PORTABLE AND MOBILE DENTISTRY: TREATMENT AT YOUR DOORSTEP: A REVIEW LITERATURE

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Abstract

Aim: The prime aim of this article is to explore the literature on portable dentistry and give an outlook to community.

Materials and Methods: A search was performed using three databases, Pub-Med, Scopus and Google Scholar. The keywords for the survey were “mobile dentistry”, “portable dentistry”, “mobile dental clinic”, ”oral health” and “mobile health units”. After the relevant articles were found the critical appraisal was made to select those that were suitable for the systematic review. The inclusion criteria of the study were surveys, clinical studies, no sample size restrictions, and only English language papers.

Results: From a total of 19 papers from different databases, 16 papers fulfilled the inclusion criteria.
Conclusion: Portable mobile dentistry can be used to dispense comprehensive oral health care including oral treatment and education given to the underserved population at same place and same time.

Key-words: Mobile Dentistry, Portable Dentistry, Mobile Dental Clinic, Oral Health and Mobile Health Units

Introduction:
India is the 2nd most populous country in the world with urban population estimated to be 377.1(31.2%) million and rural population was 833.1 million (68.8%). In India, 70% dentists are practicing in urban rather than rural areas. One of the most important indices of human growth is providing basic oral health amenities and their proper utilization.

It is very important to provide basic oral health services to people that have difficulty in gaining access to the traditional dental services. Portable and mobile dental clinics provides an innovative solution to provide dental amenities to vulnerable population.

Mobile dental clinic eliminates the geographic and transportation barrier by providing facilities to population such as low socio economic population, new immigrants and seasonal workers, people who are homebound, bedridden, homeless people with mental illness, vulnerable as well as pregnant women, the elderly and school children. In India, the oral health care services are usually provided through a network of primary health centers, community health centers, private hospitals and clinics.

Mobile dental clinic act as the first line of oral health care treatment to educate and motivate people in remote areas and thus, helps to improve the basic oral habits. Mobile dental delivery systems includes portable dental chair, dental x-ray unit, autoclave, oxygen cylinder, model and posters and dental unit waterlines, suction system.

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**Materials and Methods**

A literature search has been performed by two review authors independently in three different databases, Pub-Med, Scopus and Google Scholar, for articles published from 2013 to 2020. At first, two different authors independently analyzed the selected articles according to titles and abstracts, which were related to this study. To avoid missing any related articles during the initial search, we have analyzed the references of the selected studies. Duplicate and cross-referenced studies were removed, records were screened according to inclusion and exclusion criteria, full-text studies were assessed for eligibility, and qualitative synthesis was carried out. The keywords for the survey were “mobile dentistry”, “potable dentistry”, “mobile dental clinic”, ”oral health” and “mobile health units”. After the relevant articles were found, the critical appraisal was made to select those that were suitable for the systematic review. The inclusion criteria of the study were surveys, clinical studies, no sample size restrictions, and only English language papers. Any conference abstracts, case reports, and unpublished data were excluded from this study.

**Results**

Of 39 articles, 19 abstracts were recruited. These 39 articles were found through the databases. Finally, 16 studies were selected for the review. Three articles were rejected as they included case reports, pilot studies, and incomplete data. All the published articles were written in English. From a total of 19 papers from different databases, 16 papers fulfilled the inclusion criteria. We did not find any papers by hand searching. Very few studies examined portable and mobile dentistry.

**Brief history:**
Mobile dentistry started in Canada by formation of the Canadian army dental corps on 13th May 1915. In 1917, the Cleveland chapter of the preparedness league of the American dentists presented a dental ambulance to the army in the name of red cross which include 4 dentist and one or two assistants operated the van. During world war II there was increased use of mobile dental clinic. PRASAD (Philanthropic Relief, Altruistic Service and Development) project started first mobile dental clinic in Tansa Valley, in Maharashtra, India, 1991. It was under the guidance of Swami Muktananda. This was a non-profit organization committed to improve the quality of oral health treatment.

**Specifications in mobile dental clinic:**

The mobile dental clinic is equipped with 1-2 dental chair with seating space for 15-20 people, operating light, a suction system, dental x-ray unit, autoclave machine, glass bead sterilizer, metal cabinets with dental unit waterlines, stabilizer, generator, health education models, public address system, water tanks (4000 liters capacity), oxygen cylinder, first aid kit for dental purpose. More complex portable unit includes a vacuum, ultrasonic scaler, radiographic equipment along with compressors for air water syringes and high and low handpieces. According to many studies report, these suction system and dental unit waterlines consisted of planktonic or sessile bacterial flora. They can promote biofilm formation. It can be real risk of infection for patient and dental team. So, it should be regularly cleaned and sterilized.

**Applications of mobile and portable dental services**

- Educating the school children
- Screening of the population for various oral disease.
- Provide basic oral health services to underprivileged areas.
- It will also enable care for the elderly in their homes or care facilities.
- It is also used to serve the remote areas to provide basic dental health care including oral prophylaxis, restorations, extraction.
- Provide both curative and preventive services in homebound settings.\(^6\)

**Advantages**

Overall, mobile dental services are more approachable, have moderate cost set up and are less prone to mechanical difficulties\(^7\) and thus can be used efficiently to alleviate the value of oral health care within the community. It also eliminates the transportation barrier for patient’s. Services are easily available to local people. These basic oral health services are made available at multiple sites.

**Disadvantages**

Mobile dental units are not completely self-reliant as they are dependent on electricity\(^1\). Another limitation is that patients do not receive continuous treatment once the MDUs leave\(^8\). Also, they may not be suitable for more complex procedure such as complex oral surgeries, endodontic treatment.\(^10\) Maintenance of these mobile dental clinics are quite high. One of the main limitation of mobile dental clinics are that they are difficult to use during monsoon period and a major disadvantages are seen in mountainous villages where access of portable dental van is restricted\(^8\)

**Discussion**

After thorough analysis of several literatures, revealed a growing interest in the use of portable dentistry. Portable dentistry has a promising future in the field of dentistry\(^2\). Portable dental services provides an innovative solution for solving the imbalance of dentist population ration between urban and rural areas, lack of establishment of dental clinic for vulnerable and needy population in rural areas and urban slums\(^11\). Many studies were conducted on national and...
international platforms. Once such study done by Shobha Tandon et al, it was found that mobile dental clinic prove to be an effective adjunct to the oral health services provided by dental colleges and private practitioner. Another study conducted by Jackson DM et al, it was found that factors essential to the program success included sustained funding for operating costs. The portable dental units were seen as reliable equipment for dealing and assisting in mountainous regions where there is lack of transport.

**Mobile Dental Services in Developing Countries and India**

A collaborative program conducted in 2008-2009 between Government of India – WORLD HEALTH ORGANISATION (GOI-WHO) Study of utilization of mobile dental van in rural population around Lucknow, India. The results of this program revealed that the oral dental treatment provided as well education generated through MDV was significant.

A project commenced by a non-profit charitable trust, *Faith works India*, titled “healing touch – a mobile health care project of specialists for the needy”, had successfully provided quality medical and dental care to the needy population. The role of non-governmental organizations in promoting oral health was also highlighted by this program.

A study was conducted in Selangor Malaysia, to evaluate the satisfaction with school dental service provided through mobile dental squads under four domains of satisfaction namely patient personnel interaction, technical competency, administrative efficiency and clinical set up. It was found that 62% of the beneficiaries were satisfied with the services offered by the mobile dental squads.

In developing countries with huge population providing dental care becomes difficult for the government and health administrative and thus portable dental services can act as an effective adjunct to provide treatment to the population on large scale.
Summary and conclusion:

Portable dentistry has emerged to be an effective and efficacious way to provide dental services to the doorsteps of rural masses, school premises and urban slums through maximal utilization of dentists and dental institution. Overall, portable mobile dentistry can be used to dispense comprehensive oral health care including oral treatment and education given to the underserved population at same place and same time. The mobile dental services if efficiently implemented can make the community receptive to such an extent that the unfelt needs becomes felt needs and the felt needs becomes demands. The dental equipment is satisfactory but has a few faults which includes inflexibility and stiffness of the equipment and thus also limits the dental procedure that can be performed by the dentist. The overview of this article suggests that even though there are many limitations with portable dentistry, the potential advantages surpass these limitations.

MOBILE DENTAL CLINIC DEALS COMMUNITY AS A WHOLE.

Conflict of Interest: Nil

Source of Funding: Self- Funded

Acknowledgement: The authors wish to thank the faculty and Head of the Public Health Dentistry of Saraswati Dental College for all the support and help rendered.
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