

## ORIGINAL ARTICLE

## UTILIZATION OF SERVICES AND REFERRALS THROUGH DENTAL OUTREACH PROGRAMS IN RURAL AREAS OF INDIA. A TWO YEAR STUDY.

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### ABSTRACT

**Background.** Oral health care services are often sparse and inconsistent in India therefore it is often difficult for poor people to get access to the oral health care services. The approach by dental institutions with the help of community outreach programs is a step ahead in overcoming this situation.

**Objectives.** The study was conducted to evaluate the number of patients, disease pattern and the services provided in the outreach programmes and also effectiveness of patient referral.

**Methods.** A retrospective study was conducted and the data were obtained from records of outreach programs conducted, in last 2 years by Pacific Dental College and Hospital. The data were analysed using descriptive statistics for the computation of percentages *Chi-square* test was applied to know the association of effectiveness of referral with age and gender. Confidence level and level of significance was fixed at 95% and 5% respectively.

**Results.** A total of 22982 individuals in the age group of 4-80 years attended the outreach program. Dental caries (42.3%), periodontal diseases (63.2-69.0%) and dental fluorosis (33.7-35.0%) were commonly observed diseases. Effectiveness of referral was significantly high among the middle age adults and females ( $P < 0.05$ ). The effectiveness of referral was highly improved in 2013 after establishment of certain guidelines and strategies.

**Conclusion.** The approaches by dental institutions with the help of community outreach programs can spread awareness and disseminate treatment and thereby enhancing access to care and eliminating access to care within the rural communities.

**Key words:** motivation, utilization, referral, rural population, retrospective study

### INTRODUCTION

India is drawing the world's attention, not only because of its population explosion but also because of its prevailing as well as emerging health profile and profound political, economic and social transformations. The policies implemented so far that concentrate only on growth of economy not on equity and equality, have widened the gap between 'urban and rural' and 'haves and have-nots'.

Health is a fundamental human right and a universal human need that is same for people from all cultures

and walks of life. General health cannot be attained or maintained without oral health. The mouth is regarded as a mirror and gateway to health. As poor oral health affects morbidity more than mortality, the people as well as the government view oral diseases and conditions as less important than other life-threatening diseases. Thus, oral health programs get less priority in India. In India, the prevalence of dental caries is 50 - 60% and periodontal disease is about 90%. Absolute prevalence of these two dental conditions is expected to increase from 8000 lakhs in year 2000 to about 9800 lacs in 2015, together [1].

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India is the largest democracy and the second most populated country in the world. However, about 70% of the people of India are residing in the villages [2]. Transportation is difficult and expensive, and oral health care services are often sparse and inconsistent. Most villages receive the services of a dentist for a week, a year and often only the most urgent cases are seen. Dentistry faces serious problems regarding accessibility of its services to all. Due to significant geographic imbalance in the distribution of dental colleges, a great variation in dentist to population ratio in the rural and urban areas is seen. It is often difficult for poor people to get access to the oral health care services. The dentist: population ratio of India, on date is 1: 10,000. However, the reality is that; in rural India 1 dentist is serving over a population of 2,50,000 [3]. There has been an increase in the number of dental colleges in India over the last 50 years to over 292 dental colleges which graduated about 30,570 dentists in 2010 [4].

The distribution pattern of the dental colleges across various states of India is uneven. It can be said that, Karnataka state population will be privileged to have highest number of dentists compared to states like Gujarat, Himachal Pradesh, Bihar etc [4]. This situation leads to unequal distribution of dentists across the states affecting their dentist: population ratio. Additionally, only a few of dental specialists are trained in public health dentistry, the specialization that would typically practice in rural areas [5]. The low number of dentists in rural areas, a distribution perpetuated by the current landscape of professional oral health training, is a significant barrier to access for rural village residents.

According to the 2011 India census, Udaipur has a population of 3067549, Urban = 571178, Rural = 2496371, making it the sixth largest city of Rajasthan [6]. Presently, there are around 100 private dental clinics and 2 recognized dental institutions providing oral health care services to the population of Udaipur district.

The Department of Public Health Dentistry of Pacific Dental College and Hospital provides basic & advanced health promotion to an individual and group of people, prevention of dental diseases & awareness of oral hygiene in rural population, basic treatment in rural areas through mobile dental clinic and helps to achieve good oral hygiene & health awareness in public through organized community efforts. Thus the approach by dental institutions can help most of total population of India. Hence the present study was conducted to evaluate the number of patients, disease pattern and the services provided in the outreach programmes and also effectiveness of patient referral.

## MATERIAL AND METHODS

### *Study design*

A retrospective study was conducted using the data collected from the various outreach programs conducted by Pacific Dental College and Hospital in last 2 years (January 2012- December 2013).

### *Ethical clearance*

The study protocol was reviewed by the Ethical Committee of Pacific Dental College and Hospital and was granted ethical clearance. Official permission to conduct the study was obtained from the principal of Pacific Dental College and Hospital.

### *Details of outreach programme*

Outreach dental camps are routinely conducted by Pacific Dental College & Hospital, Udaipur in order to provide the dental services to rural communities. The institute conducts two weekly camps and others as and when organized. The services provided in the camps include patient education, thorough dental examination and consultation, oral prophylaxis, temporary and permanent restorations, extractions along with distribution of free medicines. Patients attending the outreach camps are first registered and then undergo an initial examination. Any diagnosis and required treatment is explained to the patient, followed by oral hygiene instructions. Depending on the chief complaint, a treatment plan is made and explained to the patient. Patients are referred to the dental clinics of the institute if the treatment cannot be provided at the camp site.

### *Data collection*

The data of all the patients attending the outreach program was obtained from the records maintained by the Dept of Public Health Dentistry, Pacific Dental College and Hospital included in the study. The data included general demographic information, the information about the diagnosis, treatment as well as referral of the patients. All the data was obtained in March 2013.

### *Statistical analysis*

The data were analyzed using SPSS version 15 (SPSS Inc. Chicago, IL, USA). The descriptive statistics were used to describe the type of patients, pattern of oral diseases, services provided and referrals made in the outreach programs. *Chi-square* test was applied to know the association of effectiveness of referral with age and gender. Confidence level and level of significance was fixed at 95% and 5% respectively.

## RESULTS

A total of 22,982 patients visiting the outreach programs in 2012 (n=12,283) and 2013 (n=10,669) conducted by the Department of Public Health Dentistry of Pacific Dental College and Hospital were included in the study (Table 1).

Table 1. Overview of No. of camps and patients in 2 years

Year	No. of camps	Total numbers of patients
2012	71	12283
2013	63	10699
Total	134	22982

Table 2 shows the frequency distribution of study subjects attending the outreach programs according to their age and gender. The maximum number of patients in 2012 (26.3%) and 2013 (25.1%) belonged to the age group of 46-60 years and minimum number of patients in 2012 (14.5%) and 2013 (16.5%) attending outreach program were in the age group of >60 years. The male attendance (62.7% in 2012, 60.8% in 2013) was more than female attendance (37.3% in 2012 and 40.2% in 2013).

Table 2. Distribution of study subjects according to age and gender

Variables	Year		
	2012	2013	
Age (years)	≤ 15	2011(16.3)	1710(16.1)
	16-30	2478(20.1)	2197(20.5)
	31-45	2774(22.5)	2314(21.7)
	46-60	3233(26.3)	2678(25.1)
	>60	1787(14.5)	1770(16.5)
Gender	Males	7698(62.7)	6488(60.8)
	Females	4585(37.3)	4211(39.2)
Total		12283	10699

Table 3 shows the distribution of study subjects according to oral disease and utilization pattern of services at the outreach programs. The prevalence of dental caries was found to be 43.2% in both 2012 and 2013, periodontal diseases comprised of 69% in 2012 and 63.2% in 2013. Dental fluorosis was seen among

Table 3. Distribution of study subjects according to oral diseases and their pattern of utilization of services at camp sites

Disease	2012 n (%)					2013 n (%)				
	Total no. of cases diagnosed	Utilization of services at camp sites				Total no of cases diagnosed	Utilization of services at camp sites			
		Scaling	Restoration	Extraction	Any other		Scaling	Restoration	Extraction	Any other
Dental caries	5309 (43.2)	-	2017 (37.9)	1061 (19.9)	93 (0.7)	4613 (43.2)	-	1965 (42.5)	893 (19.3)	112 (1.1)
Gingivitis	5206 (42.3)	1997 (38.3)	-	-	-	4639 (43.4)	1519 (32.7)	-	-	-
Periodontitis	2671 (26.7)	1316 (49.2)	-	407 (15.2)	113 (4.2)	2115 (19.8)	1271 (47.5)	-	260 (12.2)	88 (0.8)
Fluorosis	4380 (35.7)	-	-	-	-	3860 (33.7)	-	-	-	-
Others	856 (7)	-	-	-	-	1240 (11.6)	-	-	-	-

Table 4. Distribution of subjects according to referral and effectiveness of referral

Disease	Referral n(%)		Effectiveness of referral n(%)	
	2012	2013	2012	2013
Dental caries	2231(18.2)	1813(16.9)	479(21.4)	931(51.3)
Gingivitis	1103(8.9)	890(8.3)	207(18.7)	789(88.6)
Periodontitis	1551(12.6)	1309(12.2)	269(17.3)	981(74.9)
Fluorosis	748(6.1)	849(7.9)	79(10.5)	88(10.3)
Others	698(5.7)	991(9.2)	480(68.7)	731(73.7)
Total	6331(51.5)	5852(54.5)	1514(23.9)	3520(55.5)

35.7% in 2012 and 33.7% subjects in 2013. The other conditions included fractured teeth, severe malocclusion, and soft tissue lesions which were found to be 7% in 2012 and 11.6% in 2013.

Services utilized by the subjects included oral prophylaxis (87.5% in 2012 and 80.2% in 2013), restorations (37.9% in 2012 and 42.5% in 2013), and extractions (35.1% in 2012, 31.5% in 2013).

Table 4 shows distribution of study subjects according to referral and effectiveness of referral. A total of 51.5% patients were referred to the Pacific Dental College and Hospital for treatment in the year 2012. Among them only 23.9% visited the dental college while in the 2013 year 55.5% of the total patients referred (54.5%) visited the dental college and hospital.

Table 5. Association of effectiveness of referral with age and gender.

Variables		2012 n(%)	2013 n(%)	P value
Age (years)	≤ 15	259(12.8)	515(30.1)	P=0.001
	16-30	339(13.6)	850(38.6)	
	31-45	461(16.6)	907(39.1)	
	46-60	309(9.5)	697(26.1)	
	>60	146(8.1)	551(31.1)	
Sex	Males	882(11.4)	1814(27.9)	P=0.001
	Females	632(13.7)	1706(40.5)	
Total		1514	3520	

Test applied: Chi-square, statistical significant set at P≤0.05

Table 5 shows the effectiveness of referral which was significantly higher among the middle age subjects (16-60 years) than the children and older adults ( $P=0.001$ ). It was also higher among females than males ( $P=0.001$ ).

## DISCUSSION

Dentistry is undergoing tremendous change, with advances being made in both diagnosis and treatment. However, oral healthcare services are often sparse, expensive and are not readily available to all patients, especially those living in rural areas. Even as the technological aspects of dental practice in developed countries make rapid progress, people in rural areas of developing and underdeveloped countries continue to be deprived of basic oral health. The utilization of health care services also depends upon health attitudes, social structure and social demographic factors along with affordability, accessibility and the need for use of services. Community outreach programme is a step ahead in overcoming this situation and hence the present study was conducted to evaluate the number of patients attending, disease pattern, services provided in the outreach programmes and the effectiveness of patient referral.

In the present study it was found that most of the patients attending the dental outreach program were in the age group of 16-60 years (67%), hence lesser utilization was found by the children and older individuals (>60 years of age) which was in agreement with other studies [7,8]. It has been reported that utilization peaks in middle Ages and then declines dramatically with increasing age [9].

The presence of males was found to be higher at outreach programmes than females but upon referral the proportion of utilization of services by females was significantly higher than males ( $P<0.001$ ). This may be attributed to the motivation provided to them regarding importance of oral care which would have made a higher impact than males and moreover studies have reported that females visit dentist more often than men [10, 11, 12]. This may be because women have an aesthetic focus and a desire to look attractive and hence pay more attention to the appearance of their teeth. The literature also suggests that females frequently perceive the impacts of oral health impairment on quality of life as being greater than males [13].

The disease pattern showed that prevalence of periodontal disease was highest (63.2-69%) followed by dental caries (42.3%) and fluorosis (33.7-35%) among the rural patients attending the outreach programmes. Prevalence of dental caries in India is 50-60% [1]. The prevalence of dental caries in the present study (42.3%) is comparatively lower. This is may be due to

the presence of normal or excess amounts of fluoride in drinking water of Udaipur district. In Udaipur district the tehsils in which majority of the villages have fluoride content more than 1.5 ppm are Mavli, Salumber and Sarada [14]. *Kotecha* et al. found a dental caries prevalence of 39.53% and 48.21% in high and normal fluoride villages of Vadodara district respectively [15]. Similar findings were observed earlier by *Tsutsui* et al. in Japanese communities [16] and also by *Mascarenhas* among Lithuanian children [17]. In the present study prevalence of fluorosis (35%) was similar to the findings of study conducted by *Jain* et al. They found that the prevalence of dental fluorosis ranged from 33.1% in low, 33.3% in moderate and 33.6% in high fluoride areas of Bhil tribal area in Udaipur [18]. The prevalence of periodontal disease was as high as up to 69% among the subjects visiting the outreach programmes. These findings were in accordance to National Oral Health Survey 2002-2003 [19].

The most common services provided in the outreach programmes were oral prophylaxis followed by restorations and extractions. Those patients to whom treatment could not be provided at camp sites were referred to Pacific Dental College and Hospital. The effectiveness of referral was maximum among middle aged population and minimum among children and older adults. Out of the total referred patients only 23% visited the Pacific Dental College and Hospital in 2012. In such situations the flight of fancy of the organizing committee or hospital ends up in despair as lesser referrals get generated in spite of spending so much time and putting a lot of efforts.

Difficulty in gaining access to oral health facilities as a result of poor transport system, living in rural areas, disability and poor systemic health have been well described in the dental literature as the barriers to utilization of oral health care services. Expensive nature of dental treatment is also one of the major barriers reported in literature [20]. Certain myths also have been proved to be a hurdle in utilization of dental services among the rural population like tooth loss is an extension of old age, eating tobacco prevents caries, dental diseases can be cured by medicines alone, tooth extraction leads to loss of vision, and oral prophylaxis causes loosening of teeth [21]. Keeping in mind the various factors that hindered the patients visit to the utilization of dental services at the Pacific Dental College and Hospital, the Department of Public Health Dentistry laid down certain guidelines and strategies to improve the effectiveness of referrals by end of 2012.

1. During examination emphasis were made on explaining to the patients about the importance of oral hygiene, diseases associated, and thus encouraging them to develop a positive attitude towards dental treatment

2. Patients referred through camps were benefitted with basic oral health services free of cost and complex treatment procedures at subsidized costs.
3. Those patients undergoing complex treatments required multiple appointments. For such patients especially the elderly and those having transportation difficulties provision for accommodation was made free of cost.
4. More emphasis was made on School based screening and motivation programs.
5. Provision of free transportation to nearby villagers.

In 2013 proportion of patients attending Pacific Dental College and Hospital after referral was increased to 55.5%. School based screening and motivation programs significantly improved the percentage of children's attendance (30.1%) at the dental college. *Hebbal et al.* (2005) also found that the dental attendance of the school children in need of treatment at Bapuji Dental College and Hospital of Davangere, India was significantly improved due to school based screening and motivation [22]. Also the proportion of older adults utilizing the dental services at Pacific Dental College and Hospital increased from 8.1% in 2012 to 31.1% in 2013. In a study conducted by *Parlani et al.* (2011) the prosthodontic need fulfillment of older adults of rural areas of Lucknow increased from 3.5% to 13.6% after education and motivation [21].

Thus a wide gap that is created between the actual dental needs of the rural population and the demand for dental care can be bridged by motivating people through community outreach programs.

## CONCLUSIONS

Dental outreach programs can be solutions to spread awareness and disseminate treatment. Thus the approach by the dental institutions with the help of community outreach programs can meet the needs of the rural population and build oral health infrastructure and capacity to reduce the prevalence and impact of oral diseases, enhance access to care and eliminate disparities.

### Conflict of interest

*The authors declare no conflict of interest.*

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