

# FREQUENCY AND DETERMINANTS OF DENTAL CARIES IN LOCAL INHABITANTS OF A RURAL DISTRICT OF KHYBER PAKHTUNKHWA PAKISTAN

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## ABSTRACT

**Objective:** The objective of this study was to assess the frequency and determinants of dental caries in local inhabitants of a rural district of Khyber Pakhtunkhwa Pakistan

**Materials and Methods:** A cross-sectional survey was conducted in Lower Dir District of Khyber Pakhtunkhwa from September 2018 to February 2019. After taking ethical approval and informed consent from the participants, a total of 149 male adults were assessed regarding the frequency and determinants of dental caries through a self-developed survey tool validated by experts. The study participants were assessed for dental caries by a qualified dental surgeon and data was entered in Microsoft Excel, analyzed, and presented in form of tables.

**Results:** Our results revealed that 59.73% of the study population was in the age range of 25-45 years, 16.78% had a monthly income of less than Rs. 15000 and 48.99% were illiterate. Moreover, 69.13% were aware of the causes of dental caries, 69.80% used toothbrushes, 25% brushed their teeth twice daily, and 54.36% used fluoride toothpaste. Furthermore, 70.47% had a preference for sweet foods and carbohydrates, and 54.36% had poor oro-dental hygiene.

**Conclusions:** One-third of the studied population was suffering from dental caries. The different determinants identified in the survey were low socio-economic status, illiteracy, poor tooth brushing practices, and the use of fluoride toothpaste. Moreover, sweet food preference and oral hygiene status were frequently seen in patients with dental caries. Effective preventive, promotive, and curative services are needed to reduce dental caries and their complications.

**Key Words:** Dental Caries, Toothbrush, Oro-Dental Hygiene.

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## INTRODUCTION

Oral and dental hygiene is one of the significant aspects of body fitness and thus has a strong role in physical, social, and mental well-being<sup>1</sup>. The prevalence of dental caries varied among the countries and showed a strong difference between the developed and developing countries; and ranged from 2% to 20% among developed and up to more than 60% among the developing countries<sup>2,3</sup>. Dental caries are a widespread disease, affecting billions of people worldwide<sup>4</sup>.

The burden of dental caries varies among different Asian regions and has 35% to 72% prevalence among Eastern, Western, and Southern Asian countries<sup>5</sup>. Dental caries critically impact the health and development of children<sup>6</sup>. Research showed that there is a strong relationship between oro-dental hygiene status and parental knowledge, attitude, and perceptions<sup>7</sup>. Moreover, some etiological factors of dental caries are; fluids with a high quantity of sugar, honey, or sugar used for sweetening purposes, and unhealthy dental and mouth hygiene status<sup>8,9</sup>.

It affects 50% of populations in any country<sup>10</sup>. An international study showed a consistent positive association of dental problems with risk factors like sweet food items<sup>11,12</sup>. There is also a strong relationship between breastfeeding and dental problems, and a study revealed a nonlinear relationship between duration of breastfeeding and dental problems<sup>13</sup>.

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Dental caries are a common health problem among local communities of Pakistan. This survey aimed to assess the frequency of dental caries and their risk factors among male adults of District Lower Dir, Khyber Pakhtunkhwa Pakistan. The findings of this study will help the clinicians in developing strategies to prevent and treat dental caries in the local population.

**MATERIALS AND METHODS**

This descriptive cross-sectional survey was conducted from September 2018 to February 2019 in the Lower Dir District of Khyber Pakhtunkhwa. After taking ethical approval from the institute and informed consent from participants, a total of 149 male adults were surveyed regarding the frequency & determinants of dental caries. Only male adults and permanent residents of district Lower Dir were included. The District Lower Dir has a population of 1.44 Million with a total area of 1582km<sup>2</sup>. The survey tool was developed and validated by expert discussion and pilot testing among 15 participants. The survey questionnaire comprised of two sections, in which one was related to the demographic variables like age, monthly income, education status, number of children of participants, and home conditions, while the second section had ten survey items, of which six had yes/no responses and the remaining four items had three responses. The study participants were assessed for the presence or absence of dental caries by a qualified dental surgeon with more than five years of clinical experience. Data were analyzed in Microsoft Ex-

cel and presented in tabulated form.

**RESULTS**

The demographic characteristic of the study population was shown in Table No 1. The frequency of dental caries among the study population was 31.54%. The determinants of dental caries among the study population are shown in Table No 2.

**Table 1: Demographic Characteristics of the Study Population (n=149) Of District Lower Dir**

Demographic Variables	Results	Frequency	%
Age Groups	15 - 25 years	34	22.82
	25 - 35 years	51	34.23
	35 - 45 years	38	25.50
	46 & above	26	17.45
Monthly Income	< 15000	25	16.78
	15000 - 25000	46	30.87
	25000 - 35000	33	22.15
	> 35000	45	30.20
Educational Status	Illiterate	73	48.99
	Middle	35	23.49
	Secondary	27	18.12
	FA/BA & Above	14	9.40
House Structure Made of	Cemented	105	70.47
	Mud etc	44	29.53
No of Children	1 & 2	78	52.35
	3 & 4	43	28.86
	> 4	28	18.79

**Table 2: Determinants of Dental Caries among Study Population (n=149) District Lower Dir**

S.No	Survey Items	Response	n=149	
			Frequency	(%age)
1	Do you know the causes of dental caries?	Yes	103	69.13
		No	46	30.87
2	Do you have any dental problem currently?	Yes	16	10.74
		No	133	89.26
3	Do you tooth-brush teeth?	Yes	104	69.80
		No	45	30.20
4	Frequency of your toothbrush use per day	1 time	71	68.27
		2 times	27	25.96
		> 2 times	6	5.77
5	You use fluoride toothpaste	Yes	81	54.36
		No	68	45.64
6	Frequency of fluoride tooth paste you use per day	1 time	48	59.26
		2 times	27	33.33
		> 2 times	6	7.41
7	Do you prefer carbohydrate and sweets?	Yes	105	70.47
		No	44	29.53
8	Do you consult dentist regularly?	Yes	65	43.62
		No	84	56.38
9	When you consulted dentist for yourself?	For problem	51	34.23
		Regular	14	9.40
		None	84	56.38
10	Status of oral hygiene	Poor	81	54.36
		Satisfactory	48	32.21
		Good	20	13.42

**DISCUSSIONS**

In our study, the frequency of dental caries was found to be 31.54%, where internationally the prevalence ranges from 20 to 50%<sup>5, 14, 15, 16</sup>. Our study findings are consistent with a study conducted in Saudi Arabia, where the frequency was 30.22%<sup>1</sup>.

In our study, 83.22% had a monthly income of more than PKR 15000. This population showed a lower

frequency of caries which is consistent with international studies that highlight the relationship of high income with lower risk of dental caries<sup>17, 18</sup>. Moreover, the education status played a great role in the development of dental caries, as educated families had better opportunities and had less prevalence of dental caries as was reported by our study in which more than half of the study population was educated and thus showed less prevalence<sup>12</sup>.

International studies revealed that education plays a positive relationship with improved oral hygiene<sup>3,19</sup>. Moreover, food intake is an indirect tool to determine dental caries in a family or community. In our study, only 29.53% of families were following healthy food diets whereas in an international study, 92% of participants were following healthy foods<sup>1</sup>. Many international studies showed the same significant relationship of sugars-based diet preferences with dental caries<sup>20,21</sup>. Furthermore in our study, 66.67% of children used fluoride toothpaste, and thus had less frequency as compared to studies which showed 98.5% and 86%<sup>10, 22</sup>.

Our study was limited to a single district and had fewer participants which limit its generalizability. Further large-scale multicenter cohort studies are needed to find the causal effects of these determinants in causing dental caries.

## CONCLUSIONS

One-third of the studied population was suffering from dental caries. The different determinants identified in the survey were low socio-economic status, illiteracy, poor tooth brushing practices, and the use of fluoride toothpaste. Moreover, sweet food preference and oral hygiene status were frequently seen in patients with dental caries. Effective preventive, promotive, and curative services are needed to reduce dental caries and their complications.

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#### **AUTHOR'S CONTRIBUTION**

Following authors have made substantial contributions to the manuscript as under

**Naeem M:** Concept and Design.

**Ishtiaq M:** Acquisition and critical review.

**Hussain A:** Data collection.

**Ijaz B:** Data collection.

**Iftikhar B:** Concept and Design.

**Marwat I:** Analysis and interpretation of data.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.