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Research Article

Rural Health Awareness and Incidence of Oral Diseases in Rural Communities of Nepal

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Abstract

The paper is an attempt to explore the role and effects of dental camps in rural Nepal and to present self-reported oral hygiene and general health–related quality of life.

The authors used camp registered records to gather data about oral hygiene, general health and nutritional pattern. Perceptions of camp registered patients were captured about their oral health and how oral health affected their quality of life. The authors categorized patients as coming from different ethnic groups, age groups and sex.

There was a significant role and contribution of rural dental camps to improve oral health as measured by using the overall condition of the mouth and teeth, life satisfaction, and frequency of experiencing functional and social problems related to oral health.

Rural dental camps play a significant role to enhance awareness level as well as health practices to improve the oral hygiene and general health conditions of rural communities of Nepal. Such rural camps could affect both functional and social dimensions of oral health, possibly through a psychosocial pathway. Future research is necessary to determine whether any causal link exists.

The findings of the paper may inform oral health policy. Long-term policies designed to improve the oral health of Nepal could work best when supported by policies designed to reduce oral health problems further research is needed to examine the effectiveness of such actions.

Keywords: Oral Hygiene, Dental Camp, Dietary Pattern And Disease Treatment

Introduction

Nepal is a mountainous country where majority of people live in rural area. But most of the rural areas are deprived of basic health facilities because more than 80 percent of the country's doctors are practicing in urban areas. Nepal is one of the least developed countries in the world. Combined life expectancy at birth is 67.5 years and the country is ranked 138/169 on the Human Development Index Scale [1].

Nepal exemplifies a developing country where fertility has been high and mortality has declined steadily resulting in a population momentum. From the first population count in 1911, the population had doubled by the time the 1971 census was conducted, rising from 5.6 million to 11.6 million. The last census of 2011 showed a population of 26.5 million, presenting an average annual growth rate of 1.35 percent during the intercensal period 2001-2011 [2]. The annual growth rates of Nepal's population were low until 1941; this is attributed to incomplete census taking.

The changes in global population health over the past two decades are striking. There has been a dramatic aggregate shift in the composition of the global health burden towards non-communicable diseases (NCDs) and injuries, including those due to global ageing, and the persistence of communicable, maternal, nutritional and neonatal disorders (i.e. diseases of poverty) in South Asia. A study claims Nepal is facing an increasing burden of NCDs, with injuries from NCDs accounting for more than 44 percent of deaths. Major NCDs in Nepal are cardiovascular diseases, diabetes, cancer, chronic respiratory diseases, oral diseases, and mental disorders [3].

Healthy mouth is a unique and priceless treasure, and it is regarded as a fundamental human right to maintain a good oral

health [4]. Good Oral health is state of free of diseases that enables to perform normal functions. In 2016, the Federal Dental International (FDI) Dental World Federation redefined the oral health comprehensively, recognizing that oral health was multifaceted and involved the ability to smell, touch, taste, chew, swallow, smile, speak, and convey a lot of emotions through facial expressions with confidence and without discomfort, pain, and disease of the craniofacial region [5]. Oral health plays an important role in overall health and is an indispensable part of general health [6-8]. It is reported that there is a close relationship between oral diseases and other systemic diseases like diabetes, digestive disease, stroke, cardiovascular disease, metabolic syndrome, adverse pregnancy outcomes, obesity, et al [9-12]. On the one hand, oral problems could result in a pro-inflammatory state, where systemic diseases might develop [13,14]. On the other hand, systemic disorders might be responsible for the development of oral problems [15,16]. However, oral health care is always neglected in despite of the importance of oral health in general health [17,18].

In Nepal, rurally isolated villages usually have no access to basic dental health services at a Sub Health Post. Access to a trained doctor can mean an 8-hour walk with patients often having to pay for services and medications that are not funded by the government. Poverty, challenging terrain, limited infrastructure and civil unrest limits access to health care and exaggerates health inequalities further [19]. A number of different oral health camps have been launched in Nepal in order to provide oral health care to the most isolated and poorest rural communities recently. These oral health camps have positive impact to promote oral health awareness in certain areas where the doctors can feel easy to go and serve them.

The main aim of the study is to find out current health scenario of rural communities of Nepal especially in oral health and nutrition. The work experiences and developing knowledge of health professionals like doctors, nurses and medical students need to deliver free health services to those who are rurally isolated or could not afford specific dental/medical care. Thus, the study concentres to describe health issues of rural communities with their demographic characteristics. Regarding the impact and effect of community health like health camp for health promotion in rural community of Nepal, Rosyara and Malla (2007) pointed out that the community health programs were playing vital role in the community to promote health status of the people. Whereas the beneficiaries of the health program felt that there was an unfair advantage of community health programs lunched in the area and Government, non government health institute and private medical service providers were playing leading role to change people to healthy behavior [20].

Methods

Dental camps were setup in five villages in Sindupalchowk, Kavre, Bhaktapur and Kathmandu districts of Nepal during 2018 January to December. Villages where dental camp were conducted: Sipaghat in Sindupalchowk, Panauti in Kavre, Nagarkot and Bode in Bhaktapur and Narayanthan Budhanilkantha in Kathmandu. Based on a needs assessment performed by Kathmandu Medical College in 2017, villages were chosen due to their rural location and potentially unmet oral health care needs. The villages were 1.5-7 hours drive from the capital city Kathmandu, across different terrain. The oral health camps were conducted basically in derived communities and remote areas where health issues like dental caries, periodontal problems along with nutritional problems were prevalent.

First the oral screening was done and categorized the patients according to their diseases. Simple procedures like restoration of teeth, extraction of mobile teeth, fluoride application and oral prophylaxis was done along with oral hygiene instructions. Patients were taught brushing and flossing techniques and importance of balanced diet for healthy life. Special instructions were given on diet patterns to mothers focusing on preventing dental caries on their children. Medications like Flexon, Amoxicillin, and Metronidazole etc were distributed along with tooth pastes and tooth brushes. Dental camps conducted districts are shown in map of Nepal (Figure 1).

Figure 1: Dental camp Area, 2018.

All the camps were organized by Kathmandu Medical College and Teaching Hospital. Some dental camps were run over the course of 7 days and some were of 2 days. A preliminary day was needed to setup camp, and rest days to actively see and treat patients and a final day to pack up. Local advertising campaigns in the form of posters, leaflets and word of mouth were used to

generate awareness about the camps before their arrival. All equipment, staff and medical supplies were funded by the Kathmandu Medical College and Smile High.

International aid packs containing an assortment of antibiotics and drugs tailored to the area. Each camp comprised a minimum of four doctors, six medical students and two local village organizers.

The camps ran from 9a.m. to 4 p.m. and provided free medical care and medication to all patients who turned up.

Patients who attended the camps, after giving informed consent, had basic demographic information recorded onto a patient Performa and then queued to see a doctor. If time and resource constraints allowed, before each assessment routine observations such as blood pressure, pulse, temperature, height and weight were performed. Blood pressure was measured after at least 5 minutes of rest using a standard mercury sphygmomanometer. Pulse was taken manually as were measurements of height and weight.

Patients were then taken to a consultation room where they were assessed by a doctor. The reason for encounter, complaint or diagnosis was entered on the pro forma. Normal oral checkup was done. If medication was prescribed, patients could collect it free of charge. Each consultation would last between 5 and 15 minutes and on average, over 100 people were seen each day. If any patient needed further assessment referral was done to Kathmandu Medical College or nearby hospitals of Kathmandu Valley including Dhulikhel Hospital.

Statistical analysis

Patients' pro forma sheets were stored securely and data were entered and analyzed. Patients were divided into three age groups as ≤14 years, 15-40 and >40 years (Table 1). On the basis of prevalence of different diseases various ethnic groups were compared. To analyze overall oral health condition of different communities simple statistical tools were applied.

SN	Age group	Number	Percent
1	≤14 years	1206	75.30
2	15-40 years	179	11.20
3	>40 years	216	13.50
total		1601	100

Table 1: Number of patient by age group.

Source: Dental Camps; 2018

Table 1 shows that the majority of the dental camp patient were ≤14 years (75.30%) followed by age group >40 years and age group 15-40 years as 13.50 percent and 11.20 percent respectively. Similarly, more than 58percent patient were male and around 41percent were female table 2.

Sex	Number	Percent
Male	939	58.65
Female	662	41.34
Total	1601	100

Table 2: Number of patient by sex.

Source: Dental Camps, 2018

Regarding the ethnicity of health camp patient Brahmin, Chhetri, Rai, Tharu, Muslim, Tamang/Sherpa, Madeshi, Dalit and Majhi were registered. Out of total patient of the dental camps, the proportion of Brahmin was highest followed by Newar, Chhetri, Tamang, Dalit, Madheshi, Tharu, Muslim and Majhi as presented in table 3.

Caste/ethnicity	Number	percent
Brahmin	503	31.41
Newar	226	20.36
Chhetri	230	14.36
Dalit	121	7.55
Madheshi	57	3.56
Muslim	47	2.93
Tharu	50	3.123
Tamang/Sherpa	210	13.11
Majhi	57	3.56
	1601	100

Table 3: Number of patient by caste/ethnicity.

Source: Dental Camps, 2018

Results

Demographics

One thousand six hundred and one patients were seen over the five dental camps: 890 at Sipaghat, Sindhupalchowk, 300 at Panauti, Kavre, 81 at Nagarkot,Bhaktapur, at Budhanilkantha, Kathmandu and 30 at Bode, Bhaktapur. Among them most of the patient were below 14 years and came from Brahmin, Tamang/Sherpa, Dalit and Newar communities.

Disease burden

The most frequent diagnoses were dental caries and periodontal problems (Table 5). The least frequent diagnoses were lichen planus and oral submucous fibrosis.

Medications

Only patients with pericoronitis (with pain) and after extraction were given oral antibiotics and analgesics. The most commonly prescribed medications were oral analgesics (paracetamol, flexon, and ibuprofen), oral antibiotics (amoxicillin, metronidazole) and proton pump inhibitors (pantoprazole). Fluoridated tooth pastes and tooth brushes were also distributed among the patients.

Limitations of the Study

This is the first paper to describe the oral diseases encountered at rural areas and equally one of only a few that has analyzed a camp initiative to help to improve rural oral hygiene and personal health care. This could be the useful study frame work and basic information for future rural health services. By quantifying diseases within these rural settings, it appears that dental caries and periodontal problems are common problems affecting a large proportion of the community people.

One difficulty appeared when establishing a rural dental camp with little guidance or research as to what sort of instruments, procedures and manpower are required. By outlining disease burden, medications issued and categorizing them into specialties, this paper may help to rationalize resources and recruitment for future oral health hygiene and general health improvement in rural communities. Since populations in India and Nepal may have similar oral health care needs due to similarities in dietary patterns, race and religions, so that our findings may also be applicable in parts of India.

Weaknesses of the study include that not every patient were provided with complete treatments. Every patient was not provided with basic observations such as height, weight, and blood pressure measurements performed. This was due to time and resource constraints encountered in collecting data in remote and overworked health/dental camps. A major weakness is that clinicians were limited to purely clinical diagnoses as there was no access to investigations in such rural locations. In addition, cultural and language barriers may have led to misunderstandings and misdiagnoses. All cases were handled by junior doctors. Patients were treated presumptively. In addition, since most patients had an expectation of receiving a treatment regardless of clinical signs, medications (analgesics), tooth pastes, toothbrushes were often given when there was no clear diagnosis. Unfortunately, this may create an unhelpful dependence upon manufactured medications and supplements. Finally, the findings may not be applicable to urban areas, different seasons or to other resource poor areas.

Recommendations for Clinical Practice

One clear benefit from running the camps has been the incredible mutual learning opportunities for Kathmandu Medical College doctors and students. For doctors and students, camps afford an opportunity to encounter oral disease presentations that rural dental hygiene is essential for healthy life. Equally, for dental surgeon it was great opportunity to help their local community as well as share their ideas.

Despite treating over 1600 patients, it is difficult to know whether dental camps initiatives help to achieve long-term oral health improvements to an area. These types of dental camps can be like placing a small suture across an open wound. It treats the problem short term but undoubtedly, longer term solutions may be needed. Although we cannot deliver sustainable ongoing care alone, the collaborative health services has to be established in Nepal and funding has to be acquired to provide a rural health care worker all year round for the local community. Overall, the study has established significant indicators on prevalence of the oral disease as a burden of rural areas of Nepal and also presents problems regarding health awareness and nutritional issues that make rural communities far behind the good health.

Clearly, there are still vast challenges to overcome oral diseases in rural communities of Nepal. However, such dental camps initiatives can make a contribution to change the current oral health scenario of the rural communities of Nepal. Further, dental camps also benefit both dental surgeons and students to extend their knowledge and experiences. There are few published data on oral health needs and care of people attending rural health/dental camps in Sipaghat in Sindhupalchowk, Panauti in Kavre, Narayanthan in Kathamandu, and Bode, Nagarkot in Bhatakpur district of Nepal.

The most common complaints were tooth decay, periodontal problems, mobile teeth, crowding of teeth, malnutrition in adults and children. Dental camps were an excellent learning opportunity for health professionals and graduate students. For future dental camps, it is recommended endodontist, pedodontist, periodontist, orthodontist, and Gp's and nutritionals professionals for effective services.

Discussion

Disease Diagnosis

Various types of oral diseases were encountered during the dental camps in selected areas. The diagnosed disease/findings with their frequencies are presented in table 4.

Diseases	Number of cases
Dental caries	981
Periodontal Problems	534
Mobile teeth	400
Enamel hypoplasia	75
Lichen Planus	16
Oral sub mucous Fibrosis	23
Notched Central Incisor	21
Actinic chelitis	2
Fluorosis	67
Pericoronitis	83
Malocclusion	250

Table 4: Frequency of diseases/findings presentation in the dental Camps.

Source: Dental camps, 2018

From the table 4 it is evident that the patients registered in dental camps from five spots were diagnosed with different diseases. Among which dental caries was the most common followed by periodontal problems. Many patients came with chief complaint of mobile teeth (patients > 40years). Malocclusion was common finding among different communities leading to periodontal problems. More patients (>20) years were diagnosed with pericoronitis. Enamel hypoplasia, fluorosis and notched central incisors were commonly found among Tamang/Sherpa and Danuwar/Rai communities. Whereas Oral sub mucous Fibrosis was mainly diagnosed in Madheshi and Muslim communities' patients. Actinic chelitis and lichen planus were diagnosed in Newar communities. It reveals that the oral health problems vary in different caste/ethnic groups. This might caused due to the level of personal health awareness, dietary patterns, and socio-economic condition of rural communities in Nepal. An inquiry was done to know their oral health problems especially caries among private school children and government school children. It was found private school children had more dental caries because of consumption of junk foods, chocolates and their dietary patterns than government school students. Whereas the overall oral as well as general hygiene was better among private school children due to their parents socio-economic conditions.

Disease treatment and medications/tooth paste-brush distribution

After diagnosis of disease, patients were categorized accordingly and treatment was done. The then medications, toothpaste and tooth brush were distributed to the patients. At the ending session of each dental camps basic oral hygiene instructions (tooth brushing, flossing techniques), nutritional information, hand washing techniques and relation between diet and caries were taught to them. The detail is given in table 5.

Disease	Frequency	Treatment
Dental caries	981	312
Periodontal problems	584	76
Mobile teeth	400	216

Table 5: Disease treatment.

Table 5 indicates that 981 cases of dental caries was diagnosed among which 312 were treated. Only primary teeth were restored with Glass ionomer cement (GIC). Restoration of permanent teeth and pulpectomy/pulpotomy/RCT were referred to Kathmandu Medical College or nearby dental hospitals due to no radiographic services and proper dental setup in those areas. Fluoride application was done among all school children. Oral prophylaxis was done (using hand scalers and ultrasonic scalers) and cases like gingival recession, periodontal pockets, furcation involvement were referred to the hospitals. Extraction of mobile teeth (both primary and permanent teeth) was done under local anesthesia after checking blood pressure. Most of patient (old aged) had heart diseases, diabetes mellitus, thyroid problems so were advised to take physician advice before extraction thus were referred to nearby hospitals. Similarly, patients with pericoronitis were given antibiotics and advised for surgical extraction. As most of the team member was undergraduates precancerous conditions and lesion cases were also referred to hospitals. Patients with different malocclusion were referred for orthodontic consultation on nearby hospitals.

Conclusion

The majority of diagnosed oral diseases cases in rural health/dental camps were due to lack of awareness of oral health, negligence and wrong dietary pattern. The oral health problems found to vary according to geographical locations, caste/ethnicity as well as socio-economic status of community people. Participants of camps perceived health/dental camp services were good, effective, comprehensive and affordable to rural people who have no access

to urban doctors. Suggestions included increasing the rural health/dental camps improving facilities in the workplace and in rural areas, adequate security for doctors and facilities for health/dental camp. Group practice or more than one doctor in a health facility could be considered. Changes in the rural health service system are also suggested. Rural area of Nepal needs trained main power to function with less technology, and motivated for rural services. Doctors and supporting manpower were not felt comfortable with rural populations and so familiarization sessions and training on communicating better with villagers is required. Improving facilities for doctors in rural areas, providing relatively better facilities and reorienting medical/dental practitioners for rural health services has to be prioritized in order to improve the overall health conditions in rural Nepal.

The specificity of these conclusions can be improved by using these conclusions as a base to improve oral hygiene, general health and diet patterns in rural communities. Oral hygiene service through rural health camps in the country reflects on concrete measures which could increase the oral hygiene and nutritional practice s in rural Nepal.

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