Content available at: https://www.ipinnovative.com/open-access-journals

Journal of Dental Specialities

Journal homepage: https://www.jdsits.in/

Original Research Article

Oral health status of adults aged 18 years and above residing in Ghaziabad district – A cross-sectional study

Kalash Gupta[1], **Kanchan Doliya**[1,*], **Dipanshi Sharma**[2], **Kartiki Mehrotra**[2], **Ritu Gupta**[2], **Bhuvan Deep Gupta**[2]

[1] *Dept. of Dental, ITS Dental College, Muradnagar, Ghaziabad, Uttar Pradesh, India*
[2] *Dept. of Public Health Dentistry, ITS Dental College, Murad Nagar, Ghaziabad, Uttar Pradesh, India*

ARTICLE INFO

Article history:
Received 29-07-2023
Accepted 13-09-2023
Available online 29-09-2023

Keywords:
Oral health
Dental caries
Periodontal disease
Gingival bleeding
Cross-sectional study

ABSTRACT

Background and Objectives: Dental caries and periodontal disease are the most common oral diseases. Thus, the aim of this study was to examine the oral health status of adults aged 18 years and above visiting the various outreach camps in the Ghaziabad District.
Materials and Methods: A cross-sectional study was conducted among 336 participants of Ghaziabad District. Dental caries in form of DMFT and periodontal status was recorded based World Health Organization (WHO) criteria-2013. The Statistical analysis was done using the Statistical Package for Social Sciences (SPSS) software.
Results: In total, 336 respondents completed the survey among which 216 (64.3%) were males and 120 (35.7%) were females. Majority of the study subjects belonged to low socioeconomic background. The prevalence of dental caries was found to be 44.34 % and periodontal disease was 81.8% respectively. Individuals belonging to lower socioeconomic status has significantly higher caries prevalence when compared to upper and middle class individuals. ($p \leq 0.05$)
Conclusion: Mounting evidence has demonstrated the essential role of oral health in a long and healthy life. The oral health status of the participants indicates low awareness in majority of the population of Ghaziabad District and only a small number of participants made routine dental visits. The findings can aid planning strategies for oral health care among the population.

1. Introduction

"*Healthy citizens are the greatest asset any country can have*."

World Health Organization defines health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."[1]

One of the most important possessions somebody may have is good health. Nowadays, it is understood that the importance of oral health and overall health is equal. It defined as a standard of health of the oral and related tissues which enables an individual to eat, speak and socialize without active disease, discomfort or embarrassment and which contributes to general well-being.[2]

It has been said that the oral cavity is "the window to general health." You may improve the health of your entire body by taking good care of your teeth and keeping good dental hygiene. And the reason for that is they are interrelated. Reducing the risk of health issues like heart attacks and strokes is accomplished by practicing good oral hygiene. In simple terms, neglecting to take good care of your dental health will be detrimental to your overall health.[3] Poor oral hygiene has a substantial negative impact

* *Corresponding author*.
E-mail address: kanchandoliya33@gmail.com (K. Doliya).

https://doi.org/10.18231/j.jds.2023.021

on oral health and can lead to several issues, including periodontitis, tooth decay, pain and discomfort in the teeth and gums, infection, and tooth loss.[4]

Dental caries and periodontitis are public health issues affecting the world and represent the major cause of tooth loss. Both dental caries and periodontal disease status are two major items included in dental health surveys.[5]

Dental caries is a complex interaction between bacteria, a glucose source, and the tooth surface.[6] Physical, biological, environmental, behavioural, and lifestyle factors such as a high concentration of cariogenic bacteria, insufficient salivary flow, insufficient fluoride exposure, poor oral hygiene, incorrect baby feeding practices, and poverty, all increase the risk of caries. Common risk factors should serve as the basis for the primary preventive strategy. With a minimally invasive, tissue-preserving approach, secondary prevention and therapy should concentrate on managing the caries process over time for individual patients.[7]

Development of pockets, loss of connective tissue attachment, and destruction of alveolar bone are all symptoms of periodontitis, which is an inflammation of the periodontal tissues.[6]However, in most instances, there are barely any obvious clinical indications of the disease process; as a result, therefore therapy frequently begins relatively late in the course of the disease. Uncontrolled periodontal disease causes several local and systemic effects. Oronasal fistulas, class II perio-endo lesions, pathologic fractures, ocular issues, osteomyelitis, and a higher risk of oral cancer are some of the local effects. Whereas systemic conditions associated with periodontal disease are: renal, hepatic, pulmonary, and cardiac disorders; osteoporosis; adverse pregnancy outcomes; and diabetes mellitus.[7]

With a population of more than 1.2 billion, India is the second most populated nation in the world. Geriatric makes up 7.7% of this population that is around 92 million people. Around 72% of the population lives in rural areas with poor socioeconomic conditions. Delivering oral healthcare services to the rural population in India has several challenges, including limited accessibility, a labour shortage, poverty, and illiteracy. For instance, the dentist-to-population ratio in urban areas is 1: 10,000, whereas it is 1: 150,000 in rural areas.[8]Due to geographic and financial barriers, most people who live in rural areas have limited access to essential oral health care. In addition to the traditional and ideal techniques of cleaning teeth, it has been noted that the rural Indian population believes in several dental myths. Rural residents have been known to use tooth powder with finger, neem sticks, charcoal, salt with finger, and even brick powder occasionally.[9]

According to the World Health Organisation, 80 percent of oral disease sufferers worldwide reside in developing nations, showing that oral disease and low income are closely associated. Additionally, there is a dearth of meaningful data on the state of India's rural population's oral health, which is essential for organizing oral health services. As a result, it is important to evaluate the oral health of rural residents.[8]

The present study was conducted to assess the oral health status among adults aged 18 years and above residing in the Ghaziabad district of Uttar Pradesh.[7]

2. Material and Methods

The present study is a descriptive cross-sectional study, conducted among the adults population aged 18 years and above for assessing oral health status in Ghaziabad district of Uttar Pradesh.

2.1. Source of data

The present study was conducted in Ghaziabad district.

2.2. Study design

The study is a cross-sectional descriptive study conducted by a single calibrated examiner from the Department of public health dentistry, ITS Dental College, Ghaziabad.

2.3. Study setting

The Cross-sectional descriptive study was conducted in Ghaziabad district.

2.4. Study population

The present study was conducted in Ghaziabad district. The study population constituted of 18 years and above age group.

2.5. Overview of study area

Ghaziabad district is a largely suburban district of Western Uttar Pradesh in National Capital Region of India. Ghaziabad district has 4 blocks namely Razapur block, Muradnagar block, Bhojpur block, and Loni Block. An official Census 2011 detail of Ghaziabad released by Directorate of Census Operations in Uttar Pradesh states that Ghaziabad had population of 4,681,645 of which male and female were 2,488,834 and 2,192,811, respectively.

Present study was conducted in 4 blocks of Ghaziabad.Figure 1

2.6. Inclusion criteria

1. All the subjects who were in the age group of 18 years or above and willing to participate in the survey.
2. Subjects who gave the informed consent.

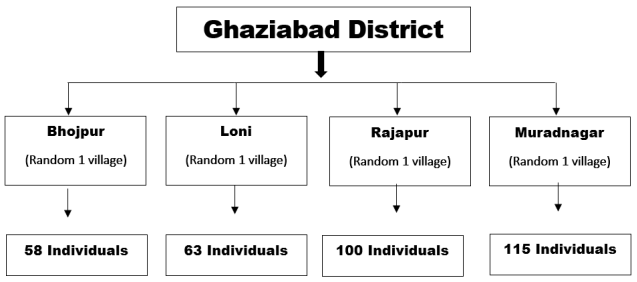

Fig. 1: Division of Ghaziabad District into blocks

2.7. Exclusion Criteria

1. Subjects using any medication which might bias the result.
2. Mentally and physically disabled adults.
3. Patients suffering from diabetes and hypertension.
4. Subjects suffering from any condition which is not suitable for clinical examination.

2.8. Sampling frame

Ghaziabad district was selected as a study area. Systemic random sampling was used for sample collection.

2.9. Sample size

Individuals were selected through various outreach camps.

2.10. Sample methodology

Systematic random sampling was used for sample selection. Through random sampling villages were selected. In each village, outreach camp was conducted.

2.11. Organization of survey

2.11.1. Preparation of protocol

A written protocol was prepared for the study which contained information like objectives and purpose of the study; description and the type of information to be collected; sampling methods to derive study population and statistical methods to analyze the data.

2.11.2. Pilot study

Pilot study was carried out on 30 participants. Pilot study was conducted on subjects before starting the main study to check the feasibility of implementing the main survey through clinical examination and questionnaire and to estimate the sample size. A group of study subjects were selected and examined according to the method and criteria set for the study.

2.11.3. Ethical clearance

The study research protocol was submitted for approval and ethical clearance from ethical committee of ITS Dental College Murad Nagar, Ghaziabad. After obtaining approval and ethical clearance of research protocol study will be implemented on scheduled dates.

2.11.4. Infomed consent

Written informed consents was obtained from the individuals before their participation in the study in order to prevent any inconvenience and to ensure full cooperation.

2.12. Method of collection of data

Data was collected using a performa, consisting of 3 parts, as follows:

1. Questionnaire regarding oral hygiene practices.
2. Kuppuswamy scale for Socio-economic status.
3. Clinical examination using WHO Oral Health Assessment form for adults 2013.

The research tool was a structured questionnaire written in English language.

2.13. Structure of questionnaire

The questionnaire comprised of close-ended questions on various oral health practices and the measuring scale included “Yes” and “No” options. The items for this questionnaire were generated from two sources: previous research studies and interaction with people. The participants who could read and write were given questionnaire to fill and responses were collected through face-to-face interview from the participants who were illiterate by a single investigator. Confidentiality was maintained throughout the whole process of collection of data and its analysis.

2.14. Modified kuppuswamy scale

This scale was devised by Kuppuswamy and is the most widely used scale for determining the socio-economic status of an individual or a family in urban areas. The scale was initially 18 developed by Kuppuswamy in the year 1976 including index parameters like education, occupation, and total income which was further modified in later years to include the head of the family educational status, occupational status, and overall aggregate income of the whole family, pooled from all sources. To perform regular revisions of the scale, the income scale in the Kuppuswamy SES is revised, as per changes in the consumer price index (CPI) for industrial workers as projected by the central ministry of statistics and program implementation on their website.

2.15. Clinical examination

Individuals were examined for oral health status. Dental caries and periodontal disease prevalence was assessed. The "World Health Organization (WHO) oral health assessment form 2013" was used to record the clinical findings. For the diagnosis of dental caries, WHO type III examination was carried out using mouth mirrors and explorers while using adequate illumination. Periodontal assessments were done by community periodontal index (CPI)-probe.

2.16. Statistical method

Data collected was tabulated using Microsoft excel. Data was analyzed using SPSS (Statistical Package for Social Science) version 20. Data was assessed using chi-square tests.

3. Results

Among 336 participants , 56(16.66%) belonged to the age group of 18-25 years of age, 61(18.15%) belonged to the age group of 26-33 years of age, 84(25%) belonged to the age group of 34-41 years of age, 47(13.98%) belonged to the age group of 42-49 years of age, 36(10.71%) belonged to the age group of 50-57 years of age and 52(15.4%) belonged to 58 & above. Among 336 study participants, 216(64.3%) were males and 120(35.7%) were females. Out of 336 participants, 10(3%) belong to lower middle socio-economic status, 33(10%) belong to upper lower and 293(87%) belong to lower socio-economic status. Out of 336 participants, 249(74%) were using Toothbrush and Toothpaste, 60(18%) were using Finger and Toothpowder, 20(6%) were using Neem stick and 7(2%) were using Brick powder. Out of 336 participants, dental caries were present in 48.2% males and 45% females. Out of 336 participants, periodontal pockets were present in 38.2% males and 61.8% females. Out of 336 participants, missing teeth were reported in 9.3% males and 10.8% females. Out of 336 participants, gingival bleeding was present in 83.8% males and 78.3% females. Out of 336 participants, calculus was present in 83.3% males and 76.3% females. Out of 336 participants, stains were present in 84.3% males and 78.3% females.

Table 1: Distribution of study participants according toSociodemographic characteristic

Variables	N (%)
Age group (in years)	
18-25	56 (16.66)
26-33	61 (18.15)
34-41	84 (25)
42-49	47 (13.98)
50-57	36 (10.71)
58 & Above	52 (15.4)
Gender	
Males	216 (64.3)
Females	120 (35.7)
Socioeconomic Status	
Upper	0 (0)
Upper middle	0 (0)
Lower middle	10 (3)
Upper lower	34 (10)
Lower	292 (87)

Table 2: Distribution of study participants according to oral health status

Variables	N (%)
Oral hygiene practices	
Toothbrush and toothpaste	249 (74)
Finger and toothpowder	60 (18)
Neem stick	20 (6)
Brick powder	7 (2)
Dental Caries	
Present	149 (44.34)
Absent	187 (55.66)
Missing Teeth	
Present	33 (9.8)
Absent	303 (90.2)
Gingival bleeding	
Present	275 (81.8)
Absent	61 (18.2)
Periodontal Pocket	
Present	128 (38.2)
Absent	208 (61.8)
Calculus	
Present	272 (81.0)
Absent	64 (19.0)
Stains	
Present	276 (82.1)
Absent	60 (17.9)

4. Discussion

The Importance of oral health is well recognized in promotion of general health since many oral health conditions are reflected in systemic diseases and vice versa. Oral health remains low priority area particularly in developing countries due to other basic needs such as food, clothing, shelter and medical facilities. [10]

The present study included 336 adult individuals. They represented a considerable fraction of the both males and females of Ghaziabad district as a major portion of the individuals visited these health camps. The present study findings show that oral conditions of the population of Ghaziabad are neglected and are alarming.

Socioeconomic status is one of the risk factors for poor oral hygiene and general hygiene. Persons of lower socioeconomic status suffer disproportionately more from nearly all diseases than people of higher socioeconomic status. In the present study, 87% of the subjects were of lower socioeconomic status which is higher when compared

to a study done by Das D et al (2020), followed by upper lower class and very low fraction of the subjects were from lower middle socioeconomic status. This might be due to the study setting which was mainly assessed among the rural population of Ghaziabad district where majority of population is illiterate and unemployed.[11]

In the present study prevalence of dental caries was 44.34%. A study done by Maru AM et al (2012) found that prevalence was 87.8%, it is possible because of lack of awareness on importance of oral health.[12] In the current study, the prevalence of subjects with bleeding gingiva was 83.8%, and it was higher in males compared with females. A lower prevalence of bleeding gingiva among males was reported in Australia in 2009.[13]In the current study, the prevalence of subjects with bleeding gingiva was 83.8% in males and 78.3% in females. A study by Janakiram et al. (2020) revealed the percentage to be 77.3% in females and 75% in males, which is lower than it was in our study. This may be due to the fact that there were differences in practice of oral hygiene between sexes.[14] In our survey, we found that 81.0% of the individuals have Calculus component of the PDI. A study done by Malakar M et al (2021) highlighted that the prevalence was 57%. The probable reason for this could be poor oral hygiene practices in the study population.[15] In the current study 74% of the subjects were using tooth brush along with toothpaste as oral hygiene method and only 26% of the subjects were using other methods of cleaning teeth such as neem stick, brick powder etc. A study done by Handa S et al., showed that 65% of the population used tooth brush along with toothpaste as oral hygiene method which is lower than the percentage in our study.[10] In the current study the prevalence of missing teeth was 9.3% in males and 10.8% in females. This percentage was determined to be 6.3% in females in a study conducted by Kumar A., which is relatively low when compared to our survey which could be due to lack of awareness for preserving tooth structure.[16]

5. Recommendations

1. Programs to raise awareness of oral health must be made available in these villages.
2. A program that incorporates oral health education, motivation, a demonstration of proper tooth brushing techniques, and the use of various cleaning aids should be planned.
3. In these villages, mobile dental clinic services can be implemented.
4. For these people's oral and general health status to improve, ongoing study and interventions are required.
5. To make dental care more accessible, transportation infrastructure in rural areas needs to be upgraded.

6. Conclusion

The baseline data from this epidemiological survey can be used to implement oral health programs. The wide range in periodontal disease prevalence and severity, in addition to those between rural and urban populations, as well as between developing and developed countries, has been attributed to several factors. A health policy that stresses oral health promotion and prevention along with traditional curative treatment would appear more advantageous in view of the high treatment needs of the study group. The curriculum for rural areas can contain an introduction and a focus on how to maintain good oral hygiene. Additionally, it is necessary to lower the cost of treatment while also increasing accessibility to dentists.[17]Moreover, more studies with longitudinal data on the same target population are needed to examine the risk factors contributing to the development of oral disease.[10]

7. Source of Funding

None.

8. Conflict of Interest

None.

References

1. Bradley KL, Goetz T, Viswanathan S. Toward a contemporary definition of health. *Mil Med*. 2018;183(suppl_3):204–7. doi:10.1093/milmed/usy213.
2. Aggur M, Garg S, Veeresha KL, Gambhir RS. Oral Health Status, Treatment Needs and Knowledge, Attitude and Practice of Health Care Workers of Ambala, India - A Cross-sectional Study. *Ann Med Health Sci Res*. 2014;4(5):676–81. doi:10.4103/2141-9248.141496.
3. Suite B. The Connection Between Your Oral Health and Your Overall Health . In: City Park Dentist. Houston ,TX; United states;.]Last accessed on 2023, Aug 18th]. Available from: https://glossdentalcitypark.com/the-connection-between-your-oral-health-and-your-overall-health/.
4. Jahangiry L, Bagheri R, Darabi F. Oral health status and associated lifestyle behaviors in a sample of Iranian adults: an exploratory household survey. *BMC Oral Health*. 2020;20:82. doi:10.1186/s12903-020-01072-z.
5. Niemiec BA. Periodontal disease. *Top Companion Anim Med*. 2008;23(2):72–80. doi:10.1053/j.tcam.2008.02.003.
6. Chang PS, Huang CJ, Hsiang CL, Lai H, Tsai AI. Prevalence of Dental Caries and Periodontal Disease of High School Students Aged 15 to 18 Years in Taiwan. *Int J Environ Res Public Health*. 2019;18(19):9967. doi:10.3390/ijerph18199967.
7. Selwitz RH, Ismail AI, Pitts NB. Dental caries. *Lancet*. 2007;369(9555):51–9. doi:10.1016/S0140-6736(07)60031-2.
8. Salunke S, Shah V, Ostbye T, Gandhi A, Phalgune D, Ogundare MO, et al. Prevalence of dental caries, oral health awareness and treatment-seeking behavior of elderly population in rural Maharashtra. *Indian J Dent Res*. 2019;30(3):332–6. doi:10.4103/ijdr.IJDR_356_17.
9. Rathod R, Parikh J. Oral Hygiene Practices and Oral Health Status in Rural India. *J Dent*. 2016;6(1):7–10.
10. Handa S, Prasad S, Rajashekharappa CB, Garg A, Ryana HK, Khurana C, et al. Oral health status of rural and urban population of Gurgaon block, Gurgaon district using WHO assessment form through multistage sampling technique. *J Clin Diagnostic Res*. 2016;10(5):ZC43–51. doi:10.7860/JCDR/2016/19048.7756.
11. Das D, Menon I, Gupta R, Arora V, Ashraf A, Ahsan I, et al. Oral health literacy: A practical strategy towards better oral health status

among adult population of Ghaziabad district. *Fam Med Prim Care Rev*. 2020;9(2):764–70.
12. Maru AM, Narendran S. Epidemiology of dental caries among adults in a rural area in India. *J Contemp Dent Pract*. 2012;13(3):382–8.
13. Australian Research Centre for Population Oral Health, The University of Adelaide, South Australia, Periodontal diseases in the Australian adult population. *Aust Dent J*. 2009;54(4):390–3. doi:10.1111/j.1834-7819.2009.01167.x.
14. Janakiram C, Mehta A, Venkitachalam R. Prevalence of periodontal disease among adults in India: A systematic review and meta-analysis. *J Oral Biol Craniofac Res*. 2020;10(4):800–6.
15. Malakar M, Ravishankar PL, Saravanan AV, Rao KS, Balaji R. Prevalence of Periodontal Disease and Oral Hygiene Practices in Kancheepuram District Population: An Epidemiological Study. *J Pharm Bioallied Sci*. 2021;13(Suppl 2):1517–22. doi:10.4103/jpbs.jpbs_196_21.
16. Kumar A, Virdi M, Veeresha K, Bansal V. Oral health status & treatment needs of rural population of Ambala, Haryana, India. *Internet J Epidemiol*. 2010;8(2):1–7.
17. Premnath K, Wasan B, Tusharbhai DM. A cross-sectional study on oral hygiene status among rural population. *Int J Applied Dental Sci*. 2019;5(3):229–33.

Author biography

Kalash Gupta, Under Graduate Student https://orcid.org/0009-0005-0225-552X

Kanchan Doliya, Under Graduate Student https://orcid.org/0009-0006-2589-2238

Dipanshi Sharma, Post Graduate Student https://orcid.org/0009-0006-0016-3418

Kartiki Mehrotra, Post Graduate Student https://orcid.org/0009-0006-7310-7310

Ritu Gupta, Professor https://orcid.org/0000-0002-8634-7501

Bhuvan Deep Gupta, HOD & Professor https://orcid.org/0000-0003-3864-2474

Cite this article: Gupta K, Doliya K, Sharma D, Mehrotra K, Gupta R, Gupta BD. Oral health status of adults aged 18 years and above residing in Ghaziabad district – A cross-sectional study. *J Dent Spec* 2023;11(2):116-121.