A Survey on Oral Health and Practice of Nepalese in Areas Affected by Earthquake in 2015

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ABSTRACT

Background

Understanding post-earthquake oral health indicators is essential for developing oral health interventions of the victims. Presumably, due to a geographic difficulty, there has been no investigation to reveal the oral health status of individuals after the Gorkha earthquake in Nepal.

Objective

The main objective was to determine the oral health and practice of Nepalese affected by earthquake in April-May, 2015.

Method

The epidemiological cross sectional study was done at 5 different districts (Sindhupalchok, Dadhing, Bhaktapur, Kathmandu and Kavre) of Nepal from September till November, 2015. Altogether 500 subjects aged form 16 to 80 years of age living in the transitional shelters community were included in earthquake-affected areas. Different parameters were studied from past and present medical and dental problems, habits, oral hygiene habits. DMFT, gingival index, periodontal index were studied and correlation was studied among them.

Result

It shows that 98% of the participants had plaque and 96.4% of the participants had calculus. Mean decayed was 9, mean missing was 4 and mean filling was 1. 22.60% of the participants had score 0, 34.8% had score 1, 34% had score 2 and 8.60% had score 3 of mean gingivitis index. 10% of the participants showed score 0, 36% showed score 1, 35% showed score 2, 10.2% showed score 3 and 8.2% showed score 4 of mean periodontal index. Moreover, significant correlation was observed among DMFT index, gingival index and periodontal index ($p<0.001$).

Conclusion

The oral health care practice, oral hygiene habits, nutritional intake of the people have been affected in the earthquake affected areas. It showed high caries index, gingival index and periodontal index in earthquake affected people suggesting further efforts are needed for an oral health improvement. Data from this study may be used as basic information for oral health planning and future steps in oral health care preventive and therapeutic programs.

KEY WORDS

Dental caries, disaster, gorkha earthquake, oral health, periodontitis

INTRODUCTION

A devastating 7.8 magnitude earthquake (Gorkha earthquake) occurred in Nepal on April 25, 2015 at 11:56 NST which was followed by over 340 aftershocks.[1-3] Another 2 major earthquakes occurred in Dolakha and Sindhupalchowk, and Ramechhap on May 12, 2015 of 7.3 and 6.3 magnitude respectively.[4-7] Death of over 8000 people, injured over 2500 and homeless over 200,000.[8] People were sleeping in streets and grounds as they are terrified by aftershocks. Earthquake caused extensive damage to buildings, temples, monuments, roads in Kathmandu and other sites.[1,2,9]

The Government of Nepal (GoN) requested assistance from various organizations.[10] The UN, international organization, and nongovernmental organization (NGO) had established coordination hubs in Kathmandu, UN office, and at Tribhuvan International Airport. Government from different nations like India, Pakistan, Australia, UK and People's Republic of China had launched an extensive humanitarian relief and rescue operation including blankets, medicines, and safe drinking water to support affected populations.[10] Nevertheless, none of oral health status was collected or reported after this disaster.

Understanding basic post-earthquake oral health indicators is essential for developing oral health interventions of the earthquake affected people. As part of the public health response, an assessment was necessary of the oral health status and practice after earthquake in Nepal. This is the first study to reveal the oral health status of individuals affected by the devastating earthquake in Nepal. The main objective of this study was to determine the oral health care and practice of individuals affected by earthquake occurred during April-May, 2015.

METHODS

The epidemiological cross sectional study was done at 5 different districts of Nepal from September, 2015 till December 30, 2015. Altogether 500 subjects aged 16 to 80 years of age living in the transitional shelters community were included in earthquake-affected areas. The sites were divided as:

Site 1: Sindhupalchok

Site 2: Dadhing

Site 3: Bhaktapur

Site 4: Kathmandu

Site 5: Kavre

The study included an interview and clinical oral examination with sufficient illumination, WHO CPI probes and mirrors. Procedures and diagnostic criteria recommended by the WHO were followed.[11] The status of the gingiva and periodontium was reported by using indices such as attachment loss and pocket depth.[12,13] The examination procedures of the two dentists were standardized.[14] Then, examination of dental caries, gingiva and periodontium in each patient was done. After that, DMFT index, gingival index and periodontal index were calculated. The scores from both examiners were collected and inter-examiner agreement was tested with Kappa. The Kappa score was 0.7 which revealed a high inter-examiner agreement.

The study protocol and ethics were approved by the Institutional Review Committee (IRC) of Kathmandu University School of Medical Science (IRC No. 73/15). All participants were requested to sign an informed consent document before participating. Following criteria were used for subject selection:

Inclusion criteria:

1) Both male and female.

2) Age of the participants: 16-70 years.

3) People affected from the earthquake occurred in April-May, 2015.

Exclusion criteria:

1) Age of the participants: under 18 and above 70 years.

2) People not affected from the earthquake.

3) Pregnancy

Statistical analyses were conducted using Statistical Package PASW 20.0 (SPSS, Chicago, IL, USA). Descriptive statistics were done to see the different parameters. To see the correlation between DMFT index, gingival index and periodontal index, Pearson's correlation was done with the level of significance (α) = 0.05. Kruskal-Wallis H test was used to apply among different sites.

RESULTS

The characteristics of the study subjects are shown in Table 1. Mean age of the participants was 35.66±16.90. Majority of the participants were married, and the level of the education of the participants were mostly university degree (40.80%) followed by primary school education (35.40%) and high school (14.60%), whereas uneducated were (9.20%). The main occupations of the participants were farming (46.40%) followed by business (43.40%) and then teaching (11.40%). Table 2 shows 100 participants from each earthquake affected sites total number of male and female and in different sites with mean ages.

Table 3 shows the past and present dental history and current dental problems in study subjects. It showed that a high number (59%) had never visited the dentist or dental clinic. Among who visited were as: 26% visited before 3 years, 9% visited before 1-2 years and only 6% visited within 1 year. Among the total participants, 80.2% had current dental problems. Among them, toothache

(55%) and decayed teeth (30%) were the prime problems for seeking dental treatment. Others had mobile teeth (9.47%) and problems of bleeding gums (4.23%). Very few had problems of swollen mouth (0.99%), and malaligned teeth (0.49%).

Table 4 shows the habit and oral health practice of the study subjects. Regarding the number of meals taking by the participants, 10% took meals ≥4 times per day and 90% took meal ≤3 times per day. Regarding alcohol consumption, 87.80% never consumed alcohol, 9.80% consumed occasionally, 2% consumed weekly and 0.40% consumed daily. Regarding smoking habit, 85.40% consumed ≤5 cigarettes per day, 13% consumed 6-10 cigarettes per day, 1% consumed occasionally, and 0.60% never consumed cigarettes. Regarding brushing habit, 4% never brushed teeth, 28.40% brushed occasionally, 55.20% brushed once per day, 10.60% brushed twice per day, 1.80% brushed ≥3 times per day and 96% used toothpaste. Regarding the use of mouthwash, 92.20% never used mouthwash, 4.60% used occasionally, 3.20% used frequently.

Regarding the presence or absence of plaque and calculus, it was found that plaque was present in 98% and calculus was present in 96.4% of the participants (fig. 1).

Figure 2 shows the mean DMFT index. It was found that more number of decayed teeth (64%) followed by missing teeth (31%) and less filled teeth (0.2%). Figure 3 shows

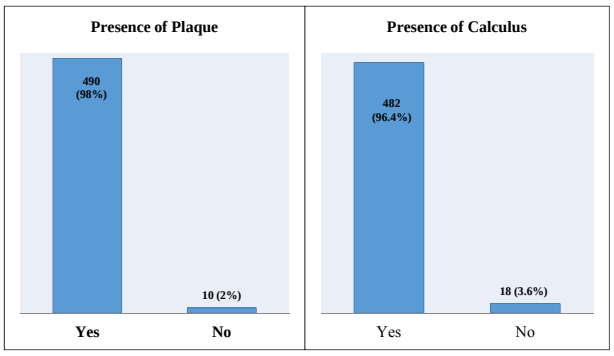

Figure 1. **Presence of plaque and calculus in the participants.**

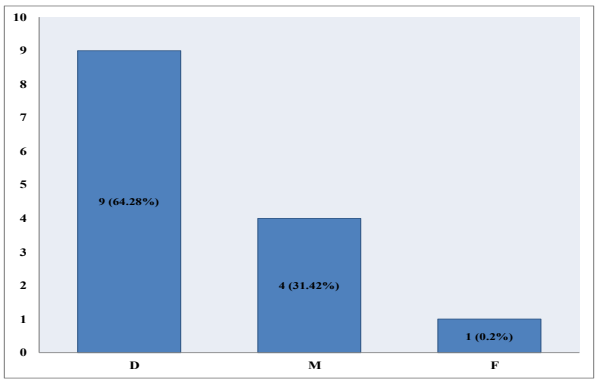

Figure 2. **Mean DMFT index of the participants.**

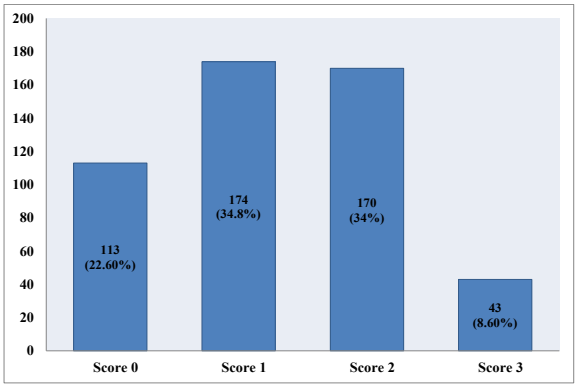

Figure 3. **Mean gingival index of the participants.**

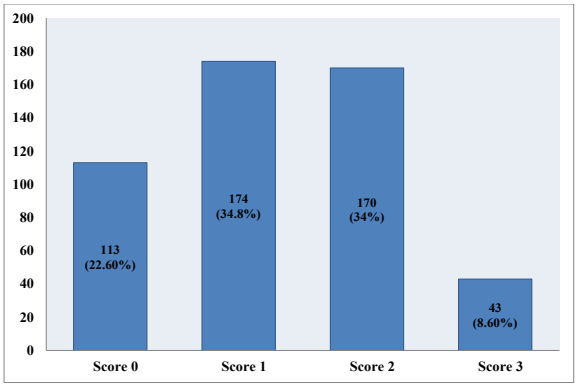

Figure 4. **Mean periodontal index of the participants.**

the mean gingival index of the participants; 22.60% had score 0, 34.8% had score 1, 34% had score 2 and 8.60% had score 3. Figure 4 shows the mean periodontal index of the participants; 10% had score 0, 36% had score 1, 35% had score 2 and 10.2% had score 3 and 8.2% had score 4. Hence, there was high prevalence of mild and moderate gingivitis (Score 1-3) and mild to moderate periodontitis (score 1-2). In addition, there was significant correlation ($p<.001$) among DMFT, gingival and periodontal index (Table 5).

DISCUSSION

April-May 2015 earthquakes were the worst natural disaster in the history of Nepal since the Nepal–Bihar earthquake which occurred in 1934.[15] This study provides information about the status of the oral health and related behavior of individuals affected by earthquakes. According to the results obtained from this study, necessary steps can be taken in prevention of the oral diseases. Moreover, this study helps in assessing the oral needs of the patients. By integrating oral health into strategies for promoting general health and by assessing oral needs, health planners can greatly enhance both general and oral health.

Oral health is an important in terms of good general health. Failure to incorporating oral health into general health promotion, people are likely suffered from consequences like toothache, gingival, periodontal disease, tooth loss leading to a poor quality of life. This study done after 4

months after the earthquake found that the status of dental caries and gingiva status was poor and deteriorating in variety of degrees, indicating that some factors related to the earthquake may cause long-term adverse effects in oral health i.e., low education, smoking habit and alcohol consumption, less nutrition, less brushing habit and less use of toothpaste, inaccessible to dental treatment and less dental visit, less use of mouth wash and dental floss. The presence of plaque in 98% and calculus in 96.4% of the participants showed that their oral health was not in good condition (fig. 1). Among the total participants, toothache (55%) and decayed teeth (30%) were the prime problems. The result of the present study showed that a high number (59%) had never visited the dentist or dental clinic (Table 3). It also showed that the oral health awareness is lacking in people of the earthquake affected residing area. These may be due to poor financial condition or inaccessible to the dentist or dental clinic.

Liu et al. investigated 1 year after the Wenchuan, Southwest China earthquake for assessment of the periodontitis of the victims and to compare it with survey data from before the earthquake.[16] A temporary housing, community-based study was conducted. This study included a total of 1495, 65-74 year old subjects, 740 county and 755 rural, 753 men and 742 women. It was found that the calculus and gingival bleeding were distinctly increased as in this present study. The prevalence of attachment loss at 4-5 mm of 77.3%, at 6-8 mm of 44.8%, at 9-11 mm of 13.6% and at ≥12 mm of 2.7%, was also much higher than the findings before the earthquake. Additionally, oral hygiene practice, stress, tobacco abuse and nutritional intake had gone into an adverse trend right after the earthquake attack, similarly to what observed in our study. They also found that perceived stress of the victims worsen periodontitis by refraining victims from proper treatment or dental visit.

Oral health is an integral part of general health of the survivors of the earthquake and for the well-being.[17] In this present study, it was found that high caries experience, high prevalence of gingivitis and calculus are significantly correlated ($p<0.001$) measured by DMFT, gingival and periodontal index. This disintegrating pattern may turn into a development of chronic periodontitis which consequences a problem of chewing and tooth loss. Therefore, it is important to pay attention to oral health of victims in an earthquake-stricken area. Our results are closely related to post-earthquake oral status observed in Chinese elderly who live in the affected areas. They claimed that population over 65 years of age is vulnerably affected through the attack and more impairment was found in this age group. These results were similar to a cross-sectional study done by Kukletova et al. where they assessed the oral health in adolescents including dental and periodontal status, dental plaque, dental calculus and orthodontic anomalies.[16,18] They found relatively high caries experience with low level of gingival inflammation and relation between GI and DMFT. Similarly, a study by Taani found that oral hygiene, gingival status, and dental caries were related.[19]

Together with our results in the present study, we strongly believed there is a necessity to strengthen a professional oversight and involvement of authorities in the oral hygiene of these victims. Those greatly involve with human resources, early medical and oral health care during and after the emergency. Data from this study demonstrated oral health status from a community-based study immediate after the earthquake, which provide basic information for health authorities and dental professionals for oral health planning and prevention strategies.

CONCLUSION

The oral health care practice, oral hygiene habits, nutritional intake of the people have been affected in the earthquake affected areas. It showed high caries index, gingival index and periodontal index in earthquake affected people suggesting further efforts are needed for an oral health improvement. Data from this study may be used as basic information for oral health planning and future steps in oral health care preventive and therapeutic programs.

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