a recent oral health needs assessment of children in San Mateo County, dental caries occurs in 80% of the children by the time they reach their 18th birthday, compared to 71% statewide. Forty-seven percent of San Mateo children 0–18 live in areas with optimal fluoridation, while 39% live in areas with partial or intermittent fluoridation. Fourteen percent of the population lives in areas without water fluoridation [14].

METHODS

Conceptual Framework

The conceptual model of health behavior described by Andersen guided the study development [15]. In this model, health service utilization depends on multiple factors, grouped under three domains: 1. Predisposing factors 2. Need factors and 3. Enabling factors [15]. The predisposing factors such as age, gender, race and ethnicity and family structure represent biological imperatives that suggest the likelihood of people seeking care. Need factors include variables such as health status, and limitations in activities that define how people view their own general health and functional state and how they experience symptoms of illnesses and pain. Enabling factors such as insurance status, poverty level, and usual source of care enable a person to seek care. That is, in order to use health care services, the providers should be available and easily accessible to the people and the people should have the means to pay for the services[15].

The predisposing factors included in the study were: age, gender, birth order, race/ethnicity, primary language, family size and single parent households. The need factors included were: parental perceptions of their child's overall and oral health status, missed school and work days. The enabling factors included were: having medical and dental insurance, having a usual source of care and family income.

Study Design and Procedures

The study was a cross-sectional study with information collected from parents using a self-administered questionnaire in County special education and mainstream elementary classrooms. The analyses focused on comparing responses by classroom type (that is, special versus mainstream education). It was difficult to estimate the expected survey response rate. To maximize the sample size of the smaller target population, all 34 County special education classes with their 270 students were eligible to participate in the study. All 34 special education classrooms were located in 13 of the 20 school districts in the county. To correspond with the special education classroom locations, 16 classrooms in 8 of the 13 participating school districts agreed to participate in the study. For mainstream classroom participation, each school principal was contacted to enroll a classroom in the study. Only schools with the school principal's permission participated in the study. In schools where multiple special education classrooms were located at a school site, the same number of classrooms was selected to participate from mainstream if the principal agreed to participate. It should be noted that mainstream classrooms are usually larger compared to special education with at least 20 students in mainstream classrooms.

Special education classrooms were generally mixed academic grade classes (with students from two academic grades in one class). Mainstream classes were selected to correspond with any of the special education academic grades housed in that school. The school principal selected one mainstream classroom for participation. Also, special education classes were composed by the child's education needs based on their health care need and with no regard to where they reside in the county. This was unlike the mainstream classes where the children enrolled were from the school district's defined neighborhood. This meant that although children in mainstream education resided in the area of the school in which they were enrolled such was not the case with special education students.

The Institutional Review Board at the University of California, San Francisco and the San Mateo County Office of Elementary Education approved the study protocol. No personal identifiers for the child or parent were on the survey other than a school identification number and name of the class teacher. Returning completed surveys was considered as

consent to participate in the study. No completed form could be traced back to an individual child or parent.

Teachers were briefed about the study purpose and design at a teachers' meeting before the questionnaires were sent to the schools. Classroom teachers distributed to their students both surveys with cover letters for parents or guardians, available in both English and Spanish, and return envelopes. The cover letter explained the study, its purpose, and directions on completing the survey. Parents completed and returned surveys to the teachers in sealed envelopes. Teachers collected all surveys and returned them to investigators. Classes with more than seventy percent response were given gift certificates for a pizza party or school supplies. All parents were provided with a resource list of dentists in the county that treat special needs children. Teachers were given extra surveys and asked to mail them a second time to parents that did not respond to the first survey four weeks after the first surveys were sent home. The two survey distributions occurred between April and June 2006.

Data Analysis

Sample size calculations using test of two independent proportions with 0.05 alpha error and 80% power projected a response of 157 participants needed in each group to show differences in dental utilization (p_1=0.050 for mainstream and Odds Ratio= 2.0) where p_1 is the smaller proportion of the two groups being compared. More stringent two-tailed statistical tests were used to study the direction of association between the independent and dependent variables. In addition, the influence of providing incentives on age and outcomes of overall and oral health was assessed.

The dependent (outcome) variables considered in the analyses were: parental reports of the status of the child's mouth and teeth and child's overall health, and indicators for patterns of dental service use. Child's oral health status and overall health were measured using a 5-point scale: excellent, very good, good, fair and poor. Overall health and oral health were each re-coded into a dichotomous variable for statistical analyses as follows: excellent/very good versus good/fair/poor. This dichotomization was chosen to correspond to reports from the NSCH for oral and overall health ratings [16] As a secondary analysis, we also combined the category 'good' with 'excellent-very good' instead of 'fair-poor' in our dataset to see if it changed the findings between differences noted in special education and mainstream enrollees.

Indicators for patterns of dental service use were measured by: child having a dental visit, number of dental visits in the past 12 months, reasons for last dental visit, dental service location, child's days missed from school for a dental reason, parents' days missed from work due to child's dental problem or dental appointment, and reasons for not receiving needed dental care.

The independent (explanatory) variables considered were: child's age, gender, race/ethnicity, academic grade, birth order, type of health insurance, language chosen for completing the survey, whether a single parent family, number of people residing in the household, and family income.

The data were entered and analyzed using SPSS 12.0. First, the distributions of the variables were examined separately for the mainstream and special education groups. Second, children from mainstream and special education classrooms were compared on demographics and outcomes. Third, bivariable analyses were performed and finally, separate multiple logistic regression analyses provided age and gender adjusted estimates of associations between family resources and each of the following pediatric outcomes as

reported by the parents: oral health status, overall health status, having a dental visit in the last year and school days missed due to dental reasons.

RESULTS

All 34 county special education classes located in 20 schools in 13 school districts participated in the study. Principals from 12 schools in 8 of these 13 school districts schools agreed and selected 16 mainstream classrooms to participate. Thus, the investigators enrolled 34 special education classes with 270 students and 16 mainstream classes with 437 students. After two mailings, an overall parental response rate of 58.8% was achieved for surveys with completed usable surveys returned by 166 (61.4%) and 250 (57.2%) parents of special education students and of mainstream students, respectively.

Descriptive Variables

Predisposing, need and enabling factors for both groups have been summarized in Table 1.

Predisposing Factors

Children from special education classes were younger in age and included a higher percentage of boys than in the mainstream classes. These differences were found to be statistically significant (each $p<0.001$). Racial/ethnic distribution of the two groups was not statistically different though the special education classes included a greater percent of African-American and Hispanic children than the mainstream classrooms. Not all parents responded to this question and some provided more than one race/ethnicity. A total of 15.4% of all returned completed surveys were in Spanish ranging from approximately 14% for mainstream and 18% for special education. More children from special education classes (13.3%) than mainstream classes (7.2%) lived in single parent households ($p=0.04$).

Need Factors

More children in special education classrooms had parental report of poor oral health status. Nearly 60 percent of the parents of children in special education see their children as having less than excellent/very good oral health whereas around 40% of the mainstream parents see their children as having less than excellent/very good oral health ($p=0.001$). Almost half (48%) of the parents of special education see their children as having excellent/very good overall health where as almost 82% from mainstream had excellent/very good overall health ($p=0.001$). Parents from both mainstream and special education classrooms were more likely to rate their child's oral health status inferior to the overall health status ($p<0.001$).

The children in special education classrooms were more likely to miss school days for dental visit or problems reasons than those in mainstream classrooms. Thirty-nine percent of students from special education had missed school days due to dental visit or problem in contrast to twenty percent from mainstream classrooms (Chi-square, $p=.001$).

Enabling Factors

Special education children were more likely (55%) than mainstream children (20%) to have publicly funded health insurance (Medicaid, S-CHIP or County health insurance programs) (Chi-square, $p=0.0001$). The proportion of parents reporting children having dental insurance were similar for both groups. No significant differences were observed in the socio-economic status of the two groups measured using the federal poverty level (derived from reported family income and number of household members).

Results for parental reports of reasons for child's last dental visit are summarized in Table 2. The most frequently reported reason by both groups was regular check-up (69% for

mainstream and 64% for special education). Other reasons cited by both groups were cleanings, fillings, gum problems, extractions and toothache. Special education students were reported having significantly higher rates of dental extractions or surgery at the last dental visit, almost twice as high, compared to mainstream students (p=0.048).

Bivariable Analyses

Results of bivariable analyses are summarized in Table 3. Indicators for access to care were compared between the two groups. Children from special education classrooms were significantly less likely to have a dental visit in the last 12 months (Chi-square, p=0.023). They were also more likely not to have had a dental visit in the last 12 months (Chi square, p=0.06) Special education students had a greater likelihood than their mainstream counterparts of having visited a hospital dental clinic (Chi-square, p=0.003), and be fearful of the dentist (chi square, p= 0.0001).

When asked about being able to access medical, dental and rehabilitative services for their children, almost 90% of the parents from both groups reported being always or almost always able to access medical services (93% mainstream, 91% special education, Chi-square, p=0.50). A higher percentage of children from mainstream (86%) as compared to those from special education (78%) were always or almost always able to get needed dental services (chi-square, p= 0.03).

For both groups, having a preventive dental visit in the prior 12 months was found to be positively correlated to perceived oral health status of excellent/very good (Spearman's correlation, p=0.010).

Logistic Regression Analyses

Logistic regression analyses are summarized in Table 4. Results from models for each outcome measure, adjusting for age and gender, indicated that children from special education classes were 2.4 times as likely to have parental perception of less favorable (good/fair/poor) oral health compared to mainstream children (p=0.001, 95% CI 1.54, 3.67) The special education students were over three times as likely to have poorer parental-reported overall health status compared to mainstream students (p= 0.001, OR= 3.09, 95% CI 1.90, 4.95). They were also 2.5 times as likely to have missed school days due to dental problem or appointment (p=0.001, 95% CI 1.55, 4.17) compared to mainstream enrollees. Special education enrollees were almost two times as likely not to have had a dental visit in the past year (p=0.048, 95% CI 1.01, 3.84). The secondary analyses using dichotomization into excellent, very good and good versus fair and poor, instead of the dichotomization followed in the results presented above suggest that the differences in overall health status and oral health status remain statistically significantly different among special education and mainstream classrooms (chi-square, both p =0.001).

Classes that were given incentives for higher rates of participation were compared to the classes that did not receive the incentives. Although fewer mainstream classrooms received the incentive, the special needs classes were smaller with less than 12 students in each class. Overall, fewer special education students received the incentives (chi-square, p=0.016). The classes that did and did not receive the incentive did not differ significantly in the outcomes of overall and oral health (Chi-square test, p=0.991 and 0.837 respectively). Older children were more likely to receive the incentive (Chi-Square p=0.002) as compared to younger children. Since the final logistic regression analyses adjusted for age, it is unlikely that the incentive influenced the outcomes. It should also be noted that whether or not the class and children received the incentive was determined after the surveys were completed and returned.

DISCUSSION

This study was a pilot investigation to assess parental perceptions of children's oral health status and dental service need and use. Parents, in addition to physicians and nurses, play an important role in the pediatric healthcare delivery team. They are in a unique position to report on the care their children receive and make decisions for their child [17]. Their perceptions and experiences of barriers to care may differ in important ways from those perceived or believed by healthcare professionals and policy makers. Understanding parental perceptions is a key to developing programs and interventions to minimize barriers and is central to the provision of patient-centered care [18].

Some of the demographic findings between groups have been shown elsewhere and others have not. This study found more boys than girls enrolled in the special education classrooms; a similar gender trend has also been noted nationally [19]. While there was no significant difference in distribution in race/ethnicity by group in our study, Native American, multiracial and Non-Hispanic Whites have been population groups reported to have the highest special healthcare needs [19].

Children in the special education classes were more likely to reside in single parent families or large families. This trend has also been noted in the analyses of 1994–95 National Health Interview Survey data for disparities in therapeutic and supportive service need and use among school age children [20].

Some barriers to not seeking dental care reported by parents were: the inability to find a dentist who can provide care, inability to make appointments and disproportionate out-of-pocket expenses. Further investigations are needed to understand associations between the type of insurance plan, parental perception and service use. Both groups reportedly had high rates of preventive dental services (69% for mainstream and 64% for special education). This utilization may be due to access to a university dental school in the area where most of the children in special education seek dental care.

In our study, all parents rated their child's overall health superior to oral health. These findings are similar to findings from the (2000) National Survey of Children's Health (NSCH) where parents rated their children's (mean age 9 years) overall health superior to oral health [21].

The results of this study may not be directly comparable to other studies of the reported oral health issues of children with special needs[8, 9] because of differences in participant age, Medicaid status and the time periods studied. However, some comparisons can be made for the special education students to the other studies reporting on CSHCN. Our study found that the most prevalent reason for not seeking dental care reported for the children in special education classes was the fear of the dentist. Other studies have cited financial reasons[11, 12] and dentists not willing to provide care[9]. In the current study, 64% of special education enrollees had a routine dental visit in the prior year. In contrast, Agili, *et al*. reported that 85% of Medicaid enrollees had a routine dental visit in the prior year.

Limitations

Our study had 40% non-response rate, which may have introduced some bias that the investigators could not control. As with most self administered surveys, people with more concerns or interest in the topic may have been more likely to respond. Since the school principal, not the investigators, selected the mainstream, control classrooms, selection bias may have been introduced. Other methodological limitations include the lack of a matched control classroom for every special education class, and reliance on children to transport

surveys to and from parents. Not all school districts in the County are represented in the study since not all school districts have county special education classrooms and there might be differences where the participating schools were located within the county. The socioeconomics of the locale where the school is located might have influenced the racial/ethnic composition of the students in mainstream education.

Since this study lacks a professionally-determined, clinical component of oral health measures, a definitive estimate of the oral health status of children enrolled in public schools in the County was not possible. Another possible limitation might be differential participation due to whether the classroom received the incentive. Since the incentives were given after the questionnaires were returned and the final logistic regression analyses adjusted for age, it is unlikely that the incentive influenced the outcomes.

Another possible limitation was the inability to compare results across the different school districts in the County. All school districts that had a special education classroom did not participate in the study and because the special education classes were comprised of children with similar learning needs and not be the geographic location of their residence unlike the mainstream classes, such comparative analyses was not possible.

Future Directions

The findings from this study may not be generalizable to the entire San Francisco Bay area, state, or nation. A larger study in the future coupled with clinical examination findings would provide more accurate estimates of the extent of dental disease in these populations and their relationship to access to dental care. Such studies would also ascertain the validity of parental perceptions, especially for children with special needs.

CONCLUSIONS

The two null hypotheses tested by the investigators were rejected. Parental perceptions of children's oral health and overall health status and reports of frequency and types of dental utilization differ significantly for children in special education and mainstream education classes. Significant oral health disparities were found to exist between these two groups of children with special education children having worse oral health and less frequent dental care.

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Table 1

Unadjusted estimates of selected characteristics of children by mainstream and special education classroom

	Mainstream (n=250)		Special Education (n= 166)		Test/p-value
Predisposing Factors					
Age (Mean ± SD in years)	8.8 ±1.8*		8.2 ± 2.0*		Chi-square 0.001
Male gender (%)	44.0*		73.0*		Chi-square <0.001
First born child (%)	48.0		49.4		Chi-square 0.662
Race/Ethnicity (%)					Chi-square 0.153 df=4
White	30.4		27.7		
African-American	2.0		11.0		
Asian	25.6		19.3		
Hispanic	27.2		34.9		
Spanish survey (%)	13.6		18.0		Chi-square 0.216
Single parent families (%)	7.2*		13.3*		Chi-square 0.040
Family size (%)					Chi-square 0.908
< 5	82.0		75.3		
≥ 5	18.0		24.7		
Need Factors					
Oral Health (%)					Chi-square 0.001 (recoded)
Excellent	22.4	58.4	11.9	38.2	
Very Good	36.0		26.3		
Good	27.2		32.5		
Fair	11.6	41.6*	24.4	59.6*	
Poor	02.8		05.0		
Overall health (%)					
Excellent	52.0	82.4	15.1	58.5	Chi-square 0.001 (recoded)

	Mainstream (n=250)		Special Education (n= 166)		Test/p-value
Very Good	30.4		43.4		
Good	12.8		25.9		
Fair	3.6	16.8*	13.9	40.9*	
Poor	0.4		1.2		
Child missed any school days for dental visit or dental problem (%)	24.0*		40.1*		Chi-Square 0.001
Parent missed any work days for child's dental visit or dental problem	24.08*		32.1*		Chi-square 0.056
Enabling Factors					
Health insurance (% yes)					Chi-square
Private insurance	66.0		56.6		0.358
Public insurance	19.5*		50.9*		<0.001
Uninsured	4.0		1.2		0.096
Dental insurance (%yes)	70.4		66.9		Chi-square 0.161
Child having a usual source of dental care (% yes)	89.6		83.7		Chi-square 0.509
Federal Poverty Level (%)					Chi-square 0.151 (df=4)
0–99%	20.3		24.1		
100–199%	22.3		25.8		
200–299%	15.2		15.8		
>300%	41.7		34.2		

Table 2

Percent distribution of parental reported reasons for child's last dental visit by classroom type

Reason	Mainstream (N=250)%	Special education (N=166)%	Chi-square test p-values
Regular checkup	69.2	64.5	0.509
Cleaning teeth	62.0	53.6	0.143
Fillings	14.0	15.7	0.571
Gum problems	0.8	2.4	0.168
Tooth extraction/surgery	7.6*	13.3*	0.048
Toothache	2.0	4.2	0.172
Other	4.0	7.2	0.134

Table 3

Percent and Frequency Distribution of Parental Report of Measures of Dental Utilization by Type of Education

Outcomes	Mainstream (n = 250)	Special Education (n = 166)	p-value
Percent having at least one dental visit (s) in the last 12 months	84.2	91.4	0.023
Percent never been to a dentist	3.6	4.8	0.547
Number of dental visits in last 12 months (%)			**Chi-square,** 0.006 (df=5)
0	4.8	8.5	
1	18.2	32.9	
2–3	69.2	52.4	
>/=4	7.6	6.09	
Child seeking dental treatment in a hospital setting (%)	0.93*	7.04*	0.003
Child afraid of dentist	2.6*	23.6*	<0.001

Table 4

Logistic regression models comparing special education to mainstream children adjusted for age and gender (Referent group: Mainstream)

Parameter	P-value	Odds Ratio	95% CI
Worse parent-reported oral health status (excellent/very good vs. good/fair/poor)	0.001	2.40	1.54, 3.67
Worse parent-reported overall health status (excellent/very good vs. good/fair/poor)	0.001	3.06	1.90, 4.95
Any missed school days (none vs. any)	<0.001	2.50	1.55, 4.17
No dental visit in the prior 12 months (none vs. any)	0.048	1.96	1.01, 3.84