

# Dental Caries Frequency & its Determinants among Adults of District Kohat & Nowshera Khyber Pakhtunkhwa Pakistan

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## ABSTRACT

The objective of this study was to assess the frequency and risk factors of dental caries among adults in District Kohat and Nowshera Khyber Pakhtunkhwa Pakistan.

**Methods:** After taking ethical approval, a descriptive cross sectional study was conducted in District Kohat and Nowshera, in which a total of n=435 adults were assessed and examined for dental caries, from November 2021 to March 2022. A structured questionnaire was used to collect data regarding dental caries and its risk factors. Moreover, relevant tooth brushing, and dietary information was also collected. Data was analyzed by SPSS and results were presented in form of tables.

**Results:** The results showed that 23.68% of adults had dental caries. Approximately, 57.70% of adults are of age between 30-60 years; 25.06% had monthly income less than 25000/PKR per month; 14.02% were illiterate, and 40.92% were overweight and obese. Moreover, 52.64% had compliance to daily tooth-brushing; 49.66% used fluoride tooth paste; 41.15% and 58.85% prefer sugar and sweet beverages respectively. Furthermore, 21.84% had poor oral hygiene; 14.94% had routine dental examinations; and 49.21% & 32.41% prefer vegetables and fruits.

**Conclusions:** Concluded that dental caries showed moderate prevalence among adults and revealed relationship with age; monthly income, body mass index, and literacy level. Moreover, frequency of tooth-brushing, fluoride tooth-paste, oral hygiene status and sweet preference showed association with dental caries and thus comprehensive preventive and health promotion strategies were needed to overcome dental caries among adults.

**Keywords:** Dental Caries, Toothbrush, Fluoride, Monthly Income, Sugar, Sweet beverages, Nowshera

## INTRODUCTION

In both developed and developing countries, dental caries is a significant public health issue [1] and [2]. Dental caries is a chronic condition that affects millions of people around the world. Dental health has improved significantly in developed countries over the past few decades thanks to water fluoridation, fluoride toothpaste, and good oral hygiene practises [3]. Caries is on the rise and has become a serious public health problem worldwide, affecting nearly all adults and affecting over 3.5 billion people worldwide. It is impacted by social, economic, educational and environmental variables as well as lifestyle factors [5] [6] [7].

According to Global Burden of Diseases Study of 2015; dental caries is most prevalent medical condition and significantly affect the general health and quality of people life [8] [9] [10]. According to the World Health Organization (WHO), 60–90 percent of persons have dental caries [11]. Research shows that obesity and dental caries are strongly linked [12]. Adults in the Kim et al., 2020 study were shown to have a link between being overweight or obese and having more advanced dental caries [13]. As a result, dental caries is more common among individuals who do not brush their teeth or use fluoride toothpaste, those who eat a lot of carbs, and those who smoke.

Dental caries affects approximately 35.3% of the world's population and has been linked to demographic and socioeconomic characteristics such as age, gender, level of parental education, urban location, family income, and socioeconomic situations [4] [22] [11]. Dental decay is a widespread public health issue around the world. A developing country, Pakistan has high poverty, low socioeconomic level, and a large number of people who are illiterate. As a result, a cross-sectional study was carried out in the districts of Kohat and Nowshera in Khyber Pakhtunkhwa, Pakistan, to determine the prevalence of dental caries and the major risk factors associated

with it, as well as to deliver the results to the relevant departments for the purpose of prevention and control.

## MATERIALS & METHODS

A descriptive cross sectional study was conducted from December 2021 to May 2022, in Kohat and Nowshera, Khyber Pakhtunkhwa Pakistan. After taking ethical approval from the Ethical Review Committee, a total of n=435 adults were screened in the rural and urban setup, based upon random sampling from all the union councils of district Nowshera. Adults age 18 to 70 years were included while those who were not permanent resident of Nowshera District were excluded. A structured questionnaire having information regarding demographics, social, personnel and behavioral determinants were collected data from the study participants. On oral examinations, the presence of tooth decay, missing and filled teeth, having toothache and sensitivity, was recorded as dental caries. Moreover, good oral hygiene was recorded for those having no food particles and or accumulation of plaque visible during examination; and poor oral hygiene if food particles and or plaques are visible in oral cavity [14]. SPSS version 23 & Microsoft Office Software was used for data entry and analysis; and results were presented in form of tables.

## RESULTS

Table 1: Dental Caries frequency among 435 Adults of Kohat District and Nowshera KPK, Pakistan

| Variables     | Response | n=435     |        |
|---------------|----------|-----------|--------|
|               |          | Frequency | (%age) |
| Dental Caries | Yes      | 103       | 23.68  |
|               | No       | 332       | 76.32  |

Table 2: Showing Demographic Characteristics of Adults n=435 Of District Kohat and Nowshera KPK Pakistan

| Demographics  | Variables   | F   | %     |
|---------------|-------------|-----|-------|
| Age of Adults | 16-30 years | 127 | 29.20 |

|                         |                        |     |       |
|-------------------------|------------------------|-----|-------|
|                         | 30-45 years            | 162 | 37.24 |
|                         | 45-60 years            | 89  | 20.46 |
|                         | 60 & above             | 57  | 13.10 |
| Gender                  | Male                   | 307 | 70.57 |
|                         | Female                 | 128 | 29.43 |
| Monthly Income in PKR   | < 25000                | 109 | 25.06 |
|                         | 25000 - 45000          | 148 | 34.02 |
|                         | 45000 - 65000          | 113 | 25.98 |
|                         | > 65000                | 65  | 14.94 |
| Educational Information | Illiterate             | 61  | 14.02 |
|                         | Middle/ Secondary      | 164 | 37.70 |
|                         | Intermediate/ Bachelor | 127 | 29.20 |
|                         | Master & Above         | 83  | 19.08 |
| Marital Status          | Married                | 286 | 65.75 |
|                         | Unmarried              | 149 | 34.25 |
| No of Children          | 1 & 2                  | 137 | 31.49 |
|                         | 3 & 4                  | 62  | 14.25 |
|                         | > 4                    | 23  | 5.29  |
| BMI                     | Normal                 | 208 | 47.82 |
|                         | Underweight            | 49  | 11.26 |
|                         | Overweight             | 113 | 25.98 |
|                         | Obese                  | 65  | 14.94 |
| Residence type          | rural                  | 154 | 35.40 |
|                         | urban                  | 281 | 64.60 |
| Occupation              | Govt Servant           | 77  | 17.70 |
|                         | Pvt Job                | 163 | 37.47 |
|                         | Labor                  | 81  | 18.62 |
|                         | No Job                 | 114 | 26.21 |
| Tobacco Smoking         | Yes                    | 127 | 29.20 |
|                         | No                     | 308 | 70.80 |
| Are You Diabetic?       | Yes                    | 70  | 16.09 |
|                         | No                     | 223 | 51.26 |
|                         | No Idea                | 142 | 32.64 |

Table 3: Showing Determinants of Dental Caries among Adults n=435 Of District Kohat and Nowshera Khyber Pakhtunkhwa Pakistan

| Variables   | Response        | n=435 |        |
|---|-----------------|-------|--------|
|   |                 | f     | (%age) |
| Do you toothbrush your teeth?                           | Yes             | 374   | 85.98  |
|   | No              | 61    | 14.02  |
| What is the frequency of toothbrush?                    | Daily           | 229   | 52.64  |
|   | 2-3 Times/ week | 104   | 23.91  |
|   | Weekly          | 41    | 9.43   |
| Do you toothbrush your teeth in morning?                | Yes             | 211   | 48.51  |
|   | No              | 163   | 37.47  |
| Do you toothbrush your teeth during at night?           | Yes             | 97    | 22.30  |
|   | No              | 277   | 63.68  |
| Do you toothbrush your teeth with fluoride Toothpaste?  | Yes             | 216   | 49.66  |
|   | No              | 31    | 7.13   |
|   | No Idea         | 127   | 29.20  |
| Do you prefer sweets?                                   | Yes             | 179   | 41.15  |
|   | No              | 256   | 58.85  |
| Do you prefer vegetables?                               | Yes             | 214   | 49.20  |
|   | No              | 221   | 50.80  |
| Do you prefer fruits?                                   | Yes             | 141   | 32.41  |
|   | No              | 294   | 67.59  |
| Do you prefer drinks and beverages?                     | Yes             | 256   | 58.85  |
|   | No              | 179   | 41.15  |
| Condition of oral hygiene?                              | Poor            | 95    | 21.84  |
|   | Satisfactory    | 157   | 36.09  |
|   | Good            | 183   | 42.07  |
| Have you every visited dentist for just dental checkup? | Yes             | 65    | 14.94  |
|   | No              | 370   | 85.06  |
| Have you ever visited dentist for dental problem?       | Yes             | 187   | 42.99  |
|   | No              | 248   | 57.01  |

**DISCUSSIONS**

In our study, the prevalence of dental caries was 23.68%, whereas in international studies showed prevalence of 86%, 64.6%, and 32% in studies of Strauss et al., 2019; Geleto et al., 2022; and Amarasena et al., 2021; respectively [14] [12] [7]. Moreover, our study prevalence of dental caries was less as compared to

Siddiqui et al., 2021; Tamura, 2005; and Tafere et al., 2018; which revealed 56.56%; 54.16%; 78.2% and 66% respectively; and was high as compared to study of Folyan et al., 2021 which revealed lowest prevalence of 3.4% [6] [2] [18] [24]. Furthermore, our prevalence of 23.68% supported and revealed similar findings as was found in Teshome et al., 2020 i.e. 23.65% among the participants [17].

According to our study, 70.57% were male whereas in study of Tafere et al., 2018; showed 53.9% of male population in a cross sectional study [2]. Moreover, in study of Geleto et al., 2022; had 47.2% of females while in our study had 29.43% [14]. Furthermore, in our study; 65.75% were married and 85.98% were literate; whereas in study of Geleto et al., 2022; and Tafere et al., 2018; had 68% and 74% literacy among the participants [14] [2].

In international studies of Stangvaltaite-Mouhat et al., 2021; and Teshome et al., 2020; association between dental caries and obesity showed positive association; as was found in our study by showing 14.94% and 35.40% of overweight and obesity respectively [9] [17]. Moreover, in study of Kim et al., 2021; and Guracho et al., 2021; found 8.4% and 6% prevalence of tobacco smoking among the participants; while in our study has 29.20% of tobacco smoking [5] [1]. Moreover, in study of Kim et al., 2021; and Strauss et al., 2019; the prevalence of diabetes mellitus was 10.6% and 5.2% whereas in our study the prevalence of Diabetes mellitus among participants was 16.09% [5] [7].

In an global study conducted by Geleto et al., 2022; found that poor oral health conditions predispose to dental problems and mostly to dental caries as was found in our study; and found 21.84% of poor oral health prevalence [14]. In study of Folyan et al., 2021; found daily tooth-brushing frequency and 91.7% of them used fluoride toothpaste whereas in our study, the daily prevalence was 52.64% and fluoride prevalence was 49.66% among those who used tooth-brushing [6]. Moreover, in studies of Guracho et al., 2021; and Tafere et al., 2018; revealed 29.3% and 28.6% of daily tooth-brushing prevalence [1] [2]. Moreover, in our study, 41.15% prefer sweets; 58.85% prefer drinks and beverages; and 14.94% visited dentist for dental checkup without any dental problem; whereas in studies of Folyan et al., 2021; 36.1% prefer sweets; and 1.1% visit dentist for dental problem [6]. Moreover, in study of Guracho et al., 2021; 57.9% prefer sweets; and 24.8% prefer drinks and beverages [1].

**CONCLUSIONS & RECOMMENDATIONS**

From our study results, it was concluded that the prevalence of dental caries among adults revealed moderate prevalence. Moreover, age, monthly income, residential setup, body mass index, literacy level, tobacco smoking, and diabetes mellitus showed relationship. Moreover, regular compliance of tooth-brushing, its frequency, fluoride tooth-paste use, oral hygiene status, dentist visits, sugar intake and sweet beverages preference showed association with dental caries. Furthermore, vegetables and fruits preference and normal routine dental checkups also showed strong association with dental caries and thus population education and awareness interventions along with comprehensive preventive, promotion behavioral change strategies were needed to reduce dental caries with an aim to avoid the unnecessary associated complications among adult population.

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