

# Assessment of Periodontal Status of the People in Chepang Hill Tract of Nepal: A Cross Sectional Study

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## ABSTRACT

### Background

Periodontal disease is one of the common oral and dental disease globally. The main etiology of periodontal disease is microbial plaque. However, it shares many common etiological factors with other chronic diseases. The Chepang are an indigenous Tibeto-Burman people group numbering around fifty-two thousand mainly inhabiting the rugged ridges of the Mahabharat mountain range of central Nepal. They are the tribes with different food habit, religion and culture. Till date no studies has been conducted about the periodontal and oral health status of the Chepang people.

### Objective

To determine the prevalence of periodontitis in adult Chepang population so that knowing about its prevalence and distribution, besides serving as a demographic tool, will also help in having overview about the need for providing proper oral health care and awareness programs and initiatives aimed at reducing the disease prevalence in this indigenous group.

### Method

The study was conducted among the adult (21 to 70 years) Chepang of Chitwan district. It was the cross sectional study with the random sampling technique. Modified Community Periodontal Index (CPI) and loss of attachment were used to record the periodontal status of all 308 sampled population.

### Result

Out of 308 sampled participants 179 were male and 129 were female. The highest number of participants were from 41 to 50 years old (38.31%). 57.14% adult Chepang brushes their teeth once daily and 31.49% brushes twice daily and 1.30% of them had never brushes their teeth. 36.36% had loss of attachment of 4-5 mm without any significant gender difference. 6.17% of the study population had severe form of periodontitis with  $\geq 12$  mm of attachment loss. Calculus deposit was abundant in 57.79% of the study sample, and 25.64% shows pocket depth of 4 to 5 mm. Loss of attachment and CPI score is found to be increased with increasing age.

### Conclusion

Result of this study reveals the presence of periodontal problems in adult Chepang population. Higher calculus with attachment loss and pocket depth were the major problems seen in this community. This highlights the necessity of implementation of more preventive program in this specific targeted population.

## KEY WORDS

*Chepang, Community, Periodontal, Prevalence*

## INTRODUCTION

Periodontal diseases are the most common oral disease in the world. It is one of the two most important oral diseases causing tooth loss.<sup>1</sup> It is a major public health problem. Gingivitis refers to inflammation of gingiva and is caused mainly due to accumulation of plaque supra-gingivally whereas, in periodontitis supporting structures of tooth are destroyed. Clinical features of periodontitis include deepening of periodontal pocket and loss of attachment, leading to tooth mobility and ultimately to tooth loss. Aggressive forms of periodontitis may be found in young individuals, but the prevalence of this condition is very rare.

Main etiology of periodontal disease is microbial plaque. Many risk factors, such as tobacco use, excessive alcohol consumption, poor diet and nutrition, obesity, psychological stress and insufficient personal/oral hygiene are important, and these principal risk factors for periodontal disease are shared with other chronic diseases.<sup>2</sup> That is why; it is considered as poly-microbial and multifactorial disease. It was found that there was higher prevalence of poor oral hygiene and calculus in developing countries than developed countries. However, WHO Global Oral Data Bank indicates a comparable prevalence of deep periodontal pockets in the industrialized and developing countries.<sup>3,4</sup>

Although periodontitis is a common oral problem but there is still lack of emphasis by many people towards periodontal disease in developing nation like Nepal. Lack of knowledge about the importance of proper oral hygiene and periodontal care might be the reason for neglecting oral hygiene. Periodontal disease has been found to be one of the major cause of tooth loss in adult age group of Nepal.<sup>5</sup>

The Chepang are an indigenous Tibeto-Burman people group numbering around fifty-two thousand mainly inhabiting the rugged ridges of the Mahabharat mountain range of central Nepal. They are the tribes with different food habit, religion and culture. Till date no studies has been conducted about the periodontal and oral health status of the Chepang people. So, the aim of this study is to determine the prevalence of periodontitis in adult Chepang population so that knowing about its prevalence and distribution, besides serving as a demographic tool, will also help in having overview about the need for providing proper oral health care and awareness programs and initiatives aimed at reducing the disease prevalence in this indigenous group.

## METHODS

This study was conducted among the Chepang population of Chitwan district of Nepal. Ethical clearance for this study was taken from the institutional review board of Kathmandu University School of Medical sciences and written informed consent was taken from each participants. Sample size

was calculated and was round off to 308. It was the cross sectional study with the random sampling technique. Free dental camp was conducted in Silinge, Uppargamgadhi and Simaldhap of Chitwan district by Nepal Dental Association in collaboration with World Dental Development Fund (WDDF) and participants were randomly selected for the study. Inclusion criteria for the study was any healthy Chepang adult of age above 21 years and below 70 years residing permanently in Chepang Hill tracts of Chitwan district. Participants who were undergoing any active periodontal therapy, with active communicable disease and lactating mothers were excluded from this study.

All the participants between the age group of 21 years to 69 years visiting the dental camp who matches the selection criteria were randomly selected for the study. They were interviewed with the help of proforma based on 'WHO Oral Health Assessment form, 2013 and were clinically assessed for periodontal status.<sup>6</sup> The assessment of the periodontal status was carried out using the Community Periodontal Index (CPI) modified.<sup>7</sup> The examination of signs of periodontal disease was performed with the aid of standardized Community Periodontal Index (CPI) probe ('TSR 621' WHO Periodontal probe). CPI probe has a ball tip of 0.5 mm diameter, black band between 3.5 mm to 5.5 mm from the tip and rings at 8.5 mm and 11.5 mm from the tip. The scoring criteria for CPI modified are as follows:

### Gingival bleeding scores

0= Absence of condition

1= Presence of condition

9= tooth excluded

X= tooth not present

### Pocket scores

0= Absence of condition

1= Pocket 4-5 mm

2= Pocket 6 mm or more

9= tooth excluded

X= Tooth not present

### Loss of attachment scores

0= 0-3 mm

1= 4-5 mm (CEJ within black band)

2= 6-8 mm (CEJ between upper limit of black band and 8.5 mm ring)

3= 9-11 mm (CEJ between 8.5 mm and 11.5 mm ring)

4= 12 mm or more (CEJ beyond 11.5 mm ring)

Loss of attachment was measured by dividing mouth in six sextants, defined by tooth numbers: 18-14, 13-23, 24-28, 38-34, 33-43 and 43-48. It was recorded only for index teeth. Two molar teeth in each posterior sextant are paired

for recording and, if one is missing, there is no replacement. If no index tooth is present, all the teeth present in the sextant were examined and the highest score was recorded. Bleeding and pocket depths were measured in all teeth. To avoid inter examiner variation all the data were collected by single examiner.

## RESULTS

Total number of sample collected was 308. Among them, 179 (58.12%) were males and 129 (41.88%) were females (Table 1). The highest proportion of the total sample was from 41 to 50 years old age group (38.31%) and the least were from 21 to 30 years old age groups (5.19%).

Among the total sampled population 176 (57.14%) brushes their teeth once daily and 97 (31.49%) brush their teeth twice daily. However 31 (10.06 %) brushes occasionally and 4 (1.30%) had never brushes their teeth. (Table 2)

In prevalence of periodontitis, both the gender has similar

**Table 1. Age and gender wise distribution of sample population**

Age Group	Male		Female		Total	
	N	%	N	%	N	%
21-30	10	3.24	6	1.95	16	5.19
31-40	40	13.00	22	7.14	62	20.13
41-50	66	21.43	52	16.88	118	38.31
51-60	48	15.58	41	13.31	89	28.90
76-70	15	4.87	8	2.60	23	7.47
<b>Total</b>	<b>179</b>	<b>58.12</b>	<b>129</b>	<b>41.88</b>	<b>308</b>	<b>100</b>

score distribution of loss of attachment (table 3). 36.36% (112) had the loss of attachment of 4-5 mm with slightly higher in female as compared to male (37.20% and 35.75% in female and male sample respectively). 22.08% had loss

**Table 2. Frequency of tooth brushing in different gender**

Gender	Twice daily		Once daily		Occasionally		Never	
	N	%	N	%	N	%	N	%
Male	60	33.52	98	54.75	18	10.06	3	1.68
Female	37	28.68	78	60.47	13	10.08	1	0.78
<b>Total</b>	<b>97</b>	<b>31.49</b>	<b>176</b>	<b>57.14</b>	<b>31</b>	<b>10.06</b>	<b>4</b>	<b>1.30</b>

of attachment of 6-8 mm, 14.29% had 9-11 mm of loss of attachment. Loss of attachment  $\geq$  12 mm was seen in 6.17% of the study population. 20.13% of the sampled population shows no or minimal loss of attachment of 0 to 3 mm (Table 3).

Community periodontal index (CPI) score was also found to be similar in both the gender except on calculus score where 62.79% of female has abundant amount of calculus deposits as compared to male with 54.18% (Table 4). Only 3.57% (11) has the healthy periodontium with CPI score

**Table 3. Gender wise loss of attachment among the study population**

LOA Score	Male		Female		Total	
	N	%	N	%	N	%
0= 0- 3 mm	37	20.67	25	35.66	62	20.13
1= 4-5 mm	64	35.75	48	37.20	112	36.36
2= 6- 8 mm	39	21.79	29	22.48	68	22.08
3= 9-11 mm	26	14.53	18	13.95	44	14.29
4= $\geq$ 12 mm	11	6.15	8	6.20	19	6.17
X= Excluded	2	1.13	1	0.76	3	0.97
<b>Total</b>	<b>179</b>	<b>100</b>	<b>129</b>	<b>100</b>	<b>308</b>	<b>100</b>

**Table 4. Gender wise distribution of CPI score among the study population**

CPI Score	Male		Female		Total	
	N	%	N	%	N	%
0= Healthy	6	3.35	5	3.86	11	3.57
1= Bleeding on Probing	4	2.23	5	3.86	9	2.92
2= Calculus	97	54.18	81	62.79	178	57.79
3= Pocket 4- 5 mm	48	26.81	31	24.03	79	25.64
4= Pocket $\geq$ 6 mm	22	12.29	6	4.66	28	9.09
X= Excluded	2	1.13	1	0.79	3	0.97
<b>Total</b>	<b>179</b>	<b>100</b>	<b>129</b>	<b>100</b>	<b>308</b>	<b>100</b>

0. 59.79% (178) has abundant deposition of calculus and 25.64% shows the pocket depth of 4 to 5 mm.

In age wise distribution of CPI scores, only 2.92% sample of age group 20-30 years had healthy periodontium. None above 50 years had the healthy periodontium. Maximum calculus deposits and pocket depth of 4-5 mm was seen in age group 41-50 years. 9.89% of the age group 51 to 60 years old had CPI score of 3 (pocket depth of 4-5 mm). Severe form of Periodontal disease with pocket depth greater than or equal to 6 mm was seen in was seen more in 61-70 years old age group (4.87%) and 51-60 years old age group (3.57%) respectively. However none from the age group 21 to 30 years had severe form of periodontal disease (Table 5).

## DISCUSSION

Results from this study indicates that periodontal diseases are endemic in the Chepang hill tracts of Chitwan district and it should be recognized as one of the crucial health problem. Overall prevalence of the periodontal diseases was found to be 73.70%. This finding is slightly lower than the finding of previous study done in 1998 by Pradhan et al. in JhorMahankal Village of Nepal where they found 100% prevalence of periodontal disease.<sup>8</sup> This difference could

**Table 5.** Age wise distribution of CPI score among the study population

CPI Score	CPI Scores				
	0	1	2	3	4
21-30	9(2.92%)	4(1.30%)	2(1.65%)	1(0.32%)	0(0)
31-40	16(5.19%)	13 (4.22%)	21(6.82%)	8(2.60%)	4(1.30%)
41- 50	12(3.90%)	27 (8.77%)	52(16.88%)	25(8.12%)	2(0.65%)
51- 60	0(0%)	29 (9.42%)	21(6.82 %)	28(9.09%)	11(3.57%)
61-70	0(0%)	0(0%)	2(0.65%)	6(1.95%)	15(4.87%)

be due to the increasing awareness towards oral health care in past two decades. Similarly a hospital based study shows the 84.3% prevalence of periodontitis in Kathmandu valley.<sup>9</sup> Healthy periodontal condition was found in 3.57% of the population and most of them belongs to young age group. Similar finding was seen in other hospital based study in Nepal.<sup>9,10</sup> A study done in Lao Peoples Democratic Republic has demonstrated less than 0.5% of the study population with healthy periodontal condition.<sup>11</sup>

In this study oral hygiene practice among the male is slightly better than the female (33.52% vs 28.68%) who brushes twice daily. 31.49% of the study population brushes twice daily and 57.14% of them brushes once daily. 10.06% of samples population brushes their teeth occasionally and 1.30% of them had never brushes their teeth. Similar result was seen in a study regarding brushing habit among the indigenous Chepang school children of Nepal.<sup>12</sup> But this finding strongly contradicts with the finding of study done by Rokaya et al in 2017 which was done in the earthquake affected area of Nepal and the sample population were living in temporary settlement which forces them to refrain from regular oral hygiene practices.<sup>13</sup>

In this study loss of attachment is almost similar in both the gender. Loss of attachment of 4-5 mm was seen in 36.36% of the sample population and severe attachment loss of 9-11 mm and  $\geq 12$  mm was seen in 14.29% and 6.17% respectively. However a study done by Philip et

al. in Indian population shows the greater prevalence of attachment loss in males as compared to females but the severity of attachment loss is similar to our study.<sup>14</sup> Severity of attachment loss seen in this study is also consistent with the finding of previous studies conducted in Nepal.<sup>8</sup>

Community periodontal index (CPI) score also does not shows any gender differences in this study except in calculus score where female has more abundant calculus deposits as compared to males (62.79% Vs 54.18%). This finding is similar to the study done by Pradhan et al. two decades back.<sup>8</sup> However the severe form of periodontitis (CPI score 4 with pocket depth  $\geq 6$  mm) is comparatively less than the earlier studies done in Nepal.<sup>8</sup> However similar result was seen in a study done in Indian and Nigerian population.<sup>14,15</sup>

In age wise distribution of CPI score 2.92% of age group 21-30 years had healthy periodontium and none in this age group had severe periodontitis. This could be due to the more knowledge and awareness among the younger age groups. It shows prevalence and severity of periodontal disease increases with increasing age. Similar result was seen in other earlier studies conducted in rural Nepal and other part of world.<sup>8,14-17</sup>

Though the study was done in the areas where Chepang population is high, however it may not be the true representative population of all the Chepang living in Nepal. A broader multi centric study with larger sample size may truly elucidate the actual burden of periodontal disease in Chepang population of Nepal.

## CONCLUSION

Result of this study reveals the presence of periodontal problems in adult Chepang population. Higher calculus with attachment loss and pocket depth were the major problems seen in this community. This gives the overview of the burden of periodontal diseases in this community. Broader study with proper focus in preventive aspect is necessary in improving the overall oral health in the Chepang population.

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