
Research Article

Social and Behavioral Determinants of Early Childhood Caries in the Aseer Region of Saudi Arabia

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Abstract

Introduction

Early childhood caries is a complex, serious and multi-factorial origin disease that involves the susceptible tooth and host, fermentable carbohydrates and cariogenic micro-organisms with the passage of time. The aim of this study and discuss was to analyze the influence of socio-behavioral variables on the prevalence of dental caries among children between four and five years old.

Method

A cross-sectional survey was performed on a sample of 422 children presented to select five Primary Health Care Centers in the Aseer region of Saudi Arabia. The investigation was conducted using The World Health Organization Methodology, decayed, missing, and filled teeth index, and detection criteria for non-cavitated lesions. A tested, self-administered questionnaire was distributed to parents to obtain information about their socio-behavioral characteristics.

Results

It was found that caries have been significantly more prevalent in children from families with employed mothers ($p=0.00811$). The presence of dental caries was found to be associated with the absence of oral health educators, oral health improving programs and oral health campaigns ($p=0.0012$).

Conclusion

High caries prevalence (77.73%) and a lack of caries treatment are revealed among Saudi pre-school children in the Aseer region in this study. The present study has identified risk factors of ECC in pre-school children within a Saudi community. ECC risk can significantly increase for children living with an occupied mother ($p=0.00811$), consuming more sweets ($p=0.00001$), and an absence of oral health educators and oral health promotion programs ($p=0.0012$). These factors could be modified through public health strategies, such as practical health advice, effective publicity concerning general dental health and developing effective strategies to promote awareness amongst the Saudi community.

Keywords

Behavioral; Caries; Children; Oral; Saudi; Social; ECC

Introduction

Early childhood caries is a complex, serious and multi-factorial origin disease that involves the susceptible tooth and host, fermentable carbohydrates and cariogenic micro-organisms with the passage of time [1,2]. Early Childhood Caries (ECC) has been defined as a rampant dental disease that affects mostly young children up to 71 months of age. In recent decades, there have been significant betterments in the oral health of pre-school goers in many developed countries [3]. However, dental caries still affect a considerable number of children. Recent studies have shown that dental decay has diminished in the Caribbean and Latin America [4]. In Brazil, there was a 17% decrease in dental caries between 2003 and 2010, and the (dmft index), decayed, missing, and filled teeth index, for 5-year-old children decreased from 2.80 to 2.30 [5].

Researchers have attempted to expand the basic microbiological models for ECC development to include various behavioral, demographic and social factors such as family status and income, tooth brushing habits and parental knowledge and beliefs, maternal education level [6,7]. Although the predictive power of the variables studied so far was inconsistent, the high disease experience within selected community groups suggests the potential impact of factors other than the existence of Mutants streptococci unique in contributing to ECC up growth. Other cross-sectional models manifest the complex interfere between ethnicity, Socio-Economic Status (SES), fluoride exposure, oral hygiene, infant feeding and ECC presence in preschool children [8-17]. However, extrapolation of current risk assessment models to the general population is still problematic because most studies of ECC have been conducted among lower socio-economic communities and specific ethnic.

In Saudi Arabia, recent studies have shown the high prevalence of dental caries among pre-school children and adults. Most of the studies that have been conducted in Saudi Arabia have shown significant association between the high prevalence of early childhood caries and some social and behavioral factors [18-21]. Although these factors have shown significant association, there are still other non-investigated factors that have not been reported previously in Saudi child population. The purpose of this study, therefore, was to discover and discuss the relationship between the presence of ECC in the 4-5 years old Saudi child population and selected social and behavioral variables.

Objective

The objective of this study was to analyze the influence of selected socio-behavioral variables on the prevalence of dental caries in the 4-5 years age group of pre-school children within the Aseer region of Saudi Arabia.

Method and Design

A cross-sectional study involving the young pre-school Saudi child population, aged between 4 and 5 years in the Aseer region - a region located in the Southern part of Saudi Arabia, was conducted. For this purpose, information was obtained using prevalence data - percentage with caries. In the present study, the participants were children aged between 4 and 5 years who were treated at dental clinics in five selected Primary Health Care Centers in the Aseer region, Saudi Arabia with their parents or at least one of them throughout the period between March to May 2015. For this, a self-administered questionnaire to obtain information regarding selected social and behavioral variables was prepared. The questionnaire consisted of 24 items varying between Multiple Choices Questions (MCQs), Likert scale and short essay questions. Moreover, the questionnaire was divided into three sections each of them consisted of eight items and pretested on 30 randomly selected individuals who came to the Although Primary Health Care Center, one of the previously selected centers. Additionally, the first section of the questionnaire was prepared to investigate Parents' knowledge in regard of dental caries, the second section to gain information regarding selected social and behavioral variables and the third section to inspect ECC experience and practices. The investigators were the dentists working at the selected dental clinics after we assured that they were aware of the WHO criteria for detecting caries by means of interviews. The parents were asked to complete the questionnaire in the clinic while dentists were screening their kids. The investigation was conducted using the decayed, missing, and filled teeth index (World Health Organization Methodology) and detection criteria for non-cavitated lesions. A tested, self-administered questionnaire was administered to one of the parents among all the participants to obtain information about their socio-behavioral characteristics. Then, the data were modelled using chi square test at the 5 per cent level of significance using SPSS software.

Permission to conduct the study obtained from the Institutional Review Board, King Fahad Medical City, Riyadh, Kingdom of Saudi Arabia. Also, verbal consent obtained from all the participants.

Results

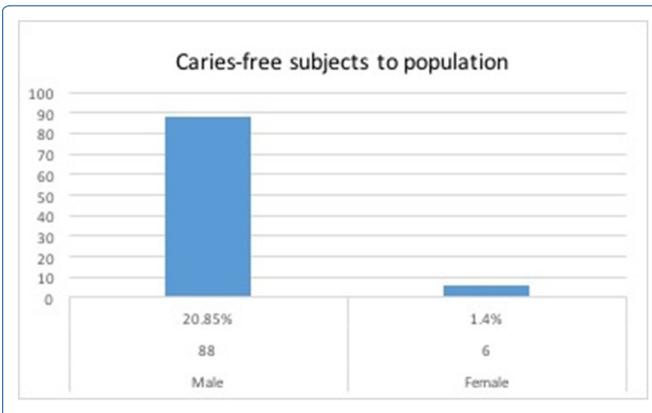
Of the 422 children examined, the prevalence of caries was seen in N=328 (77.73%). The prevalence of caries in female children was higher i.e., 96% compared to those among male children, which was 68%. The difference in the prevalence of caries was statistically significant i.e., $X^2=43.13$, $df=1$, $P_{value}=.00001$ (Table 1 and Figure 1).

Children aged between 24-36 months showed a higher caries prevalence of 89% (N=124) and there was a statistically significant relation between age of children and the prevalence of dental caries viz. $X^2=15.32$, $df=2$,

Gender	Caries free to population			Caries affected to population			Total number of participants according to gender	
	Frequency	% to same gender	% to final sample	Frequency	% to same gender	% to final sample	Frequency	%
Male	88	32	20.85	187	68	44.31	275	65.17
Female	6	4	1.4	141	96	33.41	147	34.83
Total	94		22.27	328		77.73	422	100

Table 1: Distribution of children according to gender and caries experience.

$\chi^2=43.13$, $df=1$, $P_{value} = .00001$



$P_{value}=0.000471$ (Table 2). With regard to occupation of mothers, more than 70% (N=299) of children had employed mothers and 29.14% with mothers who were house wives, out of which 80.27% of the children with employed mothers had caries. There was a statistically significant relation between occupation of mothers and the prevalence of dental caries i.e., $\chi^2=7.009$, $df=1$, $P_{value}=0.00811$ (Table 2)

Of the sample, 69.2% (N=292) favored sweets in meals and during day over salts, while 30.8% (N=130) and 53.79% had eaten sweets everyday at least once. In addition, 92.12% of children, who favored sweets, had caries. There was a statistically significant correlation of dental caries prevalence with type of favored meals viz. $\chi^2=113.50$, $df=1$, $P_{value}=0.00001$ and with eating sweets $\chi^2=125.11$, $df=2$, $P_{value}=0.00001$ (Table 2).

According to data, only 25.36% of children (N=107) brushed their teeth, 63.55% of them had no caries; whereas, of the 78 out of 422 children who used Siwak to brush their teeth, 82.1% of them had caries. The majority of children in this study (N=191) recorded in the “Mixed group”, used both toothbrush and Siwak to brush their teeth. It is found that 94.76% of children in the “Mixed group” had caries. There was a statistically significant correlation between caries prevalence and the method to apply oral hygiene i.e., $\chi^2=144.17$, $df=3$, $P_{value}=0.00001$ (Table 2). The majority of sample (N=291) 68.96% chose soft drinks, out of which 94.16% had caries. There was a statistically significant relation between prevalence of dental caries and type of drinks i.e., $\chi^2=159.76$, $df=2$, $P_{value}=0.00001$ (Table 2).

A total of 97.87% (N=413) of the final sample recorded that they had not attended or were not invited to any lecture

or campaigns related to oral health care; in this group, 78.7% (N=325) had caries. A statistically significant correlation was found between caries prevalence and attending oral health care programs and participating in oral health care campaigns i.e., $\chi^2=10.46$, $df=1$, $P_{value}=0.0012$ (Table 2). Although most of the final sample (N=420) had no dentist at school or did not know about dental health, there was no statistical significant correlation between dental caries prevalence and presence of a dentist at school; $\chi^2=4.76$, $df=2$, $P_{value}=0.0926$ (Table 2).

Discussion

This study is a desired since it is the first epidemiological study for ECC presence conducted within the Aseer region. The new findings in the present study can be utilized in the development of more effective strategies for oral health promotion and prevention of ECC within this community. As compared with the previous studies in Saudi Arabia, prevalence of ECC among the children aged between 4-5 years in the Aseer region was found to be lesser than some studies conducted at Riyadh [21-23], Tabuk [24] and Alahsa [25] and higher than some other studies conducted at Jeddah [26,27] and Tabuk [28].

In this study, significant association was found between the gender of the child and ECC. The prevalence of ECC among female children (95.5%) was more than that in male children (68%), which is contrary to many studies conducted in Saudi Arabia and other parts of the world [29-35]. Taking into account customary habits in this community like the possibility of male children to go out with their fathers and remain under care for a longer time than female children, this could shed the light on the cause of increased prevalence of ECC among female children.

Significant association was also found between the age of the child and ECC. This finding counteracts with the findings by Alkarimi HA, Khristine Marie G. in Philippines, SevalOlmez in Turkey and Wendt L.K. in Sweden. It was shown that the lower age is associated with higher prevalence of ECC, whereas they found that higher age is associated with higher prevalence of ECC among the children [36-39].

Influence of family variables on the presence of ECC reported to be high in previous studies conducted in this regard [40-46]. In this study, children of employed mothers have shown higher prevalence of ECC than those living with housewife mothers. Hence, there is a significant association

	Caries free to population		Caries affected to population		Total	X ²	df	P _{value}
	Frequency	%	Frequency	%				
1.Age (months)								
24-36	14	11	113	89	127	15.32	2	0.000471
37-48	27	22.88	91	77.11	118			
49-60	53	30	124	70	177			
2.Mother occupation								
Housewife	39	32	84	68	123	7.009	1	0.00811
Employed	59	19	240	81	299			
3.Favored meals								
Sweets	23	8	269	92	292	113.5	1	0.00001
Salts	71	55	59	45	130			
4.Eating sweets								
Everyday	16	7	211	93	227	125.1	2	0.00001
Once/twice per week	29	23	97	77	126			
No	49	71	20	29	69			
5.Oral hygiene								
Toothpaste and brush	68	64	39	36	107	144.17	3	0.00001
Siwak	14	18	64	82	78			
Mixed	10	5	181	95	191			
Nothing	2	4	44	96	46			
6.Diary drinks								
Sweetened tea and coffee	2	17	10	83	12	159.76	2	0.00001
Soft drinks	17	6	274	94	291			
Only water	75	63	44	37	119			
7.Importance of dental treatment								
Very important	11	19	46	81	57	36.11	2	0.00001
It depends	27	12	191	88	218			
Not important	56	38	91	62	147			
8.Is there dentist at school where your kid study								
Yes	1	50	1	50	2	4.76	2	0.0926
No	31	29	76	71	107			
I don't know	62	20	251	80	313			
9.Did you attended to oral health lectures or campaigns at your village								
Yes	6	67	3	33	9	10.46	1	0.0012
No, there is not	88	21	325	79	413			

Table 2: Knowledge in regard of dental caries and social factors, and ECC experience.

between the occupation of the mother and the prevalence of ECC. This may attributed to that children with employed mothers always spend the most of the day time without supervisor and to difficulty of finding a kindergarten in this area.

The highly significant role of sweets and soft drinks in higher prevalence of ECC is evident from the findings of this study, which are supportive to the findings by Ghanim, Jose B. in Kerala, Rosenblatt, Bankel and others [47-54].

The notable issues like poor oral health services, absence of oral health educators at schools and villages, and loss of oral

health campaigns have been shown to be major determinants of ECC in the present study. Findings such as the method of cleaning teeth and frequency of eating sweets have shown significant relationship in the current study.

Conclusion

A high caries prevalence (77.73%) and a lack of caries treatment are revealed among Saudi pre-school children in the Aseer region in this study.

The current study has identified risk factors for presence of ECC in pre-school children within a Saudi community.

ECC risk can significantly increase by the child living with an occupied mother ($p=0.00811$), consuming more sweets ($p=0.00001$) and absence of oral health educators.

These factors can be modified through practical health advice and public health strategies, such as effective publicity concerning general dental health. The oral health promotion and education programs should address these risk factors to fight ECC and develop effective strategies to promote awareness amongst the Saudi community.

The establishment of kindergartens in mother's workplaces and taking into account the employed mothers by employers could participate in the reduction of ECC.

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