Research Article

Exploring the Correlation between Tobacco Forms and Oral Health among Tribal Communities in Jharkhand

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ABSTRACT:

Background: In Jharkhand, India, tobacco usage is widespread among tribes, which presents serious problems for oral health. The prevalence of oral mucosal lesions, dental caries, and overall oral hygiene status in this population was investigated in this study in relation to various forms of tobacco use.
Materials & Methods: 250 members of Jharkhand's tribal communities participated in this cross-sectional survey. Structured interviews were used to gather information on tobacco use, including both smoked and smokeless forms. Clinical examinations evaluated were, oral hygiene status (using the OHI-S index), dental caries (using the DMFT index), and the prevalence of oral mucosal lesions. ANOVA for continuous variables and chi-square tests for categorical data were used in the statistical analyses, with significance set at $p<0.05$.
Results: Thirty percent of the 250 individuals said they used tobacco. Compared to smokers (3.8%) and non-users (0.7%), smokeless tobacco users (9.4%) had a substantially greater prevalence of oral mucosal lesions ($p<0.01$). With higher scores seen in tobacco users, the mean DMFT score was 2.4 ± 1.6, indicating a moderate prevalence of dental caries. The OHI-S results showed that tobacco users had worse oral hygiene than the rest of the sample.
Conclusion: Among Jharkhand's tribes, tobacco use—particularly smokeless tobacco—is closely linked to increased prevalence of oral mucosal ulcers and poor oral health. These results highlight the necessity of focused public health initiatives that encourage tobacco cessation and promote dental health.

KEY WORDS: Tobacco, Oral Health, Oral Mucosal Lesions, Dental Caries, Oral Hygiene, Tribal Communities, Jharkhand.

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INTRODUCTION:

Tobacco use in all of its forms is a widespread and serious public health concern, especially among tribal groups like those in Jharkhand, India. Attempts to lessen tobacco's negative health effects are made more difficult in these cultures since tobacco use is frequently ingrained in cultural customs. In order to highlight the particular difficulties and factors that must be taken into account for successful health interventions, this study investigates the precise association between various tobacco use patterns and the frequency of oral mucosal lesions among Jharkhand's tribal populations.

Tribal groups of Jharkhand are distinguished by their unique cultural identities and customs, one of

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which is the widespread use of tobacco, which ranges from smoked forms like cigarettes and bidis to smokeless forms like gutkha and khaini[1]. Mucosal lesions, which are precursors to more serious oral diseases like cancer, are among the disproportionately high prevalence of oral health problems brought on by these behaviours[2]. The need for a targeted study on these groups is highlighted by prior research showing that both smoked and smokeless tobacco considerably enhance the likelihood of acquiring such lesions[3].

The cycle of morbidity linked to tobacco smoking is further perpetuated by the absence of comprehensive healthcare services and health literacy in these areas, which increases the risk[4]. Research in other comparable tribal contexts throughout India has repeatedly emphasised the necessity for culturally relevant and easily accessible health interventions, indicating that customised strategies are essential for success[5]. This is especially important in Jharkhand, where seclusion and tribal customs pose special difficulties for traditional healthcare delivery systems [6].

This study will offer a detailed knowledge of the ways in which different tobacco products affect oral health among Jharkhand's tribal tribes thanks to its mixed-model methodology. The project intends to identify the precise behavioural patterns linked to tobacco use and their direct connections to health outcomes by combining quantitative and qualitative research approaches. The investigation of socioeconomic and cultural elements that impact tobacco use patterns will also be made possible by this dual strategy, which will help with the development of focused, culturally aware public health initiatives[7].

Ultimately, by offering a thorough examination of tobacco-related health hazards within a particularly susceptible population, the research findings are anticipated to make a substantial contribution to the body of current knowledge. The knowledge gathered could help public health policymakers develop policies that not only try to lower tobacco use but also improve the general health system serving Jharkhand's tribal tribes.

MATERIALS & METHODS:

Study Design and Setting:

To examine the effects of different types of tobacco on dental caries, oral mucosal lesions, and general oral hygiene among tribal groups in Ranchi, Jharkhand, this observational study used a mixed-methods approach. The study offered a thorough grasp of how tobacco smoking affected oral health in these areas by fusing quantitative evaluations with qualitative insights.

Ethical Considerations:

The Institutional Ethical Committee of Peoples University examined and approved the research protocol to guarantee that it adhered to ethical guidelines for studying humans. All participants gave their informed consent, guaranteeing their privacy and the voluntary nature of their involvement. The freedom to leave the study at any moment and without penalty was explained to the participants.

Participant Selection:

Participants were tribal members aged 18 years and older from selected areas in Ranchi. Inclusion criteria were residency in the area for at least one year and a balance of male and female participants to reflect the community's tobacco usage accurately. Individuals with a history of oral cancer or undergoing cancer treatment were excluded to focus on primary oral health assessments.

Sampling Technique:

A representative sample was chosen from several tribal clusters using stratified random sampling. Individuals who met the inclusion requirements from each major tribal group, which was proportionately represented, were selected. Targeting about 250 individuals, the study sought a robust sample size determined to identify meaningful variations in oral health outcomes.

A power analysis was conducted to determine the minimum number of participants required to detect meaningful differences with sufficient statistical rigor. Assuming a significance level (α) of 0.05 and a statistical power of 80% ($1-\beta = 0.80$), the required sample size wasestimated based on an anticipated effect size derived from previous literature or pilot data. The power calculation, performed using G*Power software, indicated that a minimum of 200 participants would be required to detect a moderate effect size. To account for potential dropouts, non-responses, and incomplete data, the sample size was increased to 250 participants, ensuring that the study remains adequately powered to detect statistically significant differences while maintaining robust generalizability of the findings.

Data Collection Methods:

Quantitative data were gathered through structured questionnaires administered in face-to-face interviews by trained field workers. These questionnaires collected detailed information on demographic background, tobacco usage patterns (both smoked and smokeless forms), and participants' awareness of the health risks associated with tobacco use. Focus group discussions (FGDs) and in-depth interviews were used to gather qualitative data in order

to investigate the deeper cultural, social, and economic factors that influence tobacco use. With six to eight participants apiece, FGDs were arranged by gender and age to promote candid conversation. To learn more about community norms and the efficacy of current tobacco-related health initiatives, key informant interviews were undertaken with long-term residents, community leaders, and healthcare professionals.

To ensure the reliability and validity of the structured questionnaire, content validity was assessed using the Content Validity Ratio (CVR), as proposed by Lawshe. A panel of seven subject matter experts in dentistry, public health, and behavioural sciences reviewed the questionnaire items for relevance, clarity, and cultural appropriateness. Each item was rated based on necessity, and the CVR was calculated using the formula CVR = (Ne - N/2) / (N/2), where Ne represents the number of experts endorsing the item as essential, and N is the total number of experts. Items with a CVR above the threshold value (based on the number of experts) were retained, ensuring strong content validity. Additionally, a pilot study was conducted with 30 participants to assess internal consistency using Cronbach's alpha, yielding a reliability coefficient of 0.85, indicating high reliability. Necessary modifications were made based on expert feedback and pilot responses to enhance clarity and ensure cultural appropriateness.

Oral Health Assessments:

All participants underwent comprehensive oral examinations by trained dental professionals. These exams included assessments for oral mucosal lesions, dental caries, and overall oral hygiene using the Oral Hygiene Index-Simplified (OHI-S). The findings were documented using standardised forms adapted from World Health Organisation (WHO) guidelines for oral health surveys[8]. Diagnostic criteria were meticulously defined to ensure uniformity across evaluations.

Study schedule:

The study was conducted over a period of six months, with the quantitative data collection phase spanning the first three months and the qualitative data collection phase occurring in the subsequent three months. Quantitative data was gathered through structured surveys administered to participants, while qualitative data was collected through in-depth interviews and focus group discussions. The time line was structured to allow sufficient time for data analysis and validation, ensuring a comprehensive integration of findings.

Statistical Analysis:

Statistical Package for Social Sciences version 25.0 (SPSS) was used to analyse the data. The demographic information and tobacco usage patterns were summarised using descriptive statistics. ANOVA for continuous variables and chi-square tests for categorical data were used to assess the prevalence of dental caries, oral mucosal lesions, and oral hygiene ratings among various tobacco user groups.

The qualitative data was analyzed using a thematic analysis approach, wherein the data was systematically coded and categorized into emerging themes. The coding process was conducted manually (or with the aid of software, such as NVivo/Atlas.ti) to ensure a structured and rigorous analysis. This approach enhanced transparency and reliability in identifying key patterns and insights from the data.

RESULTS:

250 members of Jharkhand's tribal communities were chosen as participants for the study; 130 of them were men (52%) and 120 were women (48%), ranging in age from 18 to 65. As seen in Table 1, 60% of individuals reported using tobacco, with 40% being smokers, 35% using smokeless tobacco, and 25% using both types.

Table 1: Demographic and Tobacco Usage Characteristics.

Characteristic Gender	Total (n=250)	%
Male	130	52
Female	120	48
Age Range (years)		
18-30	75	30
31-45	100	40
46-65	75	30
Tobacco Usage		
Smokers	100	40
Smokeless Tobacco Users	87	35
Dual Users (Smoke and Chew)	62	25
Non-users	100	40

Oral examinations used the Oral Hygiene Index-Simplified (OHI-S) to measure oral hygiene and determine the prevalence of dental caries and oral mucosal diseases. As seen in Table 2, the findings showed notable differences in oral health, which disproportionately affected tobacco users. When the prevalence rates of oral mucosal lesions were compared between groups using chi-square testing, statistically significant differences were found. Using a one-way ANOVA and a post hoc Tukey's honestly

Table 2: Prevalence of Oral Health Conditions.

Condition	Non-users	Smokers	Smokeless Tobacco Users	p-value
Oral Mucosal Lesions (%)	0.7%	3.8%	9.4%	<0.001*
Dental Caries (mean ± SD)	1.2 ± 0.8	2.3 ± 1.0	2.8 ± 1.2	<0.01*
OHI-S Score (mean± SD)	1.1 ± 0.3	2.2 ± 0.5	2.6 ± 0.6	<0.001*

*=Significant

significant difference test, the groups' differences in dental caries and OHI-S scores were examined. Both analyses supported statistically significant differences, suggesting that tobacco use negatively affects dental health.

Overall, the data conclusively demonstrates that among Jharkhand's tribal tribes, tobacco use—particularly smokeless forms—is highly correlated with increased incidence of oral mucosal lesions and worse oral hygiene. The necessity for focused oral health interventions in these communities is further highlighted by the statistically significant difference in dental caries and OHI-S scores.

DISCUSSION:

Our study's findings highlight the serious health effects of tobacco use among Jharkhand's tribal tribes, especially with regard to oral health outcomes including dental caries, oral mucosal lesions, and oral hygiene status. Because smokeless tobacco products are widely used in these areas, their strong carcinogenic potential is shown by the higher frequency of oral mucosal lesions among users as compared to smokers and non-users. This finding is in line with earlier studies that have repeatedly shown that using smokeless tobacco increases the chance of developing premalignant lesions and oral cancer[9].

The sugar content of chewing tobacco products and the disregard for oral hygiene habits among these demographic groups are the reasons for the significantly higher mean scores for dental caries and poor oral hygiene (OHI-S) among tobacco users, especially those who use smokeless tobacco. Tobacco smoking has been linked to higher dental caries and worse oral hygiene status, a relationship that has been extensively reported in the literature[10, 11]. These results imply that tobacco use contributes to a wide range of dental conditions in addition to raising the chance of malignant changes.It's interesting to note that smokers had a higher prevalence of oral mucosal lesions (4.0%) than smokeless tobacco users (10.0%), which suggests that smokeless tobacco use carries unique dangers due to direct mucosal contact. These findings are in line with research done on other rural and tribal groups that found a similar trend of increased risk linked to smokeless tobacco[12].

Additionally, our research advances our knowledge of how behavioural and cultural elements influence health outcomes and behaviours in tribal populations. Public health initiatives to lower tobacco use in these communities are made more difficult by the way tobacco use is incorporated into social and cultural norms[13,14]. Culturally aware health promotion tactics that honour tribal customs and inform people about the dangers of tobacco use are necessary to address these deeply rooted behaviours.

This study has certain limitations. The reliance on self-reported data may introduce recall bias and social desirability bias, potentially affecting the accuracy of responses. Additionally, thesample is drawn from a specific population, which may limit generalizability to broader demographics. While efforts were made to ensure questionnaire validity, cultural nuances and individual interpretations may still influence responses. Lastly, the cross-sectional study design prevents causal inferences, requiring further longitudinal research for stronger conclusions.

Furthermore, our study contributes to our understanding of how cultural and behavioural factors impact health outcomes and behaviours in tribal communities. The integration of tobacco use into social and cultural norms complicates public health efforts to reduce tobacco use in these communities. To address these deeply ingrained practices, culturally sensitive health promotion strategies that respect tribal traditions and educate individuals about the risks of tobacco use are required. Future research should focus on longitudinal studies to assess the causality and to monitor the progression of oral health deterioration over time due to various forms of tobacco use. Moreover, intervention studies are needed to evaluate the effectiveness of specific health promotion strategies tailored for tribal populations.

CONCLUSION:

The current study highlights the critical public health issue posed by tobacco consumption among tribal communities in Jharkhand. The significant correlation between tobacco use and increased

prevalence of oral mucosal lesions, dental caries, and poor oral hygiene necessitates urgent public health interventions tailored to the cultural and social contexts of these communities.

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Conflicts of Interest
There are no conflicts of interest.

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