

## [REVIEW]

## Oral Health and Dental Education in Nepal

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Nepal is a developing country in South Asia with a population of about 31 million in an area of 147,181 km<sup>2</sup> in 2014. Oral diseases are a major health problem in Nepal, and a detailed understanding of current oral health status and the dental education system in Nepal is of interest. The history of medical education in Nepal is 80 years old, but dental education is still in the preliminary phase. Nepal has a very high incidence of den-

tal caries and periodontal diseases ; and the ratio of population to dentists is (about 20,000 to one). The national need for the training of dental specialists is a major concern. In Nepal, the dental education system was established in 1997 when the Tribhuvan University started a Bachelor of Dental Surgery program. In this review, we will share basic information of oral health and of the dental education system in Nepal.

**1 : Introduction to basic dental care—need assessment****1.1 : Current oral health status of Nepal**

Nepal is a developing country with a population of 31 million an area of 147,181 km<sup>2</sup> (Nepal Demographics Profile, 2014), very similar to the geography of Nagano prefecture in the central part of Japan. Fifteen percent of the land area is comprised by the Himalayan region with snow capped mountains in the northern part. Seventeen percent is the flat terai region with the highest population density, stretching along the southern border of Nepal. The remaining sixty-eight percent are hills and mountains in the central part of Nepal. Due to this wide range of geographical features, the country is not able to provide medical care facilities and education equally to all parts of the country.

The World Health Organization reports that 60–90% of schoolchildren worldwide have experienced caries, with the disease being most prevalent in Asian and Latin American countries (Peterson et al., 2005 ; Wagle et al., 2014). Nearly 41 percent of the total population in Nepal is under the age of 16 years, and of the total number of school age children

87 percent are enrolled in schools. The 2004 National Pathfinder Survey reports that 58% of 5–6year old schoolchildren suffer from dental caries (Yeet et al., 2006). Nepal ranks among the top 15 percent of countries worldwide where periodontal disease of 35–44 year olds is most prevalent (van Palenstein et al., 1998). Oral health problems are often neglected and only treated if pain or other complications arise. According to the World Oral Health report 2003 “oral diseases are subject to common risk factors similar to the four leading chronic diseases cardiovascular disease, cancer, chronic respiratory disease and diabetics. Unhealthy diets, smoking of tobacco, drinking of alcohol, and poor oral health are additional risk factors for oral diseases. Among oral health complaints, dental caries is the most common in several Asian and Latin American countries” (Peterson et al., 2005).

The majority of Nepalese neglect oral health and do not consider it a major issue. They seek dental treatment only when they are in pain. Nepal has a 20,000 people/dentist ratio with just over a total number of 1,400 dentists, including about 166 dental specialists. Most dentists practice in the major cities (Wagle et al., 2014), and the Nepal dental

health service is still in its infancy. According to a recent study, 58% of 5–6 year old school children suffer from dental caries and a significant number of children miss classes because of dental pain (Yee et al., 2006). The government is not able to extend oral health services even at the district level, and as private dental hospitals and clinics are only based in some major cities, people must travel hours for simple dental treatment. However, a number of non-governmental organizations are actively involved in different remote areas of the nation to provide basic dental health care services. A good example was set during the Nepal earthquake of 2015, where more than 8,700 people lost their lives and 12,000 were injured (Adhikari et al., 2015), here field based emergency oral–dental treatments were provided by a number of institutions like the “Dhulikhel Hospital”, “Smiles across Nepal”, and “Teeth and Toilets”, in addition to many others.

The second long-term health plan for Nepal (1997–2017 Nepal) has included oral health among the essential health care services and for the first time oral health was added to the primary health care approach (NHSP, MoH, Nepal). The Government of Nepal has allocated 5–6% of the annual budget to health sector and a small portion of this is allocated to oral health in Nepal (NHSP, MoH, Nepal). Most Nepalese are deprived of oro–dental care because of constraints like financial causes, lack of perceived need, anxiety or fear, and lack of education and awareness. Annually among all cases visiting OPD, 3% of cases are due to oral health problems. Major dental problems in Nepal are dental caries/toothache, periodontal problems, oral ulcers and mucosal diseases, oral and maxillofacial diseases, and oro–facial clefts. The incidence of each of these is briefly summarized in table 1.

## 2 : History of dentistry in Nepal

Kathmandu, one of the historical and traditional cities of

Nepal, holds numerous temples and deities in every part of the city. One very interesting historical and religious belief related to tooth ache is commonly believed. Among historical sites in Kathmandu, Bangemudha is one such location where “washya dyo or danteshwori devi shrine” (meaning “the goddess alleviating toothache” according to the regional language) is found. This goddess resides in a chunk of wood, a wooden block mounted on the floor of a traditional temple (Fig.1). To alleviate toothache, the people here worship the toothache goddess by nailing a coin to the wooden log. There is no scientific evidence to support the power of alleviation of tooth ache in this manner, but the long standing belief has turned into a custom. “Washya dyo” is still preserved as a goddess by the local inhabitants and by the dental care fraternity as a historical monument of the history of dentistry of Nepal (Mainali K et al, 2008).

## 3 : Numbers of Dental practitioners in Nepal

Before the starting of dental schools in Nepal, a few dental surgeons were practicing in Nepal. They had received basic dental school education in other countries like in India,



**Figure 1 :** Danteshwori Devi shrine, known as Washya Dyo in Kathmandu, Nepal. People who suffer from toothache visit this Tooth Fairy Shrine, nail a coin to the wood and believe that toothache will be cured by god.

**Table 1 :** Incidence of major Oral complaints in Nepal in the recent 5 years

Cases	Dental caries and tooth ache	Periodontal diseases	Oral ulcers and other disease of the mucosa	Other
Year				
2009–2010	392,831	73,309	113,819	62,747
2010–2011	402,142	75,099	116,174	57,348
2011–2012	421,033	77,360	124,328	65,246
2012–2013	433,282	76,547	124,368	62,545
2013–2014	444,088	94,130	113,819	73,224

Pakistan, or Russia. Only after the start of the first Nepalese dental school in 1997, have dental school graduates been matriculated from within the country. The current number of dental practitioners registered in the respective health councils of Nepal are shown in table 2.

#### 4 : Dental Education in Nepal

##### 4.1 : History of Dental Education in Nepal

Medical education in Nepal started in 1933 with the commencement of enrolling students of the Nepal Rajakiya Ayurved Vidyalaya, a school for educating the Nepalese in traditional medical treatments. However, allopathic medical education started only in 1972 with the opening of the Institute of Medicine(IOM) of Tribhuvan University. The history

**Table 2 :** List of dental health care personnel registered in Nepal

Category	Number	Year
Dental specialists	166	2013
General dentists	1,440	2013
Dental hygienists	1,000	2012
Chair side assistants	356	2011

Data from the Nepal health professional council records

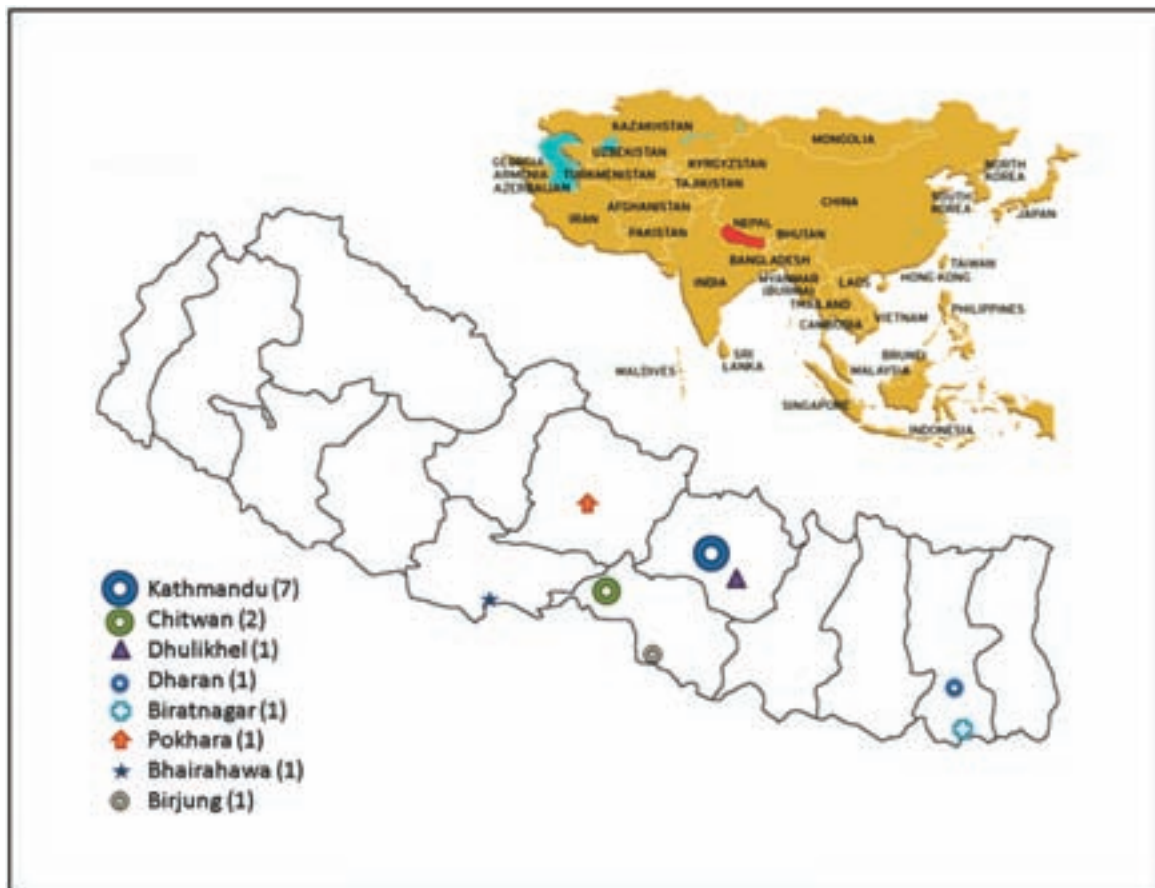
of dental schools is a mere 20 years, with the first dental college starting in the year 1997. However, Nepal is still behind other developed Asian countries. A comparison between Nepal and Japan on various parameters related to the education system and dental practitioner numbers is shown in table 5.

##### 4.2 : Dental schools in Nepal

There are 4 universities offering a dental education program in Nepal. In addition, there are 12 dental schools affiliated to these universities. The geographical distribution of these schools is shown in Fig.2. Among these, 3 universities offer dental programs at the Bachelor of Dental Surgery (BDS) and Master of Dental Surgery (MDS) levels, while NAMS offers only an MDS program. The name of the university and their affiliated colleges are listed in Table 3.

##### 4.3 : Degrees offered

The BDS is an undergraduate course of 5 years and 6 months in the dental schools of Nepal. Irrespective of the university, the undergraduate dental courses are divided into



**Figure 2 :** The geographical distribution of the dental schools in Nepal. The numbers in the legend shows the number of dental schools in the different administrative divisions of Nepal. The top map shows the location of Nepal in Asia.

**Table 3 :** List of dental schools in Nepal

University	Affiliated colleges
<b>1. Tribhuvan University</b> (government university)	<ul style="list-style-type: none"> <li>• Institute of Medicine, Maharajjung campus</li> <li>• Peoples's dental college.</li> <li>• Universal college of medical sciences.</li> <li>• KIST medical college.</li> <li>• MB kedia dental college.</li> <li>• Chitwan medical college.</li> <li>• Gandaki medical college (proposed).</li> </ul>
<b>2. Kathmandu University</b> (public university)	<ul style="list-style-type: none"> <li>• Kathmandu University Medical School</li> <li>• Nepal medical college.</li> <li>• Kathmandu medical college.</li> <li>• Kantipur dental college.</li> <li>• Nobel medical college.</li> <li>• College of medical sciences.</li> </ul>
<b>3. BP Koirala Institute of Health Sciences (BPKIHS)</b> (ranked as a university)	
<b>4. National Academy of Medical Sciences (NAMS)</b> (ranked as a university)	

**Table 4 :** Details of undergraduate courses at the two major universities of Nepal

Year	Tribhuvan University	Kathmandu University
<b>1<sup>st</sup> grade</b>	Basic subjects : Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Pharmacology. Dental subject : Dental materials science	Basic subjects : as at T.U. Dental subject : Oral Biology
<b>2<sup>nd</sup> grade</b>	Basic subjects : same as in first year. Oral anatomy	Basic subjects : same as in first year. Dental material science
<b>3<sup>rd</sup> grade</b>	General medicine General surgery and anesthesiology Oral pathology Forensic dentistry	General medicine General surgery Oral pathology, Microbiology and Forensic dentistry Community dentistry including community medicine
<b>4<sup>th</sup> grade</b>	Oral medicine and radiology Orthodontology Pedodontology Community dentistry	Oral medicine, diagnosis and radiology Periodontology Pedodontology Orthodontology
<b>5<sup>th</sup> grade (6 months)</b>	OMFS Conservative dentistry and endodontology Prosthodontology Periodontology	OMFS Conservative dentistry and endodontology Prosthodontics, crown and bridge
<b>1-year compulsory rotating residential internship.</b>		

**Table 5 :** Statistics for Nepal and Japan

	Nepal	Japan
Area (km <sup>2</sup> )	147,181	377,944
Population (million)	30.98	127.3
Number of Schools of dentistry	15	29
Number of dentists	1606	99426
Population per dentists	20,000	1434
Dental degrees awarded	BDS, MDS	DDS, PhD
Undergraduate course duration (years)	5.5	6
Graduate course duration (years)	3	4

3 phases. The 1<sup>st</sup> phase is a preclinical phase which is completed in the first and second years. Students gain knowledge of basic medical sciences, oral biology and dental materials. The 2<sup>nd</sup> phase is a clinical phase, which lasts two and

half years. Here, the students learn general clinical subjects and dental subjects. It is a student centered, problem based, community oriented, integrated, and systematic course. After successful completion of both these phases, students have to undergo 1 year of a compulsory rotating residential internship. A brief summary of the subjects at the undergraduate level offered by the 2 major universities in Nepal are given in table 4.

The MDS is a 3 year specialization course after the BDS. It is a clinical based and patient oriented course. The graduate students learn the clinical skills of the related specialty they are enrolled in.

#### 4.4 : Admission requirement

##### 4.4.1 : For the undergraduate level

The universities regulate admission to the dental school. Students have to appear for the entrance examination, and those who qualify at this examination are eligible to enroll in the undergraduate course of the university and its affiliated colleges. There are more than 2000 applicants annually, and about 250 students are admitted. The number of students who are admitted varies every year depending upon the number of opening provided by the school. Students having a higher secondary level education majoring in science are eligible to take the entrance examination.

##### 4.4.2 : For the graduate level

The number of graduate students admitted into the MDS level is very much smaller. It depends upon many factors like availability of professors in the respective fields, the number of patients of the training Centre (school) ; and other basic infrastructure of the dental school. This number is regulated and controlled every year by the NMC, MOE, and university involved. The aspirants have to pass an entrance examination. Two years of working experience may be required depending upon the norms of the university.

#### 4.5 : Scholarships

The Ministry of education (MoE) provides a limited number of scholarships to meritorious students at both the undergraduate and graduate levels ; in addition, some universities also provide a specific number of scholarships. A few scholarships are available to Nepalese students from governments of other countries and universities namely : from Bangladesh, China, India and Japan.

#### 4.6 : National examination for the dental license

The Nepal medical council (NMC) regulates the code of ethics practiced by general medical and dental practitioners in Nepal. The NMC conducts the Nepal Medical Council License Examination (NMCLE) for medical and dental graduates. License examinations are held every three months for undergraduates and every six months for graduates and specialized dental surgeons. Dental doctors are allowed to practice legally only after passing this examination.

### 5 : Associations related to dental practice :

#### 5.1 : the Nepal Medical Council (NMC)

The NMC is a non – governmental autonomous body

which regulates the code of ethical practices adhered to by general medical and dental practitioners in Nepal. It was established through the NMA act in 1964 (ii). The main functions of the NMC are :

- To determine the qualification of doctors, to provide registration certificates by undertaking license examinations for new doctors.
- To give recognition to medical institution for providing formal studies in medical sciences.
- To formulate policies related to curriculum, admission and examination arrangements of teaching institutes of medical education.
- To formulate necessary policies and create a code of conduct to ensure that the medical profession is governed equitably.
- To participate in making national health policy.

#### 5.2 : The Nepal Medical Association (NMA)

The NMA is a non – governmental professional organization which looks after all medical and dental practitioners in Nepal. It was established on March 4, 1951 (iii). It is to contribute towards the overall improvement of the health situation in the country. To help in raising the level of clinical knowledge of doctors through regular scientific sessions and publication of medical journals. It is a member of World Medical Association (WMA) and Confederation of Medical Associations in Asia Oceania (CMAAO).

#### 5.3 : The Nepal Dental Association (NDA)

The NDA is the mother organization for the welfare of dental surgeons of Nepal. It was established in 1990 and contributes towards continuing dental education through annual dental conferences and trade exhibitions, short and medium term hands on diploma courses and skill building clinical courses (iv). It also organizes different oral health awareness programs, community oriented dental camps, and conducts other activities.

#### 5.4 : Other associations

There are other associations specialized for dentists who work for the betterment of practicing specialized dentist as follows :

- a) The Nepalese association of oral and maxillofacial surgeons (NAOMS).
- b) The Nepalese society of periodontology and oral im-

plantology (NSPOI).

- c) The Nepalese prosthodontic society (NPS).
- d) The Orthodontics and dentofacial orthopedic association of Nepal (ODOAN).
- e) The Conservative dentistry and endodontics association of Nepal (CDEAN).

## 6: Conclusions

The number of dental schools and dental specialists in Nepal has increased in the recent few years. However, the dental schools are mainly focused on instilling clinical knowledge, and there is a lack of research based education in Nepal. To improve the standards and the level of the education, there is need for timely updating of the curriculum to introduce treatments of newly occurring diseases, and advanced technologies including research. Nepal is a developing country with a wide variety of geography where residents of the major cities are able to access good health facilities, while in the high hilly regions and in the Himalayan region there is still a lack of proper oral health facilities and education. This makes it important that efforts are made to establish a good oral health education system and oral health facilities in these regions.

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