Journal of Cardiovascular Disease Research

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 10, 2022

ASSESSMENT OF FACTORS INFLUENCING ORAL HEALTH CARE UTILIZATION AND PERCEIVED ORAL HEALTH OUTCOMES AMONG RESIDENTS OF CRIMINAL TRIBE SETTLEMENT IN KANPUR, INDIA: A CROSS- SECTIONAL STUDY

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ABSTRACT

Introduction: Oral health is a critical but an overlooked component of overall health and well-being among children and adults. In India there are many communities which are backward in terms of social, economic, political and educational considerations. Utilization of oral health care services is an important indicator of health status of any population. This survey was conducted to assess the predisposing, enabling and need factors using Andersen's Behavioral Model and association between the predisposing, enabling and need factors and use of oral health care services among residents of Criminal Tribe Settlement in Kanpur, India: a cross- sectional study.

Aim & Objectives: To assess the predisposing, enabling and need factors using Andersen's Behavioral Model and association between the predisposing, enabling and need factors and use of oral health care services.

Material & Method: A cross sectional survey was conducted among 352 adult residents of Criminal Tribe Settlement (CTS) Kalyanpur, Kanpur using stratified systematic sampling method. Oral health status was evaluated using WHO oral health assessment form (2013) and perceived oral health outcome was measured using OHIP-14. Clinical examination was done for recording the oral health status.

Results: When asked about perceived seriousness of disease 71.1% belief that tooth decay can make people look bad. 60.5% stated that there is no usual source of dental care available. 50.6 % reported they have some problem in the oral cavity. The dental visit in past one year was only

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20.7%. 50.5% people had painful aching in their mouth. 31% have to interrupt meals due to their oral health problems

Conclusion: Data showed high prevalence of dental problems dental health care and utilization was poor. Lack of perceived oral health care need was the main barrier to the utilization of dental services.

Keywords: Andersen; dental caries; CTS, oral health; oral health quality of life; predisposing health belief; utilization.

INTRODUCTION

Oral health is a critical but an overlooked component of overall health and well-being among children and adults.[1]

In India, there are many communities that are backward in terms of social, economic, political, and educational considerations. Over the years, significant improvements in health have been witnessed. However, despite remarkable progress worldwide, there are still people living in isolation with their traditional values, customs, beliefs, and myths intact and are known as "tribes." Worldwide, there are 350 million to 370 million indigenous people in over 90 countries. In India, there are 705 tribal groups constituting about 8.61% of the total population of the country, numbering 104.28 million and covering about 15% of the country's area. The primitive tribal communities have been identified by the Government of India in 30 states/union territories. Among them, Uttar Pradesh is the homeland of nearly 16 tribal groups. The Criminal Tribe community of India is one among them.[2,3]

Some warrior tribes were allied to Rana Pratap in his battle of Haldighati with Akbar. After his exile, the tribes moved further north into Uttar Pradesh. They fought the British in the First War of Independence in 1857.The British labelled them 'criminal' tribes and placed them in open jails in various locations. Criminal tribes were listed originally under the Criminal Tribes Act (CTA) of 1871 and were denotified in 1952 as the Habitual Offenders Act. The CTS Basti in Kanpur is one such open jail where these tribes still live· covering 159 acres of land, CTS has agricultural fields, planned houses and schools·[4]

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The settlement also came to be known as "HabudaBasti". People think Habuda is the name of a tribe. But the origin of Habuda is "*Bura"*,the Hindi word which means bad. The British would say the tribe's men were "*Bura"* and the name Habuda got coined. The land provided by British in the settlement for agriculture was the main source of income for the tribes. The women also used to stitch police and army uniforms at the sewing school. Every morning, the men were taken to British-run factories as labourers.

The condition of the tribes in Kanpur was most pathetic. The Settlement in Kanpur was the biggest. Today, the population is around 10,000. CTS inhabitants in other places are pretty well off. For example, each CTS family in Moradabad has six acres of agriculture land. The Central government's Ministry of Social Justice and Empowerment, in 2006, constituted a group to look into the condition of the tribes that were earlier declared criminal.[5,6]

Tribal health is one of the important areas for action in the health sector. The major contributors to the increased disease risk amongst tribal communities include- (i) poverty and consequent under nutrition; (ii) poor environment and poor hygiene; (iii) lack of access to health care facilities resulting in the increased severity and duration of illness; (iv) social barriers and taboos preventing utilization of available health services: (v) vulnerability to specific diseases like malaria and; (vi) low literacy and indigenous method of disease management.[7,8]

Utilization of health service is a concept expressing the extent of interaction between the service provider and the people for whom it is intended. Dental anxiety, preference for preservation of the teeth, family dental health problems, demographic factors, cultural beliefs, knowledge and attitudes towards dentists and dentistry, access to care, and health services influence the utilization of dental services.[9,10]

One of the most well-known models of health care utilization is that by Andersen. It was originally developed to understand the social, individual, and system factors that influence health service use. Over the years, this model has undergone many modifications. It was chosen because it has the advantage of identifying factors most predictive of dental utilization. Those factors can then inform focused efforts to facilitate care for that population, as many factors are potentially amenable to change and intervention. The model focuses on three core factors to explain healthcare utilization: predisposing, enabling, and need factors.[11]

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Utilization hence is an important indicator of health status of any population; such information is necessary to bridge the gap between this culturally unique and socially isolated Criminal tribes and the rest of the society.[12]

More over there is no information available regarding oral health care utilization among the tribal population. Hence this study was conducted among Criminal Tribal Settlement to assess the oral health care utilization factors shaping the perceived oral health outcomes.

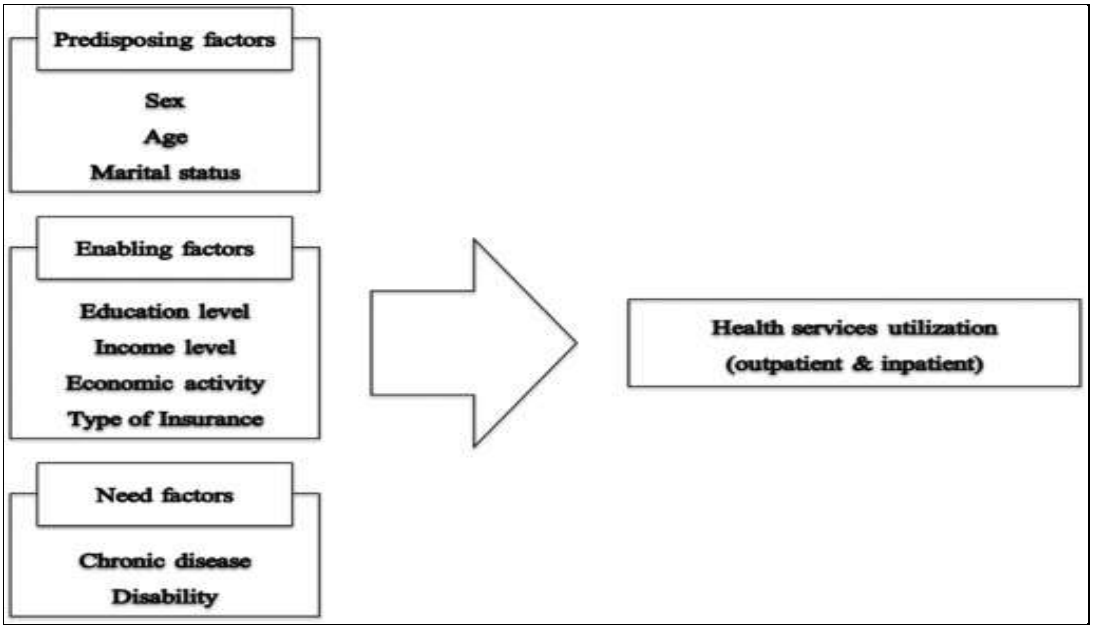

Figure: -Andersen behavior model

Utilization hence is an important indicator of health status of any population; such information is necessary to bridge the gap between this culturally unique and socially isolated Criminal tribes and the rest of the society.[12]

Moreover there is no information available regarding oral health care utilization among the tribal population. Hence this study was conducted among Criminal Tribal Settlement to assess the oral health care utilization factors shaping the perceived oral health outcomes.

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AIM

Assessment of factors influencing oral health care utilization and perceived oral health outcomes among residents of Criminal Tribe Settlement in Kanpur, India: a cross- sectional study.

OBJECTIVES OF THE STUDY

a) To assess the predisposing, enabling and need factors those are significantly associated with oral health care utilization using Andersen's Behavioral Model.

b) To assess the perceived oral health outcomes by using Oral Health Impact Profile (OHIP -14).

c) To assess oral health status and objective treatment needs by using WHO proforma 2013.

d) To assess the association between the predisposing, enabling and need factors and use of oral health care services with perceived oral health outcomes.

MATERIAL AND METHODS

Study area: The study was conducted in Criminal Tribe Settlement (CTS) Basti, Kalyanpur, Kanpur Nagar District.

Source of data: For the proposed study, data was collected from Criminal Tribe Settlement (CTS) Kalyanpur, Kanpur Nagar District.

Age group –above 18, both males and females were included in study.

Study design and Study Population: This is a community-based cross sectional-survey conducted among Criminal Tribe Settlement (CTS) Basti, Kalyanpur, Kanpur Nagar District.

Study duration: -12-14 months.

Ethical approval for the study: The study proposal was submitted for approval and clearance to the Institutional Review Board of Rama Dental College, Hospital and Research Centre, Kanpur. The study protocol was reviewed by the Ethical Committee and the ethical clearance was granted for the same.

Approval from authorities: Permission was taken from the authorities of Criminal Tribe Settlement (CTS) Basti, leader was contacted and informed about the study

Informed consent: A detailed information sheet (in Hindi and English language) was presented to the participants to explain the purpose of the study, procedure, benefits and risks to the

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participants of the study. For the participants who were illiterate, the information sheet was read aloud by the investigator. Following which, written Informed consent was taken from the participants who were willing to participate in the study.

Validity of the Questionnaire: Face and content validity of the questionnaire was tested by the faculty in the department. 20 subjects were randomly selected to assess the test-retest reliability of the questionnaire using Cohen's Kappa coefficient.

Sample size and sampling method:

A Pilot study was conducted among 50 individuals to assess the comprehension of the questionnaire and to calculate the sample size. Sample size was calculated using the following formula (from OpenEpi, Version 3,open-source calculator SSPropor.)

$n = [Np(1-p)]/ [(d2/Z21-\alpha/2*(N-1) + p*(1-p)]$

Where,

N (total population of criminal tribe) = 7000

P (prevalence) = 50% (Dental caries) d (Confident limit) = 5% Z = 1.96

Sample size is calculated to 352.

Sampling methods:

Sample was selected using Stratified Systematic Sampling technique.

Age stratification was done by dividing the population into the following homogenous age groups. Sample proportionate to size was selected from each group, so as to achieve equal representation.

- 18-36 years (177)
- 37-55 years (116)
- 56-74 years (59)
- >75 years of age

Systematic random sampling was done from each strata to achieve the desired sample size.

Inclusion criteria:

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The study included native or permanent residents of Criminal Tribe Settlements who have lived there for over 10 years, are over 18 years old, can understand the questionnaire, and are willing to participate and provide informed consent.

Exclusion criteria:

- The migrants or individuals of other tribes.
- Chronically ill patients with limited movement.
- Individuals who are absent on the day of examination

Data collection:

The subjects were interviewed by the investigator, and the following data was collected through a structured questionnaire and through clinical examination which includes**:**

A. Questionnaire: The questionnaire comprised a total of 33 questions out of these questions, 5 questions were open-ended and 28 questions were close ended questions. A Structured questionnaire was used to record Data which consisted of seven sections.

Section-1 - Socio-demographic details.

Demographic characteristics includes name, age, gender, marital status, education, occupation and Socioeconomic status was classified according to BG Prasad classification based upon per capita income.[13]

Section 2– This section consists of eleven questions of predisposing health beliefs.

Eleven oral health belief items were included in the questionnaire for which five response categories were used.[14,15]

Section 3 – This section consists of information regarding the enabling resources; seven enabling resources items were included.[16]

Section 4– This section consists of information regarding the perceived need for dental treatment. Perceived need was assessed by the question 'what do you think about your oral health?'. problem in oral cavity? and region of problem in oral cavity?

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Section 5– This section consists of information regarding the use of dental services. Recent dental attendance and dental attendance orientation was assessed by the questions; Have you been to the dentist in the last 12 months? Dental attendance orientation was assessed in response to 'In general why do you go to the dentist for? only when in problem with your teeth).

Section 6 – This section consist of perceived oral health outcomes by using Oral Health Impact Profile 14 (OHIP-14)[17]

The OHIP-14 assesses frequency of problems associated with the mouth or dentures on seven dimensions: functional limitation, pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap.

OHIP-14 Scoring:

Additive method is used in categorizing the responses as good and poor.

Don't know + never + hardly ever = GOOD

Very often + fairly often + occasionally = POOR[18]

Section 7 - This section consists of WHO proforma 2013 to evaluate the oral health need.[19]

B. Clinical examination–

Visual examination of oral cavity was done using mouth mirror, Probe, torch and magnifying glass. Clinical recording was done for recording the oral health status.

Statistical Analysis:

The data was entered in Microsoft Excel and was analyzed by using statistical software Statistical Package for Social Sciences (SPSS) version 23.0 for Windows. All study variables were described by using descriptive statistical methods like frequencies, percentages. The various factors and their association with primary study variables were studied using Chi square test. A p-value less than 0.05 was considered statistically significant.

RESULTS

This table shows the age and gender wise frequency distribution of the participants

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Table 1: Age & Gender wise frequency distribution of the participants.

AGE IN YEARS	N	%
18-36	177	50.3%
37-55	116	33.0%
56-74	59	16.7%
75 and above	0	0.0%
TOTAL	352	100.0%
GENDER	**N**	**%**
Male	169	48%
Female	183	52%

The following figures show the distribution of dentition status and treatment needs

Figure 1: Frequency distribution of dentition status.

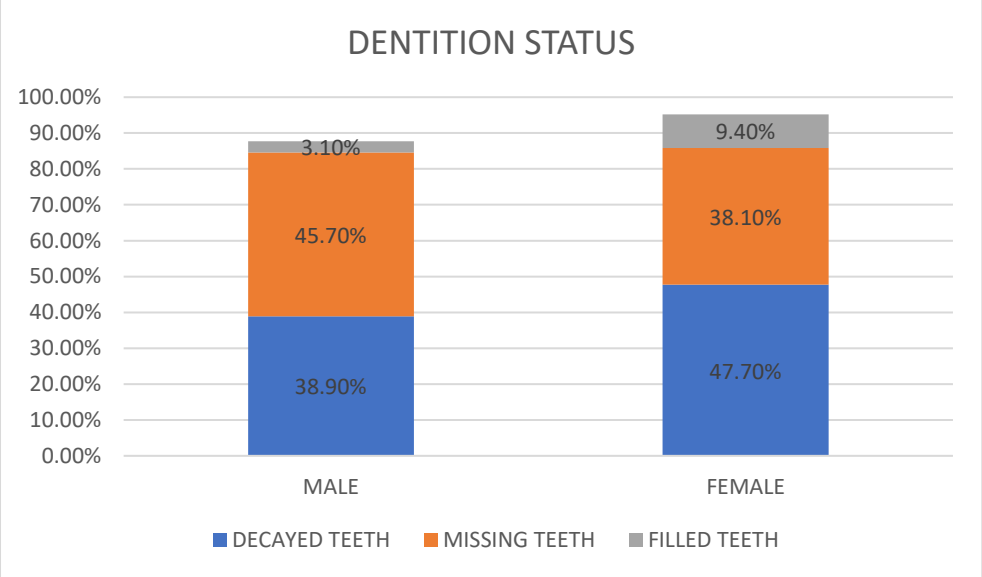

Figure 2: Frequency distribution of treatment need

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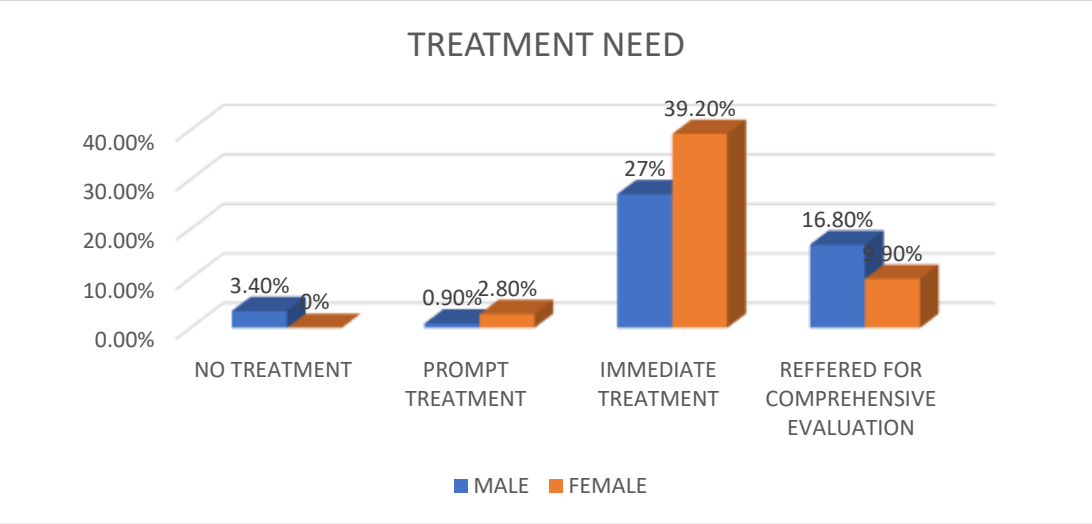

Frequency distribution according to predisposing health beliefs:

Perceived Importance and Seriousness of Oral Disease:

Among the study population, 38.3% had a lower perceived importance of oral disease, 47.1% viewed it as highly serious, and 52.8% considered it less serious.

Beliefs in Preventive Practices:

A strong belief in the benefits of preventive practices was held by 91.2% of participants, while 8.8% had a negative belief.

Beliefs in the Efficacy of Dentists:

85.5% of the study population had a high belief in the efficacy of dentists, compared to 14.5% with weaker beliefs.

The frequency distribution of response of oral health impact profile (OHIP-14):

The OHIP-14 assesses frequency of problems associated with the mouth or dentures on seven dimensions: functional limitation, pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. Participants are asked to rate for the last three months each item on a five-point scale from (‘don’t know’) to (‘very often’).

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Reported Problems According to OHIP-14 Questions:

50.5% of patients reported painful aching in the mouth or denture, 36.1% found eating uncomfortable due to dental issues, and 31% experienced interruptions in meals and felt self-conscious about their diet because of mouth or teeth problems. Additionally, 21.1% reported an unsatisfactory diet due to dental issues.

DISCUSSION:

The present study was conducted on 352 Criminal Tribes' inhabitants of the Criminal Tribe Settlement of Kalyanpur, Kanpur, Uttar Pradesh. The sample consisted of 48% (n = 169) males and 52% (n = 183) females, belonging to 18-75 years of age with a mean age of 39.25 ± 14.97. Findings reported here support Andersen's behavioral model of service use and health outcomes as applied to perceived oral health. As such, the study identifies a number of social, attitudinal, and behavioral factors that may be important in understanding the context of utilization of oral health services in the specific tribal population.

To our knowledge, this is the first study of its kind conducted among the very untouched population of Criminal Tribes residing in Criminal Tribe Settlement, Kalyanpur. Though there are studies assessing the oral health status among tribal populations and have reported the prevalence of many oral diseases, no such studies have assessed the oral healthcare utilization factors shaping the perceived oral health outcome based on the concept of Andersen's behavioral model.

This study has included predisposing health beliefs as one construct within Andersen's model; it suggests that an intention to perform a behavior is the outcome of several beliefs such as attitudes, norms, and perceived behavioral control. These factors predict intentions, which are then linked to behavior. It may be that need and enabling resources predict an individual's attitudes and perceived norms, which in turn predict intended and then actual service use.[10] Alternatively, an individual's health beliefs, attitudes, values, and knowledge about oral health and dental services may be one route by which social structural factors influence enabling resources, need, and use of services.

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Use of Oral Health Services:

In this study, we have compared the predisposing, enabling, and need components of Andersen's behavioral model with the use of oral health services. The use of oral health services was measured here using two concepts: past dental visits and reasons to visit a dentist. Due to the scarcity of studies assessing the utilization of oral healthcare services among tribal populations, most of the comparison is done taking general population in consideration:

In the present study, it was observed that 79.3% of the subjects had not visited a dentist in the last year. Regarding reasons to visit a dentist, the study reported that the major reason (75.9%) was the presence of an oral health problem.

Association of predisposing Socio-Demographic characteristics with past dental visits and reasons to visit:

Age:

- In the present study, 11.4% of adults in the 37-55 years age group visited the dentist more frequently. A similar study conducted by Davidson et al.[20] reported that middle-aged adults (12.4%) were more likely to attend a dentist compared to younger individuals (8.3%). This may be due to increased awareness of personal health status and health-seeking behavior with age. Additionally, they may be in a better financial position to afford dental care.
- We also observed that the number of subjects visiting the dentist (16.7%) decreased significantly in older age groups. Similar findings were observed in a study conducted by Wu et al.[21] on Chinese elderly, where only 13.4% had a dental visit in the past year. This can be partly explained by the belief that dental problems are a natural part of aging rather than indicators of poor health, and other systemic conditions seem more important than oral health.

Gender:

- In the present study, the number of female participants (52%) was relatively greater compared to males (48%). This is consistent with the findings of a study by Wu et al.[21] which reported that a higher percentage of female participants (63%) compared to males sought dental care.

Education:

Education is crucial for individuals to fully participate in the development process, including healthcare, as it enhances knowledge, skills, and self-confidence. The present study showed

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that 29% of the study population had not received any formal education. This lack of education could be due to the following factors:

Isolation: Living in isolation, this tribal population is less aware of the importance of education.

Economic Factors: The failure of government educational programs and the need to work to earn a livelihood rather than spend time on education.

Financial Burden: Financial crises may also contribute to the lack of formal education.

These findings are similar to those of a study conducted by Shetty et al.[22] where 19% of the population had not received any formal education.

In this study the level of education was significantly associated ($p = 0.00$) with past dental visits. Participants with education below the degree level (10.8%) visited the dentist more frequently compared to those with no education (1.7%). The level of education was also significantly associated ($p < 0.007$) with the reason for visiting a dentist. Regular visits were more common among those with higher education (6.8%) compared to those with no education (2.3%).

Marital Status:

In the present study, the majority of the study population was married (79.8%). This is consistent with the findings of Brandon McDonald et al.[23] where marriage is considered obligatory among the Gonds. Gond boys and girls are married upon reaching physical maturity.

Association with Past Dental Visits: Marital status showed a significant association ($p < 0.005$) with past dental visits. More married individuals were observed to have visited the dentist in the past, particularly when experiencing problems (60.2%).

Association with Reason to Visit: No significant association ($p > 0.000$) was found between the reason for visiting a dentist and marital status.

Occupation:

In the present study:

The majority of study subjects were employed (10.5%), followed by unemployed individuals (10.2%). With growing urbanization and the search for better financial benefits, Criminal Tribes have also changed their sources of livelihood. The study revealed that there was no significant association ($p > 0.539$) between occupation and past dental visits. However, a significant

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association ($p < 0.01$) was found between occupation and the reason for visiting a dentist. Specifically more past dental visits (10.5%) and visits when experiencing problems were seen in the employed group.

A shift from traditional farming to owning small shops was noted among the Criminal Tribes.

Socioeconomic Status:

The majority of the population in this study belonged to the lower socioeconomic class (40.1%). Socioeconomic status showed no significant association with past dental visits ($p < 0.226$). Only 10.2% of participants who visited the dentist in the past year were from the low socioeconomic group. This contrasts with a study by Manski et al.[24] where 16.2% of participants who visited the dentist belonged to the middle low socioeconomic class.

Association of Predisposing Health Beliefs with Past Dental Visits and Reason to Visit:

The study found that several predisposing health beliefs were significantly associated with past dental visits. Specifically, the perceived importance of oral health, benefits of preventive practices, and efficacy of the dentist all showed significant associations, with p-values indicating strong relationships. However, the perceived seriousness of disease did not show a significant association. These results align with a previous study by Atchinson et al.[25] which also found significant associations between the perceived importance of oral health and the efficacy of the dentist with past dental visits. Additionally, barriers to dental service utilization included low perceived importance of oral health, lack of nearby dentists, inadequate transportation, reliance on home remedies, and misconceptions about dental treatments.

Association of Enabling Resources with Past Dental Visits and Reason to Visit:

The findings of the present study reported a significant association between enabling factors and The findings revealed that there was no significant association ($p > 0.539$) between occupation and past dental visits. However, it was significantly associated ($p < 0.01$) with the reason to visit the dentist. More past dental visits (10.5%) and visits when experiencing problems were seen in the employed group.

Association of Perceived Need for Oral Health with Past Dental Visits and Reason to Visit:

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The findings of the present study reported a significant association between perceived need for oral health and past dental visits. Specifically, the perception of oral health (20.7%, $p = 0.031$) and problems in the oral cavity (18.2%, $p < 0.000$) were significant. The study also showed significant associations with reasons to visit a dentist ($p > 0.034$, 0.045). A similar study by Lopez and Baelum et al.[26] demonstrated that self-perceived poor oral health status is strongly associated with infrequent dental visits ($p = 0.002$).

Association between Oral Health Status and Dental Visits in the Past Year: The overall prevalence of gingival bleeding was found to be 20.7%, which was significantly associated with past dental visits ($p < 0.000$). This contrasts with a study conducted by Kadanakuppe et al.[27] where 36.5% had a bleeding problem.

The present study showed that the majority of study participants had periodontal pocket depths as follows: 9.1% with 4-5 mm pockets, 10.5% with 6-8 mm pockets, and 13.6% with 9-11 mm pockets, with a p-value of 0.000. These findings were similar to studies done by Philip et al.[28] where 10.2% had 4-5 mm pockets and 12.6% had 6-8 mm pockets ($p < 0.003$).

Perceived oral health outcome

The study found that perceived oral health was significantly associated with past dental visits in functional limitation, psychological discomfort, and psychological disability, but not with reasons for visits. Surprisingly, not visiting the dentist in the past year and attending only for symptoms were linked to better perceived oral health, contrary to expectations of improved oral health with regular preventive visits. This contradiction may be due to the complexity of measuring service use as a latent construct, which combines multiple indicators.

Limitations of the study:

The study's data should be viewed with certain limitations in mind. Andersen’s revised model suggests bidirectional relationships, such as how perceived treatment need influences and is influenced by healthcare use, which future research should explore. Additionally, using OHIP-14 to measure perceived oral health may not account for varying expectations among different groups, potentially leading to inaccurate assessments of perceived oral health.

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Finally, this study was conducted on the Criminal tribe's settlement, thus the findings regarding utilization of services may be particular to the belief culture and structure of services available in the area, which limits the generalizability of our findings to other populations.

Recommendations:

To the Professionals

- To reduce the burden of oral diseases is the prime duty of the dental professionals.
- Dental providers may describe and educate people about the importance of oral health, and explain the various prevention and treatment strategies to maintain

To the Policy-makers

The challenges of reducing long standing oral health disparities, expanding access to oral health services at affordable prices, and keeping up with quality of the treatment are to be dealt judiciously by the government officials and health policy makers to strengthen the Indian oral health system.

Recruitment and retention of oral health providers to rural communities may need to be augmented by the promotion of new roles of existing dental providers. Due to high treatment demands of the study population, the health strategy that highlights oral health promotion and prevention would appear more valuable in addition to curative care.

Conclusion:

The utilization of oral health care services among Criminal Tribes residing in the Kalyanpur Criminal Tribe Settlement, Basti, has been known to be less. Studies related to the oral health status of tribes have reported a dominance of untreated caries, high prevalence of gingival bleeding, periodontal pockets, and dental fluorosis.

The study concludes that a high perceived seriousness of oral disease was seen among 47.1% of the study population. The majority of participants, i.e., 79.8%, did not receive oral health education at any time. 86.1% of the participants were aware of who dentists are. There was no usual source of dental care available. The study concluded that, irrespective of the use of dental services, many predisposing socio-demographic characteristics, predisposing health beliefs, and perceived and evaluated needs had their effect on perceived oral health outcomes.

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