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Dental hygienists in The Netherlands: the past, present and future

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Abstract: Dental hygiene education in the Netherlands started in 1968 after a long political debate about roles, functions and the working domain. From a slow start with five students in a school based on the American model with a 2-year curriculum, dental hygiene education is now a 4-year, higher professional education with an admission of 300 students annually who pursue the degree of Bachelor of Health at a University of Applied Sciences. In the 45 years of its existence, the dental hygiene profession has undergone a tremendous change. In the beginning, dental hygienists worked under the supervision of a dentist, which changed in 1992 to their working 'under referral' from a dentist, and again in 2006, when dental hygienists became directly accessible. One-third of the working force of approximately 2700 dental hygienists (2010) is now working in their own independent practice. The focus of professional practice has changed from the prevention of caries via periodontology to the relationship between dental health and general health and well-being. The profession, the education and the Dutch Dental Hygienists' Association (Nederlandse Vereniging van Mondhygiënisten) have matured, and its members are now serious partners in oral health care.

Key words: association; dental hygienist; education; history; profession; The Netherlands

The origin and development of the profession of dental hygienist in the Netherlands

The discussion concerning the type of dental auxiliary required in the Netherlands dates from before World War II. In the United States of America (USA), the first training of dental hygienists started in 1906, and the Netherlands followed with a single training programme for oral nurses in 1931. As dentists did not want to relinquish their tasks to auxiliaries, this training was discontinued. Only after World War II did the idea of a dental auxiliary become more widely embraced. Because of the postwar baby boom and the changing consumption patterns, for example more sugar, the demand for dental care increased and there was a major shortage of dentists. Hence, there was a great need for additional staff in dentistry at that time. After many years of discussion between the Government, the dental schools and the Dutch Dental Association (Nederlandse Maatschappij tot bevordering der Tandheelkunde, NMT) about the roles, functions and the working domain, it was decided in 1964 to institute the role of dental hygienist specifically for dental hygiene care and prevention of oral care problems (caries and gingivitis/periodontitis).

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It was also agreed that the dental hygienist could work within the school dental services, in general dental practices and in military dental services. Moreover, the option was kept open to train dental hygienists in curative tasks to execute in school dental services (1).

In January 1965, the Minister of Social Affairs and Health proposed the establishment of the Foundation of Education of Dental Hygienists based on a report of the NMT. This foundation had to ensure the development of a programme for the training of dental hygienists in cooperation with the government, the NMT and the dental faculty of the Utrecht University. This training programme started in 1968. In the meantime, between 1965 and 1968, the first group of Dutch dental hygiene students was sent to the USA, Canada and the UK. When they returned home to the Netherlands in 1967 and went to work, one of the national daily newspapers printed the following headline: 'can a woman practice dentistry without being a dentist?' (2).

The training of dental hygienists in the Netherlands

In accordance with training protocols from the USA, the first dental hygiene training programme (with a training period of 2 years) was initiated in Utrecht in 1968 with an intake of five students. Dental hygiene students attended largely the same classes as students of the dental faculty. The first five Dutch dental hygienists who trained in the Netherlands graduated in 1970. In the following years, training programmes for dental hygienists also started in Amsterdam (two schools) and in Nijmegen (3, 4). In 1992, the training programme was extended from 2 to 3 years of training, and in 1995, a fourth school was established in Groningen. In 1999, 29 European countries agreed to reform their systems of higher education in the so-called Bologna Declaration. The goal was to achieve a common European higher education system with comparable degrees and recognized diplomas. In practice, this meant that major changes had to be made in higher education (higher professional as well as scientific education) in the Netherlands in the period leading up to 2010. From 2002, the training programme for dental hygienists in the Netherlands is embedded in the Bachelor/Master structure and leads to a Bachelor's degree. Since that time the Dutch bachelor's programme lasts 4 years of 60 European credits (European Credit Transfer System) each year. One European credit equals 28 h of study, 6720 h in total at Universities of Applied Sciences (5, 6).

Number of first-year students

Until 1992, the four dental hygiene schools together accepted 80–90 students in the first year. This number increased to 144 in 1992, and the number of first-year students increased again to 300 (first bachelor phase) in 2002. The number of first-year students is determined by the government. Sixty per cent of all first-year students graduated and almost all the graduates went to work as dental hygienists, with an average of 85% of these graduates continuing to work in this profession (7). In 2010, there were approximately 2450–2700 working dental hygienists. The majority (97%) of the working population of dental hygienists is female.

Level of education – from higher professional level to official higher professional education

The dental hygienist had to perform preventive oral care, which included data collection, diagnosis planning, intervention/treatment and evaluation. Oral health education for individuals and groups was also a main task. The first training programme that started in 1968 was at higher professional level (8) and dental hygienists at that time were pioneers of this new profession. Students were selected from secondary schools that offered the highest standards and background in scientific subjects. In 1974, the tasks, duties and the content and level of the training programme were legislated in the Act on Paramedical Professions, in the so-called Bulletin of Acts, Orders and Decrees of the Kingdom of the Netherlands (4, 9). This seemed to be a sound basis for the first 15–20 years (3), and the dental hygienist training programme became an official Higher Professional Education under the Law on Higher Education and Scientific Research in 1996.

Training period increased from 2 to 3 years in 1992

The Nederlandse Vereniging van Mondhygiënisten (NVM) realized that the areas of work in which dental hygienists could work were much larger than expected (refer to Tables 1 and 2). These developments within the profession were largely determined by the oral health sector itself. One of these developments was the increase in self-employment by dental hygienists, that is, working in independent establishments on referral by dentists from 1978 onwards. This subsequently led to dental hygienists commanding a more independent position within the oral healthcare sphere. Developments in the field of hygiene because of hepatitis B and HIV, the increased use of dental implants, increasing numbers of medically compromised

Table 1. **Distribution of dental hygienists in different areas of work (1978)**

	n (%)
General dental practice	174 (53.6)
Orthodontic practice	34 (10.4)
Oral surgery/hospitals	15 (4.6)
School dental services/city councils	30 (9.3)
Special needs care	21 (6.5)
Dental department university	10 (3.0)
Dental hygienist school	20 (6.2)
Dental nurse	12 (3.6)
Other	9 (2.7)
Total	325 (100)

Source: Nederlandse Vereniging van Mondhygiënisten (NVM), 1980.

Table 2. **Distribution of dental hygienists in different areas of work (1993)**

	n (%)
General dental practice	724 (57.83)
Orthodontic practice	126 (10.06)
Practices for periodontology	97 (6.31)
Independent practices of dental hygienists	115 (9.19)
City councils	39 (3.12)
Oral surgery/hospitals	57 (4.55)
Special needs care	38 (3.04)
Centres for special dental care	9 (0.72)
Dental department university	8 (0.64)
Dental hygienist school	41 (3.27)
Industries	2 (0.16)
Other	14 (1.12)
Total	1252 (100)

Source: Nederlandse Vereniging van Mondhygiënisten (NVM), 1994.

patients, increased data processing and changes in society, such as ageing and increased immigration, also influenced the profession.

These developments required more knowledge and therefore had implications on the curriculum. The increased workload for students resulted in extending the training programme from 2 to 3 years in 1992 (10). Apart from theoretical alignment, the practical training in various fields was expanded substantially (10). The first Professional Profile of the Dental Hygienist compiled by the Dutch Dental Hygienists' Association (1990) was adapted to the new 3-year curriculum (11).

Training period increased from 3 to 4 years in 2002

In 2000, it was determined by the Netherlands Association of Universities of Applied Sciences (HBO-raad) that a training period of 3 years was too limited for teaching the most important elements of the Higher Professional program (research skills, entrepreneurship, reflection and quality care). Treatment based on scientific evidence needed to be the guiding principle of the profession. At the same time, the government focused on task reallocation within the field of oral care. As a result of which dental hygienists had to adopt more tasks from dentists and take responsibility for low-risk patients with stable oral health. Restoring primary caries was to be one of the tasks of dental hygienists, which promoted the cooperation within the oral healthcare team (12). In 2002, the training programme was extended by 1 year to become a 4-year bachelor's training programme. Upon graduation, the student obtained in addition to the protected title of dental hygienist (since 1974), the title of Bachelor of Health. From that point onwards, the name of the training programme changed to Oral Care Education but the protected title of dental hygienist continued to exist for reasons of transparency, both in the Netherlands and internationally. The quality of education is guaranteed by the Dutch-Flemish Accreditation Organization (NVAO), which has been legally charged with accreditation since 2004 (5, 13).

Scientific master/scientific base

The introduction of the Bachelor/Master structure in higher education in the Netherlands created the possibility of further education for dental hygienists. A master's programme can be followed after completing the bachelor's phase and may have a professional or scientific focus, the latter being an important step for the development of the profession (14). According to the NVM, it is very important for dental hygienists to do research in their own professional domain. In opinion of the NVM, 'This contributes to a private, scientific area of expertise (body of knowledge) on which the professional practice of dental hygienists is based' (6).

Pioneers

The first dental hygienists were true pioneers as the exercise of the profession was not easy in a reluctant market with strict limitations. The dental hygienist was working 'under the direction (indication) and control' of the dentist and was therefore entirely dependent on the dentist to practise the profession. The lack of awareness of both dentists and the public regarding the profession of dental hygiene did not make it easy in the early years to strengthen the position of dental hygienists within the sphere of oral health care.

A long-lasting discussion

The discussion about which employees must be present and/or should be in oral care and what tasks and responsibilities they should have has been raging for many years even after the decision to train dental hygienists in 1965. In 1971 and 1972, in spite of the earlier decision regarding the role of the dental hygienist as the main preventive auxiliary, the Faculty of Dentistry at Nijmegen and Amsterdam (VU) requested a grant to start an experimental postgraduate training programme for curative auxiliaries. These initiatives were motivated by the high prevalence of caries seen at that time in both youth and adults. In fact, in the late sixties of the last century, it was highly unusual for 12-year-olds to have a set of teeth without caries (15). These experimental programmes were carried out in the seventies of the last century and resulted in a limited number of dental hygienists with expanded knowledge and skills.

In 1977, the Central Council for Public Health published a report on the desired future dental services in the Netherlands, which gave dental hygienists bad press for preventive oral care for youth as well as the adult population. In a sharp and detailed response, the NVM asserted the preventive role of the dental hygienist in improving the oral health of the Dutch population (16). Based on many experiments with different dental auxiliaries, the NVM wrote a report in 1979 entitled, 'Dental workers in the Netherlands' (17), which contained an inventory of the incidence, education and nature of various dental workers. Following this, the NVM called for thorough research into the need for the types and number of

dental workers and made an appeal for transparency for Dutch citizens. The importance of preventive oral care and the role of the dental hygienist had to be frequently noted to the Dutch authorities by the NVM as well as by individual (board) members of the association and the directors of the dental hygiene schools. As a result of these efforts, in 1985 the government gave preference to the dental hygienist as a professional member of the dental team (8). However, the discussion about the dental hygienist as a specialist in preventive oral care continued...

Areas of work

To get insight into the distribution of dental hygienists in various areas of professional occupation, the NVM started a study among all Dutch dental hygienists (400 persons in the Netherlands and abroad) in November 1978, 10 years after the start of the training programme in the Netherlands. The majority (74%) of all dental hygienists participated in the study. The study showed that the number of areas of work had increased significantly. Refer to Table 1 for an overview of the areas of work of dental hygienists and their distribution.

In 1993, the study was repeated with a response of 63%, that is, 1252 dental hygienists. The number of areas of work had expanded again from nine to 12 (refer to Table 2 for an overview).

An overview of the data included in the database of members of the Dutch Association in 2010 shows the following distribution (Table 3):

It can be noted from all three tables that dental hygienists can work in more than one area.

At the start of the training programme for dental hygienists, there was a shortage of dentists and a high prevalence of caries that changed to a surplus of dentists and a stabilized prevalence of caries in the eighties of the last century. As a result, the number of first-year dental students was drastically reduced. In the early 1990s, more than 50% of 12-year-olds had no cavities in their permanent teeth (18). At the same time, attention to periodontal problems has been increasing and the focus of the dental hygienist has increasingly shifted towards the prevention and treatment of periodontal disease. This is also reflected in the fact that dental hygienists work in periodontology practices (see Table 2) where patients with advanced periodontal disease are treated when they can no longer be treated in general dental practice or dental hygienist practice.

Table 3. **Distribution of dental hygienists in different areas of work (2010)**

	n (%)
General dental practice	905 (37.63)
Orthodontic practice	86 (3.58)
Practice for periodontology	146 (6.07)
Independent practice of dental hygienist	706 (29.36)
Employees of independent practice DH	154 (6.40)
City council	21 (0.87)
Oral surgery/hospital	73 (3.06)
Special needs care	54 (2.25)
Dental department university (research)	9 (0.37)
Dental hygienist school	79 (3.28)
Industries	15 (0.62)
Other	157 (6.53)
Total	2405 (100)

Source: Nederlandse Vereniging van Mondhygiënisten (NVM), 2010.

Currently, the differences in the oral health of children from different socio-economic status (SES) groups are high and they persist into adulthood. Children of lower SES groups score lower on cavity-free teeth and higher on untreated cavities, presence of plaque, frequency of eating and drinking (19) and dental erosion (20). The number of areas of work for dental hygienists had not increased in 2010, although there were proportional differences.

Since the amendment of the Dental Hygienist Decree in 1993, dental hygienists work on referral from a dentist, which means that supervision by a dentist is no longer needed. This increases the number of dental hygienists who are working in their own practice. These dental hygienists often work together with other dental hygienists, which mean that the number of bigger dental hygienist practices is increasing. Since 2006, patients have direct access to dental hygienists; a referral from a dentist is no longer necessary (independent practice). This direct access to the dental hygienist provides, according to the NVM, the opportunity to focus on prevention for the whole population, with priority for youth and elderly (21).

The foundation of the Dutch Dental Hygienists' Association

In 1967, the dental hygienists who studied in the USA took the initiative to start a professional association: The Organization of Dental Hygienists. In 1970, the Dutch Dental Hygienists' Association (NVM) was officially recognized through the adoption of the statutes of the Association by Royal Decree. The first years were mostly dominated by the development of the domestic rules of the association and getting the paramedical qualification for dental hygienists. The five students from the first training programme in Utrecht were prospective members of the association from the beginning and meetings were held in the training institute in Utrecht. Professor G. Dekker, the director of the Utrecht training programme at that time and one of the initiators of the development of a training programme for dental hygienists in the Netherlands, understood the importance of a professional association to acquire a strong position in society and stimulated the formation of the NVM. He was closely associated with the development of the Dutch association, and he became the first honorary member of the NVM in 1977.

The international connection

In 1970, the American Dental Hygienists' Association (ADHA) began to sponsor continuing education/scientific

sessions in foreign countries for the benefit of ADHA members (22). They organized several symposia and members of the dental and dental hygienist professions from other countries were invited to attend these scientific sessions. In 1972, the 3rd Symposium was held in London, the United Kingdom (UK), which marked the beginning of the International Connection. At that time, representatives from the national dental hygienists' associations of Canada, Japan, Norway, the Netherlands, Sweden, UK and the USA formed the International Liaison Committee (ILC), which was the forerunner of the International Federation. The first president of the ILC was Wendy Leech from the UK. In 1973, the 4th Symposium was held in Amsterdam (Netherlands). In the meantime, guidelines to become members in the ILC were developed and a committee was appointed for the purpose of developing a constitution for an International Dental Hygienists' Association. The articles and regulations needed by such an international association were developed and accepted on 28 June 1986 during the 10th International Symposium on Dental Hygiene in Oslo, Norway. From that moment the International Dental Hygienists' Federation (IDHF) was formed. The first president of the IDHF was Wilma Motley from the USA. Later, the name of the Federation was changed to International Federation of Dental Hygienists (IFDH). It was decided to name the symposia International Symposia on Dental Hygiene to allow the symposia to be accessible to professionals who did not strictly meet the definition of dental hygienists. It was also decided to organize an international symposium once every 3 years. In addition to the fact that the Netherlands has been involved in the international movement from the beginning, it has also delivered two IFDH Presidents: Til van der Sanden-Stoelinga from 1998 to 2001 and Marjolijn Hovius from 2007 to 2010. Marjolijn Hovius also became the first editor in chief of the International Journal of Dental Hygiene (IJDH). In 1992, the Dutch Dental Hygienists' Association organized the 12th International Symposium on Dental Hygiene in The Hague under the title 'From auxiliary to Colleague'. This title caused much commotion in the dental world, both nationally and internationally because dentists believed that dental hygienists could never be a colleague. Tempers calmed somewhat when the organizers explained that a 'colleague' was part of the dental team who joined efforts for the good oral health for the patient. In 1989, the European Delegates of the board of Delegates of the IFDH felt a strong need to meet as European Delegates during the symposium in Ottawa, Canada. They felt they had more in common with European dental hygienists than with dental hygienists from overseas. In 1990, the Dutch Delegates (Arien van Herk-van den Dool and Til van der Sanden-Stoelinga) organized an European exchange meeting in Amersfoort (Netherlands). In 1999, representatives of Dental Hygienists' Associations from seven European countries, among which the NVM, founded the European Dental Hygienists' Federation in Rome (Italy). A Dutch dental hygienist, Marianne Verheggen, was the first president of this Federation.

Current situation

It has been estimated that there will be approximately 3000 dental hygienists employed in the Netherlands in 2012, 2250 (75%) of whom are members of the NVM. Their distribution according to their areas of work is shown in Table 3.

Approximately one-third of their members practise privately (own practice or in combination with other employees) or work as independent entrepreneurs within a larger conglomerate of multiple practices. Most patients are referred to a dental hygienist by their dentist. However, since a change in the law in 2006, patients may now approach dental hygienists directly, eliminating the need for referral (21). In the majority of cases, patients' health insurers reimburse the costs of treatment.

The NVM

The NVM acts for and on behalf of its members in several ways: on a professional level, on a socio-economic level and also to promote the global image of the organization to the public. The overall policy of the NVM is concerned with its internal organization for members and their interests, promoting the position of the dental hygienist in aspects of general and preventive oral health care in the public arena, and finally the continued safeguarding and promotion of professional standards by means of a quality register and continuing education (6).

Prevention

The Dutch Government's policy on health care is strongly directed towards preventive intervention (23). The policy is focused on educating the population towards a more balanced and healthier lifestyle. In oral health care, this equates to the patient being adequately informed and instructed how to become responsible for aspects of their own oral hygiene and preventive measures (24), thereby reducing the need for curative intervention. It also offers a new challenge where the focus is not based solely on primary prevention but on confirmation of a more prominent role in primary, secondary and tertiary levels of prevention in oral health care. In addition, it has implications on the relationship between oral and general health. Aspects include addiction to tobacco (25), obesity, the possible relationship between periodontitis and diabetes mellitus (26) and other multisystemic disorders (27).

Position of the dental hygienist

In addition to preventive health care, government policy also focuses on the re-allocation of care within the overall healthcare sector (28). This has been implemented to maximize the efficiency of available manpower and to ensure that the level of care provided will reflect the educational level of the caregiver (12). For oral health care, dental hygienists are and will become increasingly responsible for larger groups of patients with stable oral and general health, thus reducing the numbers primarily treated by dentists (29). In addition, thanks to a

more extensive and comprehensive education/training programme of 4 years, the overall expertise and skills of dental hygienists have been broadened (14, 21). Should a patient require care outside the area of expertise of the dental hygienist, they will be referred to their dentist or to a qualified medical practitioner.

Quality

Those dental hygienists, who were trained before the 4-year training programme was implemented, are advised to undergo additional schooling to the level of Bachelor of Health. In general, healthcare 'continuing education' (life-long learning) is a precondition for professionalism. To secure the quality of the profession, the NVM has created a quality register [Kwaliteitsregister Mondhygiënisten (KRM)] to enter which certain criteria have to be met: these include work experience, continuing education, participate in a complaints procedure and underwrite the professional code (30) and profile (6) of the NVM. The quality register has its own website and is accessible to oral health professionals, health insurance providers and the general public (31).

The NVM has its own additional schooling institute (Dental Courses Mondhygiënisten) that offers a variety of courses to its members that will afford accreditation points to meet the requirements of the quality register (KRM) (32). To inform its members, the NVM organizes biannual scientific conferences and General Assemblies.

In addition to the guidelines laid down by the government, the NVM has also implicated quality indicators for the purposes of observation and caretaking within the oral healthcare sector. Additionally, dental hygienists' practices are required to participate in a patients' survey to establish patient satisfaction and, whenever necessary, make improvements to relevant issues. Dental hygienists will be expected to honour and meet all aspects of quality criteria in 2012 (33).

Networking

The external policy of the NVM is to focus on the importance of prevention within the healthcare sector, the quality of caretaking and the positioning of the dental hygienist in oral health care. The organization participates and collaborates with many other advisory groups. These include the Ministry of Public Health, the Health Inspectorate, oral health education groups, dentists and health insurers. To promote their activities, the NVM is represented in large public fairs to keep in touch with the consumer. Consumers are informed on the profession itself and their professional practice via the website of the NVM (34). During a biannual General Assembly, the NVM board is held accountable for its policy and regional meetings are also held to inform NVM members. These General Assemblies are followed by a scientific symposium.

The NVM also organizes regular study group meetings targeting particular groups of dental hygienists in different occupational settings. The NVM publishes a bi-quarterly journal: The Dutch Journal for Oral Hygiene (*Nederlands Tijdschrijft voor Mondhygiëne*). The website, monthly digital news-letters and social media (such as Twitter and LinkedIn) play an important role in mutual contact between colleagues. The IJDH provides important scientific information for the members of the NVM.

Future

The government has a clear vision of the role and position of the dental hygienist; however, the achievement of this vision in routine practice proves problematic: dentists and dental hygienists sometimes prefer a more traditional approach to oral health care, leading to discrepancies and, in some cases, animosity between the two parties. The aim and ongoing priority of the NVM is to focus on their strengths, in designing oral health care focused on the optimal benefit for the patient, specifically related to prevention before intervention. The 4-year training programme permits better competence and opportunities for students and their influence on existing practices. Additionally, the higher level of education and requisite skills provides encouragement for students and others in the profession to pursue concurrent research careers or higher qualifications. These aspects can only serve to promote the position and consummate professionalism of dental hygienists in their working environment. The NVM recognizes that there are certain groups in society who command more attention than others, for example those of lower SES, elderly, the physically and mentally disabled and the medically compromised patients. Current reviews indicate that the status of oral health in children from lower SES groups is decreasing and is on a level similar to adults of the same SES. For children and adolescents, the scores for cavity-free teeth, untreated cavities, presence of plaque, frequency of eating and drinking (19) and dental erosion (20) were reflected in the low SES scores. The government compensates for oral healthcare expenses up to the age of 18 years. However, many children lack adequate care because of the lack of familiarity with the Dutch healthcare system, their immigrant status and the inadequacies of the Dutch healthcare system (5, 19, 35). The demand for adequate oral health care for the elderly is still increasing (36). The NVM considers it to be important to provide a service to this particular niche of the community as its ethos is that a healthy mouth contributes to a feeling of social well-being and better general health.

Since its conception, the NVM has developed and progressed to establish an independent position in oral health care. This is attributable to the efforts of many people in varied roles and at all levels. The ultimate goal is to promote health, particularly a healthy mouth for every person, be it functionally, emotionally or even aesthetically.

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Conflict of interest

The authors declare that they have no conflict of interests.

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