

Oral health in Syria

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The aim of this paper is to describe and analyse the oral health situation in Syria in the last two decades and to propose recommendations for improvement of the current situation. The epidemiological data on caries of the last two decades did not indicate a decrease in the DMFT value of various age groups, nor was a decrease in the percentage of untreated caries apparent. The unequal distribution of oral health care continued to exist throughout the country, despite an enormous increase in the number of dentists from about 2,000 in 1985 to about 14,500 in 2002. The affluent part of the population is served with technically oriented expensive dental services. The public sector suffers from limited finance, the absence of appropriate technology in restorative dentistry and the lack of a community and preventive oriented approach. It is recommended to utilise dental hygienists in the public sector, since these auxiliaries if appropriately trained can offer the preventive and curative oral care wanted and demanded by the poor and that the government and the people can afford.

Key words: Epidemiology, oral health status, dental workforce, oral health care, Syria

The Syrian Arab Republic lies on the Eastern coast of the Mediterranean Sea. The land area is 185,500 km² and the total population was about 17 million in 2002, of which 18% lived in the capital Damascus. The estimated annual population growth rate was 2.6%. Infant mortality was 23/1,000 and life expectancy for women was 75 years and for men 72 years, with 41% of the population comprising 4–18-year-olds. The GNP per capita was US\$1,130 in 2002. About 45% of the population was dependent on agriculture as a livelihood. The allocation for health, including oral health was 3% of the general budget¹.

The aim of this paper is to describe and analyse the oral health situation in Syria over the last two decades and to make recommendations for improvement.

Dental caries

The results of studies using WHO criteria showed a high prevalence of dental caries among 5-year-old children. The prevalence of caries of 5-year-olds in Damascus was 77% in 1985² and 74% in 1991³ and the mean dmft score was 5.2 and 4.6, respectively.

The mean DMFT scores for different age groups and cohorts are presented in *Figure 1*. In the last two decades, the mean DMFT score of 12-year-old-children showed a fluctuating pattern ranging from 1.4 to 2.5. A secular change of caries experience was not

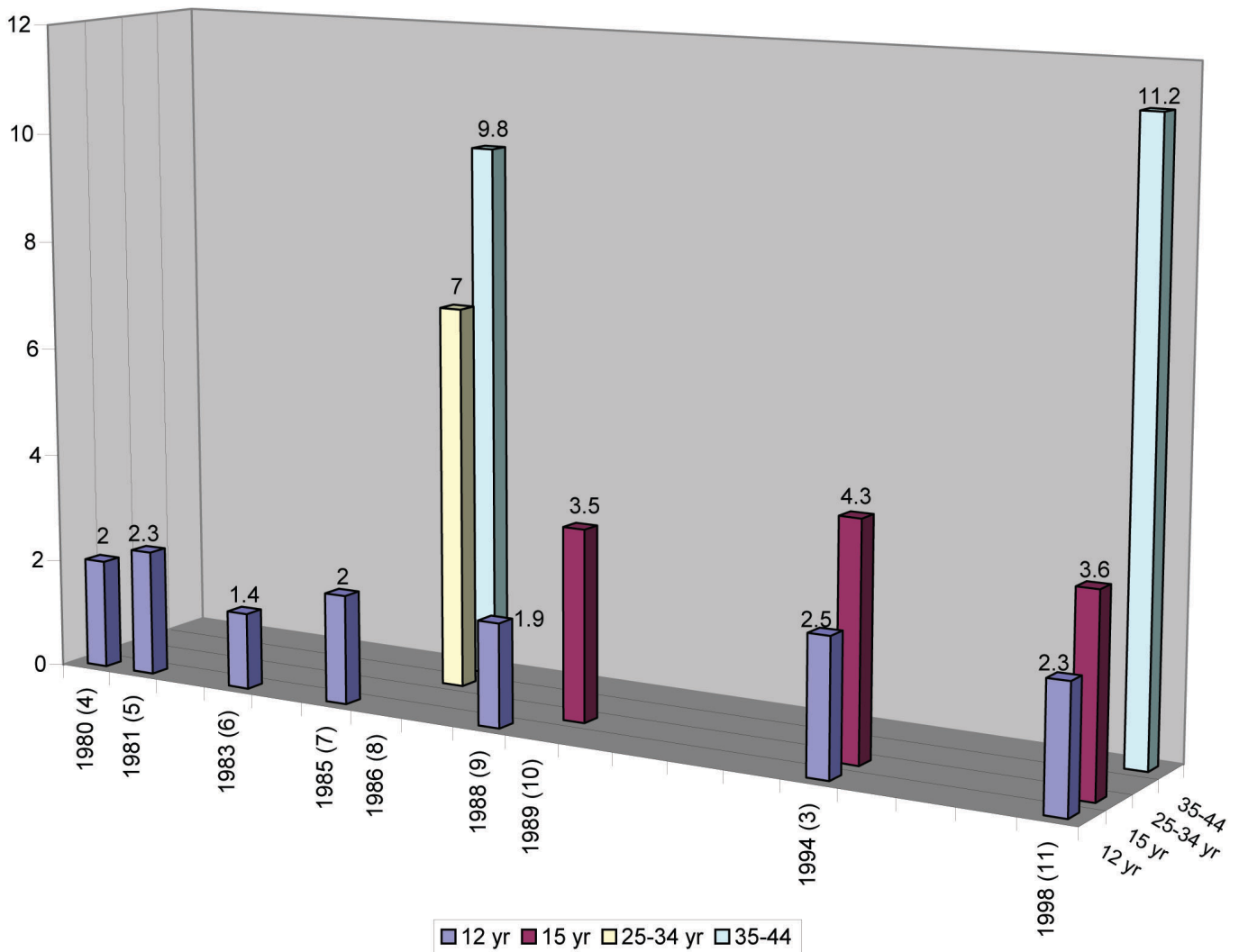


Figure 1. DMFT-values of various age cohorts in Syria, recorded between 1980–1998. The y-axis represents the DMFT-score. Each x-axis represents a specific age cohort. Each z-axis shows cohorts of increasing age.

apparent for 12-year-olds nor was a change over time apparent for the 15-year-olds.

The mean DMFT score of 5-year olds and the mean DMFT score of 12 and 15-year-old children consisted mainly of the D-component; 80–90% in the 5-year and 12-year-olds, and 70–80% in the 15-year-olds (Figure 2). The percentages of untreated caries have not changed substantially over the last two decades. Dentine lesions in children up to the age of 12 years are predominantly observed in occlusal surfaces of first molars. The high percentage of untreated caries in children resulted in an M component of the DMFT count of 40–50% in the 35–44-year-olds^{4–10}.

Oral hygiene and periodontal diseases

According to the national oral health survey of 1998 only 6–15% of 15-year- and 35–44-year-olds were free of gingival bleeding, calculus and periodontal pockets¹¹. Poor oral hygiene was common among 15-year-olds of whom 94% had a high accumulation of dental plaque¹². About 3–11% of the 35–44-year-old Syrians suffered from severe periodontal diseases¹³.

Other conditions

There are several areas in Syria where the fluoride content of water is elevated, ranging from 0.8 to 1.9ppm F¹⁴. These fluoride concentrations do not pose a

general medical risk, but are responsible for the occurrence of dental fluorosis. For example, it was reported that 78% of 13–15-year-old children in Palmyra exhibited fluorosis of which 31% had it in a moderate to severe form¹⁵. In Alhasaka, 15% of 12-year-old children were reported to have moderate to severe fluorosis¹⁴.

The prevalence of dental injuries to the permanent incisors of children in Damascus was 5% among 9-year-olds and 12% among 12-year-olds¹⁶.

Perceived oral health problems and knowledge on oral health

With regard to perceived oral health, only 27% of 13–15-year-

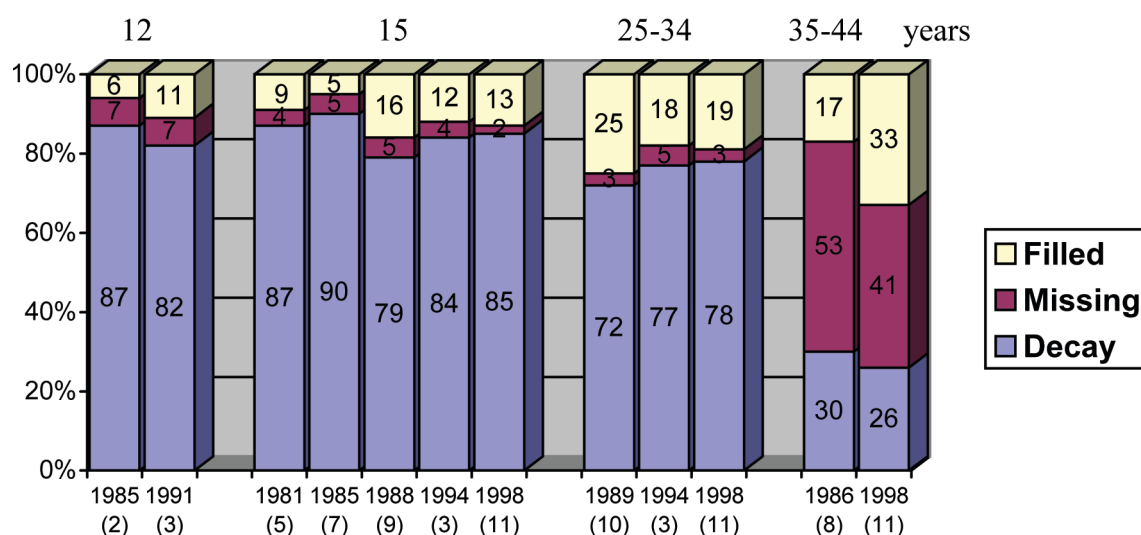


Figure 2. Proportional distribution of the DMFT components in 5-year-old children and the DMFT components of 12-, 15-, and 35-44-year-old Syrians in the period 1981–1998.

old children in Palmyra reported being free of oral health problems. Overall, 29% mentioned pain due to untreated caries, 24% to gingival bleeding and 24% to orthodontic cosmetic problems¹⁵. Poor oral health knowledge was found among 15-year-old children and among schoolteachers, school nurses and physicians^{17,18}.

Dental education and dental workforce

Dental education

There are four public dental colleges in Syria, in Damascus (1919), Aleppo (1984), Hama (1984) and Lattakia (1995). The number of graduating dentists increased dramatically in the period 1985 to 2002 (*Table 1*)¹⁹. The dental curriculum lasts for five years and is mainly based on a western, technically oriented training rather than on a community and preventive oriented approach that meets the needs and requirements of the population. About 10% of the newly graduated dentists become enrolled in postgraduate education organised by the Dental College in Damascus, the Ministry of Health and Military Medical Services Department. Dentists who do not enrol in postgraduate education, have to serve in rural

Table 1 Number of dentists and dental auxiliaries in Syria between 1985–2002

Year	Dentists	Dentist/pop ratio	Hygienists	Technicians
1985	1,975	5,200	150	500
1990	3,272	3,800	250	750
1995	8,500	2,150	450	2,200
1998	11,506	1,500	575	2,900
2002	14,610	1,172	750	4,000

areas in either their own private clinic or in a public dental clinic for two years. The large and increasing number of qualified dentists poses a considerable socio-economic and professional problem as they prefer to stay in the more affluent cities rather than working in rural areas. About 10% of them have found employment in Arabic Gulf countries²⁰.

Auxiliary education

Three intermediate dental institutes for dental technicians and dental hygienists have been established in Damascus (1973), Aleppo (1988) and in Hama (1997). The duration of training is two years. The curriculum for dental hygienists is not tailored to the priority needs of the majority of the population. About 300 dental technicians and 50 dental hygienists per year have graduated in recent years²¹. The number of dental technicians and dental hygienists graduating from

1985 to 2002 is shown in *Table 1*. The number of dental technicians is high and many have started working in another profession, whereas dental hygienists face difficulties in finding jobs in public and private sectors.

Oral health care system

Public oral health care is delivered to the population under the authority of the Ministry of Health in Maternity and Child Health Centres (MCH) and in 15 hospitals where specialists render oral surgical procedures. Under the Ministry of Education, school oral health programmes and services are delivered to children aged 6–18 years. The private sector, including dental services in companies and industries comprise the majority of curative dental services.

In 1990, the National Oral Health Plan (NOHP) was compiled aimed at achieving the WHO global goals for the year 2000²².

The NOHP was based on the adoption of:

- A preventive strategy through providing comprehensive oral health education and promotion programmes for target groups.
- A supportive curative strategy through providing oral care services for mothers and their children aged 0–18 years.

Maternity and Child Health Care Centres (MCH)

Curative oral care in MCH centres is delivered on demand. There are 1,114 MCH centres in the country compared with 235 in 1990; 476 of them are now equipped with a dental unit. The total number of dentists working in MCH centres is about 1,800 compared to 234 in 1990. This change has resulted in employment of, on an average, three dentists per MCH centre having only one dental unit. Health workers or nurses assist the dentists. Only about 40 dental hygienists are employed in MCH centres. Oral health care services in MCH centres include the provision of oral health education by nurses and health workers to pregnant mothers and mothers with infants, and limited preventive measures such as the provision of fluoride tablets for infants. Curative services on demand include restorative treatment (fillings), scaling, extractions and emergency care.

Currently, about 8% of the population benefit from these oral health care services. This percentage has remained unchanged since 1990, despite the substantial increase in dental units and the enormous increase in number of dentists.

School oral health services

The school oral health programme for primary schoolchildren started in 1991. It contained three components: oral health education and promotion, a preventive programme and a supportive curative service²³.

Oral health education and promotion

This component was directed towards 1st and 6th grades. Facilitators were dentists, school health assistants and in-service trained schoolteachers. About 50% of primary schoolchildren were involved in this programme. In 1998, the action oriented school health curriculum (AOSHC) was adopted in the school oral health programme²⁴. This AOSHC is an innovative approach based on the principle of 'discover, do and use'. It is thought that schoolchildren acquire motivation and skills to perform actions beneficial to themselves, their community and their environment. AOSHC calls for parents, teachers and children to assist in achieving these goals.

Preventive programme

The preventive programme included school-based fluoride mouth rinsing for the 2nd–6th grade children²⁵. This is carried out by in-service trained schoolteachers. About 12% of the target group children participate in this programme. Compliance of teachers with this programme was poor and extending this programme faced administrative and personnel obstacles²⁵. Besides these obstacles, an evaluation study showed low benefit in caries prevention through mouth rinsing programmes with only 0.2 DMFT reduction after 5 years of application²⁶. Therefore, fluoride mouth rinsing was replaced in many schools with topical fluoride solution application by oral health personnel.

Supportive curative service

These services were delivered mainly to the 2nd and 5th grade children and on demand to other children. There are at present 105 school dental clinics equipped with a dental unit. These school dental clinics are only located in cities and towns with about 210 dentists and 115 dental hygienists. This implies that on average two dentists and one dental hygienist work in a school dental clinic with one dental

unit. The services given to the schoolchildren are restorative treatment through the traditional and the ART approach, treatment of periodontal tissues and extractions. Limited applications of fissure sealants were provided in some school dental clinics.

About 5% of the target children (grades 2 and 5) have benefited from the school dental curative services²⁷. This coverage percentage has not substantially changed since 1990. Limited financial resources and problems with maintenance care of the technical dental equipment have restricted this type of school curative dental service.

In the last five years, initiatives have been launched to promote the application of ART²⁸ in the school dental services. Most school dentists have been trained in the ART technique and they have been encouraged to apply it. Oral health records show an increase in the use of the ART approach in school dental services during recent years. Results of clinical research conducted during the last eight years in the WHO Centre for Demonstration, Training and Research for Oral Health in Damascus showed that ART is an appropriate technology²⁹. The costs involved are a fraction of the expenses needed for the traditional restorative approach.

Private sector

The private sector delivers most of the oral health services in different specialties to people who can afford it. Private dental clinics are almost exclusively located in cities and towns.

In addition, the Military Medical Services Department and the Ministry of Interior provide dental services for their employees and their families. These services are provided on demand. They include emergency care, extraction, oral surgery, restorative procedures, periodontal disease treatment and limited prosthodontic and orthodontic treatment. Some industries

and big companies have their own dental clinics for delivering basic oral care to their workers and employees. Others have an insurance system and refer their employees to private dental clinics for restorative and curative treatment and pay a minimum fee.

Summary of the prevailing problems in oral health care in Syria

- The prevalence of caries in children and adults has not decreased in the last two decades
- The high percentages of untreated caries in 12-year and 15-year-old children (80% and 70%, respectively), have not decreased in the last two decades. Most of the caries in children is observed in occlusal surfaces
- The level of oral hygiene is poor and the prevalence of bleeding gums and calculus is high in all age groups
- The awareness of behaviour conducive to oral health is poor
- The authorities do not address the problem of dental fluorosis
- The percentage of people and schoolchildren treated in MCH centres and school dental clinics has not substantially increased in the last two decades
- There is a limited community and preventive oriented approach towards oral health in public dental clinics
- The extension of two components of the school oral health programme, the preventive fluoride programme and the supportive curative service, is limited due to application of expensive and inappropriate technology
- The undergraduate curriculum for dental students and dental hygienists is inadequate and is not tailored towards the priority needs and disease situation of the population
- There is a high surplus of dentists
- There is a high surplus of dental technicians

- The number of dental hygienists is low and those employed are underutilised in the public sector.

Rationale for a change

Common risk factor approach

The common risk factor approach is much in discussion at the moment. Over-consumption of sugar and the use of tobacco as well as traffic and sport accidents are causes of both oral and general disorders and diseases. However, restriction of the consumption of sugar and the use of tobacco and safety in traffic and sports in legislation is not feasible by political pressure of the dental profession. The dental profession must liaise with the politically more powerful medical profession when initiatives are launched by the medical profession to promote legislation for improved health.

Tooth brushing with fluoride toothpaste

As long as legislation for improved health is not implemented, decreasing the prevalence of caries can only be accomplished by raising people's awareness and by stimulating people's self care through information on oral health and by creating a healthy environment. A way to achieve this goal is through oral health promotion with emphasis on tooth brushing with fluoride toothpaste. The MCH centre is an excellent place to start oral health promotion through nurses and midwives to mothers and their infants. Early tooth brushing with a pea sized amount of fluoride toothpaste after the infant's first tooth has erupted is an important message. Nurses and midwives should be taught about the practical implications of this message during their professional education.

Availability of affordable fluoride toothpaste

The availability of effective, anti-caries fluoride toothpaste should

be promoted, preferably a locally produced toothpaste, which will contribute to the country's economy and which is regularly monitored for quality control. This locally produced fluoride toothpaste should be exempted from cosmetic taxes by the government to make it affordable for all people

Low fluoride bottled water

With regard to areas where dental fluorosis is endemic, it is not advisable to de-fluoridate drinking water in the range of 0.7–1.9ppm F. Such fluoride contents are effective in preventing the development of caries for all ages and do not pose any health risk besides dental fluorosis. The latter situation can be prevented if children under the age of 5 years drink fluoride free, bottled water.

Dental hygienists in the public sector

Extension of oral health care services with the intention improving the existing inequity in provision of services can be achieved by involving appropriately trained dental hygienists who offer preventive and curative oral care services that meet people's first needs. These oral health auxiliaries should have a similar position and function as health auxiliaries working in the primary health care system. Dental hygienists if properly trained can carry out all tasks mentioned in the WHO report 'Basic Package of Oral Care (BPOC)³⁰. BPOC contains three main components: providing emergency care, introduce prevention of dental caries and gum disease through the use of affordable fluoride toothpaste and introduce prevention through ART sealants and restorative care through ART restorations. The involvement of dental hygienists in oral care allows the system to expand, since they can implement BPOC without the use of expensive equipment that the dentist is trained to use.

Reshaping the content and workforce in school oral health

Dental hygienists are particularly useful in school oral health services where they can stimulate and guide the teachers in oral health education for schoolchildren. School-based tooth brushing under the supervision of teachers can be promoted and stimulated by dental hygienists working in the school oral health service. In addition, they can provide ART restorations and sealants for children in need of this preventive and tooth saving treatment approach. The current constraints with regard to extending the school oral health service can be solved by keeping the costs affordable. Dental hygienists can provide all care mentioned in BPOC with the use of hand instruments. This implies that the curriculum and the job description of dental hygienists have to be modified.

Dentists should more than momentarily be a manager in the public sector, where dental hygienists are the main workforce in the primary health care system and the school oral health service. However, only a limited number of manager-dentists are needed, who are responsible for the supervision, recording and monitoring of the activities of the dental hygienists. They should be well paid in accordance with their responsibilities. It implies that in the curriculum of the dental schools more time must be allocated for all aspects of public and community oral health. In addition, postgraduate courses on public health are needed to train the future manager-dentists. At the same time, a start should be made reducing the intake of dental students and similarly a reduction in the number of dental technician students is also recommended.

Acknowledgements

The authors would like to thank Dr. Jo E. Frencken, Department of Preventive and Community

Dentistry, College of Dental Sciences, Nijmegen University, for his assistance in the preparation of this manuscript.

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