DOI: https://doi.org/10.54393/df.v1i02.27

DIET FACTOR
Journal of Nutritional & Food Sciences
https://www.dietfactor.com.pk/index.php/df
Volume 1 , Issue 2 (Jul-Dec 2020)

Original Article

Dental caries in children less than 5 years of age and its impact on Quality of Life

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Keywords: Dental Caries, Quality of life, DMFT, ECOHIS

How to Cite:
Batool, A., Faridi, T. A. ., Perveen, I. ., Khan, S., Khan, M. A., & Hassan, S. B. (2020). Dental caries in children less than 5 years of age and its impact on Quality of Life. *DIET FACTOR (Journal of Nutritional &Amp; Food Sciences)*, *1*(02). https://doi.org/10.54393/df.v1i02.27

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Article History
Received: 3rd October2020
Accepted: 7th November 2020
Published: 30th December 2020

ABSTRACT

Dental caries may have a huge and direct impact on the quality of life of an individual. In the case of children, it is even more important to have healthy teeth **Objective:** To evaluate the impact of dental caries on quality of life in children less than 5 years of age **Methods:** In this cross-sectional analytical study conducted in DHQ Hospital, Hafizabad, Pakistan, children of both genders and within the age range of 1-5 years. The decayed Missing Filled (DMF) Index was used for the assessment of dental caries. Data were analyzed by using SPSS version 23.0 **Results:** There was a high frequency (243, 65.7%) of dental caries in children. Mostly their parents were illiterate (70%) and children were not brushing their teeth regularly (93.8%). **Conclusions:** Poor oral hygiene and dental caries were associated with low quality of life.

INTRODUCTION

Children are predominantly susceptible to dental caries and gingival diseases due to their increased consumption of refined carbohydrates, their less attention toward the maintenance of oral hygiene, and socioeconomic factors have been found associated with oral discomforts and diseases [1-4]. The diagnosis of caries is carried out by checking the number of missing or filled teeth with the assistance of a mouth mirror and a source of light. *Streptococcus mutans* and *Streptococcus sobrinus* have been diagnosed as causative organisms leading to the formation of dental caries. As the infection spreads the pulp tissue toothache may develop which may lead to tooth decay [4- 9].

Among the developed countries, 60-90% of school children were found affected by the disease. Among certain developing countries, however, an increasing trend has been observed regarding the prevalence rates of dental caries [5, 6, 10]. Globally, the average standard age for the permanent dentition corresponds to 12 years. That is why as per the recommendations of the World Health Organization (WHO) twelve-year-old children are assessed for the presence of dental caries. The data accessed from the WHO datasheet for decayed, missing, and filled teeth (DMFT) index regarding twelve-year-old children from Pakistan have shown an increase in prevalence score rate from 0.9 to 1.38[11-18]. The disease has thus been regarded not only as a medical as well as a social problem faced by school-going children [5]. The prevalence of dental caries amongst the five hundred (500) school-going children of Peshawar has been surveyed, a mean DMFT score of 2.163 and a prevalence percentage of 72.4% were observed. Unsatisfactory improper or irregular teeth brushing practices (76%) and excessive consumption frequency of sweets, insufficient fluoride exposure, and high illiteracy rate were found among the leading causes of this high prevalence of dental caries [6, 8]. The disease has been regarded as amongst the 4th most expensive

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disease as far as its treatment expenditures are concerned. Its treatment requires up to the US $3513 per 1000 children which would exceed the health budget of most low-income countries [7].

METHODS

The current research was carried out in the form of an analytical cross-sectional study. The participants in this study were children aged 1 to 5 years old who visited the dental departments of the DHQ hospital in Hafiz Abad, Pakistan. Children between the ages of one and five years old were included in the study. Both boys and girls were included in the study. The research comprised parents and/or guardians who were willing to participate. The youngsters who were physically and intellectually impaired were excluded from the program. Furthermore, children with any chronic condition were not included in the research. There were two measurement scales utilized. The delayed-Missing-Filled Index was used to determine the prevalence of dental caries (DMF). The early children's oral health impact scale is used to assess the quality of life (ECOHIS). Good quality of life was defined as a score of more than 60% on the ECOHIS, while the bad quality of life was defined as a score of more than 60% on the ECOHIS. On a daily basis, the children were examined clinically and their parents/guardians were questioned. A structured questionnaire was used to collect socio-demographic and factor data. The parents were questioned and the data was recorded by the researcher. SPSS version 23.0 was used to enter, clean, and analyze the data. The Chi-Square test was used to determine the relationship between categorical variables. The independent t-test was performed to compare the means of continuous variables with the occurrence of dental caries. The p-value of 0. 05 was considered significant.

RESULTS

Almost fifty-five percent (54.5%) of children who used to brush their teeth on regular basis have shown the development of dental caries. Whereas sixty percent (66%) of children who did not brush their teeth regularly were found to develop dental caries. This difference was found statistically insignificant (p-value = 0.430). As far as brushing frequency is concerned 93.8% of children do not brush their teeth prior to breakfast whereas 7.5% of these children were found to develop caries. This difference between brushing frequency prior to breakfast and the formation of dental caries was found statistically significant ($p<0.001$). A statistically insignificant ($p=0.075$) association was found between the brushing frequency of children before going to bed (66.5%) and the development of dental caries (41.7%). Dental caries was more prevalent (66.7%) in children with the thumb sucking tendency. Whereas 65.6% of children with no such tendency of thumb sucking were found to the development of dental caries. This difference was also statistically insignificant (p-value = 0.916). Sixty percent of children (62.5%) with satisfactory oral hygiene were found to develop caries whereas 78.4% children with unsatisfactory oral hygiene were found to develop dental caries. This difference between oral hygiene and dental caries was found statistically significant ($p=0.01$). Calculus deposits have been found as a contributory factor in the formation of dental caries. Almost eighty percent of children (81.8%) with calculus deposits were found to develop caries followed by 64.1% of children with no calculus deposits who were found to develop dental caries. The calculus deposition and occurrence of caries were found associated as statistically significant (p-value = 0.041). As far as gum condition is concerned children with satisfactory gum (63.5%) condition were found with dental caries. Whereas 75.8% of children with unsatisfactory gum conditions were found the development of dental caries. This difference between gum condition and dental caries was found as statistically insignificant ($p=0.057$).

Variables		N	Mean±SD	t-test Value	p-value
Brush Teeth Regularly	Yes	11	12.33±16.0	10.18	0.595
	No	359	9.68±8.73		
Tooth -Paste Usage	Yes	123	9.79±9.29	0.052	0.959
	No	247	9.74±8.89		
Staining of Teeth	Yes	09	14.68±13.41	8.175	0.294
	No	361	9.63±8.86		
Calculus Deposit	Yes	33	15.14±9.31	3.657	<0.001
	No	337	9.23±8.82		
Dental Caries	Yes	243	13.99±7.36	314.73	< 0.001
	No	127	1.66±5.74		

Table 1: Comparison of DMFT scores between Oral Health Behaviors and Oral Diseases of the 1-5 years aged Children, Significant Value ($p<0.05$)

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DMFT scores among male and female children showed the mean score as 10.16±9.12 and 9.29±8.88. These differences between DMFT scores among gender showed no statistical significance (p-value=0.354). DMFT scores among ≤2.5 and >2.5 years children showed mean scores of 6.20±7.03 and 11.3±9.34, respectively. These differences between DMFT scores among age groups showed statistical significance (p-value <0.001). Children who had developed calculus deposits have shown DMFT mean scores of 15.14±9.31 and 9.23±8.82. These differences between DMFT scores and calculus deposits have shown statistical significance (p-value < 0.001). Children with and without dental caries have shown DMFT mean scores of 13.99±7.36and 1.66±5.74, respectively. These differences between DMFT scores and dental caries showed statistical significance (p-value = <0.001). (Table 1) ECOHIS scores among male and female children have indicated mean score values of 24.38±7.43 and 23.40±7.60, respectively. The ECOHIS mean score differences for both genders were not found statistically significant (p-value=0.208). ECOHIS scores among ≤2.5 and >2.5 years aged children have shown mean score values as 25.47±7.98 and 23.26±7.22, respectively. These ECOHIS mean score differences for both the age groups have shown statistical significance (p-value = 0.009).

DISCUSSION

A high prevalence of dental caries in males (67.5%) has been reported by our study as compared to females (63.6%). This finding has been found in contradiction to another India-based study where a high prevalence percentage was reported in girls as compared to boys [15]. On the other hand, the gender-wise prevalence of dental caries as reported by our study has also been found in accordance with other India-based and Karachi, Pakistan -based studies [16]. Our study found that prior-breakfast no brushing practice led to the formation of dental caries in the children which is in line with another Peshawar-based study where a relatively 8 percent lower prevalence frequency was observed in the children who used to brush twice than those who brushed only once[17]. The DMFT index has been regarded as an accepted parameter for the assessment of prevalence and severity in a population [19]. Our study recorded the mean DMFT scores as 9.76±9.00. Some studies, however, reported mean DMFT scores in correspondence to our study. For instance, a Saudi Arab-based survey reported an 80% prevalence ratio of caries with a mean DMFT score value equal to five [20]. Another American-based study indicated that school children in The United States of America (USA) are at high risk of developing primary tooth caries. The respective values calculated for mean DMFT scores were recorded as 8.4% and 10.2% for Aiken whites and Aiken blacks [21-22]. These mean DMFT scores indicated a very high level of DMFT in the United States which is in correspondence with the DMFT scores given by our study.

CONCLUSION

Poor oral hygiene and dental caries were associated with low quality of life.

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