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ORIGINAL ARTICLE

Dental Caries: Epidemiological & Public Health Approach among Children of District Nowshera Khyber Pakhtunkhwa Pakistan

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ABSTRACT

Background: Dental caries is a global public health problem, and affects 60-90% of children; and has relationship with social; dietary; and behavioral factors. The main objective of this study was to assess the frequency and risk factors of dental caries among children of District Nowshera Pakistan.

Methods: A descriptive cross sectional study was conducted in District Nowshera, in which a total of n=295 children were examined regarding presence of dental caries, from January to April 2022. A structured questionnaire was used to collect data regarding determinants of dental caries and its risk factors from parents. Data was analyzed by SPSS and results were presented in form of tables.

Results: The results showed that 60.68% of children had dental caries. Approximately, 54.92% were male; 64.41% had age < 5 years; 42.03% were working mothers; and 53.56% were form rural setup. Moreover; 46.78% use toothbrush; 26.78% use fluoride toothpaste; 73.56% were breastfed; 20.0% were bottle fed; and 83.39% had night feeding. Furthermore; 29.49% children preferred high caloric food intake; 32.88% prefer sugars in food; and 47.80% added sugar during bottle feeding of their children.

Conclusions: It was concluded that dental caries showed moderate to high frequency among children; and showed strong relationship family income, body mass index, parent's education level; and job status of parents. Moreover, frequency of tooth-brushing, fluoride tooth-paste, and sugar preference showed association with dental caries and thus social, dietary and health promotion strategies were needed to reduce prevalence and complications of dental caries.

Keywords: Dental Caries, Toothbrush, Fluoride; Caloric Diet; Bottle Feedings; Nowshera, Pakistan

INTRODUCTION

The most frequent chronic illness in children's teeth is dental caries, which is a significant public health issue [1] [2] [3]. There are many contributing causes to dental caries, including bacteria, genetics, biochemistry, and social factors [4–5]. Many studies revealed that irregular brushing, late adoption of brushing habit, feeding practices, night feeding, snacks intake, low fruits, and high intake of sweet beverages were associated with dental caries [6] [3] [7].

There is a global public health issue with dental caries, risk factors are related to biological, socio-economical, dietary and behavioral factors [8] [9]. Changing one's diet and way of life can reduce one's risk of obesity and dental caries; and many studies revealed that as the BMI increases, dental caries decreases [10] [11] [8]. The highest rates of dental caries persist among socioeconomically disadvantaged children [12]. Moreover, parental occupation, family income and education level affects how many children have dental cavities [3] [9] [8]. Furthermore, children with low socio-economic status, increased stress and poverty have higher risk of dental caries [13] [4] [10]. Furthermore, many international studies identified that food and nutrition choices have a significant impact on the development of dental caries in children, and flavoured food items have been linked to an increased risk of dental caries [7] [14] [5].

Children oral health behavioral practices like lack of mixed foods, and frequent sweet beverages were associated with dental caries and thus affects growth and quality of children life [11] [13] [14] . The WHO estimates that 60-90 percent of schoolchildren globally suffer from dental caries, with Asians and Latin Americans having the highest rates [15] [7]. Moreover, early childhood caries is represented as one of the most prevalent dental problems worldwide [7]. Preschool years is of vital importance for the development of child health and approximately 90% of preschool children has dental caries [6]. Furthermore, children with working mothers had less dental caries prevalence and thus supported the findings that high educational levels of mothers [5].

Dental caries is a common among children and is considered as a global public health problem. Thus this cross sectional study was conducted to assess the frequency of dental caries and its determinants among children of district Nowshera Khyber Pakhtunkhwa Pakistan; and to communicate findings to the concerned departments regarding prevention and control of dental caries among children.

METHODS

After getting ethical approval; a cross sectional study was conducted from January to April 2022, by the Department of Dental Surgery, Qazi Husain Ahmad Medical Complex, Nowshera, Khyber Pakhtunkhwa Pakistan. Based upon 75% prevalence; and 95% confidence level, a sample of n=295 children were screened. Children with age between 1 and 10 years were included while those who were not permanent residents of District Nowshera were excluded. Moreover, preliminary information was collected from parents along with important determinants of family and parents. Furthermore, behavioral and social determinants of family were also assessed via a structured questionnaire having information regarding demographics, social, personnel and behavioral determinants. Qualified dental surgeons expertise was used to assess the oral cavity for presence and or absence of dental caries. SPSS version 23.0 & Microsoft Office Software was used for data entry and analysis; and results were showed table forms.

RESULTS

Table 1: Frequency of dental caries in Pakistan's District Nowshera, where there are 295 children.

Variables	Response	n=295	
		F	(%
Dental Caries	Yes	179	60.68
	No	116	39.32

Table 2: Showing Demographic Characteristics of Children n=295 Of District Nowshera Khyber Pakhtunkhwa Pakistan

Variable	Response	F	%
Gender of child	Male	162	54.92
	Female	133	45.08

Completed Age of child	< 1 year	43	14.58
	1-4 years	62	21.02
	4-9 years	87	29.49
	10-16 years	103	34.92
Residence	rural	158	53.56
	urban	137	46.44
BMI Of Child	Undernutrition	59	20.00
	Normal	120	40.68
	Overweight	78	26.44
	Obese	38	12.88
Fathers Job status	Unemployed	69	23.39
	Govt Job	92	31.19
	Private Job	89	30.17
	Daily Wages	45	15.25
Mothers Job Status	Working Mother	124	42.03
	House Wives	171	57.97
Parents monthly income	< 25000 PKR	124	42.03
	25-45000 PKR	73	24.75
	45 & Above	98	33.22
Patents education status	Illiterate	61	20.68
	Primary/ Secondary	94	31.86
	Intermediate/ Bachler	89	30.17
	Master & Above	51	17.29
Parents tobacco smoking	Yes	138	46.78
	No	157	53.22

Table 3: Showing Determinants of Dental Caries among Children n=295 Of District Nowshera Khyber Pakhtunkhwa Pakistan

Breast feeding	Yes	217	73.56
	No	78	26.44
Breast feeding at night	Yes	257	87.12
	No	38	12.88
Bottle feeding	Yes	59	20.00
	No	236	80.00
Bottle feeding at night	Yes	184	62.37
	No	111	37.63
Mixed feeding	Yes	272	92.20
	No	23	7.80
Mixed feeding at night	Yes	246	83.39
	No	49	16.61
Weaning started at which age	< 4 months	31	10.51
	4 Months	57	19.32
	6 Months	95	32.20
	9 Months	79	26.78
	1 year & Above	32	10.85
Child prefer flavored milk	Yes	146	49.49
	No	149	50.51
Child prefer high caloric food intake	Yes	87	29.49
	No	208	70.51
Child prefer sugar intake	Yes	97	32.88
	No	198	67.12
Sugar added in bottle feeding	Yes	141	47.80
	No	154	52.20

Table 3: Showing Determinants of Dental Caries among Children n=295 Of District Nowshera Khyber Pakhtunkhwa Pakistan

Child routine dental examination	Yes	46	15.59
	No	249	84.41
Child dentist visit for dental problem	Yes	204	69.15
	No	91	30.85
Child toothbrush	Yes	138	46.78
	No	157	53.22
Child started Toothbrush	1st year	7	2.37
	2nd year	28	9.49
	3rd year	40	13.56
	4 & Above years	61	20.68
Child use fluoride toothbrush	Yes	79	26.78
	No	216	73.22
Child taking meal at regular intervals	Yes	84	28.47
	No	211	71.53
Child taking snacks in-between meals	Yes	175	59.32
	No	120	40.68
Parents routine dental examination	Yes	51	17.29
	No	244	82.71
Parents dentist visit for dental problem	Yes	39	13.22
	No	256	86.78
Parents Use toothbrush	Yes	217	73.56
	No	78	26.44
Parents use fluoride toothpaste	Yes	142	48.14
	No	153	51.86

DISCUSSIONS

In our study, the prevalence of dental caries among children was 60.68%; whereas in study conducted by Kato et al., 2017, revealed 14.75% dental caries prevalence among the children [8]. Moreover, in a study conducted by Alhabdan et al., 2018; revealed 83% of dental caries and in studies of Van Chuyen et al., 2021; Jing et al., 2016; and Shi et al., 2022; revealed 68.9%; 30.7% and 58.1% of dental caries among children respectively [10] [15] [3] [5].

In our study, among the studied children; 54% were male; whereas in international studies of of Shi et al., 2022 and Olatosi et al., 2020; revealed 52.77% and 47.6% frequency of male children among the study participants [10] [11]. Moreover, in our study; 79.32% of parents having dental caries were literate; whereas in study of Alhabdan et al., 2018; 73.9% of children parents were literate [3]. Moreover, in our study; 46.44% were residing in urban setup as confirmed and supported by study of Elamin et al., 2018; which revealed strong relationship of dental caries with urban residence [9]. Furthermore, in our study, 23.39% of parents were unemployed; whereas in study of Alhabdan et al., 2018; 34.25% of parents were unemployed [3]. Moreover, in study of Alraqiq et al., 2021; 66.7% were employed [1]. In our study; 47.46% of parents had education above secondary/ A-1 level; whereas in study of Alraqiq et al., 2021; 68.41% of fathers and 75.4% of mothers were educated; and in study of Olatosi et al., 2022; only 26.75% parents were educated [11] [1].

Our study revealed 15.59%; 69.15%; 20.68% and 59.32% of prevalence of routine dental checkups; visited during dental problem; started tooth brush after 4 years of age and took snacks between meals; whereas in study of Alhabdan 2018; found 21.1%; 11%; 16.82% and 47.26% for the discussed determinants respectively [3].

In a study, published by Obregon et al., 2019, found that 65.8% of children used toothbrush and 90.5% of them used fluoride toothpaste; whereas our study showed 46.78% and 26.78% prevalence respectively [16]. Moreover, in study of Kazeminia et al., 2020; 30% of dental caries children use fluoride toothpaste [7]. Furthermore, in our study; 73.56% of parents toothbrush their teeth whereas it was 91.3% among parents in study of Obregaon et al., 2019 [16]. Furthermore, in study of Olatosi et al., 2022; 46.5%; 3.3%; 50.2% and 42.64% of dental caries children had prevalence of breast feeding; bottle feeding; mixed feeding; and feeding during night time; while in our study the prevalence was 73.56%; 20%; 92.2% and 83.39% respectively [11].

CONCLUSIONS

It was concluded that the prevalence of dental caries among children showed moderate to high frequency. Moreover, the socio-demographic; behavioral; dietary, and personnel determinants showed a strong relationship with dental caries. Furthermore, socio-economic status; living residence; parent's education and routine dental examination and dental visit during problem also showed strong relationship with dental caries among children. Thus awareness regarding food intake with dietary modifications, child feeding practices; health education and comprehensive preventive strategies were needed to control the epidemic of dental caries and to prevent the adverse effects of dental caries among children.

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