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Research Article

Effect of Sociodemographic Variables on Caries Among Preschool Saudi Children

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Abstract

Introduction: Early childhood caries (ECC) is one of the most common dental conditions found in young children, and its prevalence appears to be increasing. The rates of ECC are highest among the socially disadvantaged such as low socioeconomic groups and indigenous and ethnic minorities. The behavioral risk factors that are directly involved in ECC have been well documented. In the majority of cases, the child is given a nursing bottle containing sweet fluids, frequent snacks, and there is lack of tooth cleaning. Although the adverse feeding patterns associated with ECC are well described, the maternal psychosocial and cultural factors underlying these behaviors that place a child at risk for ECC are unclear. Thus, there are highly complex pathways connecting a mother's behavioral patterns with the child, family, and society that can impact on her child's oral health. During the past few years, many epidemiological studies were carried out comparing caries prevalence and oral hygiene levels in children; however few studies are done in Saudi Arabia. Little information is available regarding the oral health of the Saudi population. Data on caries prevalence in preschool children in Saudi are few compared with information on school children.

Objectives: To determine the relation between dental caries and sociodemographic variables in a sample of Saudi preschool children in Jeddah area, Saudi Arabia.

Materials and methods: A cross-sectional survey carried out on 602 preschool children aged 2-6 years (mixed dentition), the samples were randomly selected from King Abdulaziz University Hospital and multiple health care centers from Jeddah city, Saudi Arabia.

Methods of data collection

Questionnaires: A structural questionnaire concerning sociodemographic information, oral hygiene, habits, water consumption and diet information will be collected.

Clinical examination: The teeth will be clinically examined using a flashlight with the child facing a window, using sterile disposable mirrors and probes, according to the WHO class III classification (World Health Organization). The examination is done using dmft/DMFT index. Clinical examination findings are to be recorded in a WHO simplified data collection charts. After clinical examination, each child will receive a copy of the examination chart indicating the treatment plan for his/her teeth.

Statistical analysis: The entire information obtained from this study was scrutinized using One-Way ANOVA or t-test version @ 0.05 levels.

Results: A total of 602 children with a mean age of 4.79 (SD = 1.31) were included in this study. Father's education with university degree; the dmft/DMFT mean was 2.90 (SD = 3.46), while with intermediate education & below; the dmft/DMFT mean was 4.65 (SD = 4.09). Mother's education with university degree; the dmft/DMFT mean was 2.93 (SD = 3.48), while those with intermediate education & below; their dmft/DMFT mean was 4.63 (SD = 4.00). Father's job whether medical or professional; the dmft/DMFT mean was 2.30 (SD = 2.93), while for operational & technical; the dmft/DMFT mean was 4.22 (SD = 4.41). Mother's job if employed; dmft/DMFT mean was 2.87 (SD = 3.38), while housewife; dmft/DMFT mean was 3.67 (SD = 3.87). Number of children; if one child only, dmft/DMFT mean was 2.50 (SD = 3.49), but more than three children; the dmft/DMFT mean was nearly 4.29 (SD = 3.96). Child's gender if boys; dmft/DMFT mean was 3.59 (SD = 3.82), while for the girls; the dmft/DMFT mean was 3.01 (SD = 3.50). Child's age ranged between 1-3 years old; the dmft/DMFT mean was 3.39 (SD = 3.81), while for those ranged between 3-6 years old; the dmft/DMFT mean was 4.53 (SD = 3.63).

Conclusions: Lower level of parent education, low parents Income, low socioeconomic status, increased number of children in the family, effect of gender and increased age could be risk factors for increased caries levels among a sample of preschool children in Jeddah area.

Keywords: *Caries; preschool children; Jeddah; Saudi Arabia; ECC; DMF and oral health needs*

Abbreviations: ECC: Early childhood caries; WHO: World Health Organization; SD: Standard Deviation

Introduction

Despite major advances in the field of caries prevention over the past few decades, there are several reports of high early childhood caries (ECC) prevalence in young children [1]. Today, all experts on dental caries generally agree that it is an infectious and communicable disease and that multiple factors influence the initiation and progression of the disease. ECC is one of the most common dental conditions found in young children, and its prevalence appears to be increasing. The rates of ECC are highest among the socially disadvantaged such as low socioeconomic groups and indigenous and ethnic minorities [2]. The behavioral risk factors that are directly involved in ECC have been well documented. ECC has been posing a challenge to the dental profession throughout the developing and developed world. In Saudi Arabia, dentists working with children have long expressed their concerns about the seriousness of the ECC problem [3]. Social factors were shown to be the most important determinants of caries experience. Although the adverse feeding patterns associated with ECC are well described, the maternal psychosocial and cultural factors underlying these behaviors that place a child at risk for ECC are unclear. A mother's health behavior often reflects her own personality and age as well as her familial, cultural, ethnic, and educational background [4]. On the other hand, a mother is also influenced by her child's response and temperament as well as community and cultural factors. Thus, there are highly complex pathways connecting a mother's behavioral patterns with the child, family, and society that can impact on her child's oral health. During the past few years, many epidemiological studies were carried out comparing caries prevalence and oral hygiene levels in children; however few studies are done in Saudi Arabia. Dental caries critically impacts the health and development of children [5]. In order to combat dental caries in children, it's important to investigate factors that could affect the inanition and increase of carious process. ECC usually affects primary dentition of children aged between 1 to 6 years old. ECC includes rampant caries, nursing caries and incipient caries. As known, ECC has many risk factors such as inappropriate feeding, inadequate oral hygiene, failure of professional dental care, frequent sugar snacks between meals and feeding bottles containing sweet fluid during bedtime, awareness of mother and the background of the parents play a great role in the process of ECC [6]. As well as misconception and false beliefs in the community and the etiology of ECC. Mother's education level has an active role in solution for this problem. All these factors represent important risk factors in ECC. The main reason of the ECC is the lack of cleaning teeth with sweetened fluids during

lactation and snacks that are given to the child [7]. The attitude of the mother usually reflects her own character, age, familial, cultural, racial, educational, awareness and beliefs as well as the child response; mode and community concepts have also an impact on mothers' attitude. Children below the age of 5 years can have many oral health problems such as teething pains, ECC and dental trauma [8]. While pediatric dental research has tended to focus on the cause and epidemiology of these problems, the impact these problems have on the functional, social and psychological wellbeing of the family has received far less attention [9]. During past few years, many studies had been conducted to compare caries prevalence and oral hygiene levels, however few studies had been carried on oral health of children in Saudi Arabia.

Materials and Methods

The research consists of a cross-sectional study of 602 preschool children aged 2-6 years with mixed dentition. They were randomly selected from multiple health care centers and King Abdulaziz University Hospital distributed in the north, middle, and south of Jeddah, Saudi Arabia. After approval of study protocol by institutional ethics committee, a self-administered questionnaire comprising of 22 questions was dispersed by the researchers to his/her parents concerning the sociodemographic information, oral hygiene, habits, education and profession, and finally collected. [10]. Study subjects selected were medically free and healthy children. They have been examined intra-orally using dmft/DMFT index status. The teeth were to be clinically examined using a flashlight with the child facing a window, using sterile disposable mirrors and probes, according to the WHO class III classification (World Health Organization). After clinical examination, each child will receive a copy of the examination chart indicating the treatment plan for his/her teeth.

Statistical Analysis

The information obtained from this study was scrutinized using One-Way ANOVA or t-test version @ 0.05 levels.

Results

Father's education had an impact on caries levels; children with fathers having higher education had less dmft/DMFT score than those whose fathers having only high school or intermediate education. Mother's education also had a significant impact on caries levels; the children of highly educated mothers had less dmft/DMFT score than those whose mothers owning low or intermediate education. Father's job did not have any significance on dmft/DMFT levels in this research. Regarding mother's job; if employed; children had less significant dmft/DMFT levels compared to children whose mothers are housewives. Number of children; increased number of children especially more than two had a significant effect in increased dmft/DMFT caries levels in the study sample. Child's gender; girls had less dmft/DMFT levels which were significantly lesser than boys.

Child's age; older children had significant higher dmft/DMFT levels compared to younger children. Using tooth brush or not; there was no significant difference in dmft/DMFT score. Using toothpaste with a brush or not; using toothpaste did not have any significant difference on dmft/DMFT levels. Who put the toothpaste; when the mother placed the toothpaste, there was a lower significant difference in dmft/DMFT levels compared to when the child placed the toothpaste. When mother supervised the child during brushing; it had a significant decrease in dmft/DMFT score compared to when the child did it without supervision. Regarding the dental visit, there was none significant difference in dmft/DMFT numbers. If the child knew about fluoride or not; did not have any significant number on dmft/DMFT levels.

Brushing Frequency; after every meal, day and night, once a day, before sleeping and sometimes did not have any significant difference on dmft/DMFT levels. Amount of toothpaste used covering full, half of the brush or pea size had a significant difference on dmft/DMFT levels.

Demographics VS Caries		N = 602	dmft/DMFT		
			Mean	SD	P Value
Father's Education	Bachelor and Above	448	2.90	3.46	< 0.001*
	High School	114	4.74	4.07	
	Intermediate & Below	40	4.65	4.09	
Mother's Education	Bachelor and Above	429	2.93	3.48	< 0.001*
	High School	127	4.40	4.05	
	Intermediate & Below	46	4.63	4.00	
Father's Job	Medical	37	2.30	2.93	0.072
	Operational & Technical	41	4.22	4.41	
	Professional	427	3.43	3.76	
	Supervisory & Managerial	68	2.72	3.39	
	Others	29	4.10	3.13	
Mother's Job	Housewife	374	3.67	3.87	0.008*
	Employed	228	2.87	3.38	
Number of Children	One	50	2.50	3.49	< 0.001*
	Two	194	2.71	3.22	
	Three	183	3.42	3.83	
	More than 3	175	4.29	3.96	
Child's Gender	Male	369	3.59	3.82	< 0.001*
	Female	233	3.01	3.50	
Child's Age	1-3 yrs.	121	0.78	2.00	< 0.001*
	> 3-5 yrs.	217	3.39	3.81	
	> 5 - 6 yrs.	264	4.53	3.63	

Discussion

Children whose fathers had higher education levels showed less dmft/DMFT levels than those whose fathers graduated with high school or intermediate education, this is could be related to highly educated fathers have better socioeconomic status, more knowledge and awareness of the importance of maintaining good oral hygiene as stated in accordance with Al-Khateeb *et al*. and Al-Shammery [7,8]. Mother's education had also a significant impact on caries levels; the children of highly educated mothers had less dmft/DMFT levels than children whose mothers with low or intermediate education and this is could be attributed to that highly educated mothers have more knowledge and care for maintaining good oral hygiene for their children. Father's job did not have any significance on dmft/DMFT levels in this research. Regarding mother's job; when employed, children had less significant dmft/DMFT levels compared to children whose mothers are housewives, this could be explained that although its common in Saudi society that females are preferred to be housewives, but working mothers would be looking for a better house environment for their children including better oral health. This is in accordance with the work of Hamdan et al ,who found a significantly higher caries prevalence and mean dmft, when observed in children whose mothers presented with the lowest level of education in a sample of Jordanian children [11].

Number of children; increased number of children especially more than two had a significant effect in increased dmft/DMFT caries levels in our study sample, this could be due to that increased number of children will have less care and supervision of parents compared to younger family with two children only. Child's gender; girls had less dmft/DMFT levels, which were significantly lesser than boys. Girls usually tend to search for a better smile and better look, which necessitate them to maintain good hygiene and nice looking.

Child's age; older children had significant higher dmft/DMFT levels compared to younger children. It is well documented that when teeth stays longer in the mouth, the more liable to be affected by caries. Using tooth brush or not; there was no significant difference in dmft/DMFT score, actually this result was confusing and the only explanation for it is that as part of the Saudi tradition to use meswak, which is similar in its effect as tooth brush and its natural component helps in reducing dental and periodontal problems.

Using toothpaste with the brush or not; using toothpaste did not have any significant difference on dmft/DMFT score, as the research indicated that the main effect was related mainly to the tooth brush itself and toothpaste is just a lubricant to maintain better taste and effect. When the child was supervised by mother during brushing and while applying the tooth paste over the brush, a huge significant difference was found in dmft/DMFT levels. This could be explained that mother would be more meticulous than children in applying the toothpaste.

Neither concerning the dental visit nor the knowledge about fluoride application had a significant difference on dmft/DMFT numbers. Brushing Frequency; after every meal, day and night, once a day, before sleeping and sometimes, there was no significant difference on dmft/DMFT levels.

Conclusion

Lower level of parent education, low parents Income, low socioeconomic status, increased number of children in the family, effect of gender and increased age could be risk factors for increased caries levels among a sample of preschool children in Jeddah area.

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