

# PREVALENCE OF DENTAL CARIES AND ASSOCIATED FACTORS AMONG PATIENTS VISITING A DENTAL TEACHING HOSPITAL OF KATHMANDU

*Barsha Joshi,<sup>1</sup> Suman Gautam,<sup>1</sup> Rojin Joshi,<sup>1</sup> Anju Khapung<sup>2</sup>*

<sup>1</sup>Department of Conservative Dentistry and Endodontics, <sup>2</sup>Department of Community Dentistry, Nepal Medical College Teaching Hospital, Attarkhel, Gokarneshwor-8, Kathmandu, Nepal.

## ABSTRACT

Dental caries is the most common oral health issue for the general population. Dental caries not only affects the quality of life but also brings economic burden to individual and society. The aim of this study was to determine the prevalence of dental caries and associated factors among patients. An analytical, cross-sectional study was conducted among the patients visiting Department of Oral Medicine of Nepal Medical College Dental Hospital of Kathmandu. The results showed that overall prevalence of dental caries was 81.6%. Dental caries among participants between 25-34 years was highest (33.1%) and more among females (84.9%). Majority of the participants used toothbrush 96.8%, while 78.3% used fluoridated toothpaste. Even though most study participants claimed to use toothbrush and fluoridated toothpaste, prevalence of dental caries was high.

## KEYWORDS

Adults, associated factors, dental caries, prevalence

*Received on:* March 20, 2023

*Accepted for publication:* May 21, 2023

## CORRESPONDING AUTHOR

Dr. Barsha Joshi

Lecturer,

Department of Conservative Dentistry and Endodontics

Nepal Medical College Teaching Hospital,

Attarkhel, Gokarneshwor-8, Kathmandu, Nepal

Email: joshibarsha11@hotmail.com

Orcid No: <https://orcid.org/0000-0001-7563-2801>

DOI: <https://doi.org/10.3126/nmcj.v25i2.56049>

## INTRODUCTION

Dental caries is one of the most common oral health issues throughout the world, which develops over time and affects any age group.<sup>1</sup> Dental caries causes the destruction of hard parts of a tooth by interaction between bacteria and fermentable carbohydrates.<sup>2</sup> The development of dental caries is associated with many factors, including biological, behavioral and socioeconomic status.<sup>3</sup> Some of the primary factors for dental caries are poor dietary habits, poor oral hygiene habit and lack of dental care.<sup>4</sup> Dental caries is not always life threatening but its complications affect the quality of life. Individuals experience pain and, discomfort, and it may also impair social interactions. Dental caries is one of the major public oral health problems.<sup>5,6</sup> The high cost of treating oral disease is an economic burden to an individual, families and society.<sup>7</sup> Despite vast improvement in global oral health issues, the prevalence of dental caries among adults is still high and the disease affects most of the population in both developed and developing countries.<sup>8</sup>

The prevalence of dental caries among adults was found to be 83.0%, 57.7%, 57.4% and 33.0% in different regions of Nepal.<sup>9-12</sup> In a study conducted in Ethiopia, 57.8% of the total participants suffered from dental caries and dental caries was highly prevalent among 15-20 year age group.<sup>13</sup> In a study conducted by Sehdev *et al.*<sup>13</sup> among the Ethiopian participants, two third of the male respondents had caries.

Many of the studies on dental caries in Nepal have mainly focused on school going children rather than adult population. So, this study was done to identify the prevalence of dental caries, affected age groups and associated factors among Nepalese patients.

## MATERIALS AND METHODS

This study is an analytical, cross-sectional study. The study was conducted in Department of Oral Medicine and Radiology, Nepal Medical College Dental Hospital between August to October, 2022. Data was collected by the help of structured predesigned questionnaire with different sections. The first section included socio-demographic details, the second section was concerned with questions on oral hygiene practices, and section three was related to food consumption habits. The questionnaire was adopted from a previous study.<sup>14</sup> Dental caries was assessed by the help of standard DMFT (Decayed, Missing, Filled) index. Clinical oral examination was done with mouth mirror and

explorer for assessing decayed, missing, and filled teeth. Teeth are considered to be decayed if the lesion is clinically visible and obvious, if the explorer tip can penetrate deep into soft yielding material, if there is discoloration or loss of translucency typical of undermined or demineralized enamel, and if the explorer tip in a pit or fissure catches or resists removal after moderate to firm pressure on insertion and if there is softness at the base of the area. The study was approved by Institutional Review Committee of Nepal Medical college (Ref No: 054-078/079).

## RESULTS

A total of 338 study participants were included in the study. Majority of the participants were between age group 25-34 years (33.1%). Total female participants were (62.7%), among them (69.5%) were married, and 43.8% were of lower middle socioeconomic status (Table 1).

**Table 1: Socio-demographic characteristics of the patients**

Socio-demographic characteristics	n (%)	
Age group (years)	18-24	73 (21.6)
	25-34	112 (33.1)
	35-44	56 (16.5)
	45-54	38 (11.2)
	55-64	36 (10.6)
	65 and above	23 (7.0)
Gender	Male	126 (37.3)
	Female	212 (62.7)
Marital status	Single	95 (28.1)
	Married	235 (69.5)
	Divorced/separated/widowed	8 (2.4)
Socio-economic status	Upper	3 (0.9)
	Upper middle	107 (31.6)
	Lower middle	148 (43.8)
	Lower	80 (23.7)

Overall prevalence of dental caries was 81.6%. The prevalence of dental caries among female participants was higher 84.9% than the male participants 76.2%.

Majority of the study participants (96.8%) used toothbrush and among them 52.0% brushed once a day, 48.6% brushed in the morning and 78.3% used fluoridated tooth paste. Few (21.6%) consumed sweet food and drinks before bed (Table 2).

**Table 2: Questions regarding tooth brushing habits and sugar intake**

Habit of tooth brushing		n (%)
Use of tooth brush (n=338)	Yes	327 (96.8)
	No	11 (3.2)
Frequency of tooth brushing (n=327)	More than 3 times/day	5 (1.5)
	Twice/day	146 (44.6)
	Once/day	170 (52)
	Irregularly	6 (1.9)
Time of tooth brushing (n=327)	Before bed	22 (6.7)
	Morning	159 (48.6)
	Both in morning and before bed	140 (42.8)
	No fixed time	6 (1.89)
Fluoride tooth paste usage (n=327)	Yes	256 (78.3)
	No	71 (21.7)
Does the patient have sweet drinks or sweet food before going to bed? (n=338)	Yes	73 (21.6)
	No	265 (78.4)

**Table 3: Carbohydrate intake among the study participants**

Food consumption habit	Mean±SD
Number of times the patient eats between the meals (n=317)	2.32±1.13
Number of times the patient eats Candies and sweets between meals (n=222)	1.48±0.73

The mean number of times the patient ate between meals was 2.32±1.13 and number of times the patient ate candies and sweets between meals was 1.48±0.73 (Table 3).

Statistically significant association was seen between dental caries and gender ( $p = 0.04$ ). There was no statistically significant association of caries prevalence with marital status ( $p = 0.61$ ), socio-economic status ( $p = 0.81$ ), use of tooth brush ( $p > 0.99$ ), frequency of tooth

brushing ( $p = 0.78$ ), time of tooth brushing ( $p = 0.78$ ), fluoride toothpaste usage ( $p = 0.48$ ) and sugar intake ( $p = 0.58$ ) (Table 4).

There was no statistically significant association of the presence or absence of dental caries with number of times the patient eats between meals ( $p = 0.46$ ) and number of times the patient eats candies and sweets between meals ( $p = 0.25$ ) (Table 5).

**Table 5: Comparison of carbohydrate intake between study participants with and without dental caries**

Food consumption habit	Dental caries		p-value
	Yes Mean±SD	No Mean±SD	
Number of times the patient eats between the meals	2.15±1.19	2.29±1.36	0.46
Number of times the patient eats candies and sweets between meals	1.00±0.88	1.17±1.03	0.25

**Table 4: Caries prevalence according to age, gender, socioeconomic status, tooth brushing habit and sugar intake**

Category	Dental caries		p-value	
	Yes n (%)	No n (%)		
Age group (years)	18-24	57 (78.1)	16 (21.9)	0.36
	25-34	89 (79.5)	23 (20.5)	
	35-44	51 (91.1)	5 (8.9)	
	45-54	33 (86.8)	5 (13.2)	
	55-64	28 (77.8)	8 (22.2)	
	65 and above	18 (78.3)	5 (21.7)	
Gender	Male	96 (76.2)	30 (23.8)	0.04*
	Female	180 (84.9)	32 (15.1)	
Marital status	Single	75 (78.9)	20 (21.1)	0.61
	Married	195 (83.0)	40 (17)	
	Divorced/separated/widowed	6 (75.0)	2 (25.0)	
Socio-economic status	Upper/ Upper middle	88 (88.0)	22 (2.0)	0.81
	Lower middle	123 (83.1)	25 (16.9)	
	Upper lower	65 (81.2)	15 (18.8)	
	Lower	276 (81.6)	62 (18.4)	
Use of tooth brush(F)	Yes	267 (81.6)	60 (18.4)	>0.99
	No	9 (81.8)	2 (18.2)	
Frequency of tooth brushing (F)	More than 3 times/day	4 (80.0)	1 (20.0)	0.78
	Twice/day	116 (79.4)	30 (20.6)	
	Once/day	142 (83.5)	28 (16.5)	
	Irregularly	5 (83.3)	1 (16.7)	
Time of tooth brushing	Before bed	17 (77.3)	5 (22.7)	0.78
	Morning	133 (83.7)	26 (16.3)	
	Both in morning and before bed	112 (80.0)	28 (20.0)	
	No fixed time	5 (83.3)	1 (16.7)	
Fluoride tooth paste usage	Yes	207 (80.9)	49 (19.1)	0.48
	No	60 (84.5)	11 (15.5)	
Does the patient have sweet drinks or sweet food before going to bed?	Yes	218 (82.3)	47 (17.7)	0.58
	No	58 (79.4)	15 (20.6)	

## DISCUSSION

In Nepal, there are scarce data on the prevalence of dental caries among adult population. Majority of the studies on dental caries in Nepal have been conducted in children rather than adults. This cross-sectional study was conducted to assess the prevalence of dental

caries and its associated factors among patients attending Department of Oral Medicine and Radiology of Nepal Medical College Dental Hospital.

This study showed that majority used tooth brush for cleaning their teeth which was similar to various other studies.<sup>11,15</sup> Majority of the participants (52.0%) brushed once daily which

was supported by another study.<sup>16</sup> Majority of the participants used fluoridated toothpaste (78.3%) which was similar (71.4%) to a study conducted in terai of Nepal but higher than studies conducted in Africa (18.0%) and China (5.0%).<sup>16-18</sup>

This study showed that the prevalence of dental caries was 81.6%. Similar finding was seen in a study done in Egypt 86.6% and Kosovo 72.80%.<sup>19,20</sup> However, lower prevalence was seen in other studies done in different parts of Nepal.<sup>10,11</sup> This difference might be due to the sociodemographic differences in the study population.

The prevalence of dental caries was found to be highest among the age group 35-44 years, which was supported by another study.<sup>21</sup> On the contrary, other studies<sup>10,22</sup> showed higher prevalence of caries among age group 18-34 years. This study showed that as age advanced, the prevalence of caries decreased, which was supported by a study done in Kosovo.<sup>20</sup> The reason for low prevalence among this age group may be that with advance age more teeth were missing in comparison to young<sup>20</sup> and root caries is more prevalent among elderly<sup>23</sup> when DMFT index is not for root caries assessment.

In this study, the prevalence of dental caries was higher among the female participants (84.9%) than the male participants (76.2%) which was supported by similar studies.<sup>10,22,24,25</sup> The reason for higher prevalence of dental caries among female might be due early eruption of tooth in female which leads to long exposure time

in oral environment and other risk factors like salivary composition, saliva flow rate, genetic variations, dietary habits, hormonal, psychological and economic factors.<sup>26</sup>

In this study, the prevalence of dental caries was higher among married individuals (69.5%) which was similar to another study.<sup>27</sup> The result showed less prevalence of caries among participants using toothbrush which was similar to another study.<sup>14</sup> In this study, the prevalence of dental caries was high among participants brushing in the morning which was similar to other studies.<sup>14,27</sup> This may be due to more time for plaque accumulation, food trapped between teeth putting the teeth at risk.

This study has some limitations. This study was done in one hospital premises and focused on patients who visited dental hospital for various dental issue. Therefore, the findings cannot be generalised.

In conclusion, the prevalence of dental caries among the study participants was high, although majority used toothbrush and fluoridated toothpaste for oral hygiene maintenance. Prevalence of caries among female was higher than that in male. Brushing once a day was a common practice. To reduce the prevalence of dental caries and to minimize its impact on the overall population, oral health education should be given at community level.

**Conflict of interest:** None

**Source of research fund:** None

## REFERENCES

1. Aas JA, Griffen AL, Dardis SR *et al*. Bacteria of dental caries in primary and permanent teeth in children and young adults. *J Clin Microbiol* 2008; 46: 1407-17.
2. World Health Organization. Oral health surveys: basic methods: World Health Organization; 2013.
3. Alraqiq H, Eddali A, Boufis R. Prevalence of dental caries and associated factors among school-aged children in Tripoli, Libya: A cross-sectional study. *BMC Oral Health* 2021; 21: 1-12.
4. Kumar PN, Peeran SW, Abdalla KA, Al-Zain M, Ahmed F. Dental caries status among 6–14 years old school going children of Sebha city, Libya. *J Indian Assoc Public Health Dent* 2013; 11: 18-22.
5. Ortiz FR, Tomazoni F, Oliveira MDM, Piovesan C, Mendes F, Ardenghi TM. Toothache, associated factors, and its impact on Oral Health-Related Quality of Life (OHRQoL) in preschool children. *Braz Dent J* 2014; 25: 546-53.
6. Christian B, Ummer-Christian R, Blinkhorn A *et al*. An epidemiological study of dental caries and associated factors among children residing in orphanages in Kerala, India: Health in Orphanages Project (HOPE). *Int Dent J* 2019; 69: 113-8.
7. Peres MA, Macpherson LM, Weyant R, Jea. Oral diseases: a global public health challenge. *Lancet* 2019; 394: 249-60.
8. Petersen PE. Improvement of oral health in Africa in the 21st century-the role of the WHO Global Oral Health Programme. *Afr J Oral Health Sci* 2004; 1: 2-16.
9. Bhagat T, Rao A, Shenoy R. Assessment of Oral Health Status of 35-44 and 65-74 Year Old Adults in Bairawa, Saptari, Nepal. *Indian J Contemp Dent* 2013; 1: 123.
10. Khapung A, Shrestha S. Dental caries among adult population of a Municipality: a descriptive cross-sectional study. *J Nepal Med Assoc* 2022; 60: 870-3.

11. Singh A, Shrestha A, Bhagat T, Baral D. Assessment of oral health status and treatment needs among people of Foklyan area, Dharan, Nepal. *BMC Oral Health* 2020; 20: 1-8.
12. Yadav K, Prakash S, Khanal S, Singh J. Prevalence of dental caries among adolescence of Dhanusha district, Nepal. *Janaki Med Coll J Med Sci* 2015; 3: 29-37.
13. Sehdev B, Muruts L, Ganji KK. Prevalence of tooth decay and associated factors among Ethiopian patients. *Pesqui Bras em Odontopediatria Clín Integr* 2020; 20.
14. Tafere Y, Chanie S, Dessie T, Gedamu H. Assessment of prevalence of dental caries and the associated factors among patients attending dental clinic in Debre Tabor general hospital: a hospital-based cross-sectional study. *BMC Oral Health* 2018; 18: 1-7.
15. Aryal KK, Neupane S, Mehata S *et al.* Non communicable diseases risk factors: STEPS Survey Nepal 2013: NHRC 2014.
16. Thapa P, Aryal KK, Mehata S *et al.* Oral hygiene practices and their socio-demographic correlates among Nepalese adult: evidence from non communicable diseases risk factors STEPS survey Nepal 2013. *BMC Oral Health* 2016; 16: 1-8.
17. Varenne B, Petersen PE, Ouattara S. Oral health behaviour of children and adults in urban and rural areas of Burkina Faso, Africa. *Int Dent J* 2006; 56: 61-70.
18. Zhu L, Petersen PE, Wang H-Y, Bian J-Y, Zhang B-X. Oral health knowledge, attitudes and behaviour of adults in China. *Int Dent J* 2005; 55: 231-41.
19. Abbass MM, AbuBakr N, Radwan IA *et al.* The potential impact of age, gender, body mass index, socioeconomic status and dietary habits on the prevalence of dental caries among Egyptian adults: a cross-sectional study. *F1000 Research* 2019; 8: 243.
20. Kamberi B, Koçani F, Begzati A *et al.* Prevalence of dental caries in Kosovar adult population. *Int J Dent* 2016; 2016: 4290291.
21. WHO. Oral Health Surveys' Basic Methods. Geneva: World Health Organization. 1997.
22. Patro BK, Kumar BR, Goswami A, Mathur VP, Nongkynrih B. Prevalence of dental caries among adults and elderly in an urban resettlement colony of New Delhi. *Indian J Dent Res* 2008; 19: 95-8.
23. Kumara-Raja B, Radha G. Prevalence of root caries among elders living in residential homes of Bengaluru city, India. *J Clin Exp Dent* 2016; 8: e260-7.
24. Chikte U, Pontes CC, Karangwa I *et al.* Dental caries in a South African adult population: findings from the Cape Town Vascular and Metabolic Health Study. *Int Dent J* 2020; 70: 176-82.
25. Rao M, Nathani A, Soma LS, Vegi L. Prevalence of dental caries among rural population of Mustabad, Krishna District. *J Int Oral Health* 2016; 8: 481-3.
26. Lukacs JR. Sex differences in dental caries experience: clinical evidence, complex etiology. *Clin Oral Investig* 2011; 15: 649-56.
27. Teshome A, Andualem G, Derese K. Dental caries and associated factors among patients attending the University of Gondar Comprehensive Hospital Dental Clinic, North West Ethiopia: a hospital-based cross-sectional study. *Clin Cosmet Investig* 2020; 12: 191-8.