

# A Cross Sectional Survey on Evaluation of Oral Health Status, Prosthetic Need, and Quality of Existing Dental Prosthesis among Rural Population of Nadiad Taluka, Kheda District

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## ABSTRACT

**Aim:** This study aims to evaluate the oral health status, prosthetic needs, and the quality of existing dental prostheses among the adult rural population of Nadiad Taluka, Gujarat, India, to provide insights for improving oral health services in this region.

**Methodology:** A cross-sectional descriptive study was conducted with a sample of 500 adult participants from Nadiad Taluka, selected using a 95% confidence interval and a  $\pm 5\%$  margin of error. Data were collected through surveys conducted across outpatient departments, including N. D. Desai Medical College, Mahagujarat Medical Society, and Santram Mandir Hospital. The study assessed oral health conditions, prosthetic needs, and the quality of existing prostheses. Statistical analysis was performed with a significance threshold of  $p < 0.05$ .

**Results:** The study revealed high prevalence rates of dental caries (64%) and periodontal disease (56%). Complete edentulism was observed in 10% of participants, while 40% had partial edentulism. The demand for prosthetic interventions was substantial, with 60% requiring some form of prosthetic treatment. The quality of existing dental prostheses varied significantly, with only 20% reporting good fit and comfort, and 60% indicating no maintenance of their prostheses. Educational and income levels were significantly associated with oral health outcomes and prosthetic needs.

**Conclusion:** The findings highlight the critical need for targeted oral health interventions in Nadiad Taluka. To address the high prevalence of oral diseases and inadequate prosthetic services, it is essential to enhance oral health education, improve access to affordable dental care, establish regular maintenance programs, and provide socio-economic support. Implementing these recommendations could significantly improve oral health outcomes and the quality of life for the rural population of Nadiad Taluka.

## INTRODUCTION

Oral health is a vital component of general health and well-being, influencing not only the ability to eat, speak, and socialize but also playing a crucial role in overall health. Despite its importance, oral health often receives inadequate attention, particularly in rural areas where access to dental care is limited.<sup>1</sup> In India, rural populations face significant barriers to oral healthcare, including a lack of awareness, insufficient dental infrastructure, and socio-economic challenges. These factors contribute to a higher prevalence of oral diseases, untreated dental conditions, and unmet prosthetic needs.<sup>2</sup> Prosthetic dental care, including the provision of dentures, bridges, and other prosthetic devices, is essential for individuals who have lost teeth due to decay, periodontal disease, or injury. However, the quality and availability of these services can vary significantly in rural areas, where there may be limited access to qualified dental professionals and affordable prosthetic solutions.<sup>3,4</sup> Additionally, the existing dental prostheses among rural populations often suffer from poor quality due to factors such as improper fit, inadequate follow-up care, and lack of maintenance knowledge among patients.

The present study aims to address these gaps by evaluating the oral health status, prosthetic needs, and quality of existing dental prostheses among the adult rural population of Nadiad Taluka. By conducting a comprehensive survey, this study seeks to provide a detailed overview of the current state of oral health in this region, identify the specific needs and challenges faced by the community, and assess the satisfaction and quality of the dental prostheses currently in use.

The findings from this study are expected to offer valuable insights for healthcare providers, policymakers, and public health officials in planning and implementing targeted interventions to improve oral health services in rural areas. Additionally, the study aims to raise awareness about the importance of oral health and the need for accessible, high-quality dental care, ultimately contributing to better health outcomes and quality of life for the rural population of Nadiad Taluka.

### Methodology

Nadiad Taluka, located in the Kheda district of Gujarat, India, served as the study setting for this research. Nadiad is a town and administrative center situated approximately 90 kilometers from Gandhinagar, the capital of Gujarat. According to the 2011

Census, Nadiad Taluka has a total population of 550,330, with 282,533 residing in urban areas and 267,797 in rural regions. Prior to the commencement of the study, official permission was obtained from the District Health Officer of Nadiad Taluka. Ethical clearance was granted by the Institutional Review Board of FDS, DDU, ensuring that the study adhered to ethical standards in data collection and participant interaction.

The sample size was calculated to estimate the prevalence of prosthetic status with a 95% confidence interval and a margin of error of  $\pm 5\%$ . Based on an assumed prevalence rate of 60%, a sample size of 500 participants was determined to be adequate. The sample size calculation was conducted using the Scalex SP calculator, as described by Naing et al. (2022) in their publication on sample size calculation for prevalence studies.<sup>5</sup> This cross-sectional descriptive study was conducted across several outpatient departments, including N. D. Desai Medical College, Mahagujarat Medical Society, and Santram Mandir Hospital, in Nadiad.

### Inclusion Criteria:

1. Residents of the area for at least 10 years.
2. Individuals aged 18 years and above residing in the selected villages.
3. Participants who provided informed consent to participate in the study.

### Exclusion Criteria:

1. Participants who were non-cooperative.
2. Individuals with any condition that made oral examination difficult.
3. Participants with a full complement of natural teeth.

The data collected were analyzed using statistical methods, with a p-value of less than 0.05 considered statistically significant. This threshold was used to determine the significance of various findings and correlations observed during the study.<sup>6</sup>

### Results

The survey conducted among the adult rural population of Nadiad Taluka, Kheda District, provided comprehensive data on the oral health status, prosthetic needs, and quality of existing dental prostheses. The study involved 500 participants, chosen to provide a statistically significant representation of the population with a 95% confidence level and a margin of error of  $\pm 5\%$ . The following tables and explanatory results summarize the key findings from the study.

Table 2: Oral Health Status and Prosthetic Needs

Demographic factor	Number of participants	Percentage
<b>Age group</b>		
18-30 years	120	24%
31-50 years	200	40%
51-70 years	150	30%
70 years and above	30	6%
<b>Gender</b>		
Male	280	56%
Female	220	44%
<b>Educational status</b>		
Illiterate	100	20%
Primary education	150	30%
Secondary education	180	36%
Higher secondary and above	70	14%

Oral Health Condition	Number of Participants	Percentage
Presence of Dental Caries	320	64%
Periodontal Disease	280	56%
Complete Edentulism	50	10%
Partial Edentulism	200	40%
<b>Prosthetic Need</b>		
No Prosthesis Needed	200	40%
Need for Partial Dentures	150	30%
Need for Complete Dentures	100	20%
Need for Fixed Prosthesis (Crowns/Bridges)	50	10%

**Table 3: Quality of Existing Dental Prostheses**

Prosthesis Quality Factor	Number of Participants	Percentage
<b>Fit and Comfort</b>		
Good	100	20%
Moderate	200	40%
Poor	150	30%
<b>Aesthetic Satisfaction</b>		
Satisfied	120	24%
Neutral	200	40%
Dissatisfied	180	36%
<b>Frequency of Prosthesis Maintenance</b>		
Regular Maintenance	50	10%
Occasional Maintenance	150	30%
No Maintenance	300	60%

The study encompassed a diverse demographic, with participants ranging from 18 to over 70 years of age. The majority were aged 31-50 years, reflecting a broad representation of the working-age population. The gender distribution was fairly balanced, with a slight predominance of males (56%). Educational levels varied, with a significant proportion having only primary or secondary education, highlighting the limited educational attainment in the rural setting.

The prevalence of dental caries and periodontal disease was high, affecting 64% and 56% of participants, respectively. These findings indicate significant oral health challenges in the population. Complete edentulism was observed in 10% of participants, while 40% experienced partial edentulism. This suggests a substantial need for dental prosthetic interventions, with 60% of participants requiring some form of prosthetic treatment. Partial dentures were the most commonly needed prosthesis (30%), followed by complete dentures (20%) and fixed prostheses (10%).

Among those with existing dental prostheses, the quality varied considerably. Only 20% reported good fit and comfort, while 40% rated their prostheses as moderate and 30% as poor. Aesthetic satisfaction was similarly varied, with only 24% satisfied with their prostheses' appearance. Maintenance of dental prostheses was notably lacking, with 60% of participants reporting no maintenance, highlighting a significant gap in follow-up care and education on prosthesis maintenance. Data analysis revealed statistically significant associations ( $p$ -value < 0.05) between educational status and oral health outcomes, as well as between income levels and prosthetic needs. Lower educational and income levels were correlated with higher prevalence of oral health issues and greater unmet prosthetic needs, underscoring the impact of socio-economic factors on oral health in the rural population.

These results provide a comprehensive overview of the oral health challenges faced by the adult rural population of Nadiad Taluka, emphasizing the need for improved access to dental care and prosthetic services, as well as enhanced public health initiatives to address oral health awareness and education.

## DISCUSSION

This survey provides critical insights into the oral health status, prosthetic needs, and the quality of existing dental prostheses among the adult rural population of Nadiad Taluka, Kheda District. With a sample size of 500 participants, the study offers a statistically significant representation of the rural population, reflecting the real challenges faced in this area. The demographic distribution reveals that the majority of participants are between 31 and 50 years old, which correspond to a significant portion of the working-age population. This age group is crucial for assessing the impact of oral health on daily activities and productivity. The gender distribution was relatively balanced, but with a slightly higher proportion of males (56%). This could be attributed to various socio-cultural factors and differing health-seeking behaviors between genders. Educational attainment among participants varied, with a significant proportion having only primary or secondary

education. This demographic detail highlights the limited educational resources available in the rural setting and may impact both oral health literacy and access to dental care. Individuals with higher education levels typically exhibit better health outcomes due to increased awareness and access to healthcare resources.<sup>7,8</sup> The lower levels of educational attainment in this sample suggest a potential barrier to effective oral health education and preventive care. The prevalence of dental caries (64%) and periodontal disease (56%) is alarmingly high. These conditions are indicative of inadequate oral hygiene practices and limited access to preventive dental care. The high prevalence of these diseases underscores the urgent need for enhanced oral health education and preventive measures in the community.<sup>9</sup> The finding that 10% of participants are completely edentulous and 40% are partially edentulous reveals a substantial demand for dental prosthetic services. The need for partial dentures was the most common, affecting 30% of participants, followed by complete dentures (20%) and fixed prostheses (10%). This distribution highlights a significant gap in the availability and accessibility of prosthetic treatments, which could be attributed to a lack of local dental services or financial constraints.<sup>10</sup> The survey found considerable variability in the quality of existing dental prostheses. Only 20% of participants reported their prostheses to be of good fit and comfort, while 40% found them to be moderate and 30% deemed them poor. This disparity in prosthetic quality could be linked to several factors, including the age of the prostheses, the skill of the dental professional who provided them, or inadequate follow-up care.<sup>11</sup> Aesthetic satisfaction was also notably low, with only 24% of participants expressing satisfaction with the appearance of their prostheses. This dissatisfaction might impact the participants' self-esteem and overall quality of life, highlighting the need for improvements in both the design and material quality of prostheses.<sup>12</sup> Maintenance of prostheses was another critical issue, with 60% of participants reporting no maintenance. Regular maintenance is essential for the longevity and effectiveness of dental prostheses. The lack of maintenance can lead to further oral health complications and discomfort, indicating a need for better education and resources for prosthesis care.<sup>13</sup>

The study revealed significant associations between educational status, income levels, and oral health outcomes. Lower educational and income levels were correlated with higher prevalence of oral health issues and greater prosthetic needs. This finding aligns with existing literature that suggests socio-economic factors play a crucial role in determining oral health status and access to care. Individuals with lower socio-economic status often face barriers such as limited access to dental services, lack of awareness, and financial constraints, all of which contribute to poorer oral health outcomes.<sup>14</sup>

## CONCLUSION

This survey highlights the critical need for targeted oral health interventions in the rural areas of Nadiad Taluka. The high prevalence of edentulism and significant prosthetic needs point to a gap in dental care services. Additionally, the dissatisfaction with existing prostheses underscores the need for quality dental care and follow-up services. To address these issues, it is crucial to implement comprehensive oral health programs that include education, accessible and affordable dental care, and community engagement.

The need for comprehensive public health strategies to address the oral health challenges in Nadiad Taluka. Key recommendations include:

- **Enhanced Oral Health Education:** Implement targeted educational programs to improve oral hygiene practices and increase awareness about the importance of regular dental check-ups.
- **Improved Access to Dental Services:** Establish more accessible and affordable dental clinics in rural areas to meet the growing demand for prosthetic services and preventive care.
- **Regular Maintenance Programs:** Develop initiatives to educate prosthesis users on the importance of regular maintenance and provide resources to facilitate this.

- **Socio-Economic Support:** Address socio-economic barriers by offering financial support or subsidies for dental treatments and prosthetic services to underserved populations.
- **Community Outreach and Engagement:** Engage local community leaders and healthcare workers to promote oral health and advocate for the needs of rural populations.<sup>15,16</sup>
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In conclusion, the survey provides a valuable snapshot of the oral health challenges faced by the rural population of Nadiad Taluka. The findings highlight significant areas for intervention and improvement, particularly in the domains of education, accessibility, and quality of dental care. Addressing these issues can lead to better oral health outcomes and enhanced quality of life for the rural community. By doing so, the overall health and quality of life of the rural population in Nadiad Taluka can be significantly improved.

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