

Medical-Dental Integration-Achieving Equity in Periodontal and General Healthcare in the Indian Scenario

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ABSTRACT

Aims: Dentistry and medicine have been treated as separate entities by healthcare professionals as well as the populace since a long time. Although dentistry as a standalone entity has achieved considerable progress, there is a significant inequity in the accessibility, affordability, and acceptability of dental care among various socioeconomic strata in the community. Moreover, it is becoming increasingly evident that oral diseases and systemic diseases often share multiple risk factors. Management of oral and systemic diseases as distinct units often results in duplication of care and wastage of resources. This paper gives information on the models of medical-dental integration and possible methods for integrating the same into Indian healthcare scenario. **Materials and Methods:** A literature search was performed in PubMed/MEDLINE, CINAHL, Web of Science, and Google Scholar for articles pertaining to medical-dental integration. The data obtained were collated. **Results:** Literatures show that different modalities for medical-dental integration are in practice. However, there is a paucity in conceptual models that may be applied to bring about such an integration into the Indian healthcare system. **Conclusion:** Integration of medical and dental care would pave the way for equity in health care for everyone. Conceptual models for integrating oral disease surveillance into systemic disease have been proposed in this paper.

KEYWORDS: Dentistry, equity, health insurance, integrated care, medical care

THE CONUNDRUM OF DENTISTRY: A STANDALONE ENTITY!

The practice of dentistry in ancient times was a crude companion to the practice of medicine, and the barber surgeons of medieval times handled oral cavity with the same ease as the rest of the body and performed procedures such as cupping, leeching, and tooth extraction.^[1] Even as science progressed, the treatment for the diseases of the teeth became more of a glorified mechanical task. By mid-nineteenth century, two self-trained dentists, Chapin Harris and Horace Hayden, approached the physicians at the University of Maryland in Baltimore with the idea of adding training in dentistry to the medical curriculum bolstered by their belief that dentistry was as much

a part of scientific healthcare as medicine. However, the attempt to integrate dentistry as a scientific component of medical practice was stone-walled by the physicians at the University as they felt that the subject of dentistry was inconsequential.^[1] In 1840, the first Dental School was established in Baltimore, and dentistry emerged a separate established profession.^[1] The modern scientific practice of dentistry flourished as a standalone entity and specializations arose in diagnosis and treatment of oral pathologies, pediatric care, esthetic and functional care of the adult dentition,

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and dental public health. The professional autonomy and professional independence granted by the practice of dentistry as a separate entity resulted in rejection of attempts made in later centuries to integrate dentistry with medicine.^[1] The segregation of medicine and dentistry was further strengthened by the development of medical insurance.^[2] Insurance schemes to cover dental expenses were introduced decades after the introduction of medical insurance. The medical and dental insurance coverage had a fundamental difference, in that the design of the medical insurance allowed it to cover large, unpredictable expenses, whereas dental insurance was intended to cover predictable and lower-cost preventive care.^[3] In developed countries, 19% of the out-of-pocket healthcare expenditure is attributed to dental care,^[4] whereas an estimated 7% of households in low- and middle-income countries have faced cataclysmic expenditure for dental health.^[5] Government funding for oral healthcare is low with minimal insurance coverage for dental healthcare procedures. Payment for dental care has become a substantial burden for households in over 41 low- and middle-income countries. In India where out-of-pocket expenditure (OOPE) is the primary source of healthcare expenditure, dental treatment is often neglected due to the expenditure sustained,^[4] especially among the vulnerable population such as the socioeconomically disadvantaged sections of society, seniors, children, etc. An inverse relationship has been observed between social position and dental disease, which in turn is associated with an inverse relationship between risk exposure and social position.^[4] The access to dental care is obstructed at three levels: the microlevel which includes the individual and psychological barriers; the mesolevel which has the social processes and community structures that affect the access to dental care; the macrolevel barrier in which the population-wide structures and policies can affect the care obtained.^[6] Summarizing the current scenario, it can be said that in countries in which healthcare benefits exist, dental care is often not included in the benefit package, resulting in dental problems being uncared for or being handled in the emergency department. In other countries in which majority of the population is bereft of healthcare benefits, dental care is ignored, resulting in a significantly impaired quality of life. Thus, dental disease, termed the “silent epidemic” by the U.S. Surgeon General, has become a significant preventable public health challenge of the twenty-first century.^[7]

ORAL AND SYSTEMIC HEALTH NEXUS

The importance for oral health care was emphasized through several researches in the past few decades that

have shown that oral diseases can impact systemic health through direct and indirect pathways.^[8,9] Thus, the need for maintaining oral health to facilitate general health improvement became a driving force behind the campaigns to promote oral health. Oral health care alone utilizes US\$110 billion yearly in the USA, and in the European Union, it utilized €79 billion in the years 2008–2012,^[10] whereas the global spending on general health was US\$ 7.8 trillion in 2017 or about 10% of GDP and \$1080 per capita.^[11]

It was observed that oral diseases and major chronic diseases such as diabetes, chronic respiratory disease, cardiovascular disease, cancers, and certain chronic neurological diseases share multiple risk factors^[12] such as tobacco use, hyperglycemia, physical inactivity, stress, and abdominal obesity.^[13,14] A study by Stearns *et al.*^[15] has shown that preventive oral health programs are cost-effective and reduce the additional payments for hospital visits even in relation to systemic health conditions. However, oral disease prevention programs usually take the back seat when the decision-makers consider the allocation of healthcare resources.^[16] In this scenario, the co-occurrence of behavioral and demographic factors that predispose toward major chronic disease in the same individual shows an avenue for preventive care through reduction of common risk factors, which can be implemented through a medical-dental integrated approach.

ORAL HEALTHCARE INTEGRATION

The Health Resources and Services Administration (HRSA) has described initiatives for incorporating oral health into primary medical care practice and training of primary healthcare professionals in oral health assessment and clinical competencies.^[12] Integration of preventive dental care into general healthcare practice can help prevent duplication of care modalities and cost involved. Six levels of integration have been described by HRSA, and the key element involved in the integration changes from communication, physical proximity to practice change.^[17] The first and second levels of integration are minimal collaboration and basic collaboration at a distance, respectively, where communication is the key element bringing about the integration. The third and fourth levels of integration, in which physical proximity is the key element, are basic collaboration onsite and close collaboration onsite with some system integration. The fifth and sixth levels of integration involve practice change wherein we have close collaboration with an integrated practice and full collaboration with a merged, integrated practice.^[17] The HRSA has advocated three

interrelated components to facilitate the integration of oral health into primary care practice. The first of these is to develop a core set of oral health clinical competencies for primary healthcare providers. The clinical competencies can be divided into five domains and are given in Table 1.^[18] The second component is to identify the systems necessary to implement the core oral health clinical competencies. HRSA, through the analysis of the various systems involved, has identified finance, healthcare systems, and healthcare professions with an overarching influence of communications as the systems critical for implementation of core competencies.^[18] Identification of tactics to bring about training in core competencies among the primary healthcare providers with emphasis on the three identified systems is the third and final component to facilitate the oral health integration.^[18]

HEALTHCARE SYSTEM IN INDIA

Five major sectors in health care exist in India, that is, the Public Health Sector, Private Sector, Voluntary Health Agencies, National Health Programs, and Indigenous Systems of Medicine.^[19] The public health sector includes the primary health care; hospital or health centers such as the community health centers, specialist hospitals, teaching hospitals; agencies like the defense services and railways; and health insurance schemes such as the employee's state insurance scheme and Central Government health scheme which provides for comprehensive medical care along with optical and dental aids at reasonable rates.^[19]

The majority of healthcare needs in India is met through OOPE, and insufficient provisioning of healthcare facilities along with a predominance of privatized health sector degenerates the financial status of the poor and marginalized groups of the population.^[20] The role of safety net practices which include providers who organize and deliver a significant level of health care and other needed services to uninsured is critical

for the care of the relegated population. National Social Assistance Program (NSAP), National Rural Employment Guarantee Act (NREGA), and Rashtriya Swasthya Bima Yojana (RSBY) are some of the schemes in practice in India to support the needs of the susceptible population and thus provide essential commodities for the vulnerable.^[21,22]

ORAL HEALTHCARE SYSTEM IN INDIA

Dental care in India is provided at dental institutions which may be in the government or private sector or government-aided private dental institutions and hospitals, private clinics, and in primary health centers. The financing of dental care in India is predominantly through the OOPE; however, there are Stand Alone Dental Insurance Plan which is provided by the popular dental care product companies, Dental Insurance Cover as part of General Health Insurance Plan, in which general insurance companies provide dental insurance as part of their own general health insurance schemes.^[19]

According to the National Health Profile (NHP) 2018, the government employs 2.7% of over 2.7 lakhs dentists registered under the Dental Council of India, that is, about 7239 dentists and hence the average number of people to receive the services of one government dentist is 1.76 lakhs. In contrast, the number is 11,082 people per government medical practitioner.^[23] Previously, the services rendered by government primary-healthcare facilities had not included delivery of dental health care^[24]; however, Ayushman Bharat, the healthcare reform introduced in India, does have oral health care as one of the services provided under this scheme.^[24,25] Currently, oral healthcare services in India is primarily paid as out-of-pocket expense. Proportions of households facing catastrophic health expenditure (CHE), impoverishment, and out-of-pocket payments for dental care in India are 19.4, 9.2, and 6.8, respectively.^[26]

Table 1: Core set of oral health clinical competencies for primary healthcare providers divided into five domains^[18]

Core clinical domain	Oral health delivery framework-action
Risk assessment	Ask simple questions to evaluate the presence of factors that can affect oral health as oral questions or a questionnaire (e.g. specific medication)
Oral health evaluation	Look for simple signs of oral diseases Decide on the course of action through assessment of the risk factors, oral health status, preference of the patient and family
Preventive intervention	Act by initiating preventive strategies to reduce the risk factors and referral to dental/medical specialist as the situation indicates
Communication and education	Provide education regarding importance of oral health care and risk reduction for overall health improvement
Inter-professional collaborative practice	Document appropriately for data support and referral in a patient-specific manner

Apart from the financial concerns, there is an extreme disparity in the dentist to population ratio in the urban and rural areas. The WHO recommendation for the dentist-to-population ratio is 1 for 7500.^[23] In India, most of the dentists are concentrated in the urban areas resulting in a dentist-to-population ratio of 1 for 50,000 in the rural India.^[23] Availability of an adequate dental workforce and ability to pay for dental care affect the accessibility to dental care in India, and the economic consequences of dental care are devastating.^[26] Thus, oral diseases, of which the most common ones are dental caries and periodontal diseases, which are largely preventable, are often unheeded by the vulnerable and underprivileged members of the society and result in healthcare inequity. This paper focusses on integrating periodontal care into primary healthcare practice, thereby reducing the economic burden associated with periodontal care.

INTEGRATING PERIODONTAL CARE INTO PRIMARY HEALTH CARE

Periodontitis is a major public health problem that reduces quality of life and is a monumental burden to the healthcare economy.^[27] Global cost of lost productivity due to severe periodontitis is estimated to be 54 billion USD/year.^[28] The prevalence of periodontal disease in India has been estimated to be in the range of 86.5–100%.^[4] It has been observed by Kassebaum *et al.*^[29] that the Disability Adjusted Life Year (DALY) rate [years per 1000] for oral conditions for India is 2–2.5. The DALY rate per 100,000 for periodontal diseases among age-standardized Indians is 111.39 and 102.12 for males and females, respectively.^[30] In order to stress on the importance of periodontal health for general health and the potential for economic benefit of basic periodontal therapy, Jeffcoat *et al.*^[31] had analyzed the dental insurance claims data from 2005 to 2009 for patients who were diabetic, had coronary artery diseases, or were pregnant, and they showed that non-surgical periodontal therapy resulted in 40–74% reduction in medical costs and hospitalizations compared with those who had untreated periodontal disease. However, it is lamentable to note that though these diseases and conditions have multiple shared risk factors, they are treated as distinct entities.

The present scenario of medical and dental care leads to separate pathways, and often there is duplication in the care rendered in areas where overlap of risk factors exists. There is a predominance of the vertical program of disease management as demonstrated by the national health programs of India that are in place for the control of malaria, tuberculosis, and HIV/

AIDS. These programs ignore the local determinants leading to ill health, and there is focussed management of a single disease or condition even though the patient might be experiencing multiple diseases including oral diseases with a common etiology but with different manifestations.^[32] In the Indian healthcare scenario, this is particularly significant as health care in India is primarily focussed on curative aspects than preventive aspects.^[32] It is imperative that measures for integration of periodontal disease into systemic disease surveillance be brought in at the earliest in the healthcare setup in India, so that a comprehensive preventive oral and general healthcare system be brought into the forefront.

The barriers to the integration range from confining the dental treatment to emergencies, relief of pain, limited care in rural areas, reluctance to follow a common risk factor approach, lack of resources and high cost of dental services, lack of awareness regarding oral health, absence of policy defining the integration at education, and service delivery to payment of physicians for oral care.^[6] These barriers can be overcome through integration of oral health education into medical curriculum,^[33] a public–private extension to reduce the health gap in urban and rural areas, incorporation of oral health care in national primary healthcare policies, development of oral health education booklets for allied health professionals, and inclusion of basic oral care training in the training manual of healthcare workers.^[6]

INTEGRATING PERIODONTAL CARE INTO PRIMARY HEALTH CARE — THE INDIAN SCENARIO — THE WAY FORWARD

Equity in health care should be the fundamental principle when devising plans to integrate periodontal and oral health care into the general healthcare system. This can be achieved through equal access and equal utilization of health care for those who have equal needs and equal or more importantly equitable health outcomes.^[4]

Dental-medical integration can be through referral system, virtual integration, shared financing, co-location, and full-integration.^[34] In India, the community-based assessment checklist for early detection of non-communicable diseases (NCDs) takes into consideration age of patient, smoking, alcohol consumption, measurement of waist, physical activities for a minimum of 150 min in a week, and family history of high blood pressure, diabetes, heart disease.^[35] The risk factors being assessed for early detection of NCDs are similar to the risk factors for periodontal disease.^[13]

Incorporation of evaluation of periodontal status into the assessment checklist can be an excellent maneuver to bring about integration of periodontal disease into NCD surveillance. This may be considered as one concept to integrate medical-dental care in India

[Figure 1]. There are several risk assessment tools for periodontal disease assessment which can be incorporated into the NCD risk assessment tools.^[36] Following the basic risk assessment, the individuals at high risk can be referred to primary health centers, in

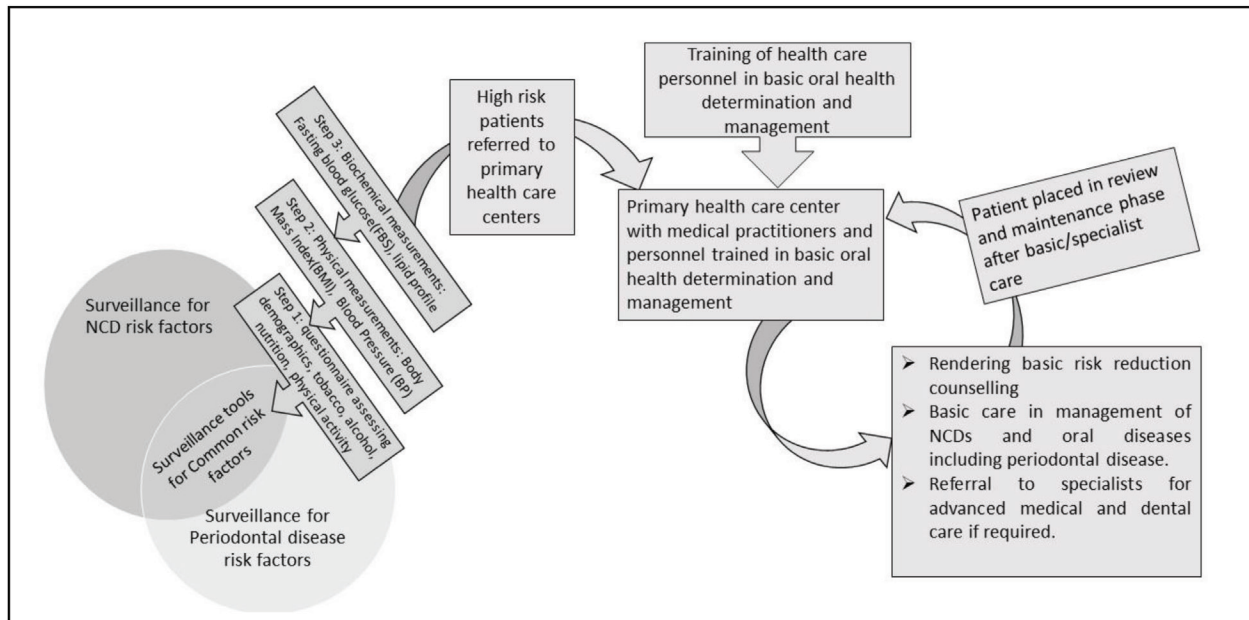


Figure 1: Entry points of medical-dental integration

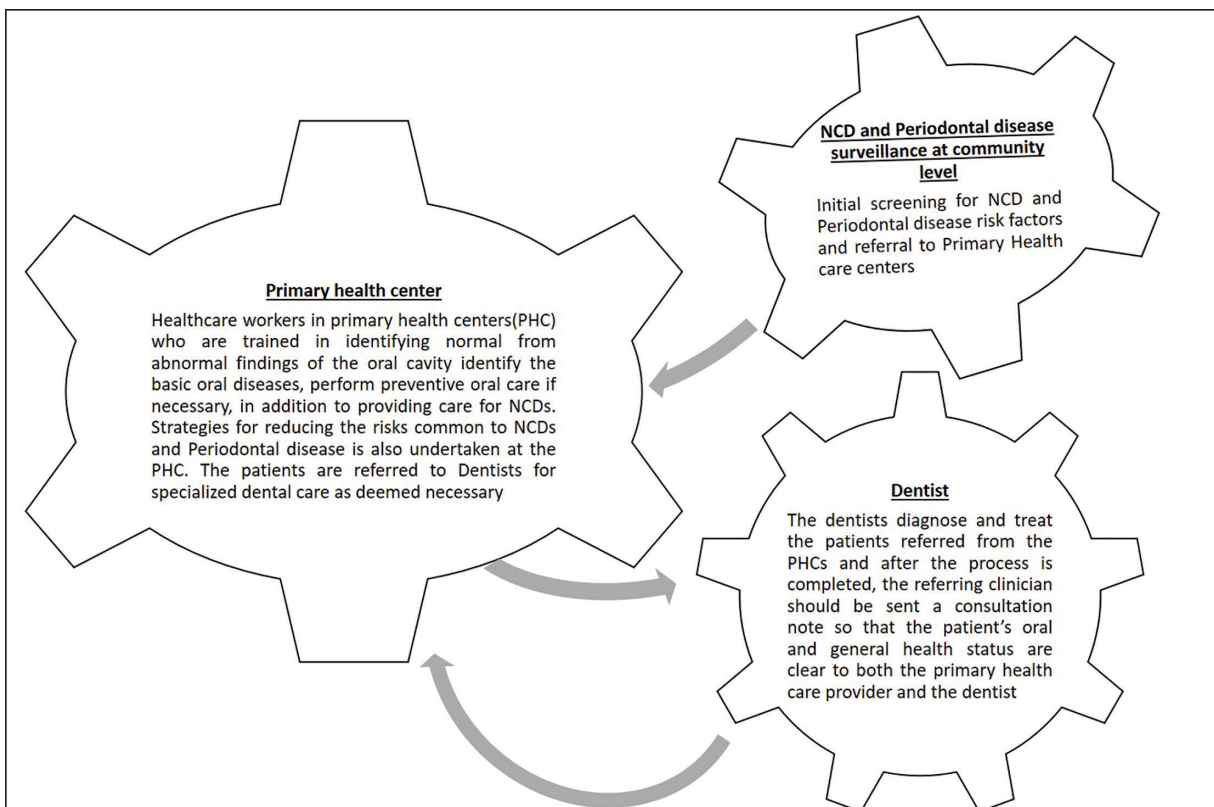


Figure 2: Overview of the medical-dental integration model

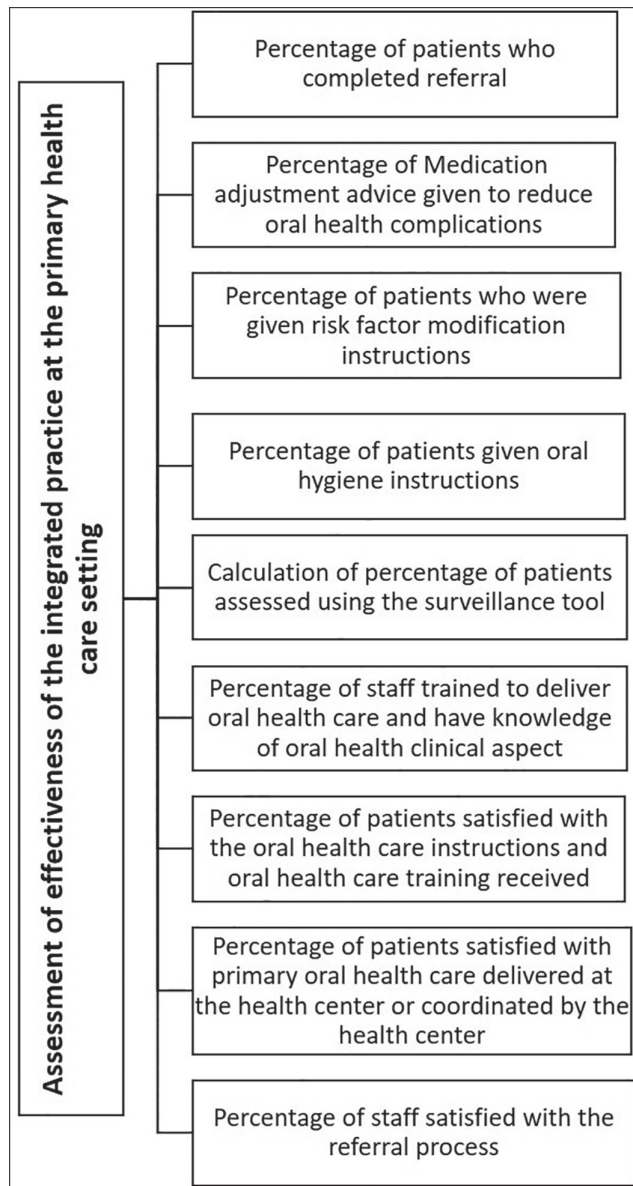


Figure 3: Assessment of the effectiveness of integrated practice at the primary healthcare setting^[37]

which primary healthcare personnel trained in basic oral health examination can assess the oral health status in addition to the systemic health status. For this concept to be brought into effect, training in basic oral health examination must be provided for the personnel in primary healthcare center.

The primary healthcare teams can be trained in the anatomy of teeth and periodontal tissue so that they can distinguish the abnormal from normal. The care team can also be trained in risk reduction strategies to reduce or modify the risk factors including modification of medications likely to cause dental problems. They can also establish and maintain relationship with dentists similar to the interactions with medical/surgical

specialties which would be useful for patient referral and clinical case discussions.^[37] The dental care team to whom the patients are referred has the responsibility to see, diagnose, and treat patients referred by primary care teams and once the process is completed, the team should send a consultation note to the referring clinician so that the patient's oral and general health status is clear to both the primary healthcare provider and the dentist.^[37] The schematic diagram for the model of medical-dental integration is given in Figure 2. The methods to assess the effectiveness of the integrated practice at the primary healthcare setting range from calculation of percentage of patients assessed using the surveillance tool to the percentage of staff satisfied with the referral process,^[37] and these methods are listed in Figure 3.

Training of the primary healthcare providers in oral health care competencies and identification of the critical stakeholders who form the integral components of systems involved in the integration process such as the financial element and development of the policies to implement the integration process are the key components of the medical-dental integration process. An efficient cross referral and risk reduction strategy has to be brought into effect for the smooth functioning of the integration process. The process of integration in accordance with this model may be initiated by development of a surveillance tool for risk factor surveillance of both systemic diseases and oral diseases. Training of healthcare professionals in basic oral health screening and employing such trained personnel in primary healthcare setup followed by appropriate referral systems would be integral in bringing about the implementation of the conceptual model 1.

The above-mentioned strategy would facilitate the integration of medical and dental care at the service level. But, in a country like India where efforts to achieve healthcare equity is overshadowed by the disconnect between the different branches of health care, it would be more beneficial to consider an integration of the oral and general health care at the grass root level [Figure 4]. The knowledge of oral health care and general health care should not be mutually exclusive. The integration from the basic level can help develop a holistic approach to health care.

CONCLUSION AND CLINICAL IMPORTANCE

The segregation of medical and dental care has resulted in a significant increase in the healthcare burden with a duplication in the care delivered since the fact that oral diseases share several risk factors with systemic diseases is often ignored. The increasing cost of health

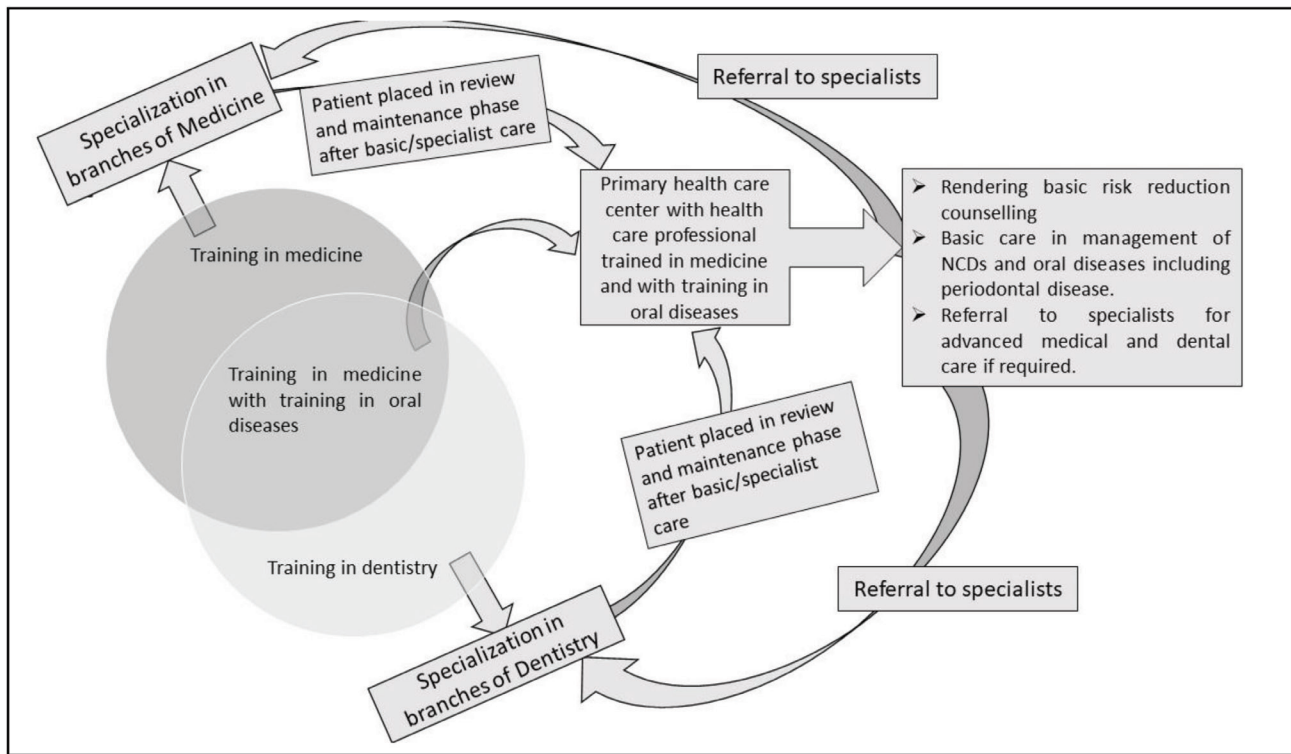


Figure 4: Workflow of medical-dental integration model

care has resulted in an inequity in the affordability of health care including oral and periodontal health care among the marginalized and vulnerable population. India has a high prevalence of NCDs and oral diseases including periodontal diseases. A possible solution to achieve equity in oral health care is through integration of oral health care with general health. This integration may be achieved through incorporation of periodontal and oral health surveillance along with the NCD surveillance at the community level. Preventive dental care may be delivered at the Primary Health Centers in which the healthcare workers can be trained in a core set of oral health clinical competencies. Another concept for integration involves a breach in the barrier between dentistry and medicine with a basic training of the medical professionals in oral health care. The path to materialization of the integrated medical-dental care would be tortuous; however, once the destination is achieved, it would pave the way for an acceptable, affordable, and accessible healthcare system for all.

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There are no conflicts of interest.

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