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Original Research Article

Oral hygiene behaviour and practices of urban slum population: a cross-sectional study

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ABSTRACT

Background: Poor oral hygiene is a major etiological factor for oral diseases. Urban slums are identified as a risk group population as the burden of oral diseases is high among them. So, the aim of the study was to evaluate oral hygiene status among the urban slum population.
Methods: A cross-sectional study was carried out on 480 urban slum people aged between 18 to 75 years. A cluster random sampling method was adopted. Data were collected by structured questionnaire. The questionnaire included information related to patient's knowledge, attitude, and practices related to their oral hygiene. Descriptive statistics were used to analyse the data.
Results: The majority of people brushed their teeth once a daily (58.3%) by using a toothbrush and toothpaste (65%) followed by mishri and charcoal. 81.7% of people did not use any other oral hygiene aid. The majority of people did not use interdental aids, tongue cleaner, mouthwash. The majority of people (72%) know the harmful effect of tobacco still they consume various forms of tobacco. The results showed an acute lack of oral hygiene awareness and practices as well as the effect of poor oral hygiene on systemic health.
Conclusions: There is a need to educate the urban slum population regarding proper dental care, oral hygiene methods, and prevention of dental diseases through dentists, outreach programs, effective oral health education, and promotion programs to make healthy individuals and healthy society.

Keywords: Attitude, Knowledge, North Maharashtra, Oral diseases, Oral hygiene practices, Urban slum

INTRODUCTION

Hygiene is a science concerned with the investigations of environmental factors that affect human health. It studies how the human body responds to them. Dental hygiene is the science and practice of the recognition, treatment, and prevention of oral diseases.[1]

Oral diseases are a major public health concern owing to their high prevalence and their effects on the individual's quality of life. One of the major etiological factors leading to these oral diseases is poor oral hygiene.[2]

Oral hygiene is the practice of maintaining oral cavity clean and healthy by the daily oral hygiene practices such as tooth brushing, interdental aids, use of mouth rinses, cessation of tobacco usage, and regular dental visits.[3]

Oral diseases affect nearly 3.9 billion people globally. Good oral hygiene is the foundation for a healthy mouth and prevents 80% of all dental problems.[4,5] Good oral health practices have an inverse relationship with oral disease and those who attend the dental clinic routinely have better-than-average oral health, fewer teeth missing

due to caries, and a lower decayed missing filled teeth score.[6]

The attainment of good oral health requires the acquisition of knowledge about oral disease prevention, having acceptable oral health behaviour such as maintenance of good oral hygiene and non-harmful dietary practices, as well as utilization of oral health facilities for preventive care, prompt disease diagnosis, and treatment.[7] Preventive oral health practices include regular, twice daily conscious cleaning of the teeth, dental flossing, decreased intake of sugar between meals, and regular attendance at the dental clinic, at least once every year.[8] Every individual's adherence to the recommended oral hygiene regime is a fundamental factor in the prevention of oral diseases.[3]

According to United Nations (UN) habitat, slum structures range from simples shacks to semi-permanent structures, lacking basic household utilities. Slums are settlements characterized by highly populous areas with unplanned and unstructured housing and very poor facilities. Nearly one-third of the world's population and more than 60% of the urban population in developing countries lives in slums.[9,10]

India is a developing nation in which a large segment of the population is migrating to urban cities seeking employment, education, and other reasons which lead to an increase in urban slums.

The population living in the slums is usually very poor, socioeconomically disadvantaged, and underprivileged. Most of its inhabitants are migrant populations coming from rural areas who subsist on low wages, under-employed, or often unemployed for an indefinite period.[11]

In the slum population, direct risk behaviours such as poor oral hygiene practices and dietary habits, tobacco use, and excessive consumption of alcohol are factors that may lead to oral diseases.[12]

The general health, as well as oral health of this underprivileged population, is largely neglected because of lack of awareness and low purchasing power, lack of health support, Poor educational status, and also People in the slum areas do not have sufficient knowledge and awareness about the importance of oral hygiene and do not follow the hygienic practices due to which the slum community faces many dental problems.[13]

Although many studies have been carried out from time to time to assess the knowledge and behaviour of people about oral hygiene practice, there is still a dearth of education regarding the same especially for urban slum people, who make up for more than 60% of the urban population in India. Also, sparse data is available regarding metropolitan slum areas such as the Dharavi slum in Mumbai but, there is limited literature available regarding the knowledge, behaviour of oral hygiene practices in the non-metropolitan slum areas such as the North Maharashtra region.

Therefore the present study was conducted to assess the oral hygiene awareness and practices amongst the urban slum population of the North Maharashtra region.

METHODS

Study design

A cross-sectional descriptive study was conducted among the urban slum population of the age group 18 to 75 years of North Maharashtra region, India from December 2019 to January 2020.

Study population and sampling technique

A cluster random sampling method was adopted in the present study. The natural clusters of the urban slum of the North Maharashtra region were identified and the required sample was fulfilled by simple random sampling.

Sample size determination was done by using the formula

$$s = 4pq/n^2$$

The final sample size was 480.

All participants of the study were given detailed study information, aims objectives, and explanations and all were provided with informed consent. The participants were asked to sign the written informed consent before the commencement of the study.

Study location

The present study was conducted at urban slum areas of North Maharashtra region. The training and calibration was done at A.C.P.M. Dental College, Dhule, Maharashtra.

Inclusion and exclusion criteria

Inclusion criteria

Subjects residing in urban slums for 10 years, and subjects who gave informed consent were included in the study.

Exclusion criteria

Subjects newly migrated to those slum areas, and subjects not willing to participate in the study and not giving informed consent were excluded.

Ethical clearance

The study protocol was reviewed by the institutional ethical committee of A.C.P.M. Dental College, Dhule, Maharashtra, and was granted ethical clearance. Also, the respective permissions were taken from the local slum authorities.

Structure of questionnaire

A self-made closed-ended questionnaire was prepared which includes 15 questions written in the English language. The questionnaire was translated into the local Marathi language by the examiner and administered to the study participants. The questionnaire included information related to the patient's demographic details such as name, age, gender, education, and occupation and further categorized to assess knowledge, attitude, and practices regarding oral hygiene practices. The questionnaire was divided into four sections.

In the first section, questions were asked to provide information regarding the socio-demographic background of the participants. In the next section participant's knowledge was gathered about oral hygiene practices. Section three consisted of questions exploring the attitude and perception of the participants regarding oral hygiene practices. The last section assessed the participant's oral health practices.

Reliability and validity of the questionnaire

A pilot study was conducted earlier on 30 participants to check the validity and reliability of the questionnaire

For intra-examiner variability was assessed by using Kappa statistics, and it was found to be 0.85. Face validity, content validity and criterion validity was also assessed

Data collection

After obtaining the written consent, every participant was administered the questionnaire. The questionnaire was translated to the local Marathi language by the examiner and the final answers were checked and reconfirmed again by a person well-versed in both languages.

Statistical analysis

Data were entered in a Microsoft excel spreadsheet, and analysis was done using statistical package for the social sciences (SPSS) software (IBM corp. released 2013. IBM SPSS statistics for Windows, version 22.0. IBM corp: Armonk, New York). Descriptive analysis was done. Frequency and percentage were calculated.

RESULTS

All the respondents completed the questionnaire successfully.

This study included a total of 480 participants aged between 18 to 75 years from urban slum areas out of which 248 (51.7%) were male and 232 (48.3%) were female. The majority of the participants were middle-aged i.e. 30 to 40 years of age (30%).

In view of their educational background, the majority of the population was illiterate. 168 participants (35%) were educated up to the secondary level. The detailed education level distribution is depicted in the Table 1.

Table 1: Distribution of subjects according to educational level.

Education	Frequency	Percent
Graduate or post graduate	32	6.7
Itermediate or post high school diploma	56	11.7
High school certificate	48	10.0
Middle school certificate	168	35.0
Primary school certificate	32	6.7
Illiterate	144	30.0
Total	480	100.0

The majority of slum people were unemployed 208 (43.3%) followed by unskilled workers 144 (30%).

Method of cleaning teeth practiced by the respondents was asked and the results showed that there were 312 (65%) participants who used toothbrush and toothpaste for cleaning their teeth, 96 (20%) participants used mishri and the remaining participants used other methods such as toothpowder, charcoal, neem stick, and other indigenous agents.

The majority of people (58.3%) brush their teeth once daily, mostly in the morning.

Regarding the brushing technique majority of participants, 26.7% of participants were not aware of their brushing technique and around 37.5% of the participants brushed their teeth in a horizontal direction.

Table 2: Distribution of subjects according to occupation.

Occupation	Frequency	Percent
Semi-profession	8	1.7
Clerical, shop owner	32	6.7
Skilled worker	64	13.3
Semi-skilled worker	24	5.0
Unskilled worker	144	30.0
Unemployed	208	43.3
Total	480	100.0

About 26.7% of participants don't know about the type of toothbrush used by them and only 10% of the sample used a soft toothbrush.

It is noteworthy that among all, only 18.3% of the participants used any interdental aids like floss, toothpick, and interdental brush while 81.7% of participants did not use any interdental aid for cleaning.

Surprisingly, 51.7% of the participants cleaned their tongue and 23.3% of the participants used the back of the toothbrush and 28.3% of participants used their thumb to clean their tongue.

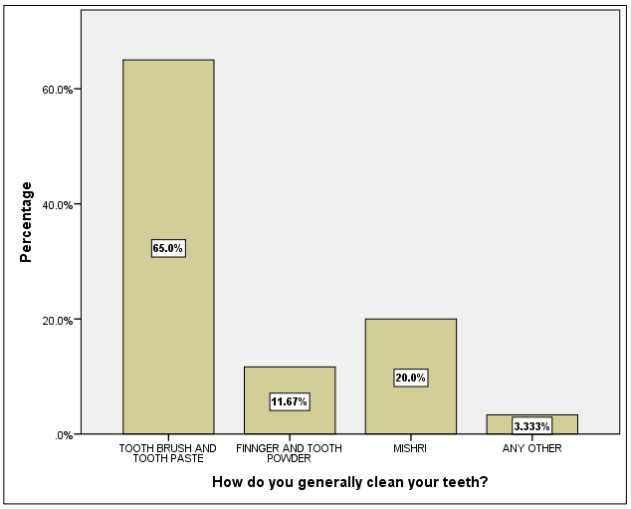

Figure 1: Distribution of subjects according to the teeth cleaning method.

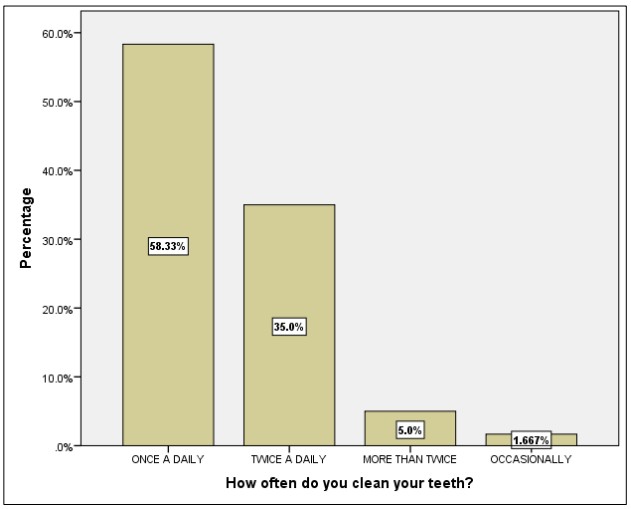

Figure 2: Distribution of subjects according to the frequency of teeth cleaning.

Regarding their awareness and knowledge about gingival and periodontal health, 73.3% of subjects had noticed bleeding gums, 66.7% of subjects feel bad breath. And it was quite satisfactory that 60% of the participants know poor oral hygiene can lead to tooth decay, gum diseases, and bad breath.

Regarding their awareness and knowledge about oral health and its effect on systemic health, the results of the study pointed out that educational level was one of the important factors that governed the knowledge, attitude, and behaviour of the people. 56.8% of participants did not have any idea regarding any relationship between oral health and oral hygiene and systemic health. Still, 66.7% of participants feel that there is a necessity for oral health education.

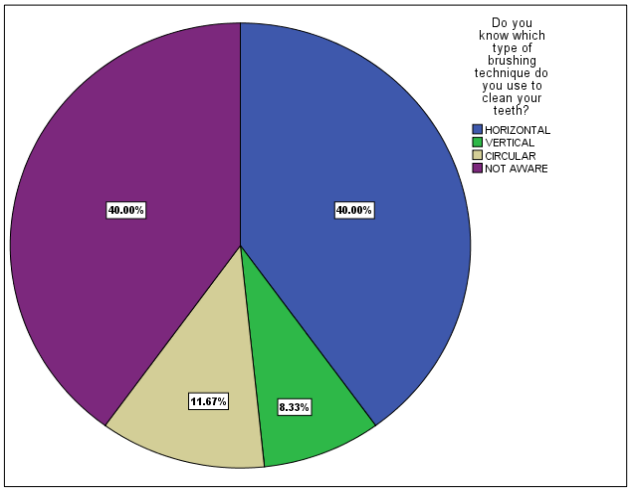

Figure 3: Distribution of subjects according to the brushing technique.

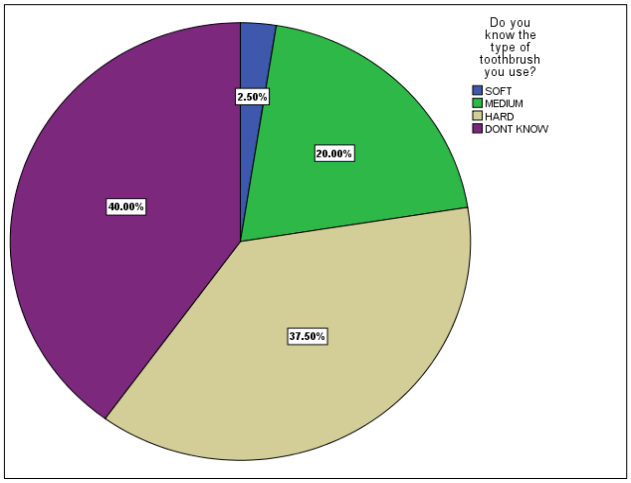

Figure 4: Distribution of subjects according to the type of toothbrush used to clean the teeth.

Figure 5: Distribution of subjects according to the use of interdental cleaning aid.

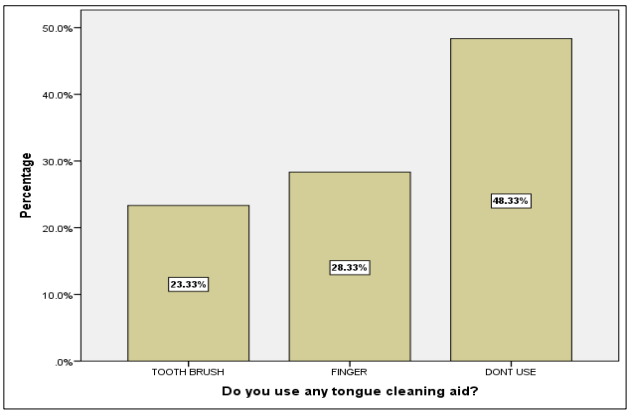

Figure 6: Distribution of subjects according to the use of tongue cleaning aid.

In the present study, it was found that the majority of people (80%) aware of the harmful effects of tobacco but they still consume both smokeless (72%) and combined smokeless-smoked (22.7%) forms of tobacco.

The visits to the dentist did not show any interesting trends. Around 58.3% of participants had never visited a dentist and 35% of participants went to the dentist only in pain.

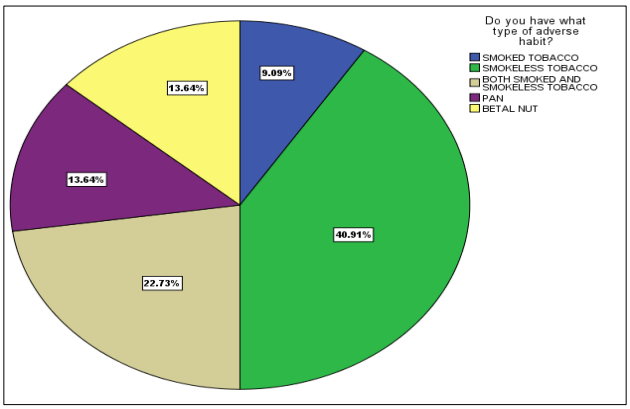

Figure 7: Distribution of subjects according to adverse habit.

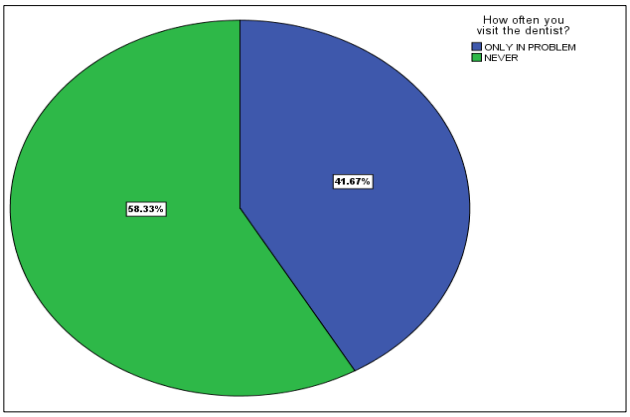

Figure 8: Distribution of subjects according to the frequency of dental visits.

DISCUSSION

This study was carried out in the urban slum population of the North Maharashtra region, India comprised of 480 participants. The selection of the urban slum population can be justified by the fact that the oral hygiene status of the urban slum population is of great concern particularly because the burden of oral diseases is concentrated in these underprivileged risk groups. It is generally expected that the slum populations have poorer health status including morbidity, mortality, and health risks as compared to the general population.[10] So, this study can give a first-hand analysis of the situation and help the policymakers to plan specific and customized oral health policy that is best suited for the urban slum population.

In the urban sum population, out of total study subjects, the majority of the population was illiterate and educated only up to primary or secondary level. These findings were in accordance with the study conducted by Ahmed et al where the majority of people were illiterate.[14] However, these findings were not in accordance with the figures obtained in the census of 2011 where the literacy rate of Maharashtra was 82.34%.[15] This though shows a low overall level of literacy, but shows a positive trend where the younger generation is probably being encouraged by the older generation to avail educational facilities. This shows promise for the social development of the urban slum populations prospectively.

In the present study, the majority of the population i.e. 43.3% of the population was unemployed and 30 % of subjects were unskilled workers this might be due to a lack of technical and skilled education in the urban slum population. These study findings are in accordance with a study conducted by Airen et al, Balasuppramaneium et al and not in accordance with a study conducted by Handa et al in the urban population.[3,16,17]

The results showed that toothbrush and toothpaste (65%) was the most common method to clean their teeth which was more than the study conducted in 2010, according to the consumer usage and attitudes, only 51% of the Indian population used toothbrush and toothpaste to clean their teeth.[18] A similar study conducted by Ali et al in slum dwellers in Pakistan showed more results than our study that 80% of the slum population used toothbrush and toothpaste for cleaning their teeth.[13]

Although brushing was the commonly used method of cleaning, the percentage of subjects brushing their teeth twice daily was 35%, which was less compared with 67% of the Chinese urban adolescents in a study by Jiang et al, 62% of the Kuwaiti adults in a study by Al-Shammari et al, and 50% of the middle-aged and 75% of the elderly Chinese adults in urban areas in a study by Zhu et al.[19-21]

In terms of brushing technique, only 35% of urban slum participants reported correct brushing technique and the majority of the population brushed their teeth in the

horizontal method that might result in compromised tooth structure and gingival health. Patel et al showed only 25.7% of the participants practiced the correct method of brushing.[22] Another study conducted by Tomar et al in Madhya Pradesh reported 22% correct brushing technique among study participants.[23] The results were significantly less than the study conducted by Zhu et al in 2005 where 60% of the sample brushed in the horizontal method.[21] There was poor knowledge regarding the correct brushing technique this might be due to low education level and ignorance of the slum people towards their brushing technique.

In the present study, only 10% of the participants used soft toothbrush, which was in accordance with the study conducted by Jain et al and it was not in accordance with the study conducted by Zhu et al in the urban adults where the majority subjects had used soft toothbrush.[14,21] The majority of the population uses the hard or medium type of brush this is because they might think a hard bristle can efficiently clean their teeth compared to a soft brush and ultimately this leads to soft tissue abnormalities and gingival recession.

In the present study, there was a failure in the use of dental floss and other oral hygiene aid such as a toothpick, interdental brush as a preventive tool. None of the subjects has used dental floss, which is in accordance with the study conducted by Jain et al this also could be attributed to the lack of oral health education and/ or cost of such aids.[14] And the results were in contrast with the study conducted by Wahengban et al and with the study conducted in Canada by Hamilton et al.[4,24] They found that a high percentage (44%) of the sample they studied in north-eastern Ontario, Canada used dental floss. The reason for this may be the significant resource allocation to health education programs that are carried out in Canada. This emphasizes the urgent need for educating and motivating the public to use this efficient method for oral health care.

In the present study, only 23.3% of the studied population showed that they clean their tongue either with a toothbrush or tongue cleaner. This missing and very basic method of maintaining oral hygiene and was a clear indication of a lack of awareness. The results were in accordance with the study conducted by Jain et al.[14]

Bad breath was experienced by 66.7% of the participants in the present study which was in contrast with that of an epidemiologic survey of the general population of japan where 24% of the individuals examined complained about bad breath.[25]

Regarding the inflamed gums the results showed similar results with the studies conducted previously in Bangladesh slum people by Hannam et al.[11] The results of the study revealed the overall poor periodontal and oral hygiene status of the study population. This supports the findings that slum people living in socioeconomically deprived conditions have a higher level of dental diseases and poor oral hygiene status.

It has been observed that oral hygiene has mostly remained an ignored and unrealized major social problem. The majority of people are unaware of the relationship between oral hygiene and systemic diseases or disorders. Many diseases show their first appearance through oral signs and symptoms and they remain unchanged or untreated because of this missing awareness. This fact coincides with the present study in which only 43.2% knew about the relationship between oral health and systemic health.

Tobacco use was more common among slum people. Habitual use causes harm to both users and their families and places a huge burden on families that are already reeling under poverty. The present findings demonstrate that majority of slum people consumed both smokeless and smoked forms of tobacco and they even know the harmful effects of tobacco consumption still, consumes various forms of tobacco. A similar study conducted by Rooban et al in Chennai India on the prevalence of tobacco use among urban slum people showed similar results.[26]

Visiting a dentist is still not considered a preventive dental behaviour in the slum population, at present, it only depends on the treatment needs. This was in accordance with the study conducted by Gundala et al.[27]

The present study shows that around 41.7% of the patients visited the dentist only in problem and only 7% of the population visited the dentist on regular basis after every 6 months. These results are similar to the study done by Jain et al where 54% of the subjects and Kapoor et al where 75% of subjects visited the dentists when they were in pain.[2,14]

The present study has confirmed the general opinion that oral hygiene has remained an ignored and unrealized major social problem. Preventive health education is in the transitional stage in India. Population-based oral health programs are yet to be implemented and followed. Hence in this study attempts were made to describe the knowledge, attitude, and practices of oral hygiene of the studied population. The present study depicts very limited knowledge on prevention and preventive dental behaviour.

Limitations

The tendency towards socially desirable responses cannot be completely excluded especially when using a self-assessment tool. Furthermore, as this was a short-term preliminary study. This makes it difficult to generalize the results of this study. KAP surveys need to be done considering other aspects of oral health to glean complete information. To research the effect of education, occupation on oral health and oral hygiene of slum population, cross-sectional and longitudinal comparisons would be more useful.

CONCLUSION

The present study shows that there is an acute lack of appropriate oral health and oral hygiene awareness and practices among the urban slum population. Oral health, as well as oral hygiene, remains a low priority particularly in slum people due to other basic needs such as food, clothing, shelter, and medical facilities are not fulfilled properly.

The standards of oral health and oral hygiene awareness are very poor with a large segment of the urban slum population being affected due to poor socioeconomic conditions and many people have never been to a dentist Moreover, the majority of people were not aware of fact that oral health affects systemic health.

Hence, there is a need to educate the urban slum population and spread knowledge of proper dental care and prevention of dental diseases through dentists, outreach programs, and relevant public health awareness to make healthy individuals and a healthy society.

Recommendations

However, the information provides insight into the oral health and oral hygiene knowledge and practices of the urban slum population of the North Maharashtra region. To be able to make a further recommendation, it would be important to generate information on how oral hygiene practices impact the oral health of the slum population and identify challenges with, and barriers to, access to preventive oral self-care practices. Only after this can recommendations be made about how to close the current gap between oral health knowledge and oral hygiene practices of the urban slum population.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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ANNEXURE

Name of participant –----------
Age – ---------- Gender–----------

Education –
Profession or Honours
Graduate or postgraduate
Intermediate or post-high school diploma
High school certificate
Middle school certificate
Primary school certificate
Illiterate

Occupation –
Profession
Semi-Profession
Clerical, Shop-owner
Skilled worker
Semi-skilled worker
Unskilled worker
Unemployed

QUESTIONNAIRE

1. **How do you generally clean your teeth?**
   Toothbrush and toothpaste or tooth powder
   Finger and tooth powder
   Mishri
   Any other
2. **How often do you clean your teeth?**
   Once a daily
   Twice a daily
   More than twice
   Occasionally
3. **Do you know which brushing technique you use to clean your teeth?**
   Horizontal
   Vertical
   Circular
   Not aware
4. **Do you know the type of toothbrush you use?**
   Soft
   Medium
   Hard
   Don't know
5. **Do you use any type of oral hygiene aid other than a toothbrush?**
   Floss
   Interdental brush
   Wooden stick
   Don't use
6. **Do you use any tongue cleaning aid?**
   Tongue cleaner
   Toothbrush
   Finger
   Don't use
7. **Have you ever noticed bleeding gums?**
   Yes
   No
8. **Do you feel bad breath?**
   Yes
   No
9. **Do you know poor oral hygiene can lead to**
   Tooth decay
   Gum disease
   Bad breath
   All of the above
10. **Do you think bad oral hygiene can affect your general health?**
    Yes
    No
    May be
11. **Do you have any adverse habits?**
    Yes
    No
12. **If yes then what type of adverse habit?**
    Smoked tobacco
    Smokeless tobacco
    Pan
    Betel nut
    Any other, specify……
13. **Do you know about the harmful effects of tobacco consumption?**
    Yes
    No
14. **How often you visit the dentist?**
    Only in problem
    Once in 3 month
    Once in 6 months
    Never
15. **Do you feel the necessity of oral health education?**
    Yes
    No