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Prevalence of dental caries and associated factors among adults admitted in Department of operative dentistry of Stomatology Hospital in Kabul, Afghanistan

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Abstract
Background
Dental caries is defined as a microbiological disease of the hard structure of teeth, which results in localized demineralization of the inorganic portion and destruction of the organic substances of the tooth. it is the most common dental health problem caused by the interaction of bacteria on tooth enamel, there are many risk factors and associated factors for dental caries such as oral hygiene, eating habits, tobacco, socioeconomic status and etc. The aim of this study is to determine the prevalence of dental caries and associated factors among adults visiting stomatology national and specialized hospital in Kabul Afghanistan.
Material and Methods
A hospital based cross sectional study was conducted on 13000 patients visited stomatology national and specialized hospital from march 2023 up to march 2024, the data was collected from the patients' medical records with a data collection form, and the background characteristics of the patients and data were entered and analyzed using SPSS version 26.
Results
A total of 13000 patients were evaluated in this study, 7896 patients (60,7%) were female and 5104 patients (39.3%) were male, (male: female ratio of 2:3). Age range was (18 and older), the majority of cases were between 18-35 years (50.5%), about (37,9%) patients aged 36-55 years and 11,6% patients aged 56 and older. (67.3%) patients were urban residents and (32,7%) patients were rural residents.
According to tissue involvement 50% of the patients had profound caries and so on caries media (20%), caries superficial (20%), incipient caries (10%). According to association, poor oral hygiene was the leading associated factor (44.2%) for dental caries ($P < 0.05$) followed by use of tobacco 21.2%, socioeconomic status (12,2%), low education level (11%) and consumption of sugary food was (11,4%).
Conclusion
This study demonstrates that the overall prevalence of dental caries was very high among patients visiting the hospital. poor oral hygiene, use of tobacco, socioeconomic status, low education level and consumption of sugary food were significantly associated with dental caries, therefore it is on the relevant authorities to hold necessary steps for oral health system, strengthening focusing on health promotion.

Keywords: Dental caries, associated factors, Stomatology Hospital, Kabul

Introduction
Dental caries is defined as a microbiological disease of the hard structure of teeth, which results in localized demineralization of the inorganic portion and destruction of the organic substances of the tooth [1]. It is a preventable, chronic and biofil mediated disease modulated by diet, and is caused primarily by an imbalance of the oral flora (biofilm) due to the presence of fermentable carbohydrates on the tooth surface over time [2]. The caries existence varies greatly among countries and even within small regions of countries. It varies with age, and sex, location, socioeconomic status, race, diet, medical conditions of the patient, oral hygiene practices, etc., [3]. Dental caries is a disease which affect humans of all ages and all areas of the world. Several studies have been carried out to assess the dental caries prevalence and associated factors among adults in different parts of the world [4]. According to a study in 2022 in Kabul, prevalence of dental caries in the ages 18-65 was 95.98% and the prevalence was higher in females than male. (5) in a community based cross sectional study on 452 patients which was carried out in Dakshinpuri, Delhi in February 2007 epecifies that the prevalence of dental caries in the 35-44 years age group was 82.4% and about 27.9% were currently using tobacco, that a significant association was found between tobacco consumtion and dental caries, and the prevalence of dental caries was higher in female patients than male [6]. In a cross-sectional study which was conducted in two secondary school in Uganda about the prevalence of dental caries and associated factors, specifies that the overall prevalence was 66.0% with a mean DMFT of 2.18, and a significantly higher prevalence of caries 74.9% was observed in adolescents aged 16-19 years and female participants had higher prevalence of caries than male patients, and associated factors about dental caries was oral hygine, tooth brushing habits [7]. In an institution based cross sectional study about the assessment of prevalence of dental caries and the assiciated factors among patients attending dental clinic in Debre Tabor general hospital in Ethiopia which was conducted among 280 patients, states that prevalence of dental caries was high and found public health problems and this study reveals that the overall prevalence of dental caries was 78.2%, socioeconomic status, education level and poor oral hygiene practices were associated factors for dental caries [8].

As mentioned, the prevalence of dental caries and associated factors varies according to people's life style and socioeconomic status, in Afghanistan there is not still much reliable published papers regarding the epidemiology of dental caries, the study was conducted to evaluate the prevalence of dental caries and associated factors among adults visiting stomatology hospital in Kabul Afghanistan.

Material and Methods

This hospital based cross sectional study on prevalence of dental caries and associated factors in adults aged 18 and over was conducted in stomatology national curative and specialized hospital from march 2023 up to march 2024 in Kabul Afghanistan, and approved by the department of PGME of ministry of public health. Stomatology hospital is located at the center of Kabul and provides different in patient and out patient dental health services for over 10 million people from all over the country.

The source population was 13000 patients which was attended to endodontics department of stomatology hospital, a non-probability convenience sampling method was used, and the data was collected by age, gender, residence, types of caries according to tissue involvement and associated factors.

Ethical approval for this study was obtained from the ethical review committee of PGME department of public health ministry and permission was obtained from administration of stomatology hospital.

A data collection form about personal details, oral hygiene and dental problems and associated factors was used in this study and data were collected from the patients' medical record and documents which was stored in health management information system (HMIS) of hospital by our team.

The inclusion criteria for this study was the patients above age 18, the patients who had systemic disease and suffers from dental caries. The exclusion criteria was the patients who were treated once and came again by the same dental problem, Individuals with orthodontic brackets and with severe extrinsic stains on their teeth. Data were checked, cleaned, edited and entered accordingly to SPSS version 26 for analysis. Descriptive analysis such as numerical summary measures and frequencies were computed.

Results

A total of 13000 patients were evaluated in this study, 7896 patients (60,7%) were female and 5104 patients (39.3%) were male, (male: female ratio 2:3). Age range was (18 and older), the majority of cases were between 18-35 years (50.5%), about (37,9%) patients aged 36-55 years and 11,6% patients aged 56 and older. (67.3%) patients were urban residents and (32,7%) patients were rural residents.

According to tissue involvement 50% of the patients had profound caries and so on caries media (20%), caries superficial (20%), incipient caries (10%). According to association, poor oral hygiene was the leading associated factor (44.2%) for dental caries followed by use of tobacco 21.2%, socioeconomic status (12,2%), education level (11%) and consumption of sugary food was (11,4%).

Table 1: distribution of the study population according to the gender

		Frequency	Percent	Valid Percent
Valid	male	5104	39.3	39.3
	female	7896	60.7	60.7
	Total	13000	100.0	100.0

Table 2: distribution of dental caries according to age groups

		Frequency	Percent	Valid Percent
Valid	18-35	6564	50.5	50.5
	36-55	4929	37.9	37.9
	56 and older	1507	11.6	11.6
	Total	13000	100.0	100.0

Table 3: frequency and distribution of dental caries according to residence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	rural	4251	32.7	32.7	32.7
	urban	8749	67.3	67.3	100.0
	Total	13000	100.0	100.0	

Table 4: frequency and distribution of dental caries types according to tissue involvement

		Frequency	Percent	Valid Percent
Valid	incipient caries	1299	10.0	10.0
	superfacial caries	2601	20.0	20.0
	media caries	2599	20.0	20.0
	Profund caries	6501	50.0	50.0
	Total	13000	100.0	100.0

Table 5: frequency and percentage of dental caries and associated factors

		Frequency	Percent	Valid Percent
Valid	poor oral hygiene	5746	44.2	44.2
	socioeconomic status	1586	12.2	12.2
	educational level	1430	11.0	11.0
	use of tobacco	2756	21.2	21.2
	consumption of sugary food	1482	11.4	11.4
	Total	13000	100.0	100.0

Discussion

Dental caries is a multi-factorial disease influenced by many factors including age, sex, diet, microorganisms, trace elements, saliva, genetic predisposition and tooth morphology [9].

This study included 13000 patients with dental caries who were presented to Stomatology National and Specialized Hospital, Kabul, which is the largest specialized, tertiary care and training center of diagnosis and treatment of dental and maxillofacial pathologies in Afghanistan and Kabul as the capital and the main political, cultural and economical city of the country with estimated 4.95 million people population in 2023 is the 75th largest city in the world [10]. The access and facility of tertiary care in Kabul leads people in Afghanistan to seek the treatment for their major and minor health problems mostly in Kabul. Therefore, most and majority of dental patients are referred to Kabul and are treated mainly in Stomatology National and Specialized Hospital.

Of a total sample, 60.7% were female (n=7896) and 39.3% were male (n=5104), the female to male ratio was 5:1, we find the high number of caries cases among females in comparison to males suggesting that females are more prone to caries than males (Table 1). However, a study in new Delhi reports the higher number of cases in female than male (65.5% vs 34.5%) [6]. This is due to number of facts, including longer exposure of girls teeth to the cariogenic oral environment, hormonal changes during pregnancy, early teeth eruption in girls in comparison to boys,

differences in dental attendance due to lack of financial independence on the part of females and fear of dentist among male and female and also to difference in dietary habits.

The mean age of the subjects were 47.3 years (age range: 18-55 and older) Among the different age group studied we found highest number of cases in 3rd decade of life between 18-35 years and the percentage of dental caries according to age groups showed that the patients in the 18-35 year of age group were the most frequently affected (50.5% n=6564) (Table 2). However, in a study in new Delhi demonstrates that the prevalence of dental caries in the age-group of 35-44 years in the present study was found to be 82.4% [6]. It might be suggested that, the development of dental caries is a long-term process. It means that the dental caries prevalence was high among adults in Kabul province. This indicates that there are still shortcomings in the areas of both preventive and curative dental care. More oral health education programs must be deployed in an attempt to control oral diseases, Also the large number of untreated caries in adults requires immediate attention. The information obtained from this study could be used to determine the most appropriate measures to be undertaken and to estimate the resources and logistic requirements necessary for addressing the current situation.

Also, the data indicates the frequency and distribution of dental caries among rural 32.7% and urban 67.3%, this suggests that individuals in urban areas are more affected by dental caries compared to those in rural areas. (Table 3) And it reflects differences in lifestyle, diet and access to care, addressing these disparities requires a combination of public health interventions, education and infrastructure improvements in both settings.

My research indicates that profound caries constitutes 50% of cases according to tissue involvements, and it highlights that the severity of dental caries within my study population. (Table 4).

Many factors have been implicated in the etiology of dental caries and the associated factors of dental caries vary from one study to another, the results demonstrate that the socioeconomic conditions, poor oral hygiene, use of tobacco, consumption of sugary foods and education level of the patients affect on the dental caries situation in adolescent and childhood. (Table 5)

Poor oral hygiene is the most significant contributor to dental caries (44.2%) (table 5) and this is due to lack of awareness about proper brushing and flossing techniques, irregular brushing, limited access to oral hygiene in low income populations and cultural neglects of oral hygiene practices.

Oral hygiene practices, dietary habits, and access to dental care services played an important role in prevalence of dental caries. Socio-economic status has been found to play an important role in access to dental care facilities. From the current report, importance for public health was noted; the socioeconomic status, educational status of parents, and family structure, affect oral health in under-privileged communities.

Healthy teeth and oral tissues and the need for oral health care are important for any section of society. Oral disorders can have a profound impact on the quality-of-life. Good oral health has real health gains, in that it can improve general health and quality-of-life and contribute to self-image and social interaction. Epidemiologic studies may be of value in assessing the prevalence of diseases, in disclosing trends in disease development, and in analyzing possible factors influencing the disease pattern [11].

Although dental caries has been the most commonly investigated oral disease, most studies have focused on children and studies on caries among adolescents and young adults are scarce. The lack of basic epidemiological information about dental caries among adolescents constitutes a serious limitation due to two main reasons. Firstly, to maintain adequate surveillance of dental caries it is important to know its behavior in all age-groups [4]. Secondly, with the decline of dental caries in several countries, including Afghanistan, the chances of extending oral health care to other groups of the population, such as adolescents and young adults, has increased significantly. Dental caries is a preventable disease which can be alleviated by creating community awareness through health education activities [12].

The prevalence of dental caries also plays an important role in oral hygiene procedures, eating patterns, and access to dental care services [13].

Conclusion

The results of this study indicates that the increasing prevalence of dental caries is found public health problem; socioeconomic conditions, poor oral hygiene, use of tobacco, consumption of sugary foods and education level were associated factors for dental caries. for this tackling dental caries requires addressing behavioral and structural factors, focus interventions on populations at the greatest risk and also engage policymakers, healthcare providers and educators in improving oral health outcomes. Also, it highlights the need for a dental health program to target this specific segment of the population through systematic public, health promotion about oral hygiene and integration of services are supremely important for the prevention of the problem of dental caries. One thing should be mentioned the majority of the study participants were females. This might bias the study results, as the sample taken is not representative of all the population, But the results might be representative for the adolescent population in urban areas of Kabul city.

Limitations

This study is limited by its retrospective design and reliance on the accuracy of medical records. Additionally, the findings are specific to a single tertiary care center in Kabul and may not be generalizable to other regions. Further prospective studies are needed to validate these findings and explore the broader epidemiological trends in dental caries.

By systematically analyzing the demographic characteristics, causes of dental caries, patterns, and treatment outcomes, this study provides a comprehensive overview of dental caries in Kabul, offering valuable insights for clinicians and policymakers aimed at improving patient care and preventive strategies.

Declaration

Funding: No external funding was received for this study.

Conflicts of Interest: The authors declare no conflicts of interest related to this study.

Ethical Approval: This study was conducted in accordance with the ethical standards of the institutional research

committee and the 2013 Helsinki Declaration and its later amendments. The research protocol was reviewed and approved by the Academic Committee of the Department of Postgraduate Medical Education of the Ministry of Public Health of Afghanistan (Ethical code: 103).

Authors' Contributions: All authors made substantial contributions to the conception and design of the study, acquisition of data, and analysis and interpretation of data. All authors were involved in drafting the manuscript or revising it critically for important intellectual content and have given final approval of the version to be published. All 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.

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References

1. Garg Nisha, Garg Amit. text book of operative dentistry. 2. Delhi: Jaypee, 2013, 2.
2. Andre V Ritter, Lee W Boushel. Sturdevants art and science of operative dentistry. St Louis: ELSEVIER, 2019, 7. 978-0-323-47833-5.
3. Prevalence of dental caries and treatment needs among school going children of Pondicherry. Saravanan S, Anuradha KP, Bhaskar DJ. 21:1, india : J Indian Soc Pedod Prev Dent, 2003.
4. Prevalence of dental caries among high school attendees. J Hamissi, GH Ramezani, A Ghodousi. Qazwin, Iran : s.n, 2008, 26. 19075448.
5. Prevalence of dental caries among adults in dentistry teaching clinic. Naseer Ahmad Shinwari, Ahmad Mujtaba Barekzai. 1, Kabul: Research Gate, 2022, 1. 362410976.
6. Prevalence of dental caries among adults and elderly in an urban resettlement colony of new Delhi. Binod Kumar Patro, Ravi Kumar Balo, Vijay Mathur. New Delhi: Indian journal of dental research, 2008. 26510979.
7. Prevalence, severity and factors associated with dental caries among school adolescents in Uganda. Barbara Nadagire, Annet Kutesa. Uganda: Brazilian dental journal, 2020, 31. 01016440.
8. assessment of prevalence of dental caries and associated factors among patients attending dental clinic in Debre Tabor general hospital. Yilkal Tafere, Selam Chanie, Tigabu Dessie. 119, Ethiopia: BMC oral health, 2018. 12903-018-0581-8.
9. Prevalence of dental caries and treatment needs among children of Cuttack. Dash JK, Sahoo PK, Bhuyan SK, Sahoo SK. Orissa: J Ind Soc Prev Dent, 2002, 20. 139-143.
10. S.N. estimated population of Afghanistan. estimated population of Afghanistan. weekened,2023:3:12.
11. prevalence of dental caries among school children of Bharatpur city. Navin Anand Ingle, Harsh Vardhan Dubey, Navpreet Kaur. India: journal of international society of preventive and community dentistry, 2014, 4. 24818096.
12. Prevalence of dental caries: Children in Darbhanga. Dr. Sumanta Kumar Kolay, Dr. Satish Kumar. 5, Bihar India: international Journal of Applied Dental Sciences, 2019. 2394-7489.
13. Dental Caries and the Influence of Associated Factors. Aliya Ehsan1, Jawwad Iqbal Afridi2, Hina Abid3, Muhammad Yusuf4. 21, Lahore Pakistan: J Evolution Med Dent Sci, 2021, 10. 2278-4802.