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# Oral Hygiene and Tobacco Use Practices in Rural Villages of Jhapa District, Nepal

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## ABSTRACT

**Background:** Smoking and use of smokeless tobacco affect oral as well as general health. People are reluctant to achieve good oral health in lieu of the avoidance of deleterious habits. The objective of this study was to analyze two contrasting health behaviors; the oral hygiene practices against tobacco use in a sample from eastern Terai.

**Methods:** This is questionnaire-based cross-sectional survey carried out in Jhapa district located in eastern Nepal. In this report, practice of toothbrushing, use of fluoridated toothpaste, frequency of using tobacco related products (paan, gutkha, chilim, cigarette, bidi, hukkah) was assessed. Association of health behavior to sociodemographic variables were tested with regression analysis at 95% confidence limits.

**Results:** A total of 1178 respondents (response rate = 96.8%) completed the interview, among them 80.8% were males. Mean age was 52.21 years (SD = 15.943). Overall 72.6% used fluoridated toothpaste and toothbrush for cleaning teeth, 58.8% consumed tobacco related products. Interdental aids utilization was very less (1.2% using dental floss). Age was significantly related to both toothbrushing and tobacco-consuming. Educational status was related significantly to toothbrushing ( $p < 0.05$ ). Other sociodemographic variables (marital status, ethnicity, educational status) were not related to consumption of deleterious products ( $p > 0.05$ ).

**Conclusions:** Our results showed that consumption of tobacco related products is moderately high in Terai village and oral health practice was found to be influenced by educational status. More such studies to identify status of oral health and impact of tobacco are recommended.

**Keywords:** Oral health; smokeless tobacco; smoking; tobacco

## INTRODUCTION

Good general health is linked with good oral health.<sup>1</sup> Many oral diseases are found to impact an individual's systemic, mental and social health to a larger extent. To achieve good oral health, tooth brushing with fluoridated toothpaste and flossing with dental floss are key methods.<sup>1-3</sup> Similarly, smoking and use of smokeless tobacco is another entity linked to well-being of a person. In Nepal's context, it was found that about 27% men and 6% women smoke on regular basis, whereas as many as 40% men and 3% women use any type of smokeless tobacco.<sup>4</sup>

People spend a large proportion of their income on deleterious habits, rather than using it for cheap dental health accessories such as a tooth brush and toothpaste. This article reports these findings of conflicting health

behavior in a rural population of Baniyani village development committee (VDC) in eastern Terai of Nepal.

## METHODS

Baniyani VDC had a total of 1217 households during the study period in December 2016, of which responses from 1178 households were complete (response rate=96.8%). Respondents were approached in each household of the entire VDC and were asked regarding their oral hygiene practices and deleterious habits. The representative from a house was selected who could understand the questions in Nepali language and willingly participate in the study. The oral hygiene practices questionnaire sought information on tooth brushing, use of interdental aids and use of fluoridated toothpaste. Regarding deleterious habits, the pattern and frequency of smoking or use of smokeless tobacco products was asked. The

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Institutional Review Committee of BPKIHS had approved the study and written Consent was obtained from each respondent prior to interview, after they were assured of their confidentiality.

All data were entered into Microsoft excel where it was coded, cross-checked and verified. Further analysis was done using SPSS statistical software version 11.5. Chi-squared test and regression analysis were performed. The level of significance was set at 95% confidence interval.

## RESULTS

The mean age of the respondents was 52.21 years (SD = 15.943, range 17 to 102 years). The majority were males (80.8%) and most were from Brahman/Chhetri and Rajbanshis ethnic communities. The sociodemographic characteristics are shown in Table 1.

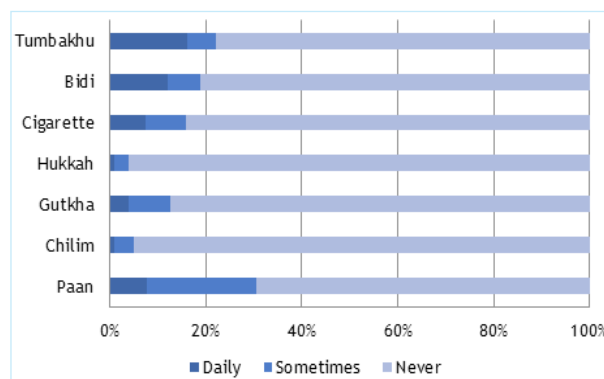
**Table 1. Sociodemographic characteristics of respondents.**

Sociodemographic characteristics	Count (N=1178)	Percentage
<b>Gender</b>		
Female	226	19.2
Male	952	80.8
<b>Ethnicity/race</b>		
Brahmin/Chhetri	454	38.5
Rajbanshi	383	32.5
Muslim	128	10.9
Madheshi	68	5.8
Indigenous janajatis	72	6.1
Newars	15	1.3
Tharu	5	0.4
Other minorities/Dalits	53	4.5
<b>Marital status</b>		
Unmarried	11	0.9
Married	980	83.2
Widowed	180	15.3
Divorced	7	0.6
<b>Educational status</b>		
Illiterate	519	44.1
Informal	68	5.8
Formal	591	50.2

The oral hygiene tool used by most of the participants in the study was tooth brush and toothpaste (86.9%). Other tools include brush and tooth powder (7%), finger

(2.2%) and datiwani (2%). Among the users of toothpaste (N=1024), only 83.5% had fluoridated toothpaste. Nine respondents had reported the practice of using bamboo sticks, ash water, salt water, cow dung preparation to clean their teeth. Only 1.2% reported using dental floss, and 0.7% used interdental brush. Use of toothpicks was reported by 28.3% of the participants.

About 58.8% participants consume tobacco related products one or other time and 41.2% reported never consuming any of tobacco-products. Regarding the frequency, daily use of tumbakhu (16.2%) and bidi (12.1%) was highest, whereas occasional consumption was maximum for paan (22.9%). Majority of the respondents reported that they did not consume cigarette (84%), chilim (95%) or gutkha (87.4%). The prevalence and frequency of different smoking and smokeless tobacco use is depicted in Figure 1.



**Figure 1. Frequency of consuming deleterious products**

More than 60% of respondents who use tobacco related products do not use toothbrush and fluoridated toothpaste (Table 2). The statistically significant association was not found ( $p > 0.05$ ) between consuming any of tobacco products and brushing teeth with a tooth brush and toothpaste.

Considering use of toothbrush and fluoridated toothpaste as standard oral health practice, and consuming any of tobacco products for any kind of frequency as deleterious habit, regression analysis was performed (Table 3). Literate persons were 1.7 times more likely to use toothbrush and fluoridated toothpaste as compared to those who are illiterate ( $p < 0.05$ ). Other variables (marital status or ethnic groups) were not associated ( $p > 0.05$ ) with oral hygiene practice. Similarly, increase in age by one year increased risk of consuming tobacco products by 1.02 times ( $p < 0.001$ ) and being single was associated with odds of consuming tobacco-related products, however other sociodemographic variables had no association with consumption of smoking or smokeless tobacco products ( $p > 0.05$ ).

Table 2. Association of consumption of tobacco and good oral hygiene practice.

Oral hygiene practice	Using tobacco related products (%)	Not using any tobacco related products (%)	Total	Pearson's chi-square statistic	p value
Use toothbrush and fluoridated toothpaste	497 (58.1)	358 (41.9)	855 (72.6)	0.631	0.427
Do not use toothbrush and fluoridated toothpaste	196 (60.7)	127 (39.3)	323 (27.4)		
Total	693 (58.8)	485 (41.2)	1178		

Table 3. Logistic regression analysis of oral hygiene practice and deleterious habits.

Variables	Odd ratio	95% CI for odds ratio	p-value
<b>Use toothbrush and fluoridated toothpaste for cleaning teeth</b>			
Age	0.996	0.987-1.006	0.446
Gender	0.605	0.389- 0.941	0.026
Marital status (married vs single)	1.177	0.743- 1.865	0.488
Educational status (illiterate vs formal education)	1.738	1.293-2.335	<0.001
Ethnic groups (Brahmin/Chhetri vs minorities)	2.787	0.453 - 17.131	0.269
<b>Use any kind of tobacco products for any frequency</b>			
Age	1.018	1.009 - 1.028	<0.001
Gender	1.324	0.917 - 1.914	0.135
Marital status (married vs single)	0.665	0.452-0.978	0.038
Educational status (illiterate vs formal education)	1.057	0.918 - 1.217	0.442
Ethnic groups (Brahmin/Chhetri vs minorities)	1.024	0.961 -1.091	0.463

p<0.05, statistically significant

**DISCUSSION**

This study explored the oral hygiene practice and consumption of tobacco related products (paan, gutkha, cigarette, bidi, hukkah and tumbakhu) in rural population from Eastern part of Nepal. We found that a good number of participants used toothbrush (86.9%) similar to other studies.<sup>5,6</sup> However, only 72.6% used fluoridated toothpaste (Table 2). This is in consistent to other population from Nepal<sup>7</sup> but higher than Nigerian population.<sup>5</sup> In contrast, a study in devastating earthquake-affected region (Nepal), however, had shown 96% prevalence of fluoridated toothpaste users.<sup>8</sup> In the context of study sites, the current location is rural Terai region and sociocultural background might have resulted this discrepancy. The difference was established as lesser odds of using fluoridated toothpaste in Terai dwellers.<sup>7</sup>

Our results suggested that educational status played a role in using toothbrush and fluoridated toothpaste (Table 3), which is in agreement with other studies.<sup>5,7</sup> Education improved oral health behavior resulting in

more number of filled teeth in another study.<sup>9</sup> A few participants admitted that they used ash water, salt water, bamboo branches and cow dung preparation for cleaning the teeth. Use of branch of local shrub as traditional tooth cleaning method was reported in other parts of Nepal.<sup>10</sup>

Use of interdental aids was very less in our study. In neighboring country India, 58% had practice of using interdental aids.<sup>6</sup> Majority in our study (28.3%) used toothpicks but use of dental floss and interdental brush was minimal. The discrepancy may be attributed to the availability and affordability of dental floss and interdental brush along with poor awareness about these items in the studied area.

It was alarming to find more people (58.8%) consumed tobacco related products. As compared to hilly region from eastern Nepal, the prevalence was almost similar (57.1%).<sup>11</sup> We found that consumption of paan, tumbakhu, bidi and cigarette in the participants either daily or occasionally. The smokeless tobacco products are easily

available in Nepali societies. A study reports prevalence of smokeless tobacco use in different years (1998-2013) in 15-49 age groups. It showed that in comparison to Bangladesh and India, Nepal has shown a stable trend on smokeless tobacco consumption over years.<sup>12</sup>

Majority of participants denied smoking (Figure 2), however, they might have been consuming smokeless tobacco otherwise. Age was significantly related to consumption of tobacco related products in this study which is in agreement with another study in Nepal done amongst students.<sup>13</sup>

Smoking is an established risk factor for many diseases. Apart from lung cancer and cardiovascular diseases, smoking is linked with many oral diseases.<sup>14</sup> Some measures were taken since long in Nepal against smoking.<sup>15</sup> Regarding smokeless tobacco products clear policies are not yet formulated. Legal provision alone may not suffice to control the sale and use of these products as was seen in India.<sup>16</sup> Smokeless tobacco products contribute to formation of N-nitrosornicotine a genotoxic carcinogen.<sup>17</sup> Higher nicotine dependence was prevalent in persons who smoke as well as use smokeless tobacco.<sup>18</sup> Thus smokeless tobacco consumption cannot be neglected.

WHO recommends widespread affordable use of fluoridated toothpaste alongside cessation of smoking as an effort to promote oral health.<sup>1</sup> Fluoride content present in water of the studied area is unknown. It is imperative to determine the fluoride level then only recommend it to prevent unwanted fluorosis. Education is an important factor in promotive health. But mere formal education may not contribute well thus, focused oral health programs are needed in rural communities in Nepal.

We investigated the interrelationship between these two contrasting health behaviors (tobacco consumption vs oral hygiene practice). Though significant association was not established, more than 60% consumers of tobacco did not bother to buy a toothbrush and fluoridated toothpaste. Anecdotally we think poor socioeconomic status pose a barrier against good oral health practice, however, the cut-down on the expenses in tobacco related practice may suffice to promote oral health.

In our study, there was a number of shortcomings. Firstly, the report was based on personal interview which can be biased for social acceptability.<sup>19</sup> Secondly, single person from a family was involved in interview, which limited to predict actual prevalence in the community. Thirdly, the consumption pattern of tobacco

products was not explored to find actual frequency for occasional consumers. Some maybe using once in a blue moon whereas some may be more frequent. The other important consideration is the questionnaire was lacking information about the quantity of tobacco consumption such as number of cigarettes or bidi.

## CONCLUSIONS

Within these limitations, we conclude that though the oral health practice was satisfactory, consumption of tobacco related products is moderately high in Terai village. About 60% persons who do not use tooth brush and fluoridated toothpaste consume tobacco or tobacco-related products. The oral health practice was found to be influenced by educational status. Age was significantly associated with both oral health practice and consumption of deleterious tobacco products. More such studies to identify the factors affecting these health behaviors (oral health and tobacco consumption) are recommended.

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