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The Impact of Selected Social Determinants on the Prevalence and Sevirity of Early Childhood Caries among a Group of Lebanese Preschool Children

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Abstract **Original Research Article**

The purpose of this study is to assess the impact of selected social determinants on the prevalence and severity of Early Childhood caries (ECC), among a group of Lebanese preschool children. A total of 500 preschool children, age 3 to 5 years were chosen with stratified random sample technique with proportional allocation of the subjects, into different strata. Out of the 500 students chosen, 409 complied and returned the questioner and hence were included in the study. The study was performed in six schools distributed in different areas of Beirut, 3 private and 3 public schools. Every child was examined using a disposable plastic dental mirror under an adequate source of light. Early childhood caries was diagnosed as present when one or more decayed (non cavitated or cavitated lesions), missing (due to caries), or filled tooth surface on any primary tooth in children up to 71 months of age [1] was detected. The severity of ECC was classified according to Whyne AH (1999) [2] Type 1 ECC (mild to moderate); Type 2 ECC (moderate to sever); Type 3 ECC (sever). All eligible children were given a questionnaire to be filled at home by parents, and were returned by a specific date. Socio-demographic factors included in the questionnaire were as follows: Age, Gender , Maternal age at birth, Number of children in family, Child order in family, Do brothers or sisters have caries, Mother's education level, Child's father job. The data were collected, tabulated and statistically analyzed, using package for social science "SPSS" version 13. The age of the study sample ranged from 3- 5 years with a mean 4.0 ± 0.9. About half of the sample was males (49.1%). The majority of children were in public schools (60.9%). In the majority of cases (52.6%), the number of children in the family was three or more, while only 5.4% of the examined children were single without siblings. About three fourths of the children (71.4%) were the second or third or more among their siblings. For half of the number of the children (49.9%), no caries was reported among siblings. The mothers of about two thirds of the children (60.6%) were older than 25 years at delivery. Half the mothers (51.6%) were educated till the primary school only. About two thirds (68.7%) of the fathers were workers either skilled or unskilled. One third of the examined children were caries free (29.6%). Of those who had caries, 38.9% had mild caries, 27.1% had moderate caries while only 4.4% had severe caries. The mean age increased significantly (P<0.0001) with increasing severity of caries (for no caries, mild, moderate and severe caries, mean ages= 3.7 ± 0.8, 4.1 ± 0.9, 4.3 ± 0.8 and 4.4 ± 0.7 respectively). No significant difference was observed between males and females in caries severity (P= 0.87). More children in public school had severe caries compared to children in private schools (6.8% and 0.6% respectively). Similarly, more children in private schools were caries free compared to children in public schools (49.4% compared to 16.9% respectively). The difference between children in public and private schools in caries severity was statistically significant (P<O.0001). Larger families were significantly associated with more severe forms of caries (P<0.0001). Percents of children with severe caries in children from families with one, two and three or more children were 0, 2.9% and 6% respectively. More children who were second in order of birth among their siblings were caries free compared to either first comes or those who ranked third (36.1%, 29.5 and 20.8% respectively). Thus, child order among siblings was significantly associated with caries severity (P=0.001). More children with no caries among siblings were caries free than those whose siblings had caries (43.1% and 11.5% respectively, P<0.0001). More children of older mothers (> 25 years) were caries free compared to children of younger mothers (20-24 years and <20 years) (34.3%, 27.6% and 5.3% respectively, P= 0.002). More children of better educated mothers (university and secondary) were caries free than less educated mothers (primary education) (43.8%, 44.1% and 16.1% respectively, P<0.0001). More children whose fathers worked as professionals were caries free than children whose fathers were workers (53.1% and 18.9% respectively, P<0.0001). These findings deserve further investigation among Lebanese preschool children.

Keywords: Dental caries, early childhood caries, social determinants, Socio-economic factors, children.

INTRODUCTION

Dental caries as one of the most prevalent chronic diseases in human beings, its prevention has always been the main objective of the dental profession. Early childhood caries is a multi-factorial, diet dependent infectious disease with significant behavioral components. Determinations of risk assessment for early childhood caries is a complex issue. Presence or absence of disease is dependent on the balance between the virulence of the attacking agent (primarily mutans streptococci), and the host resistance (integrity of primary tooth enamel, saliva, cultural demographic, behavioral and economic circumstances). Hence, dentists should be aware of risk factors that can influence the initiation and progression of early childhood caries in their community [3]. Early childhood caries is defined as the presence of one or more decayed (non cavitated or cavitated lesions), missing (due to caries), or filled tooth surface on any primary tooth in children up to 71 months of age [1]. The severity of ECC was classified according to Whyne AH (1999) [2] Type 1 ECC (mild to moderate); Type 2 ECC (moderate to sever); Type 3 ECC (sever).

Prevalence of ECC varies widely with several factors like race, culture, and ethnicity; socioeconomic status, life style, dietary pattern, and oral hygiene practices and also according to the various factors from country to country and from area to area. A review of the literature suggests that in most developed countries the prevalence rate of ECC is between 1 and 12% [4]. It may have significant implications on overall child health, often requiring extensive restorative treatment and early extraction of teeth at an early age, resulting in considerable cost and increased risk, and substantially contributing pain, personal suffering, speech, learning and eating problems, as well as poor child nutrition, low body weight and potential risk to overall child health in addition to low self – esteem [5] Despite the decline in prevalence of dental caries in children in the western countries, caries in pre-school children remains a problem in both developed and developing countries. ECC has been considered to be at epidemic proportions in the developing countries [6, 7].

Prevalence of ECC is not a common finding relative to some European countries (England, Sweden, and Finland), with the available prevalence data ranging from below 1% to 32% [8, 9]. While in less developed countries and among the disadvantaged groups in the developed countries, the prevalence has been reported to be as high as 70% [10]. A high prevalence of ECC has been reported in some Middle Eastern countries, such as Palestine (76%) and the United Arab Emirates (83%) [11, 12]. According to a study the highest prevalence of ECC is found in the 3-to 4- year-old age group and that boys are significantly more affected than girls, aged between 8 month and 7 years [13].

Researchers have attempted to expand basic microbiological models for early childhood caries development to include various social, demographic and behavioral factors such as family income, maternal education level, family status, tooth brushing habits, and parental knowledge and beliefs [14]. Infant and toddlers feeding pattern and high sugar containing food at night may increase the caries risk due to the low salivary flow rate [15]. Another area of controversy is whether prolonged or at will breast feeding can cause maxillary anterior caries. A Canadian study reports that 6% of caries free children and 22% of caries positive children were exposed to prolonged night-time breast feeding at 6 month of age [16]. There is little evidence to support the conclusion that the use of the bottle beyond the age 1 is a major caries risk factor. These findings suggest that the role of the bottle in caries development is not as clear as previously thought and further clarification of the association of infant feeding patterns and caries is required [17]. Lack of good oral hygiene practices promotes the development of ECC. Children should begin receiving oral hygiene care upon the eruption of the first primary tooth [18]. Caregivers social status, poverty, ethnicity, deprivation, number of years of education, and dental insurance coverage are other factors which influence the oral hygiene habits of children and the severity of ECC [13, 19]. Low socio-economical status, poor parental education, and life style factors have significant influence on ECC [20].

MATERIALS AND METHODS

The present study was conducted to access the impact of social determinants on the prevalence and severity of ECC among a group of Lebanese preschool children. It's a descriptive, cross sectional study that included various public and private pre-schools in Lebanon. Disposable plastic mirrors were used for screening after drying the area to be examined and before deciding the presence and severity of ECC. The examination was conducted in each school in a prepared room with a suitable source of light for screening, were the child was seated on an ordinary straight back chair. A total of 500 preschool children, age 3 to 5 years were chosen with the stratified random sample technique with proportional allocation of the subjects, into different strata. Out of 500 students chosen, 409 complied and returned the questioner and hence were included in the study. The study was performed in schools distributed in different areas of Beirut. The students in these schools came from different areas in Lebanon. And, hence the results obtained could be

generalized on all Lebanese pre- school children. The selected schools where three private and three public schools.

As for the private schools the students in the study sample were distributed as follows:

The first school with 54 students.
The second school with 45 students.
The third school with 61 students.

The students in the public schools were distributed as follows:

The forth school with 128 students.
The fifth school with 55 students.
The sixth school with 66 students.

Intra-examiner calibration was done before starting the survey where ten children were examined under the supervision of the main supervisor in order to make sure that the investigator achieved optimally uniform examination and to minimize variations which might affect the judgment of the examiner and hence the diagnosis.

Every child was examined using a disposable plastic dental *mirror* with an adequate source of light. Early childhood caries was diagnosed as present when one or more decayed (non cavitated or cavitated lesions), missing (due to caries), or filled tooth surface on any primary tooth in children up to 71 months of age [1] was detected.

The severity of ECC was classified according to Whyne AH (1999) [2].

Type 1 Early Childhood Caries (mild to moderate)

The existence of isolated carious lesion(s) involving molars and / or incisors.

Type 2 Early Childhood Caries (moderate to severe)

Labiolingual carious lesions affecting maxillary incisors, with or without molar caries, and unaffected mandibular incisors.

Type 3 Early childhood caries (severe)

Carious lesions affecting almost all the teeth including the lower incisors.

All eligible children were given a questionnaire to be filled at home by the parents and were returned by a specific date. Out of 500 students given the questionnaire, 409 returned the filled questionnaire on the specific date.

Socio-demographic factors included in the questionnaire are Age, Gender, Maternal age at birth, Number of children in family, Do brothers and sisters have caries, Mother's education level, Child's father job. Descriptive statistics were calculated in the form of frequencies and percents for qualitative variables and mean and standard deviation or medians for quantitative variables. Relation between caries severity and quantitative variables was analyzed using analysis of variance while chi square was used for analysis of association between caries severity and qualitative variables. Significant associations in these bivariate analyses were used to build an ordinal regression model to predict factors affecting caries severity. In all cases, significance was set at the 5% level. Statistical analysis was performed using SPSS version 13.

RESULTS

In order to study the impact of social and behavioral determinants on the prevalence and severity of ECC, this epidemiologic survey was conducted among 409 preschool children in Lebanon. The data were collected, tabulated and statistically analyzed, using package for social science "SPSS" version 13. And since we have a responsibility, as researchers, to insure and defend the credibility of our work, intra-examiner consistency has been assessed before collecting the data.

Table 1 shows the personal characteristics of the study sample. The age of the study sample ranged from 3- 5 years with a mean 4.0 ± 0.9. About half of the sample was males (49.1%). The majority of children were in public schools (60.9%).

Table 1: Personal characteristics

Variables	Categories	N (%)
Age	Min -max	3- 5
	Mean ± SD	4.0 ± 0.9
Gender	Male	201 (49.1)
	Female	208 (50.9)
School	Public	249 (60.9)
	Private	160 (39.1)

Table 2 shows the family characteristics of the study sample. In the majority of cases (52.6%), the number of children in the family was three or more, while only 5.4% of the examined children were single without siblings. About three fourths of the children (71.4%) were the second or third or more among their siblings. For half of the number of the children (49.9%), no caries was reported among siblings. The mothers of about two thirds of the children (60.6%) were older than 25 years at delivery. Half the mothers (51.6%) were

educated till the primary school only. About two thirds (68.7%) of the fathers were workers either skilled or unskilled.

Table 2: Family characteristics

Variables	Categories	N (%)
Number of children	One	22 (5.4)
	Two	172 (42.1)
	Three or more	215 (52.6)
	Median	3
Order of child	Single child	22 (5.4)
	First	95 (23.2)
	Second	133 (32.5)
	Third or more	159 (38.9)
Caries among sibling	Single child	22 (5.4)
	No	204 (49.9)
	Yes	183 (44.7)
Mother age at delivery	< 20 years	38 (9.3)
	20- 24 years	123 (30.1)
	25 years	248 (60.6)
Mother education	Primary	211 (51.6)
	Secondary	93 (22.7)
	University	105 (25.7)
Father occupation	Professional	128 (31.3)
	Skilled or unskilled worker	281 (68.7)

Table 3 shows caries prevalence and severity in the study sample. One third of the examined children were caries free (29.6%). Of those who had caries, 38.9% had mild caries, 27.1% had moderate caries while only 4.4% had severe caries.

Table 3: Caries prevalence and severity

Variables	N (%)
No caries at all	121 (29.6)
I (mild)	159 (38.9)
II (moderate)	111 (27.1)
III (severe)	18 (4.4)

Table 4 shows the relation between caries severity and personal characteristics. The mean age increased significantly (P<0.0001) with increasing severity of caries (for no caries, mild, moderate and severe caries, mean ages= 3.7 ± 0.8, 4.1 ± 0.9, 4.3 ± 0.8 and 4.4 ± 0.7 respectively). No significant difference was observed between males and females in caries severity (P= 0.87). More children in public school had severe caries compared to children in private schools (6.8% and 0.6% respectively). Similarly, more children in private schools were caries free compared to children in public schools (49.4% compared to 16.9% respectively). The difference between children in public and private schools in caries severity was statistically significant (P<O.0001).

Table 4: Relation between caries severity and personal characteristics

Variables	Categories	Caries				Total	Test P value
		No canes at all	I (mild)	II (moderate)	III (severe)		
Age	Mean ± SD	3.7 ± 0.8	4.1 ±0.9	4.3 ± 0.8	4.4 ± 0.7	-	12.70<0.0001 *
Gender	Male	62(30.8)	75(37.3)	56 (27.9)	8 (4)	201(100)	0.700.87 NS
	Female	59(28.4)	84(40.4)	55 (26.4)	10 (4.8)	208(100)	
School	Public	42(16.9)	97(39)	93 (37.3)	17 (6.8)	249(100)	67.76<0.0001 *
	Private	79(49.4)	62(38.8)	18 (11.3)	1 (0.6)	160(100)	

*Statistically significant
NS: Not statistically significant

Table 5 shows the relation between caries severity and family characteristics. Larger families were significantly associated with more severe forms of caries (P<0.0001). Percents of children with severe

caries in children from families with one, two and three or more children were 0, 2.9% and 6% respectively. More children who were second in order of birth among their siblings were caries free compared to either first borns or those who ranked third (36.1%, 29.5 and 20.8% respectively). Thus, child order among siblings was significantly associated with caries severity (P=0.001). More children with no caries among siblings were caries free than those whose siblings had caries (43.1% and 11.5% respectively, P<0.0001). More children of older mothers (>or= 25 years) were caries free compared to children of younger mothers (20-24 years and <20 years) (34.3%, 27.6% and 5.3% respectively, P= 0.002). More children of better educated mothers (university and secondary) were caries free than less educated mothers (primary education) (43.8%, 44.1%and 16.1% respectively, P<0.0001).

More children whose fathers worked as professionals were caries free than children whose fathers were workers (53.1% and 18.9% respectively, P<0.0001).

Table 5: Relation between caries severity and family characteristics

Variables	Categories	Caries	Total	chi square P value			
		No caries	I (mild)	II(moderate)	III(severe)		
Number of children	One	12 (54.5)	4 (18.2)	6 (27.3)	-	22 (100)	29.53
	Two	63 (36.6)	74 (43)	30 (17.4)	5 (2.9)	172	<0.0001 *
	Three or more	46 (21.4)	81 (37.7)	75 (34.9)	13 (6)	215(100)	
Order of child	Single child	12 (54.5)	4 (18.2)	6 (27.3)	-	22 (100)	
	First	28 (29.5)	39 (41.1)	21 (22.1)	7 (7.4)	95 (100)	28.39
	Second	48 (36.1)	56 (42.1)	28 (21.1)	1 (0.8)	133(100)	0.001 *
	Third or more	33 (20.8)	60 (37.7)	56 (35.2)	10 (6.3)	159(100)	
Caries among sibling	Single child	12 (54.5)	4 (18.2)	6 (27.3)	-	22 (100)	71.21
	No	88 (43.1)	81 (39.7)	28 (13.7)	7 (3.4)	204(100)	<0.0001 *
	Yes	21 (11.5)	74 (40.4)	77 (42.1)	11 (6)	183(100)	
Mother age at Delivery	< 20 years	2 (5.3)	15 (39.5)	20 (52.6)	1 (2.6)	38 (100)	
	20- 24 years	34 (27.6)	50 (40.7)	33 (26.8)	6 (4.9)	123	2.49
	25 years	85 (34.3)	94 (37.9)	58 (23.4)	11 (4.4)	248(100)	0.002*
Mother education	Primary	34 (16.1)	85 (40.3)	78 (37)	14 (6.6)	211(100)	50.09
	Secondary	41 (44.1)	30 (23.3)	19 (20.4)	3 (3.2)	93 (100)	<0.0001 *
	University	46 (43.8)	44 (41.9)	14 (13.3)	1 (1)	105(100)	
Father occupation	Professional	68 (53.1)	42 (32.8)	17 (13.3)	1/(0.8)	128(100)	55.39
	Skilled or unskilled worker	53 (18.9)	117(41.6)	94 (33.5)	17 (6)	281*(100)*	<0.0001 *

Table 6 shows the result of ordinal regression analysis to predict factors affecting caries severity. Factors with significant effect on caries severity were type of school (P=O.003), number of children in the family (P= 0.05), order of children among siblings (P=0.002), caries among siblings (P<0.0001), mother age at delivery (P= 0.05), bottle feeding (P= 0.004), duration of breast feeding (P= 0.001), age when brushing started (P= 0.05) and using pacifier (P= 0.01).

Table 6: Ordinal regression model to predict factors affecting caries severity

Variables	Wald chi square		P value
Age	0	-	0.99 NS
School	8.97		0.003*
Number of children	3.91		0.05*
Order of child	9.57		0.002*
Caries among sibling	23.47		<0.0001 *
Mother age at delivery	3.84		0.05*
Mother education	0.01		0.95 NS
Father occupation	0.06		0.81 NS

*: Statistically significant
NS: Not statistically significant

DISCUSSION

This study was undertaken primarily to determine the possible association of certain social factors (as socioeconomic status) on the prevalence and

severity of ECC among a group of Lebanese preschool children.

Students age ranged from 3-5 years, the same age group was also chosen in studies in Greece (1999) [21] and in studies by Koday and Lopez (1990) [22].

This age group was carefully chosen since at this age children have a complete primary dentition; hence, this factor is standardized.

The social data showed the personal characteristics of the study sample, and the family characteristics. The severity of caries increased significantly with increased age ($p<0.0001$). This finding was in agreement with many studies [23-25]. A possible explanation might be that the longer the teeth subjected to certain dietary and behavioral attitudes the more liable they were to decay. Therefore, the severity of caries increased as the age increased from 3 to 5 years [23].

More children in public schools had severe caries, compared to those in private schools. Similarly, more children in private schools were caries free compared to those in public schools. The difference between children in public and private schools in caries severity was statistically significant ($p<0.0001$). These results came in agreement with many studies in Europe [26-30] and Middle East [31] which demonstrated the powerful effect of social class on oral health status. Lower socioeconomic classes in poor areas in Lebanon usually place their children in public schools with minimum fees contrary to higher socioeconomic classes which place their children in expensive private schools. Social class may influence caries risk in several ways. Individuals from lower socioeconomic status experience financial, social and material disadvantage, that compromise their ability to care for themselves, obtain professional health care services and live in a healthy environment [32], all of which lead to reduced resistance to oral and other diseases [33] .

As for the gender no significant difference was observed between males and females in caries severity ($p=0.87$). This result agrees with a study [21] and disagrees with another study [34], were boys showed a significantly higher ECC severity index compared to girls ($p=0.01$). The study showed caries prevalence and severity, where (29.6%) of the examined children were caries free, (70.4%) had caries and were distributed as follows: (38.9%) had mild caries, (27.1%) had moderate caries while only (4.4%) had severe caries. A study found that the prevalence of ECC was (65%) [35]. Observations reported showed prevalence of ECC among American Indians (41.8%) and Alaskan Natives (66.8%) [36]. Non-- Native American children in Arkansas, Lousiana, New Mexico, Oklahoma and Texas showed prevalence of ECC (18.5%) for 3 years old, (22.4%) for 4 years olds and (27.9%) for 5 years olds [23].

A comprehensive review of epidemiology of ECC showed that its prevalence varies from population to population; however, disadvantaged children, regardless of race, ethnicity or culture, were most vulnerable [37]. Studies carried out in Canada and England, over a period of 20 years showed that rampant caries in preschool children was socioeconomically related [38]. In the industrialized world higher levels of disease were found in children from poorer, less well-educated families. While, in developing countries high prevalence of ECC was observed [39]. There was an association between low socioeconomic status and poor health [40], where social factors were important concerning dental caries. Young children from poorer social backgrounds had higher caries levels [41, 42].

In non-industrialized countries and disadvantaged population (immigrants, ethnic minorities) in industrialized countries, the prevalence rate of ECC was as high as 70% [37].

The study showed the relation between caries severity and family characteristics. Larger families were significantly associated with more sever forms of caries ($p<0.0001$), the percent of children with severe caries from families with one, two, and three or more children was 0%, 2.9% and 6% respectively. This agrees with a study in Brazil in 2000 [43] which states that children living in families with four people were 1.86 more likely to have high caries increment than those living in families with three or less people. A possible explanation might be that the larger the family and the number of children in it, the less the capability of the parents to cope with the needs of each child, and hence taking enough care of their oral health and oral hygiene practices in addition to their feeding practices. More children who were second in order of birth among their siblings were caries free compared to their 1st born or those who ranked third or more (36.1%, 29.5% and 20.8% respectively). The child order among siblings was significantly associated with caries severity ($p=0.001$). A study also found that a child order more than fourth born in a family was significantly associated with higher ECC prevalence ($p=0.001$) and severity ($p=0.003$) compared with earlier born children. Other studies found that the only child in the family, the first-born and the second child were all found to have the same possibility of presenting ECC. This result might be due to that in larger families, some children receive less parental care than other children, were one of the older siblings for example might take care or supervise the tooth brushing of his younger brother or sister instead of the parents [43]. More children with no caries among siblings were caries free than those whose siblings had caries ($p<0.0001$). This comes in agreement with a study which found that 31% of children with ECC had a sibling with ECC [21]. This

might be to similar social and behavioral aspects; siblings were subjected to. That's although parents might know that certain behaviors might lead to ECC, and although they might have a child already suffering from ECC still they continue in these behaviors with the rest of their children. This confirms the generally agreed-upon principle that education alone is insufficient to produce behavior change [17]. More children of older mothers (>25 years) were caries free compared to children of younger mothers (20-24 years and <20 years) (p=0.002).

Also, more children of better educated mothers (university and secondary school) were caries free than less educated mothers (primary education) (p<0.0001). This finding was in agreement with the study conducted in Australia [34] and another study [44]. A possible explanation might be the absence of adequate dental knowledge and health beliefs, in younger mothers [34]. More children whose father's occupation was professional were caries free than children whose fathers were workers (p<0.0001). This agrees with many studies which found that the prevalence and severity of ECC showed a significant linear increase with decreasing annual family income and decreasing level of education [34, 45]. ECC is a social problem because it clusters in members of low socioeconomic class in society [46]. A possible explanation might be that oral health, especially involving baby teeth, is not a priority to many who live in poverty. Also, low socioeconomic status individuals have a fatalistic point of view regarding their health [47]. Concerning canes severity; no significant difference was noticed between children who were breast fed and those who were not (p=0.59). More children who were not bottle fed were caries free than those who were bottle fed (p<0.0001). This agrees with a study conducted in Kuwait [48]. Duperon has suggested that ECC associated with misuse of feeding bottles occurs in lower socioeconomic status families. Whereas ECC associated with improper breast feeding practices tends to occur in children of well-educated parents who believe that breast-feeding imparts a sense of closeness and well-being and facilitates the transfer of passive antibodies in their offspring [49].

CONCLUSION

The findings of this study demonstrate that ECC remain a serious and urgent problem among preschool children in Lebanon and is demonstrated by an interplay of social, mental, racial, familial, community, government, and work policies. The results of this study showed that the prevalence of ECC was found to be (70.4%). As for the severity (38.2%) had mild early childhood caries, (27.1%) had moderate early childhood caries, while only (4.4%) had severe early childhood caries. ECC was not found in (29.6%), who were caries free. The factors which were mainly associated with ECC and showed significant difference after analyzing the data were as follows: The age as it increased from 3 to 5 years (p=0.0001). Children from low socioeconomic class in public schools (p 0.0001). Larger families with higher number of children (p 0.0001). Child order among siblings (p=0.001). Caries among siblings were more children with no caries among siblings were caries free than those whose siblings had caries (0.0001). Children of older mothers (25 years) were more caries free compared to children of younger mothers (20-24 years and 20 years). Children of less educated mothers (p 0.0001). Children whose fathers were workers (p=0.0001). These factors could be modified by public health strategies, such as establishing a program to address the need for extensive dental care for children with ECC and the needs of their families. Educational programs that are community based and community tailored, and measuring performance should develop at the community level, utilizing and promoting the role of trained oral health professionals (Pedodontists, GP dentists, hygienists and community-based dental educators).

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