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Dental hygienists on top of the world: supporting oral health education in Nepal

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Abstract: This article describes the oral health situation in Nepal. Based on research and strategic planning reports from the WHO and the Ministry of Health in Nepal the value of Oral Health Promotion in Nepal is being promoted. The implications of possible dental treatment and/or oral health promotions are being discussed. A plan for support of improvement of the oral health in Nepal is presented. The main focus is the support of the development of the dental hygiene education and profession in Nepal. Another focus of attention is the ability of dental hygienists in Nepal to develop them individually and to create independent professionalization. This article forms the basis for developing a 5-year collaborative programme with Kantipur School of Dentistry and the Dental Hygiene Education, Amsterdam. It can be a means to inspire dental hygienists around the world to put efforts into improving oral health in developing countries.

Key words: collaborative programmes; dental hygiene education; developing countries; oral health promotion; quality of life

Introduction

In March 2005 I had the opportunity to visit Nepal and the Kantipur School of Dentistry (KSD) in Kathmandu. This visit stimulated my interest in exploring approaches to support the oral health of the Nepalese. As with any programme planning, one needs to contextualize the programme for the target population. During my visit I have gained a better understanding of oral health needs of the population in Nepal. My interest in contributing through the development of a programme related to oral health promotion was established.

In this article, I will first provide a context for understanding Nepal and then explore the evidence related to the general and oral health status of people in Nepal. The strategies for oral health promotion that are currently being implemented or being investigated are described.

Nepal the country

Nepal is a relatively small country, bordered by India and China. The Himalayan range and the spiritual image of the country have a special attraction to travellers. Nepal is a constitutional Hindu monarchy (1). The country has a multiparty bicameral parliamentary democracy. The Nepalese King Gyanendra assumed power in 2002 and dissolved the government or Prime Minister Sher Bahadur Deuba in February of that year. The King openly ruled the country and declared a state of emergency. Some ministers were arrested and some were placed under house arrest. It was an attempt by King Gyanendra to oppose the Maoists and break their power (2).

The Communist Party of Nepal (Maoist), CPC(M) launched 'the Nepalese People's War' in 1996. Their main goal is to overthrow the monarchy and replace it with a Marxist concept of collective ownership of the means of production. The Maoists have a guerrilla strategy in which they attempt to control the countryside and encircle the cities. They now control much of the country. The Maoists increasingly violent behaviour since 1996 has thrown the country in a civil war. They impose strikes, abduct people, target government buildings and government staff. They have made the country outside the capital Kathmandu an insecure place to live and travel. Between August 2003 and December 2003 around 500 people have been killed in the conflict (1, 3, 4). Nepal is a very fragmented country because of mountains and rivers (1). The countries infrastructure is limited. Every summer rains causes landslides and just repaired roads are damaged badly again.

Nepal is one of the poorest countries in the world. There are approximately 24 million inhabitants. The amount of inhabitants seems to rise explosively. Speculations are that in 2025 the population will be doubled (3). Almost 85% of its inhabitants live in the rural areas. About 40% of the inhabitants live below the poverty line. The percentage of people living below the poverty line has not changed much in the last 25 years, which means that absolute figures show that the amount of people living below the poverty line has increased (1). About 80% of the people have access to safe water. However, in the Insight Guide® from Nepal it is mentioned that if every small district of Nepal would be provided with safe drinking water, this would provide a greater benefit to the general health status than would the construction of a fully utilized hospital (5).

General health status

In Nepal there is a high amount of infectious diseases, malnutrition and high maternal and child mortality (1, 6).

The average yearly income is about $250 (US) a year; 13% of the population earns 50% of the national income. The income in and around Kathmandu is four to five times of that in the rural areas (1, 3). The literature supports the view that poverty is a substantial barrier to health (6).

A small amount of the government budget is spent for the health sector. About $3 (US) per capita is publicly spent on health. The real amount of money spent on health is higher, because of the fact that a substantial amount of money is coming from different international organizations (1, 6).

The Ministry of Health is developing multiple plans for improving health care and health services; however, it is challenging. The Nepal Government's Second Long Term Health Plan (1999–2017) gives priority to health promotion and prevention activities. This plan also includes development and implementation of essential health care services (7). Health care is further complicated as the public services are mostly used by the middle income groups, while the rich go to the private sector and the poor rarely access it. In addition, the Maoists make it difficult for health services to reach rural areas. The mid- and far-west region (22% of the inhabitants) have the worst health indicators of the country (1). Efforts of the Ministry of Health to improve health care are being obstructed by the present political situation. Non-governmental organizations (NGOs) and donors are hesitant to put more resources into health in the current situation (1, 7). Thus the ability of the people and the Government to pay for health services are limited.

Oral health status

Research before 1998 of the Decayed Missing Filled Teeth (DMFT) in Nepalese children stated that in Nepal caries prevalence was low to very low (8, 9). However more recent research, published in 2002, concludes that the recorded prevalence of untreated dental caries in schoolchildren requires an appropriate oral health response based primarily on prevention and health promotion. It looks like the 12-year-old DMFT Nepal seems to be doubling every 10 years (6, 10). Studies carried out in a number of locations in Nepal have indicated that

the country is fast moving towards being a country with high caries. Growing urbanization and change in food habits (processed food like biscuits, noodles, sweets and carbonated drinks) are responsible for the rise in the urban areas. Many researchers have described that an increase of urbanization in developing countries can lead to an increase in oral diseases as a change of dietary habit takes place. However the change in dietary habit in the urban areas will influence the people in the rural areas, because the population associate these foods with modernization, and therefore the availability of these foods is rapidly rising. In almost every small rural village you can buy Coca Cola® but safe drinking water is lacking (10–12).

Data about the caries prevalence in Nepal is difficult to interpret, as there are differences between the regions. The Western region has the highest prevalence of tooth decay while the Terai region has the lowest. There also seems to be an increase in caries prevalence in females. Caries prevalence also seems to be related to the level of education (also of the level of education from the father).

Results from The Nepal National Oral Health 'Pathfinder' Survey (2004) show that there is a decrease in the caries prevalence, however dental caries in the deciduous teeth is still above recommended targets (13). A difference is also seen in the caries prevalence between children of governmental schools and private schools, and in urban or rural areas. Schoolchildren attending schools in urban areas (mostly private schools) had significant higher caries prevalence than those living in the rural settings (10). This is explicable because of the fact that only the upper- and upper middle-socioeconomic class have income to send their children to private schools.

The WHO reported in 1998 that the periodontal condition in Nepal belongs to the 15% worst countries in the world (6). In 2004 research has shown that periodontal health of adolescents and 35 to 50-year olds is improving. Nepal's ranking of healthy sextants is now in the middle, compared with other SEARO countries (Bangladesh, Bhutan, Korea, East Timor, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand) (13).

In the 'Pathfinder' survey (2004), it is concluded that brushing once a day is still a norm in Nepal. The level of education plays a significant role in the type of tool that is being used for oral hygiene. The less educated are using other instruments to clean their teeth. Knowledge concerning the benefits of fluoride is low in all age groups. The use of tobacco is also significantly related to the level of education. More illiterate adults, 35–50 years, use tobacco than those who are educated. The National Oral Health Policy and the National Strategic Plan for Oral Health strategies have developed strategies to reduce these inequalities in oral health (13).

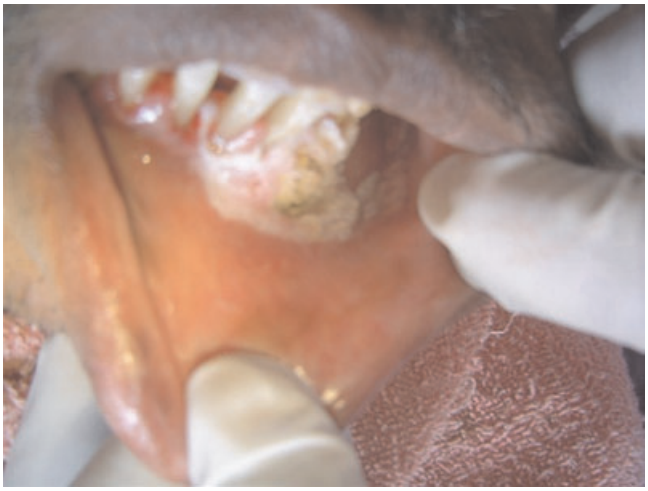

Fig 1. Oral cancer in a Nepalese patient.

Research has shown that a substantial portion of children in developing countries are affected by tooth decay, and that this is being left untreated because of limited access to oral health services (14, 15). Due to the fact that the caries will be left untreated will eventually lead to pain, loss of teeth and that will have impact on the quality of life from children and adults (6, 14, 15). In the 'Pathfinder' Survey (2004) 18% of the 5 to 6-year-old children surveyed in Nepal reported pain. From the older adults 64% reported pain.

The prevalence of oral cancer is on the rise (becoming the 11th most common cancer in the world!). Oral cancer is the most common form of cancer in men in Nepal according to data from Globocan (2001). It is a disease with a high morbidity in Nepal. Many cases are diagnosed in an advanced stage leading to poor treatment results and poor survival rates Fig. 1.

Treatment of disease

It is impossible to have all the caries treated. Nepal only has about 240 dentists and most of them work in the urban areas. Graduating more dentists may have a limited impact on oral health care services as most of the graduating dentists remain in the urban areas (6). It will cost too much money to treat caries with the traditional restorative techniques. The costs will be disproportionately expensive in relation to other priorities faced by developing countries (16).

There are not enough resources to finance an essential package of health for Nepalese children (6, 15). Although generally speaking the caries prevalence in low income countries is low, approximately 90% of the caries remains untreated. To treat a

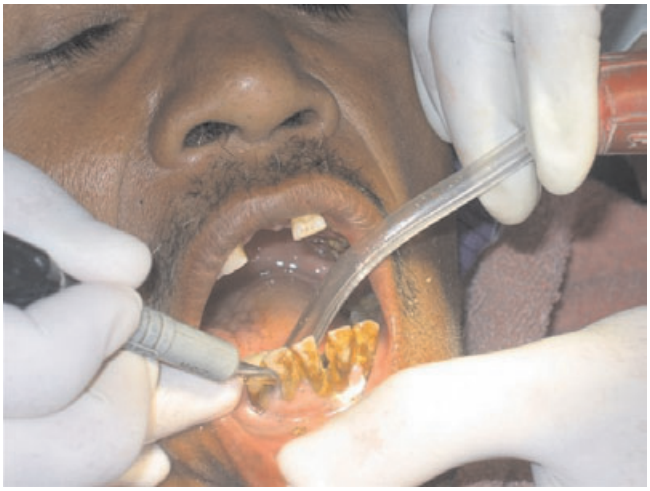

Fig 2. Patient treatment in a clinic in Butwal, Nepal.

6-year-old child with three decayed teeth is approximately 800 Nepal rupees ($11 US); this does not include lost wages, travel and accommodations. In Nepal this would be enough money for food for a month (17).

The same economical figures occur for removal of calculus. In Nepal calculus and periodontal disease seems to be highly prevalent. Research has shown that the usefulness and the effectiveness of calculus removal through mechanical debridement were found to be ineffective without unrealistic compliance regimes (25, 26).

Scaling is of little use in improving the standard of periodontal health, if it is performed occasionally and without repeated instruction of oral hygiene. To provide scaling is time-consuming and expensive. It is out of proportion to the health significance (18, 19, 25) Fig. 2.

Primary Health Care Workers in Nepal have been assigned to carry out a Basic Package of Oral Care in Nepal. These services consist of: (i) oral health promotion (OHP); (ii) arrest of caries technique (ACT; using silver fluoride or silver diamine fluoride and stannous fluoride to stop the progression of dental caries); (iii) atraumatic restorative technique (ART; using glass–ionomer cement and hand instruments for single surface restorations and for sealing pits and fissures); (iv) oral urgent treatment.

However the fact is that in Nepal most villagers are too poor to pay the minimum fee of Nepal rupees 50 ($0.70 US) for ART or ACT treatment (7, 15). Considering annual income it is once again evident that this basic package is only available for those who can afford it.

It seems that most health posts (primitive or mobile clinics) are curative centres and not health promotion oriented. The major services provided during dental visits are oral examination, dental extraction and scaling and polishing. The other services such as fillings, crowns and root canal treatment were negligible. The Nepalese mainly visit the dental clinic or health post for pain relief (7).

Oral Health Promotion seems to be the only (economically) realistic option to improve the oral health situation in Nepal (13).

Health promotion strategies

Instead of trying to treat the disease it would be preferable to address the root causes of the disease. This is anticipated to have more impact on the longer term outcomes and it is possible to reach a larger part of the community (6). There is a great need for oral health promotion in Nepal. It is anticipated that oral health promotion (i) is more cost effective; (ii) has better long-term results; (iii) adds to the quality of life, through prevention of pain and dysfunction; (iv) is easier to realize as no dentists are needed and local people can be trained to perform the tasks.

Fluoride

An important aspect of oral health promotion to reduce the caries prevalence is fluoride. Almost in every part of Nepal the drinking water is low in natural fluoride content. Water fluoridation is not really an option in Nepal as there are only a few centralized drinking water sources (6, 11). Milk fluoridation is not an effective alternative either as only a small group of the Nepalese people consumes packaged milk. Salt fluoridation was considered and is now being re-examined. However it will be difficult to regulate and control. The poor infrastructure of the country, problems with distribution and quality control make it difficult to implement (11). What all these methods have in common is fluoridation without having to alter people's behaviour. However it is essential to alter people's behaviour if you want to promote good oral health behaviour.

While fluoridated toothpastes are not an ideal solution within the context of Nepal, it does provide some opportunities. The availability of fluoridated toothpaste in Nepal was limited to expensive imported brands which is only accessible to consumers in the urban area of Kathmandu. An advocacy project related to fluoridated toothpastes in Nepal resulted in an increase of the availability of fluoridated toothpaste. In 1997 the availability and consumption of fluoridated toothpaste was almost negligible. By March 2002 the total market share of fluoridated toothpaste was up to 90%. The price of the

toothpaste with fluoride needs to be kept low, so that the poorer socio-economic classes can also benefit (4). It appears that fluoridated toothpaste may be the most important means to reducing the prevalence of dental caries.

Education

Another essential element of health promotion would involve an educational component, especially for those in the rural (hard to reach) areas. It has been shown that there is a high level interest of healers. The use of traditional healers can be a means of contribution to the work of health professionals. The traditional healers need to be educated properly to become involved with new approaches (20).

The recorded prevalence of untreated caries in schoolchildren legitimates structural OHP activities. Schools are very suitable for OHP. Although only two-third of the children go to primary school [of the dalits (one of many tribes in Nepal) only one-third] OHP via school is very efficient and cost-effective (1, 3, 14). Teachers are highly respected in Nepal and students listen to what their teachers say. They are particularly receptive and the earlier the habits are established, the longer lasting the impact. Children are not only good learners and eager to learn but also good teacher to their elders and other community members (7, 14).

The teachers are very supportive as they are aware of the oral health status of the children and want to take an active part in promoting children's health. OHP can trigger other activities as well and therefore OHP activities can be embedded in General Health Promotion activities (for example: safe water will of course be essential to the introduction of toothbrush activities within schools).

Training of oral health-care professionals

A non-profit organization, the Kantipur Dental Hospital (KDH) first provided care in 1997. A Japanese non-government organization supported the establishment of the dental hospital. The KDH was planning to start the KSD. The name of the school can be misinterpreted, because at this moment they are only running a dental hygiene education. The dental hygiene education was first implemented in 1997 in Kathmandu. The scope of practice of the Nepalese dental hygienists involves clinical therapy, health promotion and education.

There are two courses available: a 2-year programme and a 3-year diploma programme. The education comprises theoretical as well as practical knowledge in oral health. On the job training (OJT) is an integral part of the course.

Table 1. **Description of course structure Dental Hygiene School, Kathmandu (22)**

Course Structure

Dental Hygienist (DH)
- First/Second Year
  1. Basic Human Anatomy and Physiology
  2. Basic Dental Anatomy and Physiology
  3. Basic Oral Pathology and Microbiology with Sterilization
  4. First Aid, Medical Emergency and Dental Pharmacology
  5. Health, Oral Hygiene and Community Dentistry
  6. Basic Periodontics and Periodontal Diseases
  7. Clinical Dental Procedures
  8. Dental Management and Maintenance
  9. On the Job Training (OJT)

Diploma in Dental Hygiene (DDH)
- First Year
  1. English
  2. Nepali
  3. Nepal Studies
  4. Physics
  5. Chemistry
  6. Botany
  7. Zoology
  8. Math and Statistics
  9. Human Anatomy and Physiology
- Second Year/Third Year
  1. Basic Human Anatomy and Physiology
  2. Basic Dental Anatomy and Physiology
  3. Basic Oral Pathology and Microbiology with Sterilization
  4. First Aid, Medical Emergency and Dental Pharmacology
  5. Health, Oral Hygiene and Community Dentistry
  6. Basic Periodontics and Periodontal Diseases
  7. Clinical Dental Procedures
  8. Dental Management and Maintenance
  9. On the Job Training (OJT)

For both the courses, students must complete 5 months and 6 months on the job practicum towards the end of their course. Students acquire knowledge and abilities by being apprenticed to professors associated with the five branches of KDH (21–23). The description of the course structure is mentioned in Table 1.

The 2-year course is called non-academic and provides a Technical School Leaving Certificate. The 3-year course is academic. After graduation the students can join a Bachelor's course in any field. The 3-year programme contains the basic science courses as mentioned in the first year. It is a compulsory aspect of a bachelors programme in Nepal.

In 2005 there were approximately 250 dental hygienists across the country. The school has an intake of 40 students each year. Dental hygienists are eligible to apply for provincial license after graduation from a recognized education programme. Dental hygienists are licensed through provincial health care legislation (Nepal Health Professional Council) (22, 23). They are either self-employed or work in dental clinics, hospitals or other settings in the community.

Oral health promotion activities

In a fragmented and inaccessible country like Nepal, one has to look for local solutions instead of national solutions (1, 7). One should promote self care and self development instead of fostering a dependency on professional care or help.

In the National Oral Health Policy of His Majesty's Government, Ministry of Health collaboration between the public sector and INGOs, NGOs and the private sector are encouraged and promoted. The effectiveness of strategies to improve oral health is also described in this National Oral Health Policy. In the Ministry of Health's Second Long Term Health Plan, 1997–2017, the involvement of INGOs, NGOs, the public and private sectors in providing and financing oral health services is promoted. Also they want to increase the training of Auxiliary Health Workers in the Primary Health Care System to provide oral health care.

KDH and KSD do not focus solely on curative treatment. They support oral health care and preventive care. They organize dental camps in the rural areas of Nepal, in which the main focus of attention is oral health promotion activities. Oral health promotion is implemented by the students from the dental hygiene programme. This kind of fieldwork experience is a structural part of the curriculum. A compulsory component of the dental camps is OHP at schools. KSD and KDH organize school dental health check-up programmes and community dental projects in Kathmandu as well as out of Kathmandu valley.

Students from the rural areas in Nepal can apply for a special scholarship or a lower application fee, which enables students from lower socioeconomic status to enrol in the programme. During their education, students from the rural areas are encouraged to work in their communities of origin and this is anticipated to create a better distribution of oral health services in the future. KDS provides free basic treatment to the poor patients (22, 23).

The dental camp programme has proved to be very helpful in raising oral health awareness. According to the Basic Package Of Oral Care (BPOC) and the WHO, small-scale demonstration projects are recommended to assess the BPOC under local conditions before introducing it to a wider scale (7). This is exactly what KSD is trying.

Collaborative programme

Many of the barriers to oral health have been previously described. I also found other variable related to dental hygiene education and practice. Together with Buddhi M. Shrestha (chairman and director of the clinic and the school) I visited four of the clinics. KDH has several branches throughout the country; in Kathmandu, Pokhara, Butwal, Lalitpur and Narayangath Fig. 3.

Fig 3. Lecturing at Kantipur School of Dentistry.

I assessed the enabling and disabling factors at play within the practices of KDH. It is not easy to run a clinic and dental hygiene school with the limited resources they have to their disposal. For example the instruments for scaling and rootplaning are imported from India which are of low quality, but the instruments are cheap and students can afford them. It is difficult to perform a good initial treatment with those instruments. During the interviews and discussions with the dental hygienists the lack of oral health instruction in the dental practices was discussed. Based on this literature review (political situation, economical factors, efficiency of care, lack of professionals) it is important that dental hygienists are aware of the fact that they should really focus on oral health promotion and individual oral health instructions.

Other important aspects related to programme planning revolve around the cultural adaptations to meet the need of the Nepalese. If one is not adapting to the Nepalese context, it will be difficult to provide a constructive contribution to the professionalization of the dental hygiene profession and education in Nepal. One has to understand the cultural diversity and intercultural relationships. See the subject through the foreign eyes and review the education and the clinic from the Nepalese perspective (17, 22). The patients are satisfied with the treatment. Thus seen from a Nepalese perspective it means that the treatment performed by the dental hygienists suits the care in question of the Nepalese patient (17, 24).

However, I also found many enabling factors. During the interviews I experienced the friendliness of the Nepalese col-

leagues; they were willing to learn, very cooperative, dedicated and enthusiast about new information. They have an excellent attitude towards professionalization of the dental hygienist profession.

They are aware of the fact that their facilities can be improved. They started a dental hygiene education in a developing country under difficult circumstances. I have the deepest respect for their initiative. Based on these interviews the plan arose to organize workshops in the clinics about professionalizing oral hygiene treatment, instrumentation techniques, infection control procedures and treatment planning.

This project was started on personal bases, but the opportunities are challenging and require a broadened perspective. Therefore a letter of intent will formalize the cooperation between the Dental Hygiene Education, Amsterdam (DHEA), University of Professional Education, INHOLLAND and KSD in Kathmandu.

The insecure political situation in Nepal is an important factor in the realization and continuation of the project. In the future, depending on the political situation in Nepal and the fact if a safe situation can be guaranteed, students will be exchanged to join the dental camps organized by KDS. The students will work in peers and treat patients and participate in OHP projects. Part of this cooperation is the support from the DHEA with the curriculum development of KDS. Teacher mobility is planned. For teaching at another faculty or school it is necessary to be competent in dealing with intercultural differences, specific teaching and learning styles, insight in the cultural meaning of using media and technologies (17).

A plan will be developed to collect data regarding the oral health status of three groups of children (private school, government school and monastery). The children will get an oral examination at the beginning of the study. OHP will be performed at the school. The patients will also be educated. The oral health status of the children will be checked every year during a 3–5-year follow-up.

Following that, mentally and physical handicapped children from a special school in Kathmandu will get an inspection and initial treatment. Their parents will also be invited to an educational meeting about oral health.

Rural women will be trained on a resident program to promote oral hygiene in their villages.

The dental hygiene educators will be trained in instrumentation techniques and methods of teaching. The dental hygiene students will attend special lectures and a workshop during the duration of the project and their knowledge, skills and experiences will be evaluated.

Conclusion

The purpose of this project is to support the development of the dental hygiene education and profession in Nepal. Emphasis lies in delivering a structural contribution to the availability and improvement of OHP in Nepal by tutoring dental hygiene educators and to support the development of the curriculum. This project also contributes to the ability of dental hygienists in Nepal to develop them individually and to create the ability of independent professionalization, creating a lifelong learning process that will improve oral health care in Nepal.

The reason for this kind of help and support is the fact that like in many other low income countries the government is not able to provide or guarantee the provision of basic health services for the population as intended. The problem is the quality of care (equipment, drugs and supplies, as well as the technical knowledge of staff). Cooperation with and support of the dental hygiene education will improve the quality of the education and in the long run will improve the quality of oral health care.

Dental hygienists and Dental Hygiene Schools around the world can make a difference in supporting colleagues and other schools around the globe. Dental hygienists do have a mission to promote the exchange of knowledge and to promote the access to preventive oral health care services.

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