Introduction

Over the past few decades, health in India is gaining less importance, and oral health, the least.\(^1\) Oral diseases are still a burden for developing countries such as India, especially among the rural masses.\(^2\) Prevalence of oral diseases is very high in India with dental caries (50%, 52.5%, 61.4%, 79.2%, and 84.7% in 5, 12, 15, 35–44, and 65–74 years old, respectively) and periodontal diseases (55.4%, 89.2%, and 79.4% in 12, 35–44, and 65–74 years old, respectively) as the two most common oral diseases.\(^3\) It is well documented that there is an association of oral health with various systemic conditions such as diabetes, cardiovascular disorders, pregnancy, and its impact on quality of life.\(^4,5\) Orofacial pain and loss of sensorimotor functions limit food choices and the pleasures of eating, restrict social contact, and inhibit intimacy.\(^6\)

The main role of public health dentistry is to understand the distribution and determinants of oral diseases and to educate, motivate, and promote oral health in diverse populations. Over the past decades, research and practice in dental public health (DPH) have been concentrated upon the two major problems—dental caries and periodontal disease.\(^7\) According to estimates, about 50% of school children are suffering from dental caries and more than 90% of adults have periodontal diseases.\(^8\) This increase in prevalence of dental diseases is observed parallel to the rapid nutrition transition in the recent decades and may also be one of its consequences.\(^9,10\) Furthermore, India is called as the “oral cancer capital” of the world attributed to its high intake of both smoked and smokeless tobacco products, strongly associated with oral neoplasms.\(^11\) Most of these highly prevalent oral diseases are largely preventable and can be reduced through various health promotion and preventive measures.\(^12\)
Over the past 15–20 years, the context of DPH programs has been rapidly changing in India. As a result, scope and content of dental programs have also changed. The public dental health professional, with his/her understanding of dental problems and his/her competence in dealing with community affairs, can be a decisive influence in the development of health programs which are the best interests of both the public and the dental profession.[13][14] Even though the specialty has been doing its bit in improving the oral health situation since its inception, in the year 1969, there has been little to say about the achievements in India.[5][14]

Therefore, the present study was undertaken to review and analyze the current scenario of public health dentistry in India keeping in view the production, employment, and distributional patterns of public health dentists in India. The study also focused on role of dental tourism in promoting public health, conduct of mobile dental van (MDV) programs in various institutions, and status of research in DPH.

Methods

Data search for the present review was done both electronically as well as manually. Government agencies such as Dental Council of India (DCI) and Ministry of Health and Family Welfare were also consulted to get relevant data. Electronic search was conducted using databases such as PubMed and MEDLINE and articles published in peer-reviewed journals. Web-based search engines such as Google Scholar were also used to extract relevant articles using various keywords and their combinations. We found “dental public health,” “public health programme,” “dental manpower” as relevant keywords and were entered into Medical Subject Headings (MeSH) controlled vocabulary. The terms such as public health, dental, India, and programs were combined with the MeSH terms by Boolean “AND” or “OR” and entered in both PubMed and Google Scholar. More information on the topic was also gathered from PGIMER, Library, Chandigarh. The collected documents included original articles, reviews, editorials, guest editorials, letters to editor, interviews, short reports, and short communications. Some data were also obtained by cross-checking the reference lists of the articles accessed. Studies that were not published in English language were excluded from the study. A total of 38 articles were obtained during initial search which was conducted keeping in view the papers published in the last few decades. However, after scrutinizing all data, only 26 relevant articles were included in the final analysis.

Dental Public Health Workforce

The present trend in public health dentistry manpower is the increasing concern about the professional manpower. Table 1 shows that there is interstate inequality among public health dentists in India.[13] The present data also show that there are a total of 5014 positions available for entering postgraduate training in dentistry in India in all the nine branches. Of this, only 185 (3.68%) positions are available for postgraduate course in public health dentistry, which is least in all branches,[16][17] whereas in a country like India where the majority of the population resides in the rural areas, there is greater need for these specialists. However, at present, there is no policy for trained public health dentists to strictly serve the rural population. A study was conducted to know the attitudes of dental students toward choosing public health dentistry as their future career and it was found that 58% of subjects were interested in joining this dental specialty.[18]

Public health dentistry departments in the country are not rooted in the community, rather confined to hospitals.[19] This department has been used only to increase the number of patients to dental colleges to fulfill the minimum outpatient department requirement according to the DCI norms. It is seen as an advertisement agency for these colleges. Role of public health dentist has become that of a referring body. All these factors force people to seek dental care at private centers.[20]

Table 1: State-wise distribution of public health dentists in the country

| State             | Number of dental institutions | Number of available public health dentists |
|-------------------|------------------------------|-------------------------------------------|
| Andhra Pradesh    | 22                           | 50                                        |
| Assam             | 1                            | 0                                         |
| Bihar             | 7                            | 5                                         |
| Daman and Diu     | 1                            | 1                                         |
| Chandigarh        | 1                            | 2                                         |
| Chhattisgarh      | 6                            | 3                                         |
| Delhi             | 4                            | 6                                         |
| Goa               | 1                            | 2                                         |
| Gujarat           | 13                           | 13                                        |
| Haryana           | 12                           | 25                                        |
| Himachal Pradesh  | 5                            | 4                                         |
| Jammu and Kashmir | 3                            | 0                                         |
| Jharkhand         | 3                            | 0                                         |
| Karnataka         | 45                           | 143                                       |
| Kerala            | 23                           | 14                                        |
| Madhya Pradesh    | 16                           | 20                                        |
| Maharashtra       | 35                           | 28                                        |
| Orissa            | 5                            | 7                                         |
| Pondicherry       | 3                            | 5                                         |
| Punjab            | 16                           | 15                                        |
| Rajasthan         | 15                           | 35                                        |
| Tamil Nadu        | 29                           | 50                                        |
| Uttar Pradesh     | 33                           | 72                                        |
| Uttarakhand       | 2                            | 0                                         |
| West Bengal       | 5                            | 2                                         |
| Total             | 306                          | 296                                       |
| Outside the institution | 117                  |                                            |
| Total public health dentists | 413                |                                            |

As per records of Indian Association of Public Health Dentistry, 2014-2015.
with the health of the community as a whole. Dental checkup and treatment camps in most parts of the country do a little benefit for the community. Therefore, patients’ attendance during these camps falls with time as they become aware that only referrals are being made.[21] The government has not properly executed the oral health policy, a change that could have led to improvement in the differences in health status of urban and rural population.[1]

**Primary Oral Healthcare**

Primary oral healthcare, without any barrier, is still missing across several countries across the world primarily in low- and middle-income countries such as India.[22] Majority of the public (government) dental health-care setups are poorly equipped, understaffed, and oral health is not a priority in budgetary allocations. Not even 20% of the rural primary healthcare centers (PHCs) around the country have a dentist or a DPH professional. The government’s goal of appointing a public health dentist at every community health center (CHC) looks like a distant dream as government is struggling to ascertain CHCs and as half of the CHCs are not functional.[1,23] The energies, talent, and precious time of public health dentists posted in PHCs and CHCs with limited dental materials are underutilized in some states. The CHC should be available for emergency care as well as dental care.

**Underutilization of Internship Program**

Nowadays, majority of fresh dental graduates are unable to perceive the importance of community oral health and they are not aware of their responsibilities toward the society. This is because the internship program is underutilized by the dental institutions for services at the grass root level and dental health needs of our geriatric population are overlooked.[20] Organized school dental health programs are lacking so that children may learn right oral practices from the beginning and make aware regarding harmful effects of substance abuse. Moreover, faster growing population of our country, rapid westernization, and lack of resources are increasing the burden of dental disease. Tobacco abuse is further causing menace for not only the poor and disadvantaged but also civilized population. Early initiation of tobacco habits is the cause of increased morbidity in younger generations.[24]

**Self-medication for Dental Conditions**

Self-medication is a universal phenomenon which is practiced globally with a varied frequency of up to 68% in European countries and with a prevalence rates of 31–60% in the Indian subcontinent.[24] In India, retail drug stores remain the most important medium of distribution with an extensive customer outreach. Nowadays, in India, it is common practice that patient may choose the varied range of practices, therapies, and treatments. It has been reported that majority of the people did not know what medications they are taking.[8] The main reasons for self-medication include higher cost of dental treatment, long queues in the hospital, and lack of access to dental services.[20,27] The health hazards due to dental self-medication cannot be overlooked since many people do not view their practices as self-medication.

**Improving Oral Health through Mobile Dentistry**

The introduction of mobile clinics into public health dentistry dates back to 1924.[25] They have been successfully used to provide dental treatment to schools, disabled patients, rural communities, industries, and armed forces of various countries. They may offer a viable option to address the issues of oral health-care delivery for an extensive underserved population in a developing country like India with scarce resources. Currently, MDVs are used for community training and rural posting for dental interns and postgraduates of the Department of Public Health Dentistry in India.[26] However, in some of the institutions, MDVs are predominantly used for curative services rather than preventive. Personnel with no qualification or training perform duties of chair-side assistant and peon in community programs. There should be active participation of postgraduates and staff of public health dentistry department during any outreach program. Preventive services such as fissure sealants and fluoride application should also be available during dental camps. MDV programs operational in postgraduate institutions have to rectify shortcomings regarding the facilities and manpower to improve the efficiency.

**Dental Tourism and Public Health**

In the true sense, “Dental Tourism” implies to those individuals who travel from their area of residence to another location to avail dental services.[29] Indian dental market is showing a gradual increasing trend toward dental tourism. Dental tourism provides the possibility of both helping and hindering public health causes. On the one hand, procedures may become more accessible for those who cannot afford them or who live in an area where they are not available. On the other hand, dental tourism may be limiting the availability of providers as they perform procedures more profitably for out-of-town visitors, whom they can charge more. Because of the current lack of empirical research, we do not know if this is a positive or negative contribution to society. The data on dental tourism are sparse, and, hopefully, given the growing dental tourism market, the incentive to engage in such research will also grow.[29]

**Research and Programs on Dental Public Health**

Research in the field of dentistry is progressing at mightier speed worldwide. The situation of dental research in India is still in the nascent stage even though we have more than 300 dental colleges in India, which are more than any number as compared to other countries.[31] However, the representation of India toward DPH research on the international platform is negligible.[32] The newer opportunities in DPH research are epidemiological studies for the development of vaccines to prevent oral diseases, salivary proteomics in screening of oral cancers, epigenetics,
During 2001–2002, a series of 13 cessation clinics were renamed as tobacco cessation centers, and the network of tobacco cessation clinics was further expanded in 2005 to cover five new clinics in regional cancer centers in five states of which two centers were in the northeastern states of Mizoram and Assam, having high prevalence of tobacco use. The tobacco cessation clinics were renamed as tobacco cessation centers, and their role was expanded to include training on cessation and developing awareness generation on tobacco cessation.

National Tobacco Control Programme

To strengthen implementation of the tobacco control provisions under COTPA and policies of tobacco control mandated under the World Health Organization Framework Convention on Tobacco Control, the Government of the India piloted National Tobacco Control Programme (NTCP) in 2007–2008. The program is under implementation in 21 out of 35 states/union territories in the country. In total, 42 districts are covered by NTCP at present. The internal monitoring of implementation of COTPA in 21 states, where the NTCP is under implementation has revealed that only about half of the states (52%) have mechanisms for monitoring provisions under the law. Although 15 states have established challenging mechanism for enforcement of smoke-free rules, only 11 states collected fines for violations of bans on smoking in public places. Similarly, a steering committee for implementation of section-5 (ban on tobacco advertisements, promotion, and sponsorship) has been constituted in 21 states, but only three states collected fines for the violation of this provision. Similarly, enforcement of a ban on the sale of tobacco products to minors and bans on the sale of tobacco products within 100 yards of educational institutions also remains largely ineffective in many states.

On a positive note, the country has also witnessed examples of community-level initiatives for tobacco control, for example, tobacco-free villages and educational institutions being reported from many states. Even before the revised smoke-free rules came into effect, Chandigarh was the first city to be declared smoke-free in 2007. This is an excellent example of partnership of state administration and civil society for tobacco control in the country. Sikkim was the first state in the country to be declared smoke-free in 2010. Steps have been taken to incorporate tobacco control in the curriculum of undergraduate medical and dental curriculum to equip medical and dental graduates with skills for tobacco control, especially tobacco cessation.

Conclusion

The rapid growth of dental professionals has not helped the public health system as a whole. Moreover, a major imbalance exists in the distribution of public health dentists across different states. There is a need to broaden the scope of this specialty and to make it more practical. Proper orientation on this subspecialty of dentistry from the under graduation level is the need of the hour. More public health dentists should be recruited in the government/public sector to raise awareness regarding oral health problems. Utilization of MDVs is indispensable for the treatment camps, but preventive services should also be given importance. DPH education programs should be implemented on a priority basis to make people aware of the dangers of self-medication. There should be inclusion of dental health programs with family welfare programs by the government like in other developed countries. Political, social, organizational (both government and nongovernmental), professional dedication and support are needed to make oral health of this country comparable with general health.

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