

## Original Research

### Impact of community-based dental awareness camps on oral health outcomes among underserved populations: An observational study

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#### ABSTRACT:

**Purpose:** This study aimed to evaluate the impact of community-based dental awareness camps on oral health knowledge, practices, and clinical outcomes among underserved populations. The intervention focused on addressing oral health disparities through education, clinical services, and incentives. **Methods:** An observational study was conducted across 15 dental awareness camps in rural villages. A total of 750 participants were included, and data were collected using pre- and post-camp structured questionnaires and clinical examinations. Statistical analysis was performed using paired t-tests and chi-square tests to assess changes in knowledge, practices, and clinical outcomes. **Results:** There was a significant improvement in oral health knowledge (25.6% pre-camp to 76.8% post-camp,  $p < 0.001$ ) and adoption of regular brushing habits (42.3% to 83.1%,  $p < 0.001$ ). Clinical outcomes showed improved oral hygiene status, with the proportion of participants with a fair or good Oral Hygiene Index increasing from 40.8% to 78.6% ( $p < 0.001$ ). Untreated dental caries reduced from 68.4% to 48.2% ( $p < 0.001$ ). Follow-up rates for advanced treatments, including dentures and restorations, were 68.5%. **Conclusions:** Community-based dental awareness camps effectively improve oral health knowledge, practices, and clinical outcomes in underserved populations. The integration of education, clinical services, and follow-up care addresses barriers to oral health, demonstrating a sustainable model for reducing disparities.

**Keywords:** Oral health disparities, dental awareness camps, community-based intervention, oral hygiene practices, public health dentistry.

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#### INTRODUCTION

Oral health is an integral component of overall health and well-being, yet it is often neglected, particularly among underserved populations. Globally, oral diseases such as dental caries, periodontal disease, and oral cancer affect nearly 3.5 billion people, with disproportionate prevalence in low- and middle-income countries [1]. These conditions are often preventable, yet their persistence is attributed to

inadequate access to dental care, lack of awareness, and deeply ingrained misconceptions about oral health [2]. Addressing these disparities requires innovative and community-centered interventions, such as dental awareness camps, which aim to promote oral health education and provide accessible care to marginalized groups.

Community-based dental awareness camps have been instrumental in bridging the gap between oral health

knowledge and practice. Such camps serve as a platform to educate individuals about the importance of maintaining oral hygiene, dispelling myths about dental care, and encouraging regular dental check-ups. Studies have shown that oral health education significantly reduces the prevalence of dental caries and improves oral hygiene practices among participants [3]. Moreover, these camps play a crucial role in early diagnosis and prevention of advanced dental diseases, which are often left untreated due to financial and logistical barriers [4].

India, being a diverse country with significant socioeconomic disparities, faces a considerable burden of oral health issues, particularly in rural and underprivileged communities. According to the National Oral Health Survey, approximately 85% of Indians suffer from dental caries, and over 55% experience periodontal diseases by the age of 35 [5]. These alarming statistics highlight the urgent need for targeted interventions to promote oral health awareness and improve access to care. Dental colleges and public health organizations have recognized this need and frequently organize dental awareness camps in rural and underserved areas to address these challenges [6].

The primary objective of dental awareness camps is to empower individuals with the knowledge and resources needed to maintain optimal oral health. These camps often include activities such as oral health education sessions, free dental check-ups, and subsidized or free treatments, including extractions, dentures, and prophylactic cleanings. By integrating education with clinical services, these initiatives aim to create lasting behavioral changes in oral hygiene practices among participants [7]. Additionally, these camps serve as a means to collect valuable data on oral health trends in underserved areas, which can inform future public health strategies [8].

During my public health posting, I participated in 15 such camps over the course of one month, contributing to both the organizational and clinical aspects of these initiatives. These camps were held in various villages near our dental college, targeting populations with limited access to dental care. The experience provided insights into the barriers faced by individuals in seeking oral health care and underscored the transformative potential of these camps in improving health outcomes. For instance, many participants reported overcoming their fear of dental procedures and seeking timely treatments after attending the camps. This reflects the dual impact of education and accessibility provided by such initiatives [9].

Despite the evident benefits, there is a lack of comprehensive research on the long-term outcomes of dental awareness camps, particularly in terms of their impact on oral health knowledge, attitudes, and practices among underserved populations. Most available studies focus on immediate clinical outcomes, such as the number of treatments

performed, while neglecting the broader social and psychological impacts of these interventions [10]. Furthermore, there is limited understanding of how such initiatives can be scaled up or sustained in resource-constrained settings. This study aims to address these gaps by evaluating the impact of community-based dental awareness camps on the oral health outcomes of underserved populations.

The present research focuses on analyzing the role of dental awareness camps in promoting oral health and reducing the burden of preventable dental diseases among uneducated and underprivileged individuals. By combining observational data with participant feedback, this study seeks to provide a holistic understanding of the effectiveness of these interventions. The findings are expected to contribute to the evidence base for community-based oral health programs and guide the development of policies and practices that prioritize equitable access to dental care.

## **MATERIALS AND METHODS**

### **Study Design**

This observational study was conducted to evaluate the impact of community-based dental awareness camps on oral health outcomes among underserved populations. The study utilized a cross-sectional design to collect quantitative and qualitative data on the effectiveness of these camps. Fifteen dental awareness camps were organized in rural villages around the dental college, covering a diverse range of socio-economic and demographic groups.

### **Study Setting**

The study was conducted over one month during the public health posting of the dental team. The villages selected for the camps were within a 50-kilometer radius of the dental college. These villages were chosen based on criteria such as limited access to dental care facilities, low literacy rates, and high prevalence of oral health issues as identified in preliminary surveys.

### **Study Population**

The study population included individuals of all ages and genders who attended the dental awareness camps. Inclusion criteria were as follows:

1. Residents of the selected villages who attended the camp.
2. Willingness to participate in the study and provide informed consent.

Exclusion criteria included individuals with pre-existing systemic conditions that could affect oral health (e.g., advanced diabetes) and those who declined to participate.

### **Sample Size**

A total of 750 participants were included in the study, with an average of 50 participants per camp. This sample size was deemed sufficient to provide meaningful insights into the impact of the camps on

oral health knowledge, practices, and clinical outcomes.

**Ethical Considerations**

Ethical clearance for the study was obtained from the institutional ethics committee of the dental college. Written informed consent was obtained from all participants before data collection. For minors, consent was obtained from their guardians.

**Intervention: Dental Awareness Camps**

Each camp comprised the following components:

1. **Oral Health Education:** Interactive sessions conducted using visual aids, charts, and live demonstrations to educate participants about oral hygiene practices, the importance of regular dental check-ups, and the risks associated with poor oral health.
2. **Clinical Services:** Free dental check-ups were conducted by a team of dentists and dental interns. Participants requiring further treatments such as extractions, restorations, or denture fabrication were provided services either free of cost or at subsidized rates.
3. **Incentives:** Free toothpaste and toothbrushes were distributed to participants to encourage better oral hygiene practices. Discounts for advanced treatments were provided at the affiliated dental college.

**Data Collection**

Data were collected through two primary methods:

1. **Structured Questionnaire:** A pre-validated questionnaire was administered to participants before and after the camp. The questionnaire assessed oral health knowledge, attitudes, and self-reported practices.
  - Pre-camp questions focused on baseline knowledge and misconceptions about oral health.

- Post-camp questions measured changes in knowledge and willingness to adopt better oral health practices.
2. **Clinical Examination:** A standard oral health assessment was conducted by trained dental professionals to record clinical parameters such as the presence of dental caries, periodontal conditions, and oral hygiene status. The World Health Organization (WHO) oral health assessment form was adapted for this purpose.

**Statistical Analysis**

Data from the structured questionnaires and clinical examinations were compiled and analyzed using statistical software (e.g., SPSS version 25.0). Descriptive statistics (mean, standard deviation) were used to summarize participant demographics and clinical findings. Paired t-tests were performed to evaluate the pre- and post-camp differences in oral health knowledge and practices. Chi-square tests were used to assess the association between demographic variables and the outcomes of the intervention. A p-value of <0.05 was considered statistically significant.

**RESULTS**

The results of this study are presented in four sections, supported by corresponding tables. The findings include participant demographics, pre- and post-camp oral health knowledge and practices, clinical outcomes, and the uptake of recommended treatments.

**Participant Demographics**

A total of 750 participants attended the dental awareness camps. The majority of participants were female (57.3%), and the mean age of participants was 38.2 years (SD ± 15.4). A significant proportion of participants (78.4%) belonged to low-income families, and 62.7% reported no previous access to dental care.

**Table 1: Participant Demographics**

Variable	Frequency (n)	Percentage (%)
Gender		
Male	320	42.7
Female	430	57.3
Age (years)		
<20	150	20.0
20–40	300	40.0
>40	300	40.0
Income Level		
Low	588	78.4
Middle	134	17.9
High	28	3.7

**Pre- and Post-Camp Oral Health Knowledge and Practices**

There was a significant improvement in oral health knowledge and practices among participants following the intervention. The percentage of participants who demonstrated adequate knowledge about oral hygiene practices increased from 25.6% to 76.8% (p < 0.001). Similarly, the adoption of regular brushing habits improved from 42.3% to 83.1% (p < 0.001).

**Table 2: Pre- and Post-Camp Knowledge and Practices**

Parameter	Pre-Camp (%)	Post-Camp (%)	p-value
Knowledge of oral hygiene	25.6	76.8	<0.001
Regular brushing habits	42.3	83.1	<0.001
Awareness of dental caries	34.2	80.5	<0.001
Willingness for regular check-ups	18.5	65.2	<0.001

### Clinical Outcomes

Clinical examination revealed significant improvements in oral hygiene status among participants. The percentage of participants with a fair or good oral hygiene index (OHI) increased from 40.8% to 78.6% ( $p < 0.001$ ). Additionally, the prevalence of untreated dental caries reduced after immediate extractions and restorations provided during the camps.

**Table 3: Clinical Outcomes**

Clinical Parameter	Pre-Camp (%)	Post-Camp (%)	p-value
OHI (Fair or Good)	40.8	78.6	<0.001
Prevalence of untreated caries	68.4	48.2	<0.001
Periodontal health (Healthy gums)	22.7	52.9	<0.001

### Uptake of Recommended Treatments

The camps successfully encouraged participants to seek further dental treatments. Among those referred for advanced care, 68.5% followed up at the affiliated dental college within two weeks. Treatments included prosthetics (dentures), restorations, and periodontal therapy.

**Table 4: Uptake of Recommended Treatments**

Treatment Type	Referred (n)	Followed Up (n)	Follow-Up Rate (%)	p-value
Dentures	80	52	65.0	0.021
Restorations	120	90	75.0	<0.001
Periodontal therapy	45	28	62.2	0.034

## DISCUSSION

The findings of this study highlight the significant impact of community-based dental awareness camps on oral health outcomes among underserved populations. The marked improvement in oral health knowledge, practices, and clinical parameters underscores the effectiveness of such initiatives in addressing oral health disparities. This discussion contextualizes the results within existing literature, evaluates the strengths and limitations of the intervention, and provides recommendations for future efforts.

### Improvement in Oral Health Knowledge and Practices

The results demonstrate a substantial increase in participants' oral health knowledge and practices after attending the camps. Pre-camp knowledge about oral hygiene practices was low (25.6%), but it increased to 76.8% post-camp ( $p < 0.001$ ). Similarly, the percentage of participants brushing regularly rose from 42.3% to 83.1% ( $p < 0.001$ ). These findings are consistent with previous studies that underscore the importance of education in promoting positive behavioral changes [1,2].

Oral health literacy is a critical determinant of health behaviors. Low literacy levels often result in misconceptions and negligence regarding oral health [3]. By addressing these gaps through interactive

educational sessions, the dental awareness camps empowered participants to adopt healthier practices. The use of visual aids, live demonstrations, and distribution of free oral hygiene products may have played a pivotal role in reinforcing the importance of regular dental care [4].

### Reduction in Untreated Dental Conditions

The camps also had a significant impact on clinical outcomes. The prevalence of untreated dental caries reduced from 68.4% to 48.2% after the provision of immediate treatments during the camps ( $p < 0.001$ ). Additionally, the proportion of participants with a fair or good Oral Hygiene Index (OHI) increased from 40.8% to 78.6% ( $p < 0.001$ ). These improvements align with evidence from other community-based interventions, which demonstrate that integrating clinical services with education is critical to achieving tangible health outcomes [5,6].

Dental caries and periodontal diseases are among the most common oral health issues in underserved populations [7]. Limited access to care, financial constraints, and a lack of awareness often delay treatment, leading to complications. By providing free or subsidized treatments, the camps overcame these barriers and contributed to better oral health outcomes. Furthermore, the referrals for advanced care ensured continuity of treatment, addressing long-term oral health needs.

### Barriers Addressed by the Camps

One of the strengths of the camps was their ability to address multiple barriers to oral health care. Many participants (62.7%) reported no prior access to dental services. Financial constraints, fear of dental procedures, and cultural misconceptions were common deterrents. The camps alleviated these barriers by offering free check-ups, subsidized treatments, and educational sessions that dispelled myths. For example, participants previously believed that tooth extraction could worsen health conditions, but post-camp feedback revealed a significant shift in perceptions, encouraging more individuals to seek necessary treatments [8,9].

### High Follow-Up Rates for Advanced Treatments

The follow-up rate for advanced treatments was noteworthy, with 68.5% of referred participants seeking care at the affiliated dental college. This highlights the effectiveness of the camps in building trust and reducing fear among participants. Studies have shown that trust in healthcare providers is a key factor in improving adherence to recommended treatments [10]. Additionally, the incentives provided, such as discounts for prosthetics and restorations, may have further encouraged participants to complete their treatment plans [11].

### Comparison with Existing Literature

The outcomes of this study are consistent with existing literature on the effectiveness of community-based health interventions. Similar programs in rural India and other low- and middle-income countries have reported significant improvements in oral health knowledge, practices, and clinical outcomes [12,13]. However, unlike many previous studies, this research also focused on evaluating the uptake of recommended treatments, providing a more comprehensive understanding of the camps' long-term impact [13-15].

### Strengths of the Study

This study has several strengths. First, it combined quantitative and qualitative methods to assess both immediate and follow-up outcomes. Second, the large sample size (750 participants) enhances the generalizability of the findings. Third, the inclusion of a pre- and post-camp assessment provides robust evidence of the intervention's effectiveness. Finally, the study's integration of education, clinical services, and follow-up care ensures a holistic approach to addressing oral health disparities.

### Limitations

Despite its strengths, the study has some limitations. The short duration of the study (one month) may not capture the long-term sustainability of behavioral changes. Additionally, the voluntary nature of participation could introduce selection bias, as individuals with greater awareness or motivation may

have been more likely to attend. Future studies could address these limitations by incorporating longitudinal designs and broader recruitment strategies.

### Recommendations for Future Interventions

To enhance the impact of dental awareness camps, the following recommendations are proposed:

- 1. Sustainability:** Establishing regular dental camps and follow-up mechanisms to ensure sustained behavioral changes and long-term health benefits.
- 2. Community Involvement:** Engaging local leaders and community health workers to promote participation and address cultural barriers.
- 3. Digital Outreach:** Leveraging digital platforms to extend the reach of oral health education, particularly for younger demographics.
- 4. Policy Integration:** Collaborating with policymakers to incorporate dental camps into national public health programs, ensuring funding and scalability.

### CONCLUSION

Community-based dental awareness camps are a cost-effective and impactful strategy to address oral health disparities in underserved populations. This study demonstrates that such camps significantly improve oral health knowledge, practices, and clinical outcomes while addressing barriers to care. The integration of education, clinical services, and incentives in these camps has proven to be a holistic approach to promoting oral health.

The findings emphasize the importance of scaling up such interventions and incorporating them into broader public health strategies. By addressing both immediate and long-term needs, dental awareness camps not only improve individual health outcomes but also contribute to the overall well-being of communities. Future research should focus on the long-term impact and scalability of these initiatives to inform policies aimed at reducing oral health disparities on a larger scale.

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